COMPETITION ECONOMISTS GROUP

Economic Review of Draft Decision on the WACC Percentile

A REPORT FOR NZ AIRPORTS

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Executive Summary

1. This report has been prepared by CEG for the New Zealand Airports Association (NZ Airports). Its subject is the Commerce Commission's Draft Decision[1] on the appropriate weighted average cost of capital (WACC) percentile to apply to energy businesses regulated under Part 4 of the *Commerce Act 1986* ("the Act"). NZ Airports has asked us to consider a number of questions, all of which require us to review and comment from an economic perspective on the integrity of the various economic analyses that underpin the Draft Decision.

2. It is unclear how the Commission's analytical framework will be translated into the airport sector. For example, the Commission has been content to take analysis for the electricity sector and apply it to the gas sector on the basis that they are "sufficiently similar". On the other hand it has deferred consideration of the choice of percentile for airports.

3. We understand that NZ Airports will focus on airport specific matters as part of the indicated separate process. However, we have been advised that, given the uncertainties regarding how the analytical framework developed for electricity and gas will be translated into the airport sector (but assuming some of it will be relevant), it is eager to ensure the Commission has followed a robust process and that its decisions are based on reliable evidence.

Does the 75th percentile have special standing?

4. The Commission contends that a consequence of the High Court judgment is that the 75th percentile "does not logically have any special standing as the status quo".[2] We disagree. The Court did not overturn the 75th percentile – it *upheld it*, which it did not have to do. It would therefore appear to us that the 75th percentile is the status quo. Moreover, it is our view that the Commission should provide clear and compelling evidence that another percentile is better before departing from the status quo. We do not consider it has surpassed that threshold.

5. In this context, the Commission's decision to review only the WACC percentile and overlook several other aspects of the IM that the Court questioned is troubling. Several of these matters, including the bias in the Commission's WACC model against low beta stocks and the deficiencies in the term credit spread differential (TCSD) could well require a higher WACC percentile, if investigated further. The

[1] Commerce Commission, *Proposed amendment to the WACC percentile for electricity lines services and gas pipeline services*, 22 July 2014 (hereafter: "Draft Decision").

[2] Draft Decision, p.24.

Commission's seemingly selective approach is therefore highly unlikely to achieve the additional certainty that it is ostensibly seeking.

6. That certainty would only be achieved if the Commission either retained the status quo, or investigated *all* relevant matters. As we stated in a previous report,[3] the best – and perhaps only – forum in which to consider all of the relevant factors is a full IM review. This will enable all of the relevant interactions with the other CAPM parameters to be taken into account. In our opinion, the best way to minimise uncertainty in the meantime is to maintain the percentile at its current level and not focus unduly on a single issue.

7. For these reasons, the Commission has not met the threshold that a regulator should be endeavouring to meet before departing from a past decision – particularly a determination that was upheld on appeal by the High Court. As we elaborate in more detail throughout the remainder of this report, in our opinion, it has not offered any persuasive evidence to suggest that the 67th percentile would be better than the 75th percentile and, in fact, there is good reason to think that the 75th percentile would be materially better.

What is the appropriate welfare standard?

8. From an economic perspective, the purpose statement should lead an economist to conclude that a total welfare standard should be employed when selecting the appropriate WACC percentile. This is because workably competitive markets – the outcomes from which the Commission is required to promote – maximise total welfare, not consumer welfare alone. There are also significant theoretical and practical difficulties associated with implementing a consumer welfare standard, such as:

   - it is impossible to know *a priori* whether a transfer from a producer to a consumer is "excessive profit" or will, in fact, result in the firm earning an economic loss (which cannot reasonably be considered a benefit); and
   - any benefits to a person in her capacity as a consumer must be weighed against any losses in her capacity as a worker, land-owner and/or investor, i.e., consumers and producers are not neatly distinguishable.

9. These difficulties suggest that, if the Commission is inclined nonetheless to place some weight on distributional objectives, it should be much less than that placed on genuine efficiency gains. In other words, every $1 reduction in deadweight loss (i.e., gain in total welfare) should be valued more highly in the Commission's assessment than every bare $1 transfer of wealth from producers to consumers. However, that does not appear to be the approach that has been adopted.

3 CEG, *Review of the use of the 75th WACC percentile,* A Report for Orion, May 2014, p.14.

10. Rather, the Commission appears to have determined its WACC range by taking Oxera's range and increasing the "upper limit" to account for certain shortcomings. The problem with this approach is that Oxera's range is based on the application of a pure consumer welfare standard.[4] Had Oxera placed less weight on bare wealth transfers this would have materially increased the upper limit of its WACC range – potentially well above the 75th percentile.

11. Given the way that the Commission has constructed its "reasonable" WACC range, it seems highly likely that any such increase in Oxera's range would have flowed through to its own. This may, in turn have caused the Commission to select a WACC estimate higher than the 67th percentile – and perhaps even higher than the 75th percentile. This conclusion is reinforced once various other deficiencies in the determination of the Commission's WACC range are recognised.

Is the evidence the Commission has considered robust?

12. In our opinion, much of the evidence that the Commission has relied upon to arrive at its Draft Decision that the WACC should be reduced from the 75th to the 67th percentile is not robust. This is because the underlying analyses contain material errors and inconsistencies including, most notably:

- the Commission's analysis of RAB multiples does not reveal any discernible trend, and the one RAB multiple that is materially greater than 1.0 is explainable through factors other than the regulatory WACC being set above investors' WACC (including the potential for outperformance relative to regulatory benchmarks and differences in businesses' historical debt risk premiums);
- failure to properly assess the evidence provided by a comparison of the Commission's WACC allowance and the WACC estimates of:
  - New Zealand investment analysts of energy infrastructure businesses. The adjustments that the Commission makes to the WACC estimates prepared by analysts render those comparisons meaningless – the more relevant comparison is to the unadjusted estimates, which reveals that the Commission's WACC is lower, even at the 75th percentile;
  - International regulators of energy infrastructure businesses. The Commission's dismissal of CEG's international benchmarking analysis is similarly inappropriate – it is justified on the basis that other regulators' use different methodologies to estimate the WACC when the key question is whether the end results are comparable to its own;

4 As we explain in more detail in section 3, this is despite Oxera seeming to conclude that a pure consumer welfare standard is inappropriate.

- the Commission states that "other tools" such as an IRIS for capex and revenue-linked quality incentive schemes can incentivise investment, yet these aspects of the regulatory framework do not yet exist – and may never exist, so their effect on the appropriate WACC percentile cannot be known except in the context of a full IM review; and
- the Commission's analysis of recent capital expenditure and quality of service outcomes is based on a dataset that does not contain enough observations for any trends to be revealed and it cannot provide any insight into the appropriateness of the 67th percentile in any event.

13. Once these shortcomings are recognised, it is apparent that the evidence that the Commission points to as supporting its proposed reduction in the WACC percentile is not persuasive. In our view, this evidence suggests that, if anything, the choice of WACC percentile by the Commission should be increased and not reduced. The Commission therefore has not provided a logical rationale for preferring the 67th percentile to the 75th percentile.

Has the Commission considered all relevant evidence?

14. The Commission has ignored or given insufficient consideration to several other matters that are highly relevant to its choice of WACC percentile. It has articulated no convincing reasons for overlooking these matters – all of which suggest that the 75th percentile may actually be too low; namely:

- the Commission has not considered potential shortcomings in the specification of the TCSD and its cost of debt calculation. Professor Lally and CEG have both separately expressed the view that the cost of debt term should be based on the term of debt actually issued by similar firms – not the term of the regulatory period. In our assessment, addressing those matters may significantly increase the mid-point WACC estimate and, in turn, the WACC implied by any particular percentile;
- the Commission implicitly acknowledges that it has not comprehensively accounted for all relevant forms of uncertainty when specifying the distribution around the mid-point WACC – this means that its estimated distribution of uncertainty is too narrow. Consequently, using this distribution to estimate a given percentile uplift will under-estimate the true uplift associated with that percentile; and
- the Commission has disregarded asymmetric cash-flow risks – the expected costs of which we estimate as being very material, are not "dealt with through cash-flows" (which the Commission's claims to be its favoured approach) and cannot be eliminated through investor diversification.

15. In our opinion, taking proper account of these factors would result in a conclusion that the WACC percentile needed to increase. At the very least, having regard to

these factors would mean that there is no sound basis to reduce the WACC percentile from its current level.

Conclusion

16. In our opinion, once the errors in and omissions from the Commission's Draft Decision are recognised, the Commission does not have a sound basis to reduce the WACC percentile for energy businesses. Indeed, if the above matters were properly assessed we consider that the appropriate conclusion for the Commission to arrive at is that the current IM WACC estimate is too low – even with the application of the 75th percentile. Accordingly, in our view, the 75th percentile (at least) is materially better than the 67th at meeting the objectives of Part 4.

1 Introduction

17. This report has been prepared by CEG for the New Zealand Airports Association (NZ Airports). Its subject is the Commerce Commission's Draft Decision[5] on the appropriate weighted average cost of capital (WACC) percentile to apply to energy businesses regulated under Part 4 of the *Commerce Act 1986* ("the Act"). Although NZ Airports' members are not directly affected by the Commission's Draft Decision, they are naturally interested in the approach that has been taken, since the Commission will soon be embarking on a similar process for airports.

18. NZ Airports has asked CEG to consider a number of questions, all of which require us to review and comment from an economic perspective on the robustness of the various economic analyses that underpin the preliminary conclusions set out in the Draft Decision. We set out those questions and the structure of our report in due course, but we begin by providing a brief overview of the Draft Decision, including the evidence that the Commission relies upon to reach that preliminary position.

1.1 Overview of Draft Decision

19. The Commission's draft decision is to reduce the WACC percentile for energy transport businesses from the 75th to the 67th percentile for price-quality regulation and to narrow the range for information disclosure (ID) regulation from the 25th-75th percentiles to the 33rd-67th percentiles. It begins by stating clearly that it considers that it is appropriate to use a WACC significantly above the mid-point estimate for price-quality regulation, because:[6]

> *"[T]he potential costs of under-investment from a WACC that is too low are likely to outweigh the harm to customers (including any over-investment) arising from a WACC that is too high."*

20. The Commission points to a variety of evidence as supporting the application of a WACC in excess of the mid-point, including the facts that:[7]

    - all of its expert advisors (Oxera, Lally, Vogelsang and Franks) – and the vast majority of expert reports lodged on behalf of submitters (including by CEG) – agree that an increment upon the mid-point WACC is appropriate; and

5 Commerce Commission, *Proposed amendment to the WACC percentile for electricity lines services and gas pipeline services*, 22 July 2014 (hereafter: "Draft Decision").

6 Draft Decision, p.8.

7 *Ibid.*

- overseas regulators often exercise judgement by adopting a WACC above the mid-point of the range, sometimes by using estimates of individual parameters which are generous in favour of suppliers.

21. However, it concludes that the weight of evidence suggests that the 75th percentile is too far above the mid-point. It points to (amongst other things):[8]

    - the enterprise values for Powerco and Vector, which it calculates (wrongly, in our view) as being significantly greater than their corresponding regulatory asset base (RAB) values, which it says suggests the 75th percentile is more than sufficient to compensate investors;
    - the "loss-function" approach adopted by Oxera, which recommends that an estimate between the 60th and 70th percentile is sufficient to compensate for asymmetric social costs (as we explain subsequently, if Oxera had not made several inappropriate assumptions this range would be significantly wider); and
    - the fact that it has "other tools" at its disposal to incentivise efficient investment, such as quality standards (and associated penalties) and incremental rolling incentive schemes for opex and capex (note that it does not disclose how it might change these aspects of the framework).

22. The Commission consequently concludes that the 75th percentile is the "upper limit" and that the 60th percentile is the "lower limit".[9] The Commission states that selecting a point within that range ultimately requires regulatory judgement – it then selects the 67th percentile. It conducts a series of "reasonableness tests" on its selected estimate:

    - it compares its own WACC (with the revised 67th percentile) against estimates derived by New Zealand analysts for comparable firms which are adjusted to "enable comparability" (these adjustments are highly problematic);
    - in doing so, the Commission (wrongly) discounts the relevance of the comparative benchmarking exercise undertaken by CEG for Wellington Electricity that showed that, even with the 75th percentile, its compensation for risk was below that of other regulators; and
    - the Commission also undertakes a rather perfunctory analysis of trends in net capital expenditure under the price-quality paths and concludes that there are no signs of under-investment or material deterioration in quality standards.

8 Draft Decision, p.9.

9 Note that this is slightly different to the 60th to 70th percentile range recommended by Oxera. However, Oxera's conclusion was based only on the consideration of reliability investments, which appears to have prompted the Commission to use a higher "ceiling".

23. The Commission also rejects the proposition that an additional increment to the WACC is required to deal with asymmetric cash-flow risks, e.g., costs arising from natural disasters, stranding risks, etc. It states that:

- these matters are best dealt with through businesses' cash-flows (this is unobjectionable so long as it is done – *which it is not*); and
- that a "well-diversified investor" would require little or no compensation for such risks (this proposition is *simply not true*).

