
Third review of submissions on the WACC for UCLL/UBA

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1 Introduction

Following the publication of the New Zealand Commerce Commission's further draft decision¹ and Oxera's second review report of the expert submissions on the WACC for UCLL and UBA,² the Commission received a third round of submissions from stakeholders. These submissions commented on the Commission's further draft determinations and Oxera's analysis in estimating the asset beta for the provision of UCLL and UBA services in New Zealand. We have reviewed these submissions and the concerns raised by the various experts.

The key issues raised by the submissions were as follows:

- the updates to the asset beta analysis were applied only to the latest estimation window, and betas for earlier time periods were not updated, leading to inconsistencies in the analysis;
- the assumption of an invariant zero debt for all comparator firms introduces a bias within the asset beta analysis, lowering the results.

The remainder of this report addresses the issues raised by the submissions in more detail, and also presents further updates to the asset beta and leverage analysis for Chorus and the comparator set of global telecommunications firms.

¹ Commerce Commission New Zealand (2015), 'Cost of Capital for the UCLL/UBA pricing reviews – Further draft decision', 2 July.

² Oxera (2015), 'Second review of expert submissions on the WACC for UCLL/UBA services', 15 May.

2 Analysis of the submissions and cross-submissions

2.1 Recap and summary of conclusions

Oxera's initial report, published in June 2014, recommended a range of 0.30–0.45 for the asset beta to be used for UCLL and UBA services in New Zealand. This was primarily based on the market data available for Chorus (for which data was available from November 2011).³ The range was also supported by the average two- and five-year betas of the refined international comparator set for the most recent estimation window ending in April 2014. The international comparator set of telecommunications companies was based on those considered by Dr Hird,⁴ but tested for the following criteria.

- **Availability of data**—data on each comparator had to be available, at least for the time since Chorus started trading on 25 November 2011.
- **Nature of network**—comparators with no copper network assets were excluded. This represents a fundamental difference in the core assets of the comparator firm, and therefore in the nature of the business risk.
- **Share of revenues in country of main operation**—comparators with a majority of revenues from overseas operations were excluded. The exposure to exchange rate risks and various regulatory regimes is likely to pollute the asset beta analysis.
- **Liquidity**—a necessary condition for beta estimates is that markets for their securities are sufficiently liquid.⁵ There are several possible measures of liquidity, each with its own limitations. For the purposes of simplicity, only those companies with non-zero trading volumes on at least 80% of all trading days were included in the sample.

Based on the results of these tests, eight out of 31 firms considered by Dr Hird were excluded from our refined comparator set.

Our recommendations remained unchanged during the first round of stakeholder submissions and cross-submissions, as presented in our response paper in August 2014.⁶

The Commission published its draft determinations in December 2014. It was minded to place primary weight on the results based on the comparator analysis and, where available, to use the Chorus beta estimate as a cross-check to the beta values of the refined comparator sample. The draft decision was followed by a second round of stakeholder submissions, received in February 2015. In response, we updated the beta analysis for Chorus and the comparator firms to include data up until 16 March 2015.⁷ In the process, Portugal Telecom was also dropped from the refined comparator sample due to unusually volatile financial data. The updated evidence for the comparator beta companies suggested a marginal increase in their perceived asset risk relative to the results obtained in June 2014, and we revised our recommended range for the asset beta for UCLL and UBA services in New Zealand to 0.30–0.50.

³ Oxera (2014), 'Review of the beta and gearing for UCLL and UBA services', 23 June.

⁴ See Hird, T. (2014), 'Response to Commerce Commission UCLL/UBA WACC consultation paper', March, p. 13.

⁵ Illiquidity imposes additional trading costs on investors, breaching the assumption in the CAPM of zero transaction costs.

⁶ Oxera (2014), 'Review of expert submissions on the WACC for UCLL/UBA', 23 August.

⁷ Oxera (2015), 'Second review of expert submissions on the WACC for UCLL/UBA services', 15 May.

In the third round of stakeholder submissions (summarised in section 2.2), Network Strategies⁸ made a few observations regarding the methodology to update the beta analysis, the measure of central tendency, and the choice of comparators. CEG's⁹ main comment concerned the assumptions regarding debt betas for the comparator firms.

As in our previous response to stakeholder submissions, we have updated our earlier analysis for Chorus and the international comparator set. We continue to observe a gap between the daily and weekly beta values for Chorus (0.35 and 0.52, respectively), and the weekly statistic is likely to remain less reliable.¹⁰ However, the evidence from the international comparator set remains broadly consistent with our March 2015 findings, and we are minded to maintain our recommended range of 0.30–0.50.

The rest of this section expands on responses to the submissions and cross-submissions and presents Oxera's updated analysis.

2.2 Summary of submissions and cross-submissions

Network Strategies commented that, since we had used March 2015 data to update our previous analysis, the relevant comparison for the immediately adjacent time period should have been the five years to March 2010 rather than the five years to June 2009, and that all the estimation windows needed to be shifted forward accordingly. Furthermore, it suggested that it would be prudent to drop Portugal Telecom from all the beta estimation windows (and not just the latest period) for consistency purposes.

In addition, it argued that the median asset beta would represent a better measure for inferring the results of the comparator analysis.

CEG's submission, on behalf of Chorus, argued that debt betas associated with highly leveraged companies would be greater than those for companies with low leverage. As a result, CEG ascertained that the Commission's assumption of an invariant zero debt beta was incorrect and introduced a bias into the results of the analysis. CEG presented analysis for correcting this bias and suggested that it led to an increase of 0.02–0.03 in the asset beta estimates for the comparator sample.

Schroders, on behalf of its clients who are significant investors in Chorus, commented that derivation of asset betas from share prices was flawed and did not reflect the risk in Chorus' underlying cash flows, implying an asset beta derivation based on cash flows.¹¹

In its cross-submission, Network Strategies commented on CEG's arguments regarding the debt beta, and how these were inconsistent with CEG's previous analysis for this proceeding and also with the Input Methodologies.¹²

CEG's cross-submission commented on Network Strategies' arguments concerning the Commission's asset beta analysis and Network Strategies' preference for the most recent estimates of the asset beta.¹³ CEG then went on

⁸ Network Strategies (2015), 'Revised draft determination for the UCLL and UBA price review', 13 August.

⁹ Competition Economists Group (2015), 'Response to the further draft determination', August.

¹⁰ See Oxera (2015), 'Second review of expert submissions on the WACC for UCLL/UBA services', 15 May, Appendix A3.

¹¹ Schroders (2015), 'Submission on draft determinations of the UCLL and UBA access service final pricing principles—letter to Tricia Jennings', 27 July.

¹² Network Strategies (2015), 'Response to submissions on revised draft determination', 24 September.

¹³ Competition Economists Group (2015), 'Price trends and asset beta cross submission', September.

to reproduce arguments from its earlier reports presented in February and March 2015.

2.3 Oxera's analysis of submissions

We agree with some of the arguments raised by Network Strategies in its submission and cross-submission.