24. Finally, the Commission states that it can consider the WACC percentile in isolation. It contends that the mid-point estimate of the WACC is not biased and that the choice of percentile is not significantly interdependent with other aspects of the input methodologies (IMs).[10]

1.2 Structure of this report

25. NZ Airports has asked us to address the following questions:

1) *Do you agree with the Commission's contention that the 75th percentile has "no special standing" as the status quo?*
2) *From an economic perspective, does the purpose statement suggest that it is appropriate to use a consumer welfare standard or a total welfare standard when selecting the appropriate WACC percentile? How does this relate to the approach used by the Commission's experts?*
3) *In your opinion, how robust is the evidence that the Commission has relied upon to arrive at its Draft Decision? In providing your answer, please consider:*
    a) *the Commission's reliance on RAB multiples;*
    b) *the Commission's comparison's to WACC estimates prepared by New Zealand analysts for similar businesses and its dismissal of CEG's international comparisons;*
    c) *the Commission's contention that it can incentivise investment using "other tools" such as an incremental rolling incentive scheme (IRIS) for capex and revenue-linked quality incentive regimes; and*
    d) *the Commission's analysis of recent trends in capital expenditure and quality of service outcomes.*
4) *In your opinion, is there any other evidence that the Commission has either ignored or afforded insufficient weight in arriving at its Draft Decision? In providing your answer, please consider:*

[10] Draft Decision, p.39.

a) *The Commission's approach to calculating the cost of debt, including the term credit spread differential (TCSD);*

b) *The Commission's approach to estimating the WACC distribution;*

c) *The Commission's proposed treatment of asymmetric cash flow risks, including its contention that a diversified investor would require minimal or no compensation for bearing the risk of events such as natural disasters; and*

d) *other interdependencies and the Commission's position that they are not relevant to the choice of percentile.*

5) *In light of your answers to the above questions, does the Commission have a sound basis for its Draft Decision?*

26. We answer these questions in the remainder of this report, which is structured as follows:

- **section two** addresses question 1, and explains why the 75th percentile *does* have special standing as the status quo and that this has led the Commission to answer the wrong question in its Draft Decision;
- **section three** addresses question 2, and concludes that the Commission has placed undue weight on consumer welfare in assessing social costs, which will have materially reduced the "upper limit" of its "reasonable WACC range";
- **section four** addresses question 3 and shows that the Commission's Draft Decision is informed by analysis that contains errors and inconsistencies and a number of irrelevant matters; specifically:
  - we set out several flaws in the Commission's use of RAB multiples, which mean that the analysis cannot provide any meaningful insight into the appropriate WACC percentile;
  - we explain why the "adjustments" that the Commission has made to the WACC estimates prepared by other analysts undermine completely the efficacy of the exercise;
  - we also describe why the Commission was wrong to discount the relevance of the comparative benchmarking exercise undertaken by CEG for Wellington Electricity;
  - we highlight that several of the "other tools" that the Commission claims it can use to provide incentives for efficient investment do not yet exist – and may never exist – and so their effects are currently unknowable; and
  - we explain why the Commission's analysis of a very short time series of recent capital expenditure and quality of service outcomes cannot be used to discern anything about the appropriate WACC percentile;

- **section five** addresses question 4 and highlights that the Commission has ignored or placed insufficient emphasis on a number of factors that are relevant to any decision on the appropriate WACC percentile; namely:
  - we explain that the Commission has overlooked deficiencies in its cost of debt calculation (specifically, in the term credit spread differential) that, if addressed, would increase the WACC;
  - we observe that the Commission has not properly accounted for all forms of uncertainty in its distribution around the mid-point, which will lead it to underestimate any percentile it is seeking to obtain; and
  - we note that the Commission has effectively ignored asymmetric cash flow risks – the costs of which are significant, not "dealt with through cash flows"[11] and cannot be diversified away by investors;
  - we also set out why the Commission's assertion that a diversified investor would require minimal or no compensation for bearing the risk of events such as natural disasters is incorrect; and
- **section six** concludes by summarising our answers to questions 1 to 4 and our attendant answer to question 5 – which is that the Commission does *not*, in our view, have a sound basis for reducing the WACC percentile.

27. In a number of places, this report draws upon material contained in other reports that CEG has prepared throughout this consultation process:
    - *Review of the use of the 75th WACC percentile, A Report for Orion*, May 2014;
    - *International precedent relevant to the 75th percentile, A Report for Wellington Electricity*, May 2014;
    - *Economic Review of Covec Report, A Report for the NZ Airports Association and the Electricity Networks Association*, June 2014; and
    - *International precedent and selection of a WACC percentile, A report for Wellington Electricity*, August 2014.

[11] The Commission identifies this is as its preferred way of dealing with such risks in its Draft Decision. *See:* Draft Decision, p.41.

2 Status of the 75th Percentile

28. In this section we consider the status of the existing WACC percentile and the resulting implications for the general approach that the Commission has taken to this consultation. Specifically, we address the following question from NZ Airports:

> *"Do you agree with the Commission's contention that the 75th percentile has "no special standing" as the status quo?"*

29. We begin by explaining why the 75th percentile *does* have special standing as the status quo and that this has led the Commission to answer the wrong question in its Draft Decision. We also observe that the Commission's interpretation appears to have influenced the questions that Oxera was asked to answer and consequently its findings.

2.1 The 75th percentile is the status quo

30. In our previous report for Orion, we explained that good regulatory practice requires a regulator to weigh all of the evidence and arguments objectively, and to provide a clear explanation of the relevant factors that led to it reaching its decision. We also explained that, once that decision has been made, it is vital that businesses can then rely on that precedent, and have confidence that it will not be departed from unless the right process is followed and compelling reasons are provided to support a change.

31. The Commission attempts to circumvent this tenet of best regulatory practice in its Draft Decision by, in essence, asserting that the High Court's judgment has "wiped the slate clean". It contends that, as a result of that judgment, the 75th percentile "does not logically have any special standing as the status quo".[12] In other words, it is as though that decision had never been made, making it necessary to approach the matter of the appropriate WACC percentile afresh.

32. Consequently, throughout the Draft Decision, the Commission is essentially asking: "should there be an increment on the mid-point WACC"? In other words, once it has decided that the 75th percentile does not have any precedential value, the "de facto" position appears to be that the WACC should be set at the mid-point, unless there is empirical evidence to suggest that something higher is needed. In our opinion, there are a number of significant problems with this general approach.

33. The most obvious problem is that any contention that the 75th percentile does not have "any special standing as the status quo" is plainly inconsistent with what the High Court actually decided. The Court *upheld* the Commission's WACC input

[12] Draft Decision, p.24.

methodology (IM), including its application of the 75th percentile. It follows that it *is* the status quo and *does* have special standing. If the Court felt sufficiently strongly that the Commission had gone astray in selecting that percentile in light of the evidence that was before it, it could have amended or substituted the IM.

34. It follows that the Commission has asked itself the wrong question. As we noted above, it has asked: "is there any evidence to suggest that should there be an increment on the mid-point WACC?" What it *should* have asked is: "is there any evidence to suggest we should decrease the WACC from the 75th percentile?" These questions are quite different. The Commission answers the first and concludes that there is sufficient evidence to suggest that something higher than the mid-point is needed, but that an "up-lift" to the 67th percentile is sufficient.[13]

35. The Commission does not directly address the question of whether the 67th percentile is "materially better" than the 75th percentile – the threshold that needs to be met to overturn an IM on appeal. The fact that both the 67th and 75th percentile are within the Commission's own "reasonable range" seems particularly instructive on this point. Given that both the 67th and 75th percentile are both "reasonable" in the Commission's view,[14] it is difficult to envisage a Court concluding that the former is materially better.

36. Furthermore, one might reasonably say that the Commission has gathered the additional evidence that the Court alluded to in its judgment and it has revealed that the 75th percentile is appropriate. These conclusions are strengthened once one realises that the Commission has very likely understated the "upper limit" of its "reasonable WACC range" for the reasons we set out in subsequent sections.

37. For all of these reasons, the Commission has not met the threshold that a regulator should be endeavouring to meet before departing from a past decision – particularly a determination that was upheld on appeal by the High Court. As we elaborate in more detail throughout the remainder of this report, in our opinion, it has not offered any persuasive evidence to suggest that the 67th percentile would be better than the 75th percentile and, in fact, there is good reason to think that the 75th percentile would be materially better.

2.2 The Commission's focus is overly narrow

38. The second shortcoming with the Commission's overall approach is that it focusses unduly on one obiter dicta aspect of the High Court's judgment. As we explained in

[13] As we explain throughout the remainder of this report, we do not consider that conclusion has a sufficient basis.

[14] As we explain in subsequent sections of this report, the Commission is likely to have underestimated the "upper limit" of that range in its Draft Decision.

our previous report for Orion, the Commission appears to believe that, unless this particular aspect of the IM is resolved in the near term, it will create unacceptable levels of uncertainty. It is essentially saying that: "the High Court asked questions about our choice of WACC percentile and if we do not answer them now, this will create intolerable uncertainty for investors".

39. The basic problem with this contention is that it rests on the unsound assumption that the Commission will reduce uncertainty by undertaking this narrow review of the WACC percentile. We do not refute that, if the WACC percentile is not reviewed prior to 2018, the commentary of the High Court would cause investors to ponder whether the 75th percentile will continue to be used beyond that point. However, uncertainty surrounds many of the aspects of the cost of capital IM that will be applied when it is next reviewed. For example:

- investors will doubtless have observed that regulators in the United Kingdom and Australia have moved away from setting "on the day" estimates of the cost of debt and towards a long-term moving average – something that we explore in more detail in section 5; and
- investors will be cognisant of the fact that there is evidence to the effect that the Commission's capital asset pricing model (CAPM) framework underestimates the return on low beta stocks, such as electricity networks and implicitly overstates the value of distributed franking credits.

40. As we explained in our previous report, these matters will doubtless be raised again in any IM review and there is necessarily some uncertainty surrounding them. In other words, there is *always* going to be some uncertainty surrounding the WACC that will be used at the next reset. Investors in regulated assets are used to that uncertainty and can manage it. However, the level of uncertainty increases substantially if investors know that, at any time, the Commission might re-open the WACC "mid-period" to tinker with one particular element.

41. In our opinion, that is precisely the sort of uncertainty that the Commission is likely to create through its current consultation unless it substantially alters its scope. What makes the Commission's current approach particularly undesirable from the perspective of promoting uncertainty is the very narrow nature of its inquiry. Specifically, the criterion that the Commission has cited to justify "re-opening" its choice of WACC percentile has not been applied consistently to other elements of the High Court's judgment.

42. The Commission's choice of WACC percentile was not the only aspect of the WACC IM about which the High Court had questions. The Court also raised legitimate questions about the aforementioned tendency of the Simplified Brennan-Lally (SB-L) version of the capital asset pricing model (CAPM) to underestimate the returns on low beta stocks. The Commission argued that, because it had decided that the

SB-L CAPM was the best model for estimating the cost of equity, it was incumbent on it to implement it in the standard manner. The Court disagreed, stating that:[15]

> *"We would not go that far. There is no principle that bars well-based adjustments being made to the output of a model, although it is a task that should be approached with caution … The question is whether the SB-L CAPM is biased in the sense that the estimates it produces for the Energy Appellants are likely to be lower than their actual cost of equity."*

43. However, the Court was not prepared to overturn this aspect of the IM, because none of the appellants had provided evidence "that the alternative models produce unbiased or less biased estimates for the regulated New Zealand firms."[16] In other words, it did not rule that no bias existed – it simply concluded that no empirical evidence had been provided to support such a bias. In our opinion, this is virtually indistinguishable from the High Court's treatment of the WACC percentile; namely:

- the Court raised questions about the Commission's approach and did not dismiss the appeal out of hand; but
- it went on to highlight a lack of empirical evidence to support the appeal before upholding the Commission's decision.

44. The Court also raised similar questions about other aspects of the Commission's WACC IM including, for example, the design and application of the term credit spread differential (TCSD) – a matter that we broach in more detail in section nine. It is therefore conspicuous that the Commission has launched an urgent review to obtain additional evidence on the appropriate WACC percentile, but has not deemed it necessary to further investigate these other areas about which the Court also expressed some scepticism.

45. This selective treatment of issues is unlikely to provide additional certainty. Rather, if the Commission is seen to address one particular matter queried by the Court and ignore others, then investors may justifiably be left uncertain as to when it might consider intervening in the future. They may be even more unsettled by the fact that the Commission appears to have narrowed in on an aspect of the Court's judgment that might suggest a lower WACC could be appropriate, and ignored the others that suggest a higher WACC could be needed.

46. Investors would inevitably – and quite rightly – be left to ask: if the Commission is prepared to re-evaluate the WACC percentile now, then what confidence can I have in all of the parameters around which there is some uncertainty? They may wonder:

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15 *Wellington International Airport Ltd & Ors v Commerce Commission* [2013] NZHC, [11 December 2013], paragraph 1704.

16 *Ibid*, paragraph 1706.

"Would the Commission re-open its IM if, subsequent to its publication, an expert report from leading economists shows that, based on compelling new data, the equity beta should be lowered by 0.2? What about if the report said that it should be *raised* by 0.2?"