The rationale for updating the beta analysis in our earlier review was to compare the impact on the results of the additional data points that have become available since June 2014 with the results from the initial analysis. Shifting all the beta estimation windows forward by approximately 11 months would not have allowed a clean comparison.

However, given that over 14 months have passed since our initial analysis, we have now updated the entire time horizon for the analysis, which addresses the concern raised by Network Strategies. The beta analysis now considers data from August 1995 to August 2015. Additionally, we have presented results including and excluding beta values for comparator firms that are no longer suitable for the entire time horizon of the analysis.¹⁴

Regarding the use of the median beta value, we have previously commented on the most appropriate measure of central tendency to infer results from the comparator analysis.¹⁵ Network Strategies has not raised any new points in its arguments and we are not persuaded to alter our previous methodology.

With respect to the arguments raised by CEG pertaining to the debt beta, we agree that, in theory, it is unlikely that all of the comparators will have a zero debt beta, and finance theory suggests that this is likely to be directly proportional to a comparator firm's leverage.

As previously mentioned, in theory, the debt beta should be calculated identically to the equity beta. However, in practice, calculating the debt beta tends to be more difficult. Debt issues are often thinly traded, and therefore estimating the debt beta in the same way as the equity beta may give inconclusive results. This is the primary reason that a majority of regulators (including the Commission) have resorted to using a zero debt beta assumption.

Our previous analysis demonstrating the impact of a non-zero debt beta (as cited by CEG) was based on ad hoc assumptions regarding the cut-off leverage point for the applicability of a non-zero debt beta, which was intended for the purposes of demonstrating results from sensitivity analysis. As our report states:

we have not repeated all of the same analysis as was applied for the equity beta in estimating the debt beta.¹⁶

In practice, there is no widely agreed method to establish the value of debt beta that may be associated with a particular level of leverage. This is evident from UK regulatory precedent regarding the adoption of a non-zero debt beta. For example, Ofcom assumed a debt beta of 0.10 for BT Openreach¹⁷ at a notional leverage of 32%, whereas Ofgem assumed the same level of debt beta at a

¹⁴ In addition to Portugal Telecom, data for Windstream Holdings suggests that it is no longer a suitable comparator (see Appendix A3). However, including or excluding these firms from the refined comparator set does not alter the conclusions.

¹⁵ See Oxera (2014), 'Review of expert submissions on the WACC for UCLL/UBA', 19 September, p. 12.

¹⁶ Oxera (2014), 'Review of the beta and gearing for UCLL and UBA services', June, p. 50.

¹⁷ Ofcom (2014), 'Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 – Annexes', 26 June.

notional leverage of 65% for RIIO-ED1.¹⁸ In contrast, Ofwat assumed a zero debt beta for water companies in its 2014 price review determinations while the notional leverage was set at 62.5%.¹⁹

CEG's analysis for monthly asset betas at best presents a sensitivity to the Commission's assumptions. Its methodology of replicating Oxera's analysis and inferring results from using a debt beta of 0.075 and 0.15, for companies with leverage between 40–55% and greater than 55% respectively, is not based on sound theory and is not empirically well evidenced. The results emerging from this analysis are highly dependent on the threshold levels of leverage at which the non-zero debt beta is applied, and need to be viewed with caution.

Oxera agrees with Schrodgers to the extent that cash flow betas provide an alternative approach to estimating betas for companies. However, there is a fundamental difference between the two approaches to measuring betas. Share price betas are a forward-looking beta measure, as share prices reflect the present value of current expectations of future earnings for a firm. In contrast, cash flow betas are a backward-looking beta measure based on outturn cash flows realised by a firm. In the context of a regulatory price control, the aim is to set a forward-looking cost of capital, and hence it is more appropriate to adopt share price betas. Furthermore, there are several practical constraints with estimating cash flow betas:

- low frequency of cash flow data for companies—data is only available quarterly and would require a very long time series for any meaningful analysis;
- choice of most-appropriate cash flow—there are several cash flow metrics that could be adopted (e.g. free cash flows, operating cash flows), and it is not evident which would be the most suitable;
- lack of regulatory precedent—Oxera is not aware of any regulator having adopted a cash flow beta for a regulated company, and this would also be inconsistent with the Commission's Input Methodologies.

As a result, we is not persuaded to change our approach to measuring betas.

2.4 Oxera's analysis of the cross-submissions

In terms of Network Strategies' cross-submission, we broadly agree with Network Strategies' point on the inconsistencies within CEG's arguments over the entire process and, as noted above, the presentation of the analysis based on adopting a non-zero debt beta appears opportunistic.

With respect to CEG's cross-submission, CEG appears to have reproduced much of its previous analysis in support of adopting a longer-term view of inferring asset beta estimates from the international comparator set. Oxera has previously commented on CEG's analysis regarding the impact of the financial crisis and the European sovereign debt crisis on betas for telecommunications companies, the perceived inverse relationship between finance and telecommunications betas, and its general view on the appropriate history for

¹⁸ Ofgem (2014), 'RIIO-ED1: Final determinations for the slowtrack electricity distribution companies', 28 November.

¹⁹ Ofwat (2014), 'Setting price controls for 2015-20 Final price control determination notice: policy chapter A7 – risk and reward', December.

considering beta values from comparator companies.²⁰ CEG does not appear to have made any new arguments.

2.5 Oxera's assessment

The previous sub-section has discussed the arguments raised by Network Strategies and CEG.

While respondents raised some interesting points, we do not consider the points on debt beta and the median asset beta value for the comparator set to be sufficiently well evidenced, and are not persuaded to fundamentally change our approach to estimating asset betas.

The next section presents updates to the asset beta analysis for Chorus and the comparator firms.

²⁰ See Oxera (2015), 'Second review of expert submissions on the WACC for UCLL/UBA services', 15 May.

3 Updates to the analysis

We have updated our asset beta analysis for Chorus and the comparator set, and the new cut-off date is 31 August 2015.

Evidence on betas for Chorus and comparator companies

In order to update the beta analysis, we conducted a validity check on Chorus and all of the comparators to ensure that they were still suitable.²¹ Due to market developments since 24 April 2015, Windstream Holdings has undergone a significant restructuring, as a result of which its observed market gearing spiked from 65% to 90%. In light of this, we have elected to remove Windstream Holdings (in addition to Portugal Telecom) from our refined comparator set on the basis that this development gives rise to unreliable recent beta estimates (see Appendix A3 for details).²²

Tables 3.1 and 3.2 below present updates to the five- and two-year asset beta calculations respectively. As before, these results assume the debt beta to be zero.

²¹ Network Strategies raised a point regarding the exclusion of Portugal Telecom from the refined comparator sample for all beta estimation windows. Excluding Portugal Telecom from the refined comparator sample for all estimation windows does not alter the conclusions of the analysis.

²² The comparator beta results are not very sensitive to the exclusion of Windstream Holdings.

Table 3.1 Five-year asset beta calculations (assuming a zero debt beta), 1995–2015

Comparator firm	Daily				Weekly				Monthly			
	2000	2005	2010	2015	2000	2005	2010	2015	2000	2005	2010	2015
AT&T	0.65	0.68	0.62	0.45	0.69	0.55	0.57	0.46	0.66	0.67	0.51	0.31
Belgacom			0.41	0.50			0.34	0.54			0.28	0.50
BT Group	1.19	0.83	0.53	0.71	1.28	0.53	0.51	0.65	0.91	1.06	0.65	0.76
CenturyLink	0.43	0.50	0.44	0.39	0.59	0.46	0.41	0.42	0.73	0.50	0.45	0.39
Chorus												
Cincinnati Bell	0.51	0.61	0.34	0.29	0.75	0.63	0.38	0.28	1.32	1.00	0.48	0.28
<i>Cogent Communications</i>			1.14	0.90			1.33	0.86			1.14	0.95
<i>Colt Group</i>			0.85	0.69			0.81	0.72			1.25	0.71
Deutsche Telekom		0.74	0.24	0.34		0.40	0.23	0.36		0.52	0.06	0.31
Elisa		0.50	0.49	0.43		0.56	0.46	0.48		0.67	0.35	0.32
FairPoint Communications												
Frontier Communications	0.20	0.35	0.39	0.34	0.23	0.35	0.44	0.43	0.30	0.59	0.38	0.29
Hawaiian Telecom												
Hellenic Telecommunications Org.			0.49	0.58			0.45	0.59			0.40	0.69
Iliad			0.55	0.44			0.76	0.31			0.74	0.41
Koninklijke KPN	0.83	0.57	0.32	0.37	0.73	0.43	0.32	0.40	1.03	0.58	0.20	0.11
<i>Lumos Networks</i>												
Orange		0.68	0.34	0.46		0.52	0.31	0.45		0.81	0.20	0.32

Comparator firm	Daily				Weekly				Monthly			
	2000	2005	2010	2015	2000	2005	2010	2015	2000	2005	2010	2015
Portugal Telecom	1.33	1.34	0.60	0.62	1.22	1.25	0.59	0.71	1.17	1.26	0.48	0.77
Swisscom		0.42	0.40	0.38		0.32	0.41	0.36		0.27	0.25	0.38
TDC			0.10	0.30			0.18	0.31			0.14	0.23
<i>Telecom Corporation of New Zealand</i>			0.95	1.22			0.77	1.11			0.77	0.83
Telecom Italia		0.39	0.31	0.23		0.38	0.31	0.24		0.49	0.19	0.26
<i>Telefónica</i>	0.94	0.94	0.48	0.48	0.98	0.91	0.47	0.48	0.99	0.94	0.41	0.52
Telekom Austria			0.47	0.27			0.47	0.30			0.38	0.21
<i>Telenor</i>			0.57	0.61			0.49	0.63			0.80	0.59
<i>TeliaSonera</i>			0.62	0.56			0.62	0.53			0.63	0.36
Telstra		0.70	0.33	0.45		0.47	0.29	0.36		0.20	0.16	0.41
<i>TW Telecom</i>		0.68	0.83	0.65		0.66	1.11	0.60		1.64	1.02	0.69
Verizon Communications	0.49	0.59	0.53	0.43	0.50	0.42	0.51	0.45	0.60	0.65	0.45	0.31
Windstream Holdings			0.44	0.27			0.46	0.34			0.49	0.11
Average (all comparators)	0.73	0.66	0.51	0.50	0.77	0.55	0.52	0.49	0.86	0.74	0.49	0.45
Average (refined comparators)	0.70	0.64	0.42	0.41	0.75	0.52	0.42	0.42	0.84	0.66	0.36	0.37
Average (refined comparators excluding Portugal Telecom and Windstream Holdings)	0.62	0.58	0.40	0.41	0.68	0.46	0.41	0.41	0.79	0.62	0.35	0.36

Note: Italics indicate firms that are excluded from the refined comparator set. The cut-off date for the analysis is 31 August in each relevant year of the analysis. Belgacom has been rebranded as Proximus, Portugal Telecom as Pharol, and Telecom Corporation of New Zealand as Spark New Zealand, but for consistency purposes Oxera has retained the old trading names in this report.

Source: Oxera analysis based on Bloomberg, Datastream, and Hird, T. (2014), 'Response to Commerce Commission UCLL/UBA WACC consultation paper', March, p. 13.

Table 3.2 Two-year asset beta calculations (assuming a zero debt beta), 1995–2015

Comparator firm	Daily				Weekly			
	2000	2005	2010	2015	2000	2005	2010	2015
AT&T	0.68	0.62	0.55	0.46	0.72	0.79	0.50	0.41
Belgacom			0.37	0.65			0.30	0.71
BT Group	1.40	0.55	0.41	0.72	1.69	0.49	0.38	0.79
CenturyLink	0.39	0.36	0.42	0.39	0.60	0.39	0.40	0.51
Chorus				0.35				0.52
Cincinnati Bell	0.63	0.52	0.24	0.31	0.85	0.44	0.30	0.40
<i>Cogent Communications</i>		0.12	1.03	0.66		0.55	1.14	0.73
<i>Colt Group</i>			0.83	0.67			0.75	0.74
Deutsche Telekom	1.09	0.41	0.24	0.57	0.79	0.41	0.24	0.66
Elisa		0.42	0.46	0.59		0.68	0.47	0.63
FairPoint Communications				0.34				0.26
Frontier Communications	0.23	0.30	0.32	0.37	0.32	0.32	0.36	0.58
Hawaiian Telecom				0.34				0.29
Hellenic Telecommunications Org.		0.83	0.37	0.82		0.93	0.34	0.66
Iliad			0.38	0.70			0.60	0.35
Koninklijke KPN	1.05	0.47	0.27	0.54	0.94	0.33	0.26	0.51
<i>Lumos Networks</i>				0.48				0.58
Orange		0.58	0.32	0.60		0.45	0.31	0.57

Comparator firm	Daily				Weekly			
	2000	2005	2010	2015	2000	2005	2010	2015
Portugal Telecom	1.57	1.27	0.54	0.99	1.36	1.29	0.54	1.07
Swisscom		0.40	0.35	0.38		0.34	0.32	0.35
TDC		0.55	0.08	0.33		0.68	0.15	0.35
<i>Telecom Corporation of New Zealand</i>			0.83	1.15			0.64	1.05
Telecom Italia	0.49	0.51	0.23	0.26	0.68	0.47	0.22	0.28
<i>Telefónica</i>	1.02	0.87	0.48	0.48	1.09	0.87	0.45	0.50
Telekom Austria		0.73	0.43	0.20		0.62	0.45	0.28
<i>Telenor</i>		0.82	0.55	0.74		0.74	0.46	0.78
<i>TeliaSonera</i>		0.82	0.57	0.60		0.78	0.56	0.63
Telstra	0.85	0.45	0.25	0.60	1.03	0.37	0.22	0.58
<i>TW Telecom</i>		0.51	0.83	0.38		0.73	1.14	0.46
Verizon Communications	0.48	0.48	0.44	0.48	0.46	0.59	0.39	0.52
Windstream Holdings			0.39	0.19			0.42	0.35
Average (all comparators)	0.82	0.57	0.45	0.53	0.88	0.60	0.46	0.55
Average (refined comparators)	0.81	0.56	0.35	0.49	0.86	0.56	0.36	0.51
Average (refined comparators excluding Portugal Telecom)	0.73	0.51	0.34	0.48	0.81	0.52	0.35	0.49

Note: Italics indicate firms that are excluded from the refined comparator set. The cut-off date for the analysis is 31 August in each relevant year of the analysis. Belgacom has been rebranded as Proximus, Portugal Telecom as Pharol, and Telecom Corporation of New Zealand as Spark New Zealand, but for consistency purposes Oxera has retained the old trading names in this report.