47. The Commission's narrow response to the High Court's judgment will make it very hard for investors to predict when an IM might be re-opened. This will undermine the very certainty that the IMs were intended to create. To improve certainty, the Commission must consider *all* relevant matters. This would include the matters queried by the High Court referred to above as well as those that have come to light as a result of the Draft Decision itself, which we explain in more detail in the following sections.

48. Finally, it is worth observing that the Commission's actions for the three monitored airports has created uncertainty that did not exist following the Court's judgment (when the Commission's approach to the percentile range for the airport sector was expressly considered by the Court to be appropriate for information disclosure regulation, and no concerns were raised by the Court about the Commission's approach).

2.3 Conclusion and implications

49. We do not agree with the Commission's contention that the 75th percentile has "no special standing" as the status quo. In our opinion, the 75th percentile demonstrably is the status quo and, consistent with good regulatory practice, the Commission should provide clear and compelling evidence that another percentile is better before departing from it. We do not consider it has surpassed this threshold in its Draft Decision.

50. The Commission's decision to review only the WACC percentile and overlook several other aspects of the IM that the High Court also questioned is also conspicuous. In our opinion, this seemingly selective application is highly unlikely to achieve the additional certainty that the Commission is ostensibly seeking through this consultation. That certainty would only be achieved if the Commission retained the status quo, or investigated *all* relevant matters.

51. As we stated in our previous report, the best – and perhaps only – forum in which to consider all of the relevant factors is a full IM review. This will enable all of the relevant interactions with the other CAPM parameters to be taken into account. In the meantime, the certainty that the Commission is seeking to promote through undertaking this consultation on the WACC percentile would be greatly enhanced by it maintaining the percentile at its current level.

3 The Appropriate Welfare Standard

52. In this section we consider the appropriate welfare standard for the Commission to apply when determining the appropriate WACC percentile. Specifically, we address the following question from NZ Airports:

> *From an economic perspective, does the purpose statement suggest that it is appropriate to use a consumer welfare standard or a total welfare standard when selecting the appropriate WACC percentile? How does this relate to the approach used by the Commission's experts?*

53. We begin by providing our opinion on the welfare standard suggested by the legislative purpose statement. We then explore the practical difficulties associated with applying a consumer welfare standard before setting out the implications for the Commission's Draft Decision.

3.1 What does the purpose statement imply?

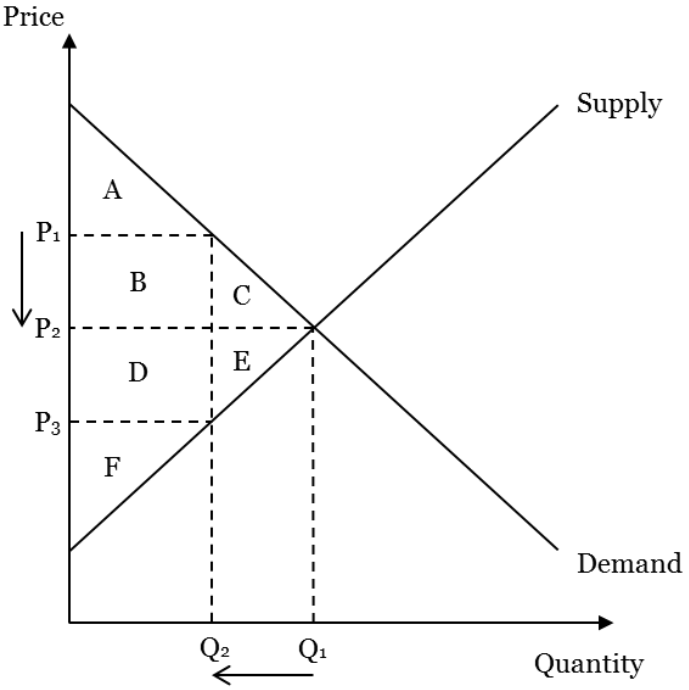
54. Before we provide our opinion on the welfare standard implied by the legislative purpose statement, it is worth briefly reiterating the essential difference between a "total welfare" standard and a "consumer welfare" standard. The distinction between these two welfare objectives can be most easily understood by considering the simple demand and supply diagram set out in Figure 1 below. If the price decreases from P1 to P2 in Figure 1; then:

- Under a **total welfare** standard, the increase in total surplus is equal to the triangle C + E – this represents the value placed on the additional demand that is served at P2 (that went unserved at P1) less the cost of providing that additional demand. The value of the additional output is given by the demand curve and the cost of producing that output is given by the supply curve – with the difference between these (area C+E) being the total increase in welfare. This increase in welfare does not come at the expense of consumers or producers. It is what is known in economics as a potential "Pareto improvement" arising from a reduction in "deadweight loss".
- Under a **consumer welfare** standard, the increase in consumer surplus is equal to the triangle C (a fraction of the total welfare gain) *plus* the rectangle B. This rectangle represents the reduction in the amount paid for the quantity of the service in question that consumers would have bought at P1 (i.e., without the price reduction). This increase in consumer welfare consequently comes wholly at the expense of producers – it is a bare transfer.

55. Put another way, the total welfare standard focusses only on the creation of *additional* wealth (or the destruction of existing wealth), not the *redistribution* of wealth from one party to another. In contrast, a consumer welfare standard focusses

on the wealth accruing to consumers – whether that is through the creation of additional wealth (such as the triangle C below) or the transfer of existing wealth from producers (such as the rectangle B below).

Figure 1 Total welfare vs. consumer welfare



56. We considered the appropriate welfare standard to adopt in any assessment of the social costs and benefits of over- versus under-estimating the WACC in some detail in our review of Dr Small's report for the Board of Airline Representatives.[17] In our review of Dr Small's report, we gave two reasons why the purpose statement contained in s52A of the Act would ordinarily be expected to steer an economist towards a "total welfare" standard. We briefly revisit those aspects of the purpose statement in the following sections.

3.1.1 Workably competitive markets maximise total welfare

57. The first thing to note is that the legislative objective set out in s52A of the Act is to "…promote the long-term benefit of consumers in markets … by promoting outcomes that are consistent with outcomes produced in competitive markets". As we explained in our review of Dr Small's report, one of the defining characteristic of

[17] CEG, *Economic Review of Covec Report*, A Report for the NZ Airports Association and the Electricity Networks Association, June 2014, pp.4-12.

long-run equilibrium in a workably competitive market is that the price will simultaneously reflect two variables:[18]

- the cost incurred by the "marginal producer" to supply the unit of output that clears the market, including a normal risk-adjusted return on capital; and
- the "willingness to pay" of the "marginal consumer" who purchases (i.e., demands) the unit of output that clears the market.

58. Critically, this serves to maximise *total* surplus, because:

- no demand *goes unserved* that could have been met at a price that would have covered the relevant supplier's costs of production; and
- no demand *is served* at a price that does not enable the supplier to cover its costs of production, including a normal risk-adjusted return on capital.

59. Workable competition cannot, however, be assumed to maximise the *individual* quantities of either producer or consumer surplus. For example, in some circumstances consumer surplus can be increased through the imposition of a binding price ceiling and, similarly, producer surplus can sometimes be increased by introducing a binding price floor. Moreover, such interventions almost always give rise to deadweight loss that reduces *total welfare* relative to the workably competitive market outcome.

60. The reference to workably competitive market outcomes would therefore direct an economist to a total welfare standard, not a consumer welfare standard. If there was nonetheless a desire to place some weight on redistributive objectives, another aspect of the purpose statement places clear limitations on that exercise. Specifically, the Commission is directed to promote workably competitive market outcomes such that suppliers (amongst other things) "are limited in their ability to extract excessive profits", the significance of which we discuss below.

3.1.2 Limiting excess profits does not mean imposing economic losses

61. In workably competitive markets, if all firms (including the "marginal producer") are seen to be earning profits that exceed their costs of production, including a normal risk-adjusted return on capital, this will cause new firms to enter and/or existing suppliers to expand. This entry and expansion will continue until, over the

[18] The exception is when the supply and demand curves do not intersect because of a shortage of supply. This causes customers to compete for the limited supply by bidding up the price. As would-be buyers offer higher prices, other buyers who do not value the good sufficiently "drop out". This process continues until the quantity demanded by those fewer remaining customers equals the available supply. The market price reflects the willingness to pay of the marginal consumer, but *exceeds* the production cost of the marginal producer. Nonetheless, total surplus is still maximised.

long run, the market price is again equal to the cost[19] incurred by the "marginal producer"[20] such that it is earning a "normal" economic profit.[21]

62. However, by the same token, in workably competitive markets, firms also do not incur *economic losses* in the long-run. This is because any firm that fails to recover its costs of production, including a normal risk-adjusted return on capital, will exit over the longer term by redeploying its capital elsewhere. As we noted in our review of Dr Small's report, these competitive dynamics are reflected in the structure of the purpose statement:

- section 52A(d) speaks of limiting regulated suppliers' ability to extract excessive profits; but
- it does not speak of eliminating the ability of firms to earn any profits or forcing firms to incur economic losses.

63. Therein lies a key problem with approaches that place equal weight on bare transfers from producers to consumer and genuine efficiency gains arising from reductions in deadweight loss. Namely, in the current context, because the true WACC is not estimable, the very nature of the exercise means that it is impossible to determine *a priori* whether any estimated transfer of surplus from producers to consumers arising from a change to the WACC percentile will comprise:

- only "excess profits", i.e., a transfer of rent that would otherwise have simply enabled producers to earn returns in excess of the "true WACC"; or
- whether it might also comprise some "economic losses", i.e., transfers of rent that result in producers earning returns that are below the "true WACC".

64. For those reasons, even if it was appropriate to place some weight on bare rent transfers when assessing the social costs and benefits of over- versus under-estimating the WACC (a questionable proposition in our view), they should certainly not receive the same weight as reductions in deadweight loss, i.e., demonstrable welfare/efficiency increases. Aside from not being genuine efficiency gains in any event, there is also some chance that a proportion of those transfers may not be a result of "limiting excess profits", but instead stem from producers being forced to incur below normal returns.

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19 Assuming that price rationing is not necessary – see previous footnote.

20 As noted earlier, the price will also reflect the "willingness to pay" of the "marginal consumer" who purchases (i.e., demands) the unit of output that clears the market.

21 Note that this does not mean that *all* firms will be earning normal profits. There may also be infra-marginal producers whose costs of production are lower than the marginal producer's and who therefore make a "positive economic profit" on each unit sold at the market price.

65. Put another way, even if it was appropriate to value $1 of consumer surplus more highly than $1 of producer surplus, in our opinion, that difference should not be substantial – and producer surplus should certainly not receive zero weight. That conclusion is reinforced when one realises that the distinction that one must draw between "consumers" and "producers" in order to give effect to a consumer welfare standard is often illusory in practice. We elaborate below.

3.2 Practical difficulties measuring consumer welfare

66. Even if one believed that, in theory, $1 of consumer welfare should be valued more highly that $1 of producer welfare, that is often not a meaningful distinction *in practice* since consumers and producers are oftentimes one and the same. A person that is impacted by a price change in her capacity as a "consumer" may similarly be affected in her capacity as a taxpayer, land owner, worker or investor. Attempting to isolate and provide greater weight to consumer surplus is therefore infeasible, since every "consumer" may also be a "producer". For example:

- some of the businesses for which the Commission is determining a WACC percentile are government-owned, e.g., Transpower is a state-owned enterprise and so its "end-customers" (i.e., New Zealand electricity consumers) are also its "ultimate" shareholders;
- in a similar vein, other businesses – including some energy businesses and the three monitored airports – are wholly or partly owned by local councils, and so their "end-customers" will also be its "ultimate" shareholders, i.e., those customers also pay rates to the local council;
- those businesses that are publicly listed will have consumers who hold shares – either directly or through financial institutions tasked with investing people's financial assets – these people may also be effected in their capacity as "producers" by any decision on the WACC. Vector is a special case in point – with the Auckland Energy Consumer Trust owning 75.4%. This means that the persons named on power bills living in the Trust District (Auckland Manukau and the northern parts of Papakura) are both consumers and owners; and
- the businesses in question employ a significant proportion of New Zealand's workforce, and so any effect that the WACC percentile has on worker compensation and conditions, etc., will naturally affect those employees in their capacity as "producers".

67. For every dollar that is gained by a person in her capacity as a "consumer" of a regulated service following a change in the WACC, that person may lose more or less than a dollar in her capacity as a shareholder, rate/taxpayer, trust recipient or employee. The application of an approach that placed much greater weight on consumer welfare than producer welfare might therefore conclude that such a person was better off, despite the fact that she may be indifferent or worse off. The

result could easily be that the welfare of consumers is actually reduced if the analysis fails to give the same weight to losses the same people suffer in their joint role of 'producers'.

68. Indeed, one could not even be confident that "consumers" had been identified, much less that the economic benefit accruing to this group had been maximised or lent particular weight. To do so with any precision is simply infeasible since there is ultimately no way to distinguish between welfare impacts upon producers and consumers. In any event, there are more efficient vehicles to redistribute income than through regulatory policy, as the New Zealand Treasury has observed:[22]

> *"We consider regulation is best used to improve the efficiency of markets. The Government has other policy instruments to address concerns about distribution of income."*

69. We agree. In our opinion, from an economic perspective, the purpose statement suggests that it is appropriate to apply a total welfare standard when selecting the appropriate WACC percentile. If the Commission nonetheless concludes that it is relevant to also consider distributional objectives, bare transfers of wealth from producers to consumers should be afforded considerably less weight that reductions in deadweight loss. Most importantly, the objective *should not* simply be to maximise consumer surplus, irrespective of how that is achieved.