Source: Oxera analysis based on Bloomberg, Datastream, and Hird, T. (2014), 'Response to Commerce Commission UCLL/UBA WACC consultation paper', March, p. 13.

The updated estimates of five- and two-year daily asset betas for the refined comparator set (excluding Portugal Telecom and Windstream Holdings) presented above indicate a range of 0.36–0.49.²³ The upper bound of the range is primarily dominated by the two-year beta estimates. This is broadly consistent with our observations in our previous update, where the data indicated a range of 0.38–0.47.

Table 3.3 presents average five- and two-year beta values for all comparators and refined comparators on an annual basis.

Table 3.3 Average asset beta values for the comparator set (2000–15)

Year	Refined comparators (excluding Portugal Telecom and Windstream Holdings)					All comparators				
	Five-year asset betas			Two-year asset betas		Five-year asset betas			Two-year asset betas	
	Daily	Weekly	Monthly	Daily	Weekly	Daily	Weekly	Monthly	Daily	Weekly
2000	0.62	0.68	0.79	0.73	0.81	0.73	0.77	0.86	0.82	0.88
2001	0.61	0.62	0.80	0.77	0.71	0.74	0.72	0.86	0.90	0.85
2002	0.64	0.55	0.72	0.61	0.44	0.73	0.64	0.78	0.71	0.54
2003	0.64	0.55	0.75	0.54	0.41	0.72	0.63	0.81	0.59	0.47
2004	0.60	0.50	0.67	0.58	0.53	0.69	0.61	0.82	0.61	0.58
2005	0.58	0.46	0.62	0.51	0.52	0.66	0.55	0.74	0.57	0.60
2006	0.55	0.45	0.56	0.52	0.53	0.63	0.53	0.66	0.59	0.60
2007	0.54	0.51	0.65	0.52	0.51	0.61	0.60	0.80	0.61	0.60
2008	0.46	0.48	0.49	0.47	0.48	0.56	0.60	0.65	0.55	0.59
2009	0.43	0.44	0.38	0.38	0.38	0.52	0.53	0.54	0.48	0.48
2010	0.40	0.41	0.35	0.34	0.35	0.51	0.52	0.49	0.45	0.46
2011	0.39	0.39	0.34	0.34	0.35	0.50	0.50	0.48	0.46	0.48
2012	0.36	0.37	0.30	0.35	0.34	0.47	0.48	0.45	0.46	0.44
2013	0.35	0.36	0.27	0.35	0.34	0.47	0.47	0.43	0.44	0.43
2014	0.37	0.37	0.32	0.43	0.43	0.47	0.47	0.43	0.50	0.50
2015	0.41	0.41	0.36	0.48	0.49	0.50	0.49	0.45	0.53	0.55

Note: The cut-off date for the analysis is 31 August in each relevant year of the analysis.

Source: Oxera analysis based on Bloomberg, Datastream, and Hird, T. (2014), 'Response to Commerce Commission UCLL/UBA WACC consultation paper', March, p. 13.

Table 3.4 below presents the movements in five-year beta estimates for refined comparators (the Commission's primary reference point for its decision being the five-year monthly beta values).

²³ Including Portugal Telecom and Windstream Holdings does not materially change the conclusions of the analysis.

Table 3.4 Summary of asset beta movements for five-year asset beta values for the comparator set (March 2015–August 2015)

Asset beta	March 2015	August 2015	Percentage change
<i>Five-year monthly</i>	<i>0.42</i>	<i>0.36</i>	<i>(14%)</i>
Five-year weekly	0.40	0.41	2%
Five-year daily	0.38	0.41	8%

Note: Refined comparators exclude Portugal Telecom and Windstream Holdings. The cut-off date for the analysis is 16 March and 31 August.

Source: Oxera analysis based on Bloomberg, Datastream, and Hird, T. (2014), 'Response to Commerce Commission UCLL/UBA WACC consultation paper', March, p. 13.

4 Conclusion

In this report, we have reviewed the third round of expert submissions provided to the Commission.

Our updated analysis in response to the evidence provided by the submissions on the asset beta suggests that, for Chorus, the asset betas appear to have increased since March 2015. However, the daily beta estimate lies well within the recommended range. With respect to the weekly beta estimate, as previously discussed in Oxera's May 2015 report, this is likely to be less reliable.

The data for the comparator set suggests that the daily and weekly asset betas for the comparator firms have increased marginally, while evidence from the monthly data suggests a decrease. However, all the beta estimates lie within the recommended range.

On balance, the data is broadly consistent with our findings from the March 2015 updates, and we continue to recommend a range of 0.30–0.50 for the asset beta for UCLL and UBA services in New Zealand.

Table 4.1 and Figure 4.1 below summarise the movements in asset betas since March 2015.

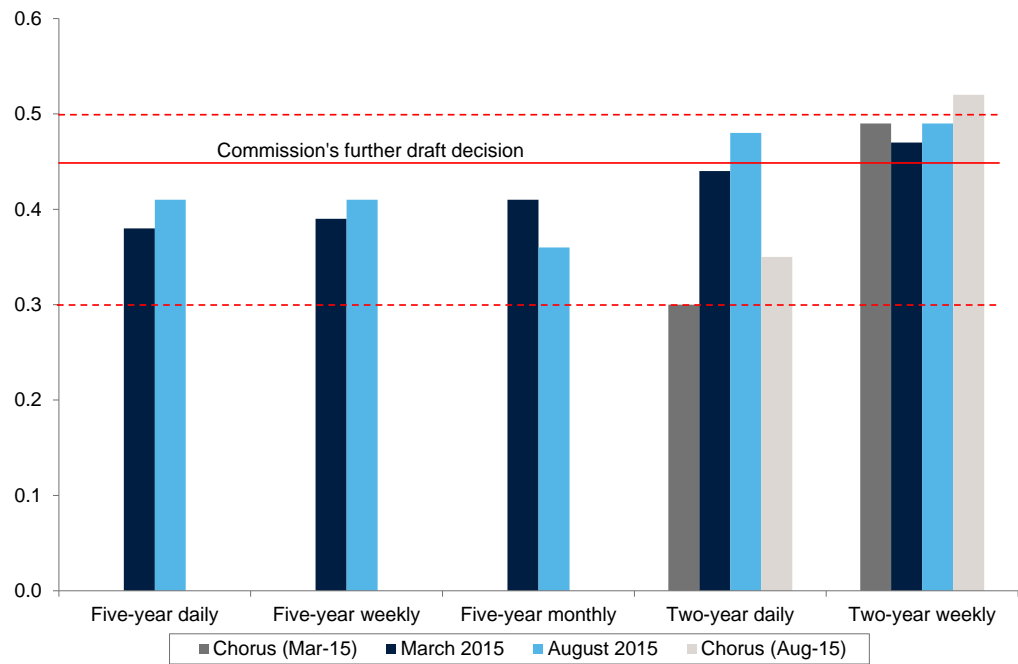
Table 4.1 Summary of asset beta movements for Chorus and the refined comparator set

Asset beta	March 2015*	August 2015**
Chorus		
<i>Two-year daily</i>	0.30	0.35
<i>Two-year weekly</i>	0.49	0.52
Refined comparator set		
<i>Five-year daily</i>	0.38	0.41
<i>Five year weekly</i>	0.39	0.41
<i>Five year monthly</i>	0.41	0.36
<i>Two-year daily</i>	0.44	0.48
<i>Two-year weekly</i>	0.47	0.49
Oxera range	0.30–0.50	0.30–0.50

Note: * Data for the refined comparator set excludes Portugal Telecom. ** Data for the refined comparator set excludes Portugal Telecom and Windstream Holdings

Source: Oxera analysis based on Bloomberg, Datastream, and Hird, T. (2014), 'Response to Commerce Commission UCLL/UBA WACC consultation paper', March, p. 13.

Figure 4.1 Summary of asset beta movements for Chorus and the refined comparator set



Note: Data for March 2015 set excludes Portugal Telecom. Data for August 2015 set excludes Portugal Telecom and Windstream Holdings. The perforated lines depict Oxera's recommended range for both the March and August 2015 updates.

Source: Oxera analysis based on Bloomberg, Datastream, and Hird, T. (2014), 'Response to Commerce Commission UCLL/UBA WACC consultation paper', March, p. 13.

A1 Updates on comparator leverage

Table A1.1 presents updates to the observed market leverage of comparator firms. The methodology to compute the leverage is net debt over the total market capitalisation. Net debt is estimated as total debt less cash and cash equivalents. Market capitalisation represents the total value of the free float of a company.

Table A1.1 Leverage for comparator firms

Comparator firm	Two-year leverage (2015)	Five-year leverage (2015)
AT&T	30%	27%
Belgacom	17%	17%
BT Group	18%	29%
CenturyLink	51%	46%
Chorus	66%	n.a.
Cincinnati Bell	74%	76%
<i>Cogent Communications</i>	13%	15%
<i>Colt Group</i>	(18%)	(30%)
Deutsche Telekom	43%	48%
Elisa	22%	22%
FairPoint Communications	71%	n.a.
Frontier Communications	57%	58%
Hawaiian Telecom	47%	n.a.
Hellenic Telecommunications Org.	24%	46%
Iliad	9%	11%
Koninklijke KPN	47%	49%
<i>Lumos Networks</i>	47%	n.a.
Orange	50%	50%
Portugal Telecom	30%	40%
Swisscom	24%	28%
TDC	37%	38%
<i>Telecom Corporation of New Zealand</i>	14%	19%
Telecom Italia	71%	74%
<i>Telefónica</i>	46%	48%
Telekom Austria	50%	50%
<i>Telenor</i>	18%	16%
<i>TeliaSonera</i>	22%	23%
Telstra	16%	19%
<i>TW Telecom</i>	22%	21%
Verizon Communications	31%	29%
Windstream Holdings	67%	61%
Average (all comparators)	36%	34%
Average (refined comparators)	41%	41%
Average (refined comparators excluding Portugal Telecom and Windstream Holdings)	41%	40%

Note: Italics indicate firms that are excluded from the refined comparator set. The cut-off date for the analysis is 31 August 2015. Belgacom has been rebranded as Proximus, Portugal Telecom

as Pharol, and Telecom Corporation of New Zealand as Spark New Zealand, but for consistency purposes Oxera has retained the old trading names in this report.

Source: Oxera analysis, based on Bloomberg and Datastream.

Table A1.2 presents two- and five-year leverage for refined comparators and all comparators on an annual basis from 2000 to 2015. This considers net debt and market capitalisation as on the cut-off date in each year.

Table A1.2 Annual leverage for comparator firms (2000–15)

Year	Refined comparators excluding Portugal Telecom and Windstream Holdings		All comparators	
	Two-year leverage	Five-year leverage	Two-year leverage	Five-year leverage
2000	21%	22%	19%	19%
2001	30%	29%	28%	27%
2002	39%	34%	39%	34%
2003	44%	36%	45%	37%
2004	38%	35%	39%	36%
2005	30%	34%	33%	36%
2006	29%	33%	30%	35%
2007	29%	32%	28%	33%
2008	32%	31%	29%	30%
2009	39%	33%	35%	31%
2010	43%	35%	38%	32%
2011	41%	38%	36%	34%
2012	44%	41%	39%	37%
2013	46%	42%	40%	37%
2014	44%	41%	39%	36%
2015	41%	40%	36%	34%

Note: The cut-off date for the analysis is 31 August in each relevant year of the analysis. Belgacom has been rebranded as Proximus, Portugal Telecom as Pharol, and Telecom Corporation of New Zealand as Spark New Zealand, but for consistency purposes Oxera has retained the old trading names in this report.

Source: Oxera analysis, based on Bloomberg and Datastream.

A2 Telecommunications comparators: updates to analysis of equity and asset beta standard errors

This appendix presents updated estimates for the daily, weekly and monthly standard errors for the equity and asset betas for the comparator set, as shown in Tables A2.1–A2.4.

Table A2.1 Current and historical standard errors for five-year equity betas of the Chorus comparator set

Comparator firm	Daily				Weekly				Monthly			
	2000	2005	2010	2015	2000	2005	2010	2015	2000	2005	2010	2015
AT&T	0.04	0.04	0.02	0.02	0.10	0.10	0.05	0.05	0.17	0.25	0.13	0.13
Belgacom			0.02	0.03			0.05	0.06			0.11	0.15
BT Group	0.06	0.05	0.04	0.04	0.13	0.12	0.08	0.07	0.27	0.22	0.22	0.16
CenturyLink	0.04	0.04	0.03	0.04	0.10	0.10	0.07	0.08	0.22	0.26	0.14	0.18
Chorus												
Cincinnati Bell	0.07	0.11	0.04	0.06	0.15	0.25	0.10	0.15	0.36	0.49	0.26	0.31
<i>Cogent Communications</i>			0.06	0.05			0.15	0.12			0.34	0.24
<i>Colt Group</i>		0.11	0.05	0.06		0.30	0.11	0.12		0.67	0.27	0.29
Deutsche Telekom		0.07	0.02	0.03		0.13	0.06	0.07		0.24	0.10	0.14
Elisa		0.03	0.03	0.02		0.08	0.06	0.05		0.13	0.12	0.12
FairPoint Communications												
Frontier Communications	0.05	0.05	0.03	0.05	0.09	0.14	0.07	0.13	0.22	0.30	0.15	0.27
Hawaiian Telecom												
Hellenic Telecommunications Org.			0.03	0.03			0.06	0.06			0.08	0.15
Iliad			0.03	0.03			0.07	0.08			0.22	0.22
Koninklijke KPN	0.05	0.05	0.02	0.05	0.14	0.14	0.05	0.13	0.28	0.30	0.11	0.30
<i>Lumos Networks</i>												
Orange		0.04	0.02	0.02		0.15	0.06	0.06		0.39	0.13	0.17