3.3 Influence on the Draft Decision

70. In order to appreciate the implications of the preceding analysis for the Draft Decision, it is first necessary to understand what the Commission's experts said about the appropriate welfare standard in their reports. This is because the recommendations of those experts – particularly Oxera – have clearly had a significant bearing on the Commission's choice of WACC percentile.

3.3.1 What did the Commission's experts say?

71. The issue of the appropriate welfare standard is discussed by three of the Commission's experts. Dr Lally makes it plain in his report that he does not support a pure consumer welfare standard, i.e., an approach that places equal weight on reductions in deadweight loss (triangle C) and bare transfers (rectangle B). In commenting upon the report prepared by Dr Small on behalf of the Board of Airline Representatives, he states that:[23]

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22 The Treasury, *Treasury Report No T2004/774: Briefing for EDC Local Loop Unbundling and Fixed PDN in New Zealand*, 10 May 2004, p.8.

23 Lally, M., *The Appropriate Percentile for the WACC Estimate,* 19 June 2014, pp.21-22.

> *"I do not agree that the wording of section 52A of the Commerce Act implies that producer surplus should be ignored; the effect of doing so on new investment is limited in any event, and the effect on 'sunk' investment (de facto confiscation) is so extreme as to be completely unviable."*

72. We agree. As we noted above, this is one of the key weaknesses that we identified with Dr Small's report in our own review. Oxera also explores the appropriate welfare standard in some detail in its report. It defines a total welfare function as given by: TW = αCS + (1-α)PS, where TW is total welfare, CS is consumer surplus, PS is consumer surplus and α is the weight given to each of these surpluses in the estimation exercise.[24] It explains that:[25]

    - if one assumes that α is equal to 0.5, then consumer and producer surpluses have equal weight and a transfer from the latter to the former will have no impact on total welfare, i.e., this is a "total welfare" standard; and
    - if one assumes that α is equal to 1, then any reduction in consumer surplus is a welfare loss, even if there an off-setting increase in producer surplus, i.e., this is a "pure consumer welfare standard".

73. One of the potential problems with the Oxera analysis is that it makes no distinction between bare transfers of wealth and genuine efficiency gains/losses, i.e., changes in deadweight loss. To put it colloquially, it does not distinguish between "rectangles and triangles". This may be because Oxera considers that changes in deadweight loss are sufficiently small that they can be ignored or not afforded separate consideration (we consider the potential implications of this in Box 1 below). Having made that assumption, Oxera states that:[26]

> *"…it would be reasonable to expect that the value of α which the Commission is expected to take into consideration in setting a price path lies between 0.5 and 1 (given its duties to protect customers from monopoly pricing)."*

74. In other words, Oxera concludes that it would be appropriate for the Commission to adopt a value for α of between 0.5 and 1 when setting the appropriate WACC percentile. However, despite concluding (rightly, in our view) that a pure consumer welfare standard is inappropriate, it proceeds to counts every reduction in consumer surplus as a welfare loss in its empirical assessment of the costs to consumers associated with different WACC percentiles. In other words, it assumes that α is equal to 1.

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24 Oxera, *Input methodologies, Review of the '75th percentile' approach, Prepared for the New Zealand Commerce Commission,* 23 June 2014, p.29.

25 *Ibid.*

26 Oxera, *Input methodologies, Review of the '75th percentile' approach, Prepared for the New Zealand Commerce Commission,* 23 June 2014, p.29.

75. This error may well have been inadvertent but it has a material bearing on the results that Oxera sets out in its report. Had Oxera "followed its own advice" as it were, the upper limit of its recommended WACC range (which it estimates as being 70%) would inevitably have been significantly higher. Professor Vogelsang makes precisely this point in his peer review of its report:[27]

> *"Oxera uses a consumer welfare approach for its policy assessment. Compared to a total surplus approach such an approach tilts the evidence against using a higher WACC percentile."*

76. To arrive at its recommended WACC range, Oxera calculates the increase in charges that consumers will face at different percentiles relative to the 50th percentile and considers whether it is in their interests to pay that "insurance premium" given the potential annual cost of severe outage events (which is estimates as being between $1bn and $3bn).[28] This calculation is undertaken using a "combined RAB" for all electricity companies – around $4.7bn for Transpower and $10bn for electricity distribution businesses (so around $14.7bn in total).

77. Table 1 below sets out Oxera's calculation of the cost to consumers of the 60th, 70th and 80th percentiles. It illustrates that the 70th percentile implies an "insurance premium" of around 10% of the annualised potential cost of the insured risk (assumed to be $1bn), which Oxera deems to be acceptable. However, the 80th percentile involves a $133m cost per annum, which represents almost the expected cost of one severe event within each 7-year IM period. Oxera deemed this cost to be too high.

Table 1 Oxera approach to determining the percentile[29]

Percentile	Additional cost to consumers	Rationale
60th	$40m	$40m increase represents less than 5% of the potential size of the risk mitigated (based on Oxera's $1bn annualised estimate).
70th	$83m	$83m increase is approaching 10% of the potential size of the risk mitigated (based on Oxera's annualised $1bn estimate).
80th	$133m	At $133m per annum, this represents almost the expected cost of one severe event within each 7-year IM period.

78. Oxera does not report separate numbers for the increase in deadweight loss and the transfer from consumers to producers associated with its postulated price increases.

27 Vogelsang, I., *Review of Oxera's Report, Input methodologies – Review of the '75th percentile' approach*, July 10 2014, p.1.

28 *See:* Oxera, *Input methodologies, Review of the '75th percentile' approach, Prepared for the New Zealand Commerce Commission,* 23 June 2014, p.72.

29 *Ibid.*

It simply presents a single number. As noted above, this may be because the additional cost is intended to represent only a bare transfer of wealth, i.e., Oxera may consider the change in deadweight loss to be relatively insignificant.

79. Critically, Oxera has not adjusted its estimated costs to consumers to reflect the fact that those sums are being paid by producers. In other words, 100% weight is placed on the additional consumer welfare, and 0% weight on producer welfare. This is demonstrably at odds with Oxera's own recommendation that α be set between 0.5 and 1. As soon as positive weight is placed on the change in producer surplus (which appears to be simply the inverse of the estimated cost to consumers), Oxera's welfare calculations change – potentially dramatically.

80. Table 2 below illustrates that, under Oxera's framework, the 75th percentile is more than justified using even highly conservative values of α. For example, when α is set at 0.8, such that consumer welfare is afforded more than three times the weight of producer welfare, the estimated welfare impact of applying the 80th percentile is $80m. This is less than the $83m that Oxera mistakenly calculated as being associated with the 70th percentile, and which it deemed to be reasonable.

Table 2 Percentiles implied by revised welfare standard

	60th Percentile			70th Percentile			80th Percentile		
	Wealth Transfer = $40m			Wealth Transfer = $83m			Wealth Transfer = $133m		
α	α x ΔCS	α x ΔPS	ΔTW	α x ΔCS	α x ΔPS	ΔTW	α x ΔCS	α x ΔPS	ΔTW
0.5	$20	-$20	$0	$42	-$42	$0	$67	-$67	**$0**
0.67	$27	-$13	$14	$56	-$27	$28	$89	-$44	**$45**
0.75	$30	-$10	$20	$62	-$21	$42	$100	-$33	**$67**
0.8	$32	-$8	$24	$66	-$17	$50	$106	-$27	**$80**
0.9	$36	-$4	$32	$75	-$8	$66	$120	-$13	$106
1	$40	$0	$40	$83	$0	$83	$133	$0	$133

81. In other words, the simple exercise set out above illustrates that, once less than 100% weight is placed on consumer welfare, Oxera's own framework establishes that the 75th percentile is more than reasonable. Moreover, as we explain throughout the remainder of its report, there are several other factors that will also have caused Oxera to have underestimated the upper limit of its WACC range. If these matters had been properly accounted for its upper limit would have been higher still. These factors include:

- its exclusive focus on reliability investments – factoring in the potential benefits from other types of investment would have increased the upper limit of Oxera's WACC range, as the Commission acknowledges;[30] and

[30] Draft Decision, p.71.

- the fact that it was directed by the Commission to disregard asymmetric cash flow risks – as we explain subsequently, these risks are significant and would have further increased the upper limit of Oxera's range.

82. In other words, all of the Commission's experts whom opined on the appropriate welfare standard clearly caution against the application of a consumer welfare standard – and rightly so.[31] However, Oxera then disregards its own counsel and erroneously applies a consumer welfare standard to arrive at its recommended WACC range. As we explain below, this has almost certainly had an effect upon the Commission's Draft Decision.

[31] We also note that those experts who have prepared reports on behalf of submitting parties that have recommended the application of a consumer welfare standard have been thoroughly discredited.

Box 1: Distinguishing Between Transfers and Deadweight Loss

Oxera defines a total welfare function as given by: TW = αCS + (1-α)PS, where TW is total welfare, CS is consumer surplus, PS is producer surplus and α is the weight given to each of these surpluses in the estimation exercise. This means that, if α is greater than 0.5:

- an additional $1 of consumer surplus that arises from a reduction in deadweight loss is valued equally to an additional $1 that stems from a bare transfer from producers; and
- a $1 reduction in deadweight loss that stems from an increase in consumer surplus is weighed more heavily than a $1 reduction arising from an increase in producer surplus.

To the extent that there is allocative efficiency consequences associated with changing the WACC (and, in turn, regulated prices), Oxera's conceptual framework for measuring welfare outcomes entails even more problems than those described above. If there are more than bare transfers of rent caused by price changes, Oxera's numbers are even less reliable, because:

- it is inappropriate to value $1 of additional consumer welfare arising from a reduction in deadweight loss the same as a $1 arising from a bare transfer of wealth; and
- there is no basis in economics for valuing reductions in deadweight loss stemming from increases in consumer welfare more highly than those from increased producer welfare.

To illustrate, suppose that α was equal to one and that changes in producer welfare were irrelevant (which Oxera itself concedes is not a reasonable assumption). Suppose also that 25% of the additional cost to consumers from any uplift in the WACC percentile is a deadweight loss and that the remaining 75% is a bare transfer.[32] Suppose finally that bare transfers receive 50% of the weighting of increases in deadweight loss.

In reality, the percentage of any additional costs to consumers attributable to deadweight losses would be likely to be much lower than 25%. Moreover, in our opinion, the matters described in sections 3.1 and 3.2 arguably provide a sufficient basis for placing even less weight on bare wealth transfers. Nevertheless, as the table below illustrates, even these conservative assumptions are sufficient to justify the 75% percentile using Oxera's rationale.

Percentile	Additional cost to consumers – Oxera analysis	Deadweight loss (25% of cost)	Bare transfer (75% of cost & 50% weighting)	Total cost implied by new welfare standard
70th	$83m	$21m	$62m x 0.5 = $31m	**$62m**
80th	$133m	$33m	$100m x 0.5 = $50m	**$83m**

Indeed, the revised $83m additional cost associated with the 80th percentile in the table above is the same as that which Oxera mistakenly calculated as being associated with the 70th percentile, and which it deemed to be reasonable. In other words, the simple exercise set out above illustrates that, once a more orthodox welfare standard is applied, Oxera's own framework establishes that the 75th percentile is more than reasonable.

[32] Note that this analysis assumes a perfectly elastic supply curve. If the curve was upward sloping, there would be an additional deadweight loss associated with reduced production.

3.3.2 How did this advice influence the Draft Decision?

83. The Commission spends relatively little time directly addressing the question of the appropriate welfare standard in its Draft Decision. It concludes that bare transfers of wealth are relevant to its assessment. However, the Commission appears to acknowledge (rightly in our opinion) that they should not be afforded the same weight as efficiency gains and that the precise emphasis to be given to such factors is a matter of some conjecture.[33]

84. What is less clear is how this conclusion has actually influenced the Commission's selection of the WACC percentile. It simply states that:[34]

> *…Our analysis, and that of our experts, therefore adopts both consumer welfare and total welfare approaches. This means that in reaching our draft decision as to what will best promote the long term benefit of consumers by promoting outcomes consistent with outcomes produced in competitive markets, we have had regard to transfers from suppliers to consumers, but have also had regard to aggregate efficiency considerations."*

85. The Commission states in the above passage that its analysis "adopts both consumer welfare and total welfare approaches". It is not altogether clear what this means, since it has not undertaken any of its own empirical analysis of social costs and benefits that has involved distinguishing between efficiency gains and bare transfers. Its Draft Decision appears to have been influenced primarily by the analysis that has been undertaken by its experts – particularly Oxera.

86. It is therefore possible that what the Commission really means is that its *experts* have adopted either consumer or total welfare approaches. And, because it has taken all of those experts' analyses into account in reaching its Draft Decision, it too has been influenced by both welfare approaches – albeit indirectly. If that is the case, then that is problematic because, as we explained above, the welfare standard applied by Oxera is, by its own admission, inappropriate.

87. The Oxera report appears to have influenced the Commission's determination of the "reasonable WACC range" more than any other. Oxera concludes that a point estimate between the 60th and 70th percentile is likely to be appropriate.[35] Although the "upper limit" of the Commission's WACC range is slightly higher (the 75th percentile) this appears to be because:[36]

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33 Draft Decision, p.27.

34 Draft Decision, p.27.

35 Oxera, *Input methodologies, Review of the '75th percentile' approach, Prepared for the New Zealand Commerce Commission,* 23 June 2014, p.6.

36 The Commission also notes that Oxera omits the benefit that customers get from underinvestment in terms of lower prices, which would serve to partly offset the exclusive focus on reliability investments.

- the Oxera report focuses exclusively on reliability investments and the Commission recognises that factoring in the potential benefits from other types of investment would increase the upper limit of Oxera's WACC range;[37] and
- there was some analytical support for using a WACC above the 75th percentile,[38] including from one of the Commission's own experts – Dr Martin Lally, who concluded that the current WACC was likely too low.[39]

88. In other words, it appears as though the Commission has started with Oxera's range and increased the upper limit to account for these additional factors. This begs the question: how would the Commission's decision as to the reasonable WACC range have been affected if Oxera had adopted its own recommendation and not assigned equal weight to bare transfers and efficiency gains? As we explained earlier, if Oxera had employed an appropriate welfare standard that placed significantly less weight (or no weight) on bare wealth transfers, the upper limit of its WACC range would have been significantly higher – certainly above the 75th percentile if a total welfare standard was applied.

89. That being the case, given the way that the Commission appears to have arrived at its own range – i.e., ostensibly taking Oxera's range and increased the "upper limit" to account for perceived shortcomings – it seems reasonable to conclude that if Oxera had applied a more appropriate welfare standard that this would have influenced the Draft Decision. Namely, the upper limit of the Commission's "reasonable" WACC range may have been significantly above the 75th percentile and its choice of point estimate within that range higher than the 67th percentile.

3.4 Conclusions and implications

90. From an economic perspective, the purpose statement should lead an economist to conclude that a total welfare standard should be employed when selecting the appropriate WACC percentile. This is because workably competitive markets – the outcomes which the Commission is required to promote – maximise total welfare, not consumer welfare. In other words, it is a total welfare standard that best promotes the long-term benefit of consumers.

91. There are also significant theoretical and practical difficulties associated with implementing a consumer welfare standard, such as:

However, it should be noted that Oxera also do not account for the benefit that customers receive from overinvestment in terms of higher reliability.

37 Draft Decision, p.71.

38 Draft Decision, p.71.

39 Lally, M., *The Appropriate Percentile for the WACC Estimate,* 19 June 2014, p.3.

- it is impossible to know *a priori* whether a transfer from a producer to a consumer is "excessive profit" or will, in fact, result in the firm earning an economic loss (which cannot reasonably be considered a benefit); and
- any benefits to a person in her capacity as a consumer must be weighed against any losses in her capacity as a worker, land-owner and/or investor, i.e., consumers and producers are not neatly distinguishable.

92. These difficulties suggest that, if the Commission is inclined nonetheless to place some weight on distributional objectives, it should be much less than that placed on genuine efficiency gains. In other words, every $1 reduction in deadweight loss (i.e., gain in total welfare) should be valued more highly in the Commission's assessment than every bare $1 transfer of wealth from producers to consumers. However, perhaps inadvertently, that does not appear to be the approach that has been adopted.

93. Rather, the Commission appears to have determined its WACC range by taking Oxera's range and increasing the "upper limit" to account for certain shortcomings. An additional shortcoming in Oxera's range is that it has, contrary to its own advice, adopted a pure consumer welfare standard. Had it adopted a total welfare standard (or, at least, placed much less weight on bare wealth transfers) this would have materially increased the upper limit of its WACC range – in our view to well above the 75th percentile. This alone would have demonstrated that the 75th percentile estimate was more than reasonable (being within the Oxera range even before the Commission extended it) and would, holding all other aspects of the Commission's reasoning constant, have caused the Commission to select a WACC estimate higher than the 67th percentile.

94. As we explain in more detail in the subsequent sections of this report, that conclusion is reinforced once various other deficiencies in the determination of the Commission's WACC range are recognised. Once all of these matters are addressed – including the shortcomings in the application of the welfare standard described above – it becomes apparent that the Commission is likely to have significantly underestimated the upper limit of its WACC range which, in turn, will have affected its choice of percentile.

4 Review of Evidence Considered

95. In this section we consider the weight of the empirical evidence that the Commission has relied upon to justify its draft recommendation that the WACC be reduced from the 75th to the 67th percentile. Specifically, we address the following question from NZ Airports:

> *"In your opinion, how robust is the evidence that the Commission has relied upon to arrive at its Draft Decision?"*

96. We consider the Commission's analysis of RAB multiples, its comparative benchmarking, its reliance on "other tools" from the regulatory framework and its analysis of recent trends in capital expenditure and network reliability. In each instance we illustrate that the analysis in question contains significant errors and inconsistencies. These render the Commission's conclusions unreliable and, when corrected, suggest that, if any change to the WACC percentile was to be contemplated outside a full IM review, it should have been an increase.

4.1 RAB multiples

97. The Commission points to recent enterprise values for Powerco and Vector in its Draft Decision. It calculates that, at particular points in time, these values exceeded the businesses' corresponding regulatory asset base (RAB) values, i.e., they had "RAB multiples" rather than "RAB fractions". Specifically, it calculates the Powerco multiple to be 1.33 and Vector's to be between 1.09 and 1.16.

4.1.1 Regulatory precedent for the use of RAB multiples

98. The Commission places what is, in our view, an exceptionally strong weight on its RAB multiple analysis in informing its ultimate conclusion. It is the first reason listed in the Commission's summary of its reasons for reducing the 75th percentile.[40]

99. The Commission's reasoning goes so far as to place the existence of RAB multiples as a reason for rejecting any evidence in support of maintaining the 75th percentile. For example, in rejecting the relevance of evidence to the effect that, even with the 75th percentile, the Commission's allowance for risk premia was well below that of international regulators, paragraph B23.3 of the Draft Decision states:

> *B23.3 CEG's analysis does not discuss why, if the NZ risk premia is unattractive relative to that allowed by regulators overseas, the stake in Powerco still attracted strong buyer interest (including from international*

[40] Paragraph X20 on page 9 and paragraph 6.38 on page 80 of the Draft Decision.

investors) and was transacted at a significant premium to Powerco's RAB, and why Vector too trades at an implied premium to its RAB.

100. Similar sentiments are expressed at paragraphs 6.35 to 6.36 and A39. This weight given to RAB multiples in an analysis of the appropriate WACC is, in our experience, extreme relative to the use of such values by other regulators. Other regulators have, in our view correctly, expressed considerable caution about the use of RAB multiples in regulatory decision making. For example, the Australian Energy Regulator (AER) has recently described how it proposes to use RAB multiples:[41]

> *"We now propose to* ***not*** *apply levels and changes in RAB acquisition and trading multiples as a direct reasonableness check on the overall rate of return at the time of a particular revenue determination or access arrangement. Instead, we propose to use these multiples as part of a set of indicators* ***that we monitor over time and across network businesses*** *to help inform us of potential areas of inquiry and research. This more general use of these multiples reflects the fact that there are many potential influences on RAB acquisition and trading multiples, such as changes in the expectations and the realisations of business revenues, expenditures and rates of return.* ***Given these many potential influences, any changes in these multiples may not be immediately attributable to any one factor.*** *We propose to continue to monitor RAB acquisition and trading multiples to inform us of market outcomes over time and in response to changes in the environment of the network businesses,* ***without making use of them directly in the rate of return determination process.****"* [Emphasis added.]

101. We describe in the following sections how many of the difficulties alluded to by the AER in the above passage plague the Commission's own use of RAB multiples in its Draft Decision (as well as outright errors in the Commission's analysis).

102. Moreover, even if it was appropriate to adopt a 'target' RAB multiple when setting the WACC, the Commission would need to explain what that target level was. It has not done that in its Draft Decision. The only clear conclusion that the reader can draw from the Draft Decision is that the Powerco estimated RAB multiple of 1.33 is above some undisclosed target level. However, presumably the Horizon RAB multiple (less than 1.0) is below a target level. The status of the Vector RAB multiples, which the Commission estimates at between 1.09x and 1.16x, is unclear (noting also that, as we explain below, correcting errors in the Commission's calculations considerably reduces the top and bottom of this range).

41 AER, *Explanatory Statement: Rate of Return Guideline*, December 2013, p.48.

4.1.2 What might cause a RAB multiple?

103. In and of itself, it is thoroughly unremarkable for a business to have an enterprise value that exceeds its RAB. As the Commission acknowledges in its Draft Decision, there are a multitude of factors that might generate a RAB multiple – or a RAB fraction – at a specific point in time. The valuation that an investor places on a regulated business will not be based purely on the RAB and the regulatory WACC at that point in time. An investor's expectations of the net present value of forward-looking cash flows may also be influenced by:

    - temporary fluctuations in discount rates used in equity markets (these are most relevant if a 'snapshot' RAB multiple is estimated rather than a long history or RAB multiples);
    - the value of cash-flows that the business is expected to earn from unregulated activities, i.e., activities not captured in the RAB or the WACC;
    - any positive option value associated with ownership of the firm;
    - various differences between the regulator's forecasts and the investor's perception of how the firm will perform, for example:
        - an investor may expect the firm to outperform forecast operating and capital expenditure allowances; and/or
        - an investor may expect volumes to exceed the regulator's demand forecast, also resulting in outperformance;
    - divergences between the forecast financial conditions at the time of the purchase and those during the window used to set the WACC, for example:
        - the Commission's allowance for the cost of debt is based on the market conditions immediately prior to a regulatory period; but
        - businesses' actual embedded costs of debt are based on historical averages, and so may be higher or lower than the Commission's estimates.

104. The above factors mean that over time, it would not be surprising to see a range of RAB multiples (or fractions) across regulated energy businesses. It follows that, in order to draw any robust inferences about the sufficiency or otherwise of the regulatory WACC from such RAB values, it is necessary to comprehensively account for all of the above factors in any such analysis. One must have a sufficiently large sample of observations showing statistically significant results consistently through time. The Commission's analysis of RAB multiples meets neither criterion.

4.1.3 The Commission has not established any robust level of RAB multiples across its sample

105. The Commission is seeking to draw conclusions about the sufficiency of its WACC percentile from two enterprise values. In our opinion, that is simply not enough

data from which to draw any reliable inferences. Moreover, as it turns out, there is plainly no robust estimate that falls out of the very small sample of data used by the Commission. As Professor Ingo Vogelsang highlights in his peer review of the Draft Decision, the Commission cannot be confident that Vector's RAB multiple is different from one, from a statistical perspective:[42]

> *"...the resulting valuations are clearly subject to potential valuation errors. Because of such potential errors the comparatively low RAB multiples (compared to that of Powerco) are somewhat disturbing. It may be that from a statistical perspective they are not really larger than 1.0."*

106. Moreover, the Commission's own estimates are that Horizon Energy is trading at an implied discount to the RAB, i.e., it has a RAB fraction.[43] In other words, the Commission has not illustrated a statistically significant estimate across New Zealand businesses – and it cannot with such a small pool of data. Instead, it has identified a range of RAB multiples/fractions, which suggests that investors' decisions are being influenced by matters other than the RAB and the regulatory WACC, i.e., the factors we described above. We explore the potential effects of those factors in more detail below.

4.1.4 Snapshots versus sustained trends

107. The Commission has reported snapshot estimates of RAB multiples rather than any estimate of a sustained RAB multiple in excess of 1.0. This can be problematic if the market value of equity in that snapshot period is unusually high. This might demonstrate a RAB multiple temporarily materially in excess of 1.0 when the average RAB multiple through time is much lower and, may even be materially below 1.0. For this reason it is important that the equity value of a business used in a RAB multiple analysis represents the average value of equity through time.

108. In our view, the snapshots of equity values for Vector which the Commission uses in its RAB multiple analyses are not representative of the value of Vector's equity through time. In this regard we note that, contrary to the statement at paragraph A18.2.1 of the draft decision, the Commission has not used Vector's average share price for the 20 trading days to June 2013 in its analysis. The average share price over this period was $2.63 whereas the Commission has used a share price of $2.78.

109. The use of a figure of $2.78 is somewhat puzzling because there is no 20 day period since Vector shares became publicly traded when the average share price has been this high (the highest 20 day average of Vector's share price is $2.71 for the period

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42 Vogelsang, I., *Review of New Zealand Commerce Commission "Proposed amendment to the WACC percentile for electricity lines services and gas pipeline services"*, July 22, 2014, p.5.