Comparator firm	Daily				Weekly				Monthly			
	2000	2005	2010	2015	2000	2005	2010	2015	2000	2005	2010	2015
Portugal Telecom	0.03	0.04	0.03	0.05	0.07	0.09	0.07	0.13	0.11	0.16	0.13	0.29
Swisscom		0.03	0.02	0.02		0.05	0.04	0.05		0.14	0.13	0.12
TDC			0.03	0.03			0.06	0.07			0.15	0.15
<i>Telecom Corporation of New Zealand</i>			<i>0.04</i>	<i>0.07</i>			<i>0.08</i>	<i>0.15</i>			<i>0.18</i>	<i>0.29</i>
Telecom Italia		0.03	0.03	0.03		0.07	0.06	0.07		0.14	0.13	0.13
<i>Telefónica</i>	<i>0.02</i>	<i>0.02</i>	<i>0.01</i>	<i>0.01</i>	<i>0.06</i>	<i>0.06</i>	<i>0.04</i>	<i>0.03</i>	<i>0.11</i>	<i>0.10</i>	<i>0.10</i>	<i>0.08</i>
Telekom Austria			0.02	0.03			0.05	0.07			0.11	0.16
<i>Telenor</i>			<i>0.02</i>	<i>0.02</i>			<i>0.06</i>	<i>0.06</i>			<i>0.13</i>	<i>0.12</i>
<i>TeliaSonera</i>			<i>0.02</i>	<i>0.02</i>			<i>0.05</i>	<i>0.04</i>			<i>0.12</i>	<i>0.11</i>
Telstra		0.05	0.03	0.03		0.11	0.07	0.06		0.23	0.17	0.14
<i>TW Telecom</i>		<i>0.14</i>	<i>0.05</i>	<i>0.04</i>		<i>0.38</i>	<i>0.11</i>	<i>0.08</i>		<i>0.95</i>	<i>0.28</i>	<i>0.18</i>
Verizon Communications	0.05	0.04	0.02	0.02	0.09	0.09	0.05	0.06	0.19	0.22	0.12	0.15
Windstream Holdings			0.03	0.05			0.06	0.12			0.17	0.38
Average across time for refined comparator set (excluding Portugal Telecom and Windstream Holdings)		0.04				0.09				0.19		
Average across all comparators and time		0.04				0.09				0.21		

Note: The cut-off date for the analysis is 31 August in each relevant year of the analysis. Belgacom has been rebranded as Proximus, Portugal Telecom as Pharol, and Telecom Corporation of New Zealand as Spark New Zealand, but for consistency purposes Oxera has retained the old trading names in this report.

Source: Oxera analysis based on Bloomberg, Datastream, and Hird, T. (2014), 'Response to Commerce Commission UCLL/UBA WACC consultation paper', March, p. 13.

Table A2.2 Current and historical standard errors for two-year equity betas of the Chorus comparator set

Comparator firm	Daily				Weekly			
	2000	2005	2010	2015	2000	2005	2010	2015
AT&T	0.08	0.06	0.03	0.04	0.16	0.14	0.06	0.11
Belgacom			0.03	0.05			0.06	0.13
BT Group	0.10	0.08	0.06	0.05	0.20	0.16	0.12	0.12
CenturyLink	0.07	0.08	0.03	0.06	0.17	0.19	0.09	0.16
Chorus				0.17				0.44
Cincinnati Bell	0.11	0.14	0.06	0.12	0.22	0.27	0.13	0.26
<i>Cogent Communications</i>		0.56	0.07	0.09		1.51	0.18	0.19
<i>Colt Group</i>	0.15	0.21	0.07	0.10	0.40	0.53	0.15	0.20
Deutsche Telekom	0.15	0.05	0.03	0.05	0.31	0.11	0.08	0.11
Elisa		0.08	0.04	0.04		0.17	0.08	0.09
FairPoint Communications				0.10				0.26
Frontier Communications	0.07	0.09	0.04	0.11	0.13	0.19	0.10	0.24
Hawaiian Telecom				0.07				0.15
Hellenic Telecommunications Org.		0.06	0.04	0.04		0.13	0.08	0.07
Iliad			0.04	0.08			0.08	0.16
Koninklijke KPN	0.10	0.06	0.03	0.06	0.28	0.12	0.07	0.14
<i>Lumos Networks</i>				0.13				0.35
Orange	0.07	0.05	0.03	0.05	0.14	0.13	0.07	0.13

Comparator firm	Daily				Weekly			
	2000	2005	2010	2015	2000	2005	2010	2015
Portugal Telecom	0.06	0.06	0.04	0.12	0.11	0.14	0.10	0.28
Swisscom		0.03	0.03	0.04		0.08	0.05	0.08
TDC		0.09	0.05	0.06		0.15	0.09	0.11
<i>Telecom Corporation of New Zealand</i>		0.06	0.07	0.12		0.11	0.12	0.26
Telecom Italia	0.07	0.05	0.03	0.05	0.17	0.13	0.08	0.13
<i>Telefónica</i>	0.04	0.03	0.02	0.02	0.10	0.07	0.04	0.06
Telekom Austria		0.07	0.04	0.06		0.11	0.06	0.12
<i>Telenor</i>		0.06	0.04	0.04		0.11	0.08	0.10
<i>TeliaSonera</i>		0.06	0.03	0.03		0.13	0.06	0.08
Telstra	0.11	0.08	0.05	0.03	0.28	0.16	0.09	0.08
<i>TW Telecom</i>		0.26	0.07	0.06		0.52	0.14	0.16
Verizon Communications	0.08	0.06	0.03	0.04	0.14	0.14	0.07	0.11
Windstream Holdings			0.04	0.12			0.08	0.31
Average across time for refined comparator set (excluding Portugal Telecom and Windstream Holdings)		0.06				0.14		
Average across all comparators and time		0.07				0.17		

Note: The cut-off date for the analysis is 31 August in each relevant year of the analysis. Belgacom has been rebranded as Proximus, Portugal Telecom as Pharol, and Telecom Corporation of New Zealand as Spark New Zealand, but for consistency purposes Oxera has retained the old trading names in this report.

Source: Oxera analysis based on Bloomberg, Datastream, and Hird, T. (2014), 'Response to Commerce Commission UCLL/UBA WACC consultation paper', March, p. 13.