43 Draft Decision, p.93.

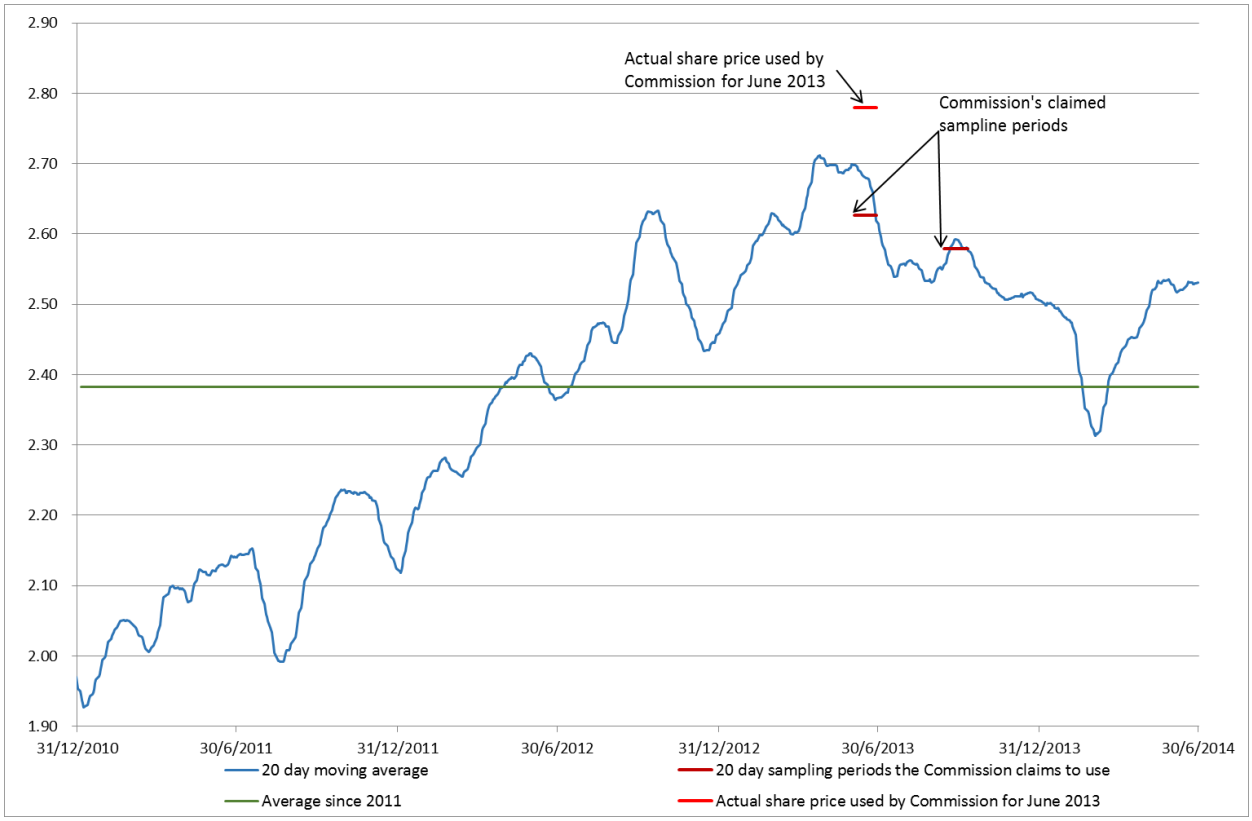
ending 25 May 2013). We note that the highest ever daily closing value for Vector's share price is, perhaps by coincidence, $2.78 which occurred on 17 May 2013.

110. The use of $2.78 is clearly not based on what the Commission states it has done. It is possible that at some stage the Commission searched for the highest ever share price recorded by Vector and used this in a preliminary RAB multiple analysis - but failed to change this value in its analysis when it adopted a different period. Whether this is the basis of the Commission's use of $2.78 in its analysis we cannot know. However, it is the case that the Commission's highest RAB multiple estimate for Vector of 1.16x is calculated based on a share price that is equal to the highest price ever achieved by Vector shares.

111. Moreover, even the share prices recorded during the two periods that the Commission says it used (as opposed to the periods it actually used) are unusually high relative to both historical averages and the time since those two periods.

112. We have illustrated this by plotting the 20 day moving average of Vector's share price since 2011. In the same figure we have plotted the two 20 day sampling period 'snapshots' that the Commission has said that it used to perform its RAB multiple analysis for Vector (as well as the $2.78 figure actually used). It can be seen that these snapshots are taken during in periods when Vector's share price was unusually high relative to the average over the period (and relative to the time since).

Figure 2: Timing of Commission RAB multiple estimates and 20 day moving average of Vector share price



Source: Bloomberg, Commerce Commission, CEG analysis

113. Had the Commission used the average share price over the period January 2011 to June 2014 ($2.38) in its analysis then the RAB multiples estimated for Vector would have been 1.04x and 1.03x – hardly different from 1.0. It may be argued that this estimate includes too much data from the early period of the above chart and that the RAB in that period was also likely to be lower. However, the same point can be illustrated using only data from the first half of 2014. The average share price in this period was $2.46 which, when used in the Commission's analysis, results in RAB multiples of 1.07x and 1.05x. Of course, these estimates are likely overstated because they do not account for Vector's investment in its RAB since then.

114. The fundamental conclusion from this analysis is that, even in the Commission's own analysis, Vector's RAB multiple was not materially higher than 1.0x. Correcting this by using more representative estimates of the market value of Vector's equity results in RAB multiples that are even lower.

115. When it comes to the RAB multiple 'snapshot' used to estimate Powerco's RAB estimate it must be recognised that the company is not publicly traded. Consequently, the Commission is in some sense forced to rely on a snapshot value of equity based on the period of any announced trade of Powerco's shares. In this

case, the Commission has relied on the purchase by AMP of Powerco shares announced on 4 July 2013.

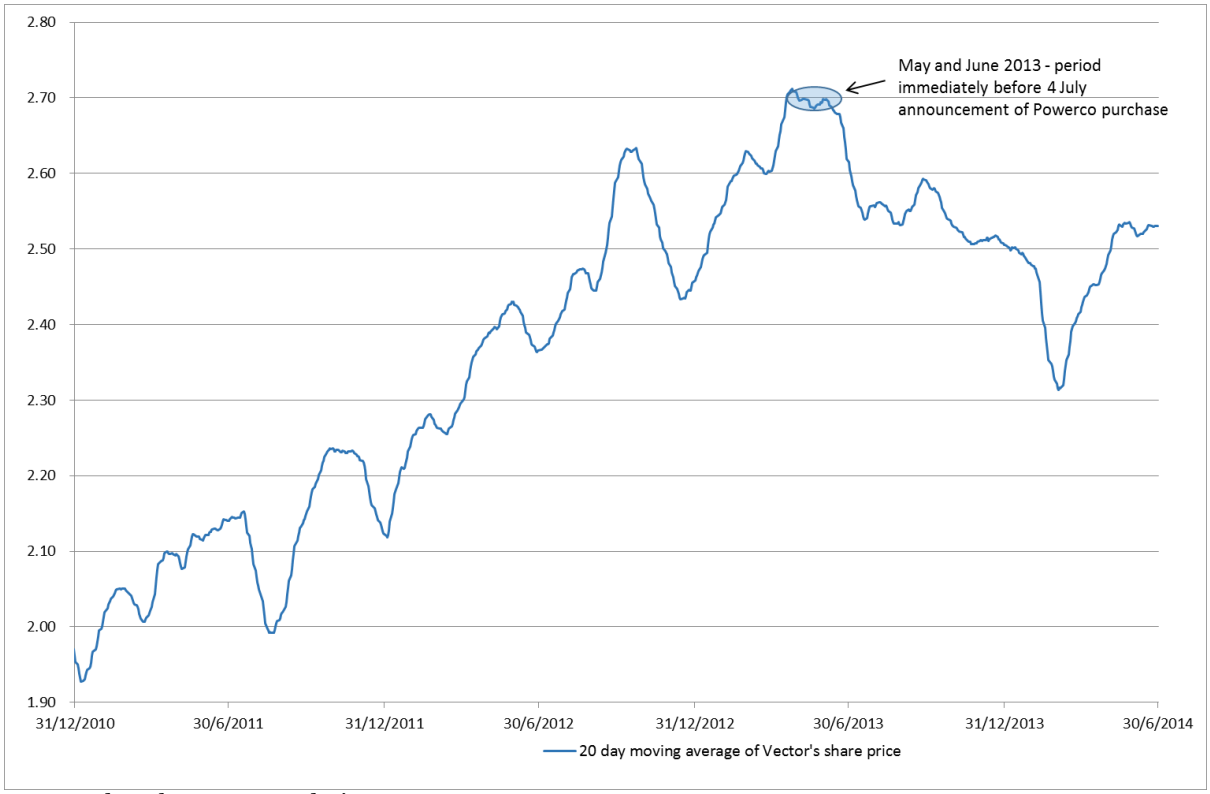
116. It is not possible to directly test how this estimate of the RAB multiple would be different if performed at different periods, because there are limited or no other publicly announced trades of equity in Powerco that can be used for this purpose. However, it is possible to indirectly test whether this snapshot is likely to be representative by examining the level of market transactions in similar assets.

117. For this purpose we have reproduced the same Vector share price data used in Figure 2 but have highlighted the two months before the 4 June 2013 announcement of the AMP purchase – on the basis that equity market valuations in those two months are likely to have played an important role in negotiating the announced sale price.

118. It can be seen that those two months have the highest average prices for Vector's share prices since 2011 (it is also the case, but cannot be seen, that this is higher than any period pre 2011). Obviously, this is for Vector and not Powerco. However, it is reasonable to believe that, given the similarity in their underlying regulated activities,[44] a period when Vector's share price was at its height would also be a period when investors valued Powerco at an unusually high level.

[44] Moreover, if this cannot be assumed because Powerco is in some sense fundamentally different to Vector then this would imply that the Powerco RAB multiple was of no wider significance for other regulated businesses – the very purpose for which the Commission is seeking to apply it.

Figure 3: AMP purchase of Powerco vs Vector share price



Source: Bloomberg, CEG analysis.

119. For those reasons, in our view, the Powerco RAB multiple snapshot should be treated with a great deal of caution. It is only a single snapshot, which should be treated with caution even if we have no reason to believe it is from a period of unusually high equity valuations. Furthermore, it is from a period where we have reason to believe that equity valuations for regulated businesses in New Zealand were their highest level ever (or at least since Vector listed 2005).

4.1.5 The Commission has not accounted for other factors

120. The only business that the Commission calculates as having a RAB multiple significantly greater than one[45] is Powerco. In our opinion, the factors that we listed in section 4.1.2 could quite easily account for that outcome. First, as discussed in the previous section, the AMP purchase appears to have occurred in a period of unusually high market valuations which is not representative of equity markets over time.

45 As noted earlier, the Commission's own expert, Professor Vogelsang, quite rightly observes that Vector's RAB multiple is not different from one from a statistical perspective.

121. Second, the Commission focusses only on Powerco's RAB because it concludes that unregulated activities are immaterial to its analysis. Powerco's unregulated revenues are indeed relatively modest. However, it does not follow that AMP was only purchasing a 42% stake in Powerco's regulated assets. It had other assets of value.

122. Indeed, AMP was actually buying a 42% stake in Powerco's entire business, as represented by its entire balance sheet. That stake would have included Powerco's relatively modest unregulated assets, but also approximately $30 million in accounts receivable. The latter can be expected to have had a positive bearing on an investor's expectations of the business' forward looking cash flows and, in turn, on the enterprise value. However, they are not included in the RAB and are therefore not factored into the Commission's analysis.

123. Third, AMP could have anticipated Powerco outperforming the cost or volume assumptions underpinning its future price paths. This expectation may have been based on Powerco continuing in its current structure or, possibly, AMP may have foreseen it acquiring other businesses in the future so as to obtain cost efficiencies. Interestingly, the Commission places a "cap" on the perceived value of any such outperformance. Specifically, it states that:[46]

> *"…expert advice to a UK regulator suggested it was highly unlikely outperformance on incentives and cost would contribute any more than 10% of a premium to RAB, and that a larger premium indicated a mispricing of the regulated rate of return."*

124. In other words, the Commission is essentially saying that "outperformance" might potentially explain a RAB multiple of 1.1 (a 10% premium), but it cannot solely explain a multiple of higher than this. This contention is not based on any of the Commission's own empirical analysis. Rather, it appears to be based exclusively on an extract from a report provided to the UK Office of Rail Regulation (ORR) from Cambridge Economic Policy Associates (CEPA) in June 2013.[47] The key passage in the CEPA report is the following:[48]

> *"Analysis of MARs [market asset ratios] suggests that the traded values of utility companies have generally exceeded their RABs by 10-30% since 2004 … This is a strong indication of outperformance against the allowed WACC, as it is highly unlikely as outperformance on incentives and cost would contribute any more than 10% of premium. The Chairman of Ofwat supported this position in a March 2013 lecture, stating that:*

46 Draft Decision, p.90.

47 Cambridge Economic Policy Associates (2013), "ORR - Advice on Estimating Network Rail's Cost of Capital", Final Report, June 2013, p.46.

48 *Ibid.*

'The continuing trend for water companies to be sold for prices around 130% of RAV only suggests that the regulator's adopted cost of capital is too high and the premia reflect excess demand for these assets.'"