Table A2.3 Current and historical standard errors for the five-year asset betas of the Chorus comparator set

Comparator firm	Daily				Weekly				Monthly			
	2000	2005	2010	2015	2000	2005	2010	2015	2000	2005	2010	2015
AT&T	0.04	0.03	0.02	0.02	0.08	0.09	0.04	0.04	0.15	0.21	0.09	0.10
Belgacom			0.02	0.02			0.04	0.05			0.10	0.12
BT Group	0.06	0.03	0.02	0.03	0.12	0.08	0.05	0.05	0.25	0.14	0.13	0.12
CenturyLink	0.03	0.02	0.02	0.02	0.07	0.06	0.04	0.04	0.16	0.15	0.09	0.10
Chorus												
Cincinnati Bell	0.05	0.04	0.01	0.02	0.12	0.10	0.03	0.04	0.30	0.19	0.08	0.08
<i>Cogent Communications</i>			0.05	0.04			0.13	0.10			0.28	0.21
<i>Colt Group</i>			0.06	0.07			0.13	0.15			0.32	0.37
Deutsche Telekom		0.04	0.01	0.01		0.07	0.03	0.03		0.14	0.06	0.07
Elisa		0.02	0.02	0.02		0.05	0.05	0.04		0.09	0.10	0.10
FairPoint Communications												
Frontier Communications	0.02	0.02	0.01	0.02	0.05	0.06	0.03	0.05	0.11	0.14	0.07	0.11
Hawaiian Telecom												
Hellenic Telecommunications Org.			0.02	0.02			0.04	0.03			0.06	0.08
Iliad			0.03	0.03			0.07	0.07			0.20	0.19
Koninklijke KPN	0.04	0.03	0.02	0.03	0.09	0.07	0.04	0.06	0.19	0.16	0.07	0.15
<i>Lumos Networks</i>												
Orange		0.02	0.01	0.01		0.07	0.03	0.03		0.17	0.07	0.08

Comparator firm	Daily				Weekly				Monthly			
	2000	2005	2010	2015	2000	2005	2010	2015	2000	2005	2010	2015
Portugal Telecom	0.03	0.03	0.02	0.03	0.07	0.07	0.04	0.08	0.10	0.12	0.08	0.17
Swisscom		0.02	0.02	0.01		0.05	0.03	0.03		0.13	0.10	0.09
TDC			0.02	0.02			0.03	0.04			0.08	0.09
<i>Telecom Corporation of New Zealand</i>			0.03	0.06			0.06	0.12			0.13	0.24
Telecom Italia		0.01	0.01	0.01		0.02	0.02	0.02		0.05	0.05	0.03
<i>Telefónica</i>	0.02	0.01	0.01	0.01	0.05	0.04	0.02	0.02	0.08	0.07	0.06	0.04
Telekom Austria			0.02	0.01			0.03	0.04			0.07	0.08
<i>Telenor</i>			0.02	0.02			0.04	0.05			0.10	0.10
<i>TeliaSonera</i>			0.02	0.01			0.04	0.03			0.10	0.09
Telstra		0.04	0.02	0.02		0.09	0.05	0.05		0.19	0.13	0.12
<i>TW Telecom</i>		0.05	0.03	0.03		0.14	0.07	0.06		0.35	0.19	0.14
Verizon Communications	0.03	0.03	0.01	0.02	0.07	0.07	0.03	0.04	0.15	0.16	0.09	0.11
Windstream Holdings			0.01	0.02			0.03	0.05			0.09	0.15
Average across time for refined comparator set (excluding Portugal Telecom and Windstream Holdings)		0.02				0.05				0.12		
Average across all comparators and time		0.03				0.06				0.13		

Note: The cut-off date for the analysis is 31 August in each relevant year of the analysis. Belgacom has been rebranded as Proximus, Portugal Telecom as Pharol, and Telecom Corporation of New Zealand as Spark New Zealand, but for consistency purposes Oxera has retained the old trading names in this report.

Source: Oxera analysis based on Bloomberg, Datastream, and Hird, T. (2014), 'Response to Commerce Commission UCLL/UBA WACC consultation paper', March, p. 13.

Table A2.4 Current and historical standard errors for the two-year asset betas of the Chorus comparator set

Comparator firm	Daily				Weekly			
	2000	2005	2010	2015	2000	2005	2010	2015
AT&T	0.07	0.05	0.02	0.03	0.14	0.12	0.04	0.08
Belgacom			0.03	0.04			0.05	0.10
BT Group	0.09	0.05	0.03	0.04	0.19	0.10	0.05	0.10
CenturyLink	0.05	0.05	0.02	0.03	0.12	0.12	0.05	0.08
Chorus				0.06				0.15
Cincinnati Bell	0.09	0.05	0.01	0.03	0.18	0.09	0.03	0.07
<i>Cogent Communications</i>		0.13	0.05	0.07		0.35	0.14	0.17
<i>Colt Group</i>			0.08	0.12			0.18	0.23
Deutsche Telekom	0.12	0.03	0.02	0.03	0.26	0.06	0.04	0.06
Elisa		0.06	0.03	0.04		0.13	0.06	0.07
FairPoint Communications				0.03				0.08
Frontier Communications	0.04	0.05	0.01	0.05	0.08	0.10	0.04	0.10
Hawaiian Telecom				0.04				0.08
Hellenic Telecommunications Org.		0.04	0.02	0.03		0.09	0.04	0.05
Iliad			0.03	0.07			0.07	0.15
Koninklijke KPN	0.07	0.04	0.02	0.04	0.19	0.08	0.04	0.08
<i>Lumos Networks</i>				0.07				0.18
Orange		0.03	0.01	0.03		0.07	0.04	0.07

Comparator firm	Daily				Weekly			
	2000	2005	2010	2015	2000	2005	2010	2015
Portugal Telecom	0.06	0.05	0.02	0.10	0.11	0.11	0.05	0.23
Swisscom		0.04	0.02	0.03		0.09	0.04	0.06
TDC		0.06	0.03	0.03		0.10	0.05	0.07
<i>Telecom Corporation of New Zealand</i>			0.05	0.10			0.08	0.23
Telecom Italia	0.03	0.02	0.01	0.02	0.07	0.06	0.02	0.04
<i>Telefónica</i>	0.03	0.02	0.01	0.01	0.08	0.05	0.03	0.03
Telekom Austria		0.04	0.02	0.03		0.07	0.04	0.06
<i>Telenor</i>		0.05	0.03	0.04		0.09	0.06	0.08
<i>TeliaSonera</i>		0.06	0.02	0.03		0.12	0.05	0.07
Telstra	0.10	0.07	0.03	0.03	0.26	0.14	0.07	0.07
<i>TW Telecom</i>		0.07	0.04	0.05		0.14	0.09	0.12
Verizon Communications	0.06	0.04	0.02	0.03	0.11	0.10	0.04	0.07
Windstream Holdings			0.02	0.04			0.04	0.10
Average across time for refined comparator set (excluding Portugal Telecom and Windstream Holdings)		0.04				0.09		
Average across all comparators and time		0.04				0.10		

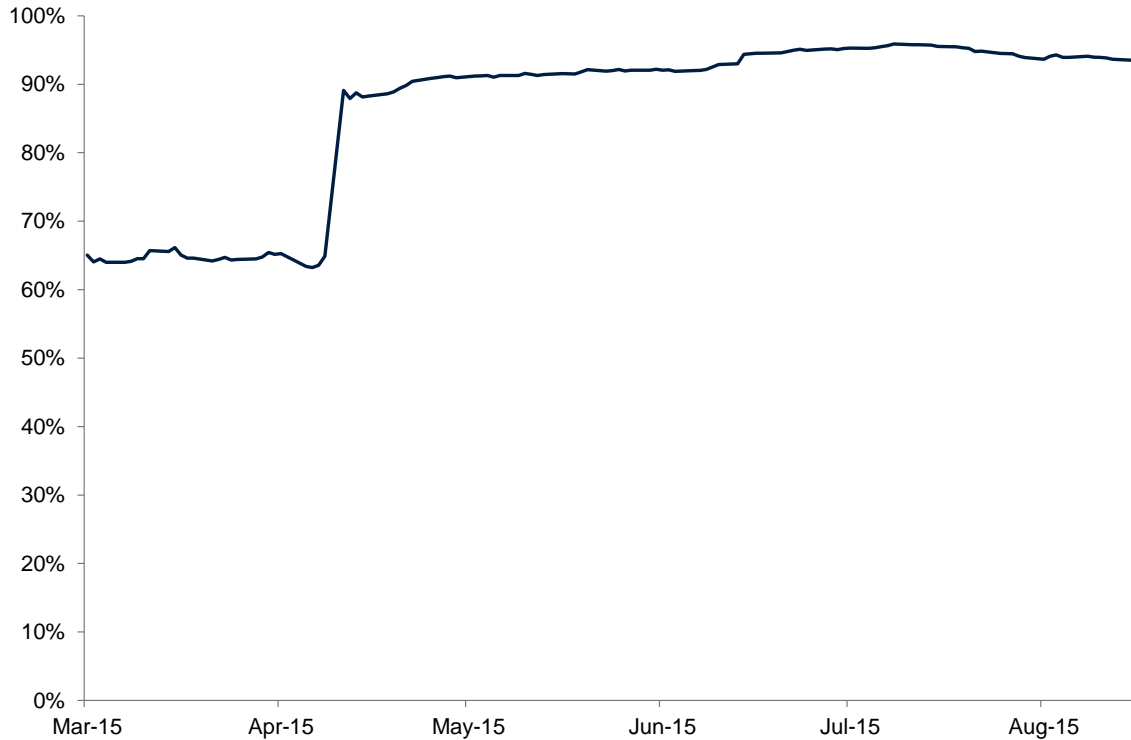
Note: The cut-off date for the analysis is 31 August in each relevant year of the analysis. Belgacom has been rebranded as Proximus, Portugal Telecom as Pharol, and Telecom Corporation of New Zealand as Spark New Zealand, but for consistency purposes Oxera has retained the old trading names in this report.

Source: Oxera analysis based on Bloomberg, Datastream, and Hird, T. (2014), 'Response to Commerce Commission UCLL/UBA WACC consultation paper', March, p. 13.

A3 Developments in market data for Windstream Holdings

Figures A3.1 and A3.2 show the developments in Windstream Holdings' financial data.

Figure A3.1 Gearing data for Windstream Holdings since 16 March 2015



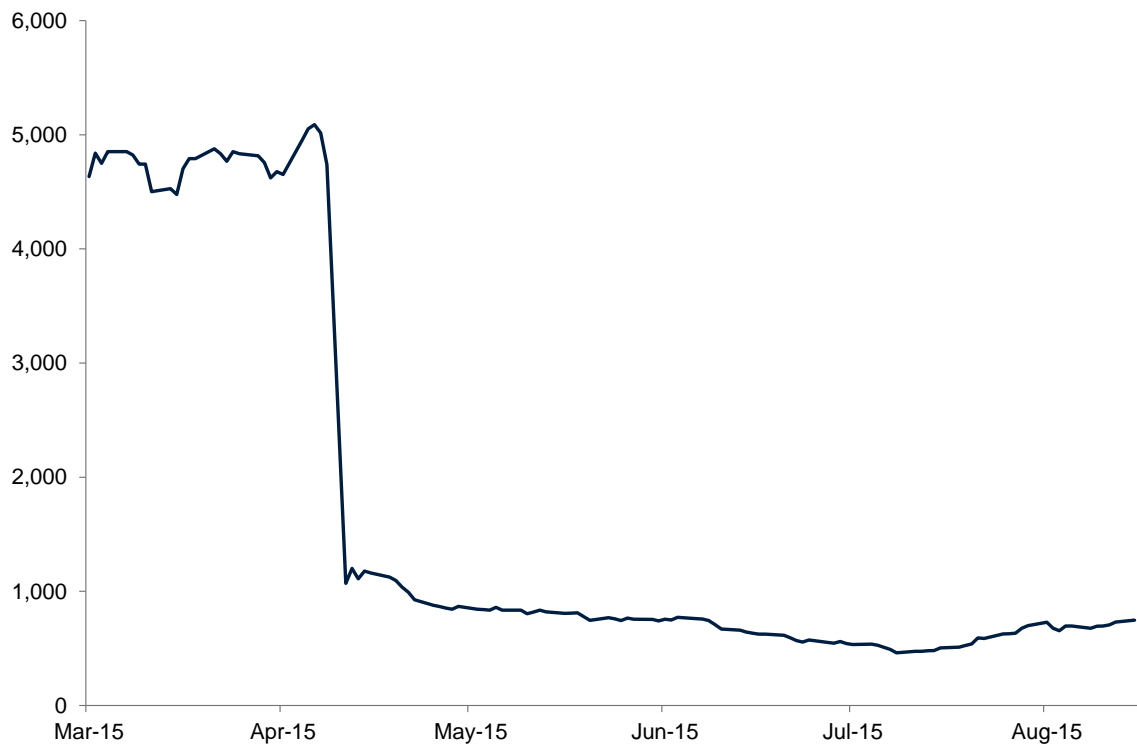
Note: The cut-off date for the analysis is 31 August 2015.

Source: Oxera analysis based on Bloomberg.

The steep rise in gearing is the result of financial restructuring after the tax-free spin-off of select telecommunications network assets into Communications Sales and Leasing (CS&L).²⁴ After this restructuring, Windstream Holdings' market value dropped by over 75% (see Figure A3.2).

²⁴ See Windstream (2015), 'Windstream Completes Tax-Free Spinoff of CS&L', 24 April, <http://investor.windstream.com/investors/releasedetail.cfm?releaseid=908571>, accessed 13 September 2015.

Figure A3.2 Movements in Windstream Holdings' market value since 16 March 2015 (US\$m)



Note: The cut-off date for the analysis is 31 August 2015.

Source: Oxera analysis based on Datastream.

CS&L became an independent publicly traded real estate investment trust. In addition, Windstream announced the near-completion of a one-for-six reverse stock split of Windstream's shares. Under the terms of the spin-off and reverse stock split it is not clear how the net debt would be split between the two separate entities, and the most recent financial data may not be a reliable measure of the underlying business risk.