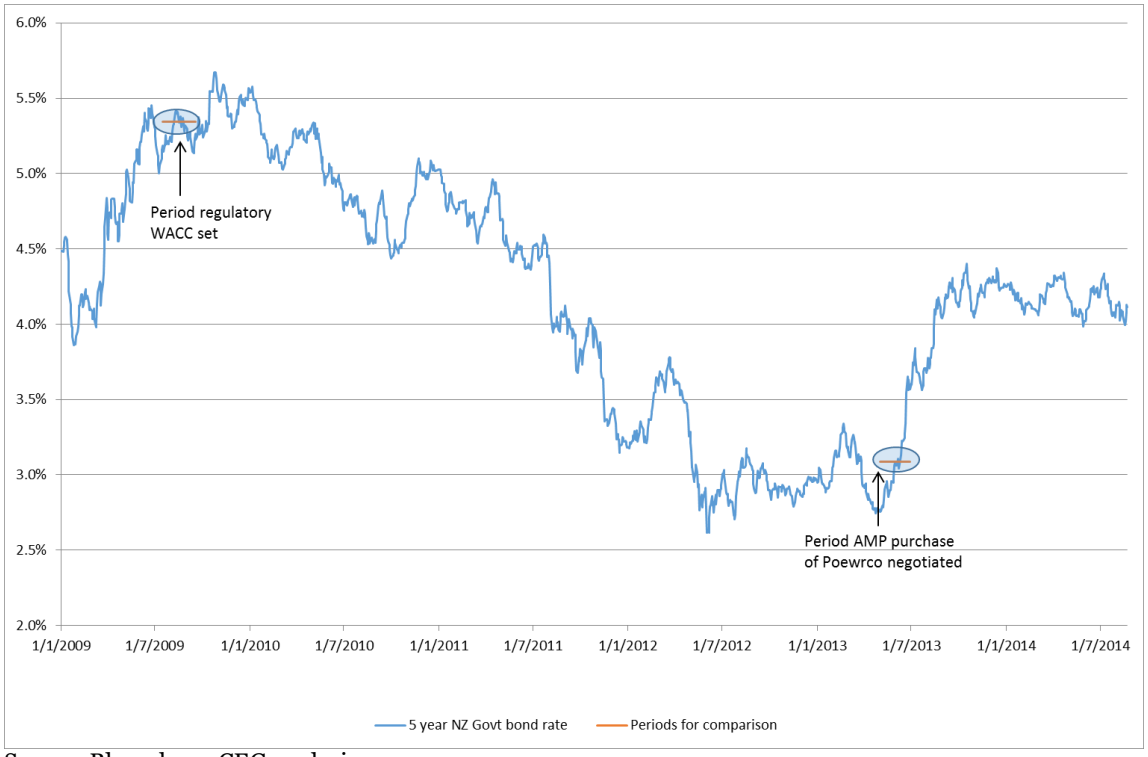
125. We have reviewed both the CEPA report and the lecture given by the Chairman of Ofwat, Mr Jonson Cox, at the Royal Academy of Engineering to which it refers in the above extract.[49] We have not been able to identify any empirical analysis in either document that supports the proposition that outperformance can contribute at most a 10% premium. This appears to be nothing more than an unsubstantiated contention from CEPA. Therefore, the Commission has not provided a sound basis for citing it as evidence of a "cap" on the potential premium on the RAB.

126. Even if the Commission was correct to assume that outperformance can explain only a 10% premium, the residual increment (which is very small in any event) could be readily explained by the last factor listed in section 4.1.2. Namely, there may have been a material divergence between the financial conditions that were forecast at the time of at the time of the purchase and those that prevailed during the window in which the regulatory WACC was set.

127. In this regard it is relevant to note that the five year Government bond rate was 3.08% at the time of the Powerco purchase. This is almost half the five year Government bond rate used to set the cost of capital for Powerco under the DPP (5.32%). This is illustrated in the figure below.

49 Cox, J., *Observations on the regulation of the water sector*, 5 March 2013.

Figure 4: 5 year NZ Govt bond rates – DPP WACC vs AMP purchase



Source: Bloomberg, CEG analysis.

128. The Commission's methodology for setting the cost of equity under the IMs assumes that the cost of equity falls "one for one" with the 5 year government bond rate. If this was a reliable way to estimate the cost of equity,[50] then, purely as a matter of chance, we would expect Powerco's regulatory WACC to be above the WACC that an investor in Powerco would use at the time of the AMP purchase. If this was the case then one would expect to observe a RAB multiple at that time.

129. Of course, this is purely a matter of luck and is not evidence of any systematic overcompensation in the regulatory WACC. Had NZ Government bond rates risen rather than falling since September 2009 the same logic would suggest depressed RAB multiples rather than elevated RAB multiples. In addition, there could well have been a significant difference between:

- the actual embedded debt risk premiums on Powerco's debt (taking into account historic hedges); and
- the regulatory cost of debt estimated by the Commission at that time (based on its "measurement window") and forecast by AMP.

50 Note that we do *not* believe this is a reliable way to estimate the cost of equity.

130. As we explain in more detail in section 5 (in which we discuss the TCSD), regulated energy businesses do not raise all of their debt in a window immediately preceding a regulatory decision. Rather, they tend to raise debt relatively constantly over time. For that reason, a regulated business' actual cost of debt is unlikely to be equal to the regulatory cost of debt that the Commission estimates for a "notional" business that finances itself at the outset of a regulatory period. A business' actual cost of debt may be higher, or it may be lower.

131. Powerco appears to be no different. When AMP purchased its 42% equity stake, Powerco had (and continues to have) 13 year debt that it raised in 2003. In addition, it has a range of other debt facilities that are locked in until up to 2028. There is no reason to think that Powerco's interest costs will be the same as those estimated by the Commission's methodology, which is based on the interest rates immediately preceding a regulatory period. Note that this is true even if Powerco fully hedges the base rate using interest rate swaps.

132. Rather, Powerco's actual interest costs may be more than those implied by the Commission's methodology, or they may be less. If Powerco financed at times when the cost of debt was below that implied by the Commission's IM, this essentially delivers it a "windfall". AMP may well have been prepared to pay materially more for the 42% stake than the level implied by Powerco's RAB at the time. This factor alone could quite conceivably result in a business' RAB multiple being well above (or below) one.[51]

4.1.6 Summary

133. It is not possible for the Commission to draw any meaningful conclusions about the appropriate WACC percentile from its analysis of RAB multiples. The average of the RAB multiples in the sample that the Commission has estimated is not obviously above 1.0 and, by the Commission's own estimates, one of the three companies examined has a RAB "fraction". There are also mistakes and omissions in the analysis that tend to bias upwards the Commission's estimate.

134. Moreover, the only estimate that, on first appearances, is materially more than 1.0 (the Powerco estimate) is a single snapshot, taken at a time of unusually high equity valuations, that provides no evidence of a sustained positive RAB multiple for Powerco let alone for the industry as a whole. The Commission's analysis therefore does not support the contention that investors have a lower prospective WACC than it currently allows for with its IM, and does not provide any evidence that the current approach to the percentile results in a regulatory WACC that is "too high".

[51] We assume that Powerco will be able to explain to the Commission whether it did indeed find itself on the positive side of the cost of debt IM.

4.2 Comparative benchmarking

135. This section considers the Commission's use of comparative benchmarking. We begin by explaining why the "adjustments" that the Commission has made to the WACC estimates prepared by other analysts undermine completely the efficacy of the exercise. We then describe why the Commission was wrong to discount the relevance of the comparative benchmarking exercise undertaken by CEG for Wellington Electricity.

4.2.1 The comparisons to analysts' estimates are flawed

136. The Commission seeks to test the reasonableness of its decision by comparing its WACC to those estimated by New Zealand analysts for comparable firms.[52] However, it does not simply compare the analysts' WACC estimates with its own. Rather, it makes adjustments to those analysts' estimates that it claims are necessary in order to make them comparable before assessing their relativities. In our opinion, these adjustments compromise the validity of the exercise.

137. The Commission's IM estimates the WACC for a regulatory period by taking estimates of the risk-free rate and debt premium prevailing in a narrow window of time immediately prior to the regulatory period, i.e., they are "spot rates". In contrast, the Commission claims[53] that the analysts' estimates of these parameters are based on long-term averages. This different estimation methodology results in WACC estimates that are significantly higher than the Commission's.

138. However, instead of acknowledging that its WACC is lower, the Commission recalibrates those estimates. It takes out analysts' estimates of the risk free rate and the cost of debt and replaces them with its own, lower, spot estimates. It rationalises this substitution in the following way:[54]

> *"This recognises that the use of the reasonableness tests is to assess our decision to move from use of the 75th percentile to the 67th percentile of the WACC distribution, and is not to highlight differences in the risk-free rates which are used by different analysts. The approach to estimating the risk-free rate is outside the scope of this consultation."*

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52 Draft Decision, p.103.

53 It is not altogether clear whether this is an accurate description of the methodology that analysts typically employ. Our understanding is that analysts will often use the spot risk free rate, but will apply a bespoke upward adjustment to reflect the fact that the use of spot rates will not produce an accurate representation of the current cost of capital, when combined with conventional market risk premiums. Nevertheless, the key point is that, regardless of the methodology employed by analysts, their WACC estimates are unambiguously higher than the Commission's.

54 Draft Decision, p.103.

139. In our opinion, this justification is unsatisfactory. It is hardly surprising that analysts' estimates of the WACC are similar to the Commission's once it has re-engineered their calculations to more closely match its own. But that is simply not a relevant comparison, since it rests on circular logic. If there are methodological differences in the way that analysts and the Commission are calculating the WACC that are leading to a material divergence in the estimates, then this is *highly relevant* to any reasonableness check.

140. The most logical conclusion to draw from the comparison of the unadjusted estimates is that the Commission's WACC appears to be on the low side. This should, in turn, lead one to enquire as to whether the way that the Commission is calculating the risk free rate and the cost of debt is, in fact, appropriate. We note, for example, that UK and Australian energy regulators no longer use spot rates to estimate the cost of debt.[55] This serves to highlight precisely why, if it is to be reviewed at all, the Commission's decision to adopt the 75th percentile needs to be reviewed holistically *alongside the rest of the IMs*.

4.2.2 The CEG comparisons were wrongly discounted

141. The flawed logic that the Commission relies upon to justify adjusting the WACC estimates of other analysts is cited again when it considers CEG's international benchmarking analysis. In a report prepared for Wellington Electricity, we provided a comparison of:[56]

- the implied premium on the Commission's IM WACC above the NZ Government bond rate; relative to
- the implied premium above the government bond rate in regulatory decisions for EDBs in Australia, the UK and the USA.

142. That comparison showed that the premiums provided to electricity distributors in these other jurisdictions were larger than those seen in New Zealand, even accounting for the application of the 75th percentile. That analysis did not seek to account for regulators' different approaches to, say, estimating the risk free rate and the cost of debt. That decision was quite deliberate.

143. What matters is the size of the implied premium – not how it was produced. As we noted above, if such a comparison revealed a noticeable difference – which it did – the questions are then: why has that difference emerged and does it indicate that we

55 *See:* Ofgem, *Strategy decision for the RIIO-ED1 electricity distribution price control*, March 2013, p.10; and Australian Energy Regulator, *Explanatory Statement, Rate of Return Guidelines*, December 2013.

56 *See:* CEG, *International precedent relevant to the 75th percentile, A Report for Wellington Electricity,* May 2014

need to revisit those aspects of our methodology? The Commission instead relies on the same unsatisfactory reasoning described above, stating that:[57]

> *"CEG's analysis essentially compares estimates of WACC which incorporate long-term averages of the risk-free rate, with our estimate of the WACC which uses a spot rate for the risk-free rate. When interest rates are below long-term averages, as they currently are, it is unsurprising that our implied premia appears relatively small."*

144. This is not an acceptable approach to take to comparative analysis. For example, imagine that a firm was deciding end-of-year bonuses for its staff and that the intention was to provide comparable compensation to other international businesses. Suppose also that the firm discovered that end-of-year bonuses were broadly similar in the UK to in New Zealand. Finally, imagine that base salaries were seen to be much higher in the UK, such that staff in that location were paid significantly more overall.

145. In our opinion, the much higher base salaries observed in the UK would be highly germane to that comparative analysis. It would rather undermine the purpose of the benchmarking exercise if the firm was to replace the higher base salaries seen in the UK with the lower base salaries paid in New Zealand before making a comparison. It would, in essence, risk overlooking the fact that its staff were paid less than their counterparts in UK firms – the very thing that the benchmarking exercise was designed to establish.

146. For exactly the same reason, if there are methodological reasons why overseas regulators' WACC estimates are higher than the Commission's, it is incongruous for them to be ignored. As we noted earlier, these differences should be explored and the Commission should be open to the possibility that the approaches adopted by these other regulators result in a more robust estimate of the WACC given the current market conditions.

4.2.3 Summary

147. The Commission conclusion that other analysts' estimates of the WACC are broadly aligned with its own is based on a misleading analysis. The Commission has substituted those analysts' estimates of the risk-free rate and cost of debt with its own, lower estimates. This adjustment is inappropriate and, once it is unwound, it is immediately evident that the Commission's WACC estimate is actually significantly lower than those calculated by analysts for similar businesses.

148. These results are also consistent with the international comparisons set out in our report for Wellington Electricity, which are wrongly dismissed by the Commission

57 Draft Decision, p.108.

in its Draft Decision. In our opinion, the fact that the Commission's WACC is lower than those estimated by other analysts and its international peers suggests that the Commission should be exploring the reasons for those differences and the potential implications for its choice of WACC percentile. It should not be ignoring them.

4.3 Reliance on "other tools"

149. In its Draft Decision, the Commission claims that the regulatory WACC is not the only mechanism that it can use to incentivise efficient investment. It states that: "There are other tools to help incentivise efficient investment from regulated suppliers, in addition to the WACC percentile."[58] The Commission points to three such "other tools" throughout the course of its Draft Decision, which it claims can be used to foster efficient investment outcomes. First, it notes that:[59]

> *"The IMs include an incremental rolling incentive scheme (IRIS), which provides a mechanism by which suppliers are able to retain the benefits of efficiency gains beyond the end of a regulatory period. The IRIS increases the incentives on suppliers to economise on capital expenditure and operating expenditure.* ***We have proposed extending the IRIS to include capex****."* [Emphasis added]

150. Second, the Commission observes that:[60]

> *"…****as part of the current price-quality path resets for EDBs and Transpower we have proposed revenue-linked quality incentive schemes****. These schemes provide improved incentives for suppliers to efficiently invest in service quality."* [Emphasis added]

151. Third, the Commission states that:[61]

> *"We are able to monitor the investment of regulated businesses and take action if we see evidence of under-investment"*

152. The existence of these "other tools" for incentivising efficient investment is presented as one of the pieces of evidence that the Commission that suggests the WACC can be reduced below the 75th percentile.[62] The problem with this proposition is that the "tools" described above either do not exist or have not been

58 Draft Decision, p.34.

59 Draft Decision, p.34.

60 Draft Decision, footnote 218, p.81.

61 Draft Decision, p.73.

62 Draft Decision, footnote 218, p.81.

specified in any detail. The IRIS for capex and the revenue-linked quality incentive scheme are examples of the former.

153. These two "other tools" exist only as proposals in an ongoing consultation on the default price/quality path (DPP). The Commission cannot know how the consultation process will unfold and the change that might be made to these proposals. The submission process could conceivably reveal that both proposals are unviable, in which case neither will be implemented. The key point is that it is impossible for the Commission to ascertain the effect – if any – these strictly hypothetical tools might have on investment incentives.

154. The Commission's contention that it is able to monitor the investment of regulated businesses and "take action" if it sees "evidence of under-investment" can be discounted due to its vagueness. The Commission has not articulated how it would detect underinvestment, when it might contemplate acting upon any perceived underinvestment, or what that remedial action might comprise. For those reasons, this cannot reasonably be characterised as an additional "tool".

155. In our opinion, there is therefore no sound basis for the Commission to conclude that these as-yet-unspecified "tools" can incentivise efficient investment *at all,* much less that they support a specific reduction in the WACC percentile. The Commission's approach also introduces a clear inconsistency. Namely, the Commission states repeatedly throughout its Draft Decision that it does not have to take into account other aspects of the WACC IM because setting the percentile is the "last decision made."[63]

156. Yet, despite maintaining that it can ignore these interdependencies with other WACC parameters, it nonetheless seeks to take into account supposedly relevant interdependences with other aspects of the regulatory framework that *do not even exist*. In our opinion, it is incongruous to cite the latter (which are irrelevant considerations) as a basis for reducing the WACC percentile while overlooking the former considerations (which are highly germane), which would almost certainly support a higher WACC.

4.4 Analysis of recent trends

157. In its Draft Decision, the Commission provides two charts that show actual (for 2009-10 to 2012-13) and forecast (for the next 6 years) growth in businesses' regulatory asset values.[64] It also provides a chart tracking movements in quality of

63 Draft Decision, p.10.

64 Draft Decision, p.76.

service measures for EDBs subject to price-quality regulation.[65] The Commission states that these charts illustrate that:

- regulated energy businesses have continued to undertake significant capital expenditure while the WACC has been at the 75th percentile; and
- that there has not been any noticeable decline in network reliability throughout the period in question.

158. The Commission concludes that these charts indicate that the 75th percentile has been sufficient to cause continuing investment. In our opinion, this conclusion can be refuted relatively expeditiously. First, the charts present only three full years' of data from the period in which the WACC has been set at the 75th percentile. That is simply not a sufficiently large dataset from which to derive any meaningful conclusions about what could have contributed to the observed movements.

159. Second, even if there was a more comprehensive pool of data, and they showed no noticeable reduction in the level of investment, that still would not reveal anything useful about the appropriateness of the current WACC. The Commission would still have to ask: "how does the observed level of investment compare with an *efficient* level of investment?" Constant investment may be symptomatic of under-investment if *more* is needed to reach an efficient level.

160. The Commission has not attempted to ascertain whether the current and forecast levels of investment are efficient, and it therefore cannot draw any conclusions about the sufficiency of the 75th percentile from these data. Finally, even if the Commission could make meaningful observations about the effect of the 75th percentile from the available data (which it cannot), they certainly do not reveal anything about the appropriateness of the 67th percentile.

161. For these reasons, the Commission's analysis of a very short time series of recent capital expenditure and quality of service outcomes cannot be used to discern anything about the appropriate WACC percentile. It was therefore inappropriate for the Commission to attach any weight to that analysis to arrive at its conclusion that the WACC should be reduced from the 75th to the 67th percentile.

4.5 Summary and implications

162. In our opinion, much of the evidence that the Commission has relied upon to arrive at its Draft Decision that the WACC should be reduced from the 75th to the 67th percentile is not robust. This is because the underlying analyses contain material errors and inconsistencies including, most notably:

65 Draft Decision, p.77.

- the Commission's analysis of RAB multiples does not reveal any discernible trend and is explainable through factors other than the WACC, including the potential for outperformance relative to regulatory benchmarks and differences in businesses' historical debt risk premiums;
- the adjustments that the Commission makes to the WACC estimates prepared by analysts for similar businesses render those comparisons meaningless – the more relevant comparison is to the unadjusted estimates, which reveals that the Commission's WACC is lower, even at the 75th percentile;
- the Commission's dismissal of CEG's international benchmarking analysis is similarly inappropriate – it is justified on the basis that other regulators' use different methodologies to estimate the WACC when the key question is whether the end results are comparable to its own;
- the Commission's states that "other tools" such as an IRIS for capex and revenue-linked quality incentive schemes can incentivise investment, yet these aspects of the regulatory framework do not yet exist – and may never exist, so their effect on the appropriate WACC percentile cannot be known; and
- the Commission's analysis of recent capital expenditure and quality of service outcomes is based on a dataset that does not contain enough observations for any trends to be revealed and it cannot provide any insight into the appropriateness of the 67th percentile in any event.

163. Once these shortcomings are recognised, it is apparent that the Commission does not have a sound basis for its recommended reduction in the WACC percentile. Indeed, as we explain in the following section, had the Commission taken account of other germane factors, it could well have concluded that the WACC percentile needed to increase, not decrease.

5 Review of Evidence Overlooked

164. In this section we consider whether there is any evidence that the Commission has ignored or given insufficient weight that might have caused it to reach a different conclusion in relation to the appropriate WACC percentile. Specifically, we address the following question from NZ Airports:

> *"In your opinion, is there any other evidence that the Commission has either ignored or afforded insufficient weight in arriving at its Draft Decision?"*

165. We consider three additional sources of such evidence below: the deficiencies in the TCSD, sources of uncertainty that are not factored into the WACC distribution and the Commission's decision to overlook asymmetric cash flow risks. These matters are highly relevant to any decision on the appropriate WACC percentile, including for any subsequent consideration of the percentile choice for the airport sector.

5.1 Deficiencies in the TCSD

166. The Commission's IMs set the cost of debt allowance based on an estimate of the cost of debt observed in a narrow window prior to the beginning of the regulatory period. For the current default price-quality path (DPP) period the window in question was the month of August 2009.

167. In the IM process, a number of submitters, including CEG, argued that this was inappropriate and that the cost of debt allowance should be based on an assumed term of debt that reflects efficient business practice. It was argued that efficient business practice involved the issuance of longer term debt and that the Commission should compensate for the full costs of this debt.

168. The Commission attempted to deal with this issue by including in the IMs an allowance for a term credit spread differential (TCSD). However, the structure of the TCSD calculation used by the Commission was idiosyncratic and did not actually provide compensation based on the costs associated with issuing longer term debt. The reasons for this conclusion are set out in detail in a recent report for Chorus.[66]

169. Similarly, the High Court found the construction and explanation for the inclusion of the TCSD problematic:[67]

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66 CEG, *Response to Commerce Commission UCLL/UBA WACC consultation paper*, March 2014, paragraphs 248 to 252.

67 *Wellington International Airport Ltd & Ors V Commerce Commission* [2013] NZHC [11 December 2013], paragraphs 1283 and 1284.

> *"We observe more generally that the TCSD was developed by the Commission very late in the piece: the concept of a TCSD was first mentioned in the Airports Consultation Update Paper of 1 October 2010. A TCSD methodology first appeared in the Revised Draft IM Determination for the EDBs released on 22 October 2010. Thus, unlike other aspects of the IMs, the TCSD was only subject to comment on technical drafting. As noted, a TCSD has not featured previously in the Commission's risk-free rate term decision*
>
> *We accept the submissions of the regulated suppliers that the concept of the TCSD, and more particularly its implementation, were not well explained by the Commission. For example, the Commission responded to criticisms by Vector of the feasibility and efficacy of swaps to re-price long-term debt to the regulatory period with what can be described as the "two swap" example. But, at no point, did the Commission explain the relationship between that example and the TCSD. Moreover, Ms Scholtens at one point acknowledged that there was no evidence of the availability of a "five year swap product" which appeared to be another type of swap the Commission had in mind."*

170. Subsequently the High Court directs the Commission as follows:[68]

> *"[We] would expect the Commission to review the structure and efficacy of the TCSD and, in so doing, undertake further empirical research on the nature and availability of swaps for regulated suppliers so that a TCSD – where necessary – may be able to be better articulated and connected with market practice."*

171. CEG has recently provided further advice on this issue for Chorus in the Commission's parallel consideration of the appropriate WACC to be applied in its pricing exercise for the regulated UBA and UCLL services. As part of that process, the Commission asked Dr Lally to review CEG's report for Chorus on the TCSD and he essentially agreed with our criticisms and recommended that it be replaced with a cost of debt comprised of: a five year risk free rate; plus a DRP based on a term of debt reflecting the actual term of debt issued by similar businesses (which he put at 7 years); plus the costs of managing a swap portfolio to convert the risk free component of the debt portfolio from a longer term issued gradually through time to a risk free rate with a term of 5 years reset every five years.

172. While we consider that this is not the optimal solution and that it will underestimate the true cost of debt materially[69] we agree with Dr Lally that his proposal better reflects the efficient debt management costs of a business than the current IMs.

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68 Wellington International Airport Ltd & Ors V Commerce Commission [2013] NZHC [11 December 2013] Paragraph 1288

173. In order to assess how much higher the DPP cost of debt would have been under an approach such as suggested by Dr Lally it is necessary to estimate:

- the difference between the 7/10 year DRP and the 5 year DRP in August 2009;
- to add to this the costs of maintaining a swap portfolio; and
- subtract from this the average TCSD allowance provided by the Commission.

174. Based on Australian BBB fair value curves published by the Reserve bank of Australia, the value of the first dot point is around 33bppa.[70] No similar BBB fair value curve is published in New Zealand in August 2009.[71] The cost of managing a swap portfolio (second dot point) has been estimated at around 11bppa.[72] The sum of these is around 44bppa.

175. The simple average TCSD allowance provided by the Commission was zero basis points. The weighted average TCSD allowance provided by the Commission was 0.7bppa. The net effect of reforming the TCSD in the way Lally proposed would be to increase the cost of debt by around 43bppa (44.0-0.7). This translates to an increase in the WACC of around 19bppa (given a 44% gearing assumptoin).

176. By contrast, the Commission's proposed amendment to the 75th percentile will reduce the WACC for EDB's by 25bppa.[73] That is, reforming the TCSD in the manner proposed by the Commission's adviser would have the effect of negating almost entirely the Commission's proposed amendment to the 75th percentile.

177. This illustrates the significant problems associated with the Commission's selective approach to reopening the IMs only with respect to the selection of the appropriate percentile. Had the Commission also re-examined the TCSD calculation, which was questioned by the High Court in precisely the same way as the 75th percentile, then it would presumably have sought advice from Dr Lally (whom it sought advice from when CEG questioned the TCSD for Chorus). Similarly, it would presumably have received the same advice and the effect of following that advice would have been to

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69 We consider a trailing average cost of debt allowance for a 10 year term (not a 7 year term) is more appropriate.

70 The 7/10 year spread to government bonds was 36bppa/28bppa (where these values are the averages of the reported values for the last day of July and the last day of August).

71 However, Bloomberg did, at that time, publish an A fair value curve and the corresponding values in August 2009was 22bppa/5bppa over the month of August. This is likely to be a material underestimate of the BBB credit spread and the 5bppa per annum estimate is itself inconsistent with the other estimates reported.

72 http://www.qca.org.au/getattachment/13d1d1f1-14b7-4348-a947-17c83d049f35/Incenta-Credit-Rating-and-Cost-of-Debt.aspx

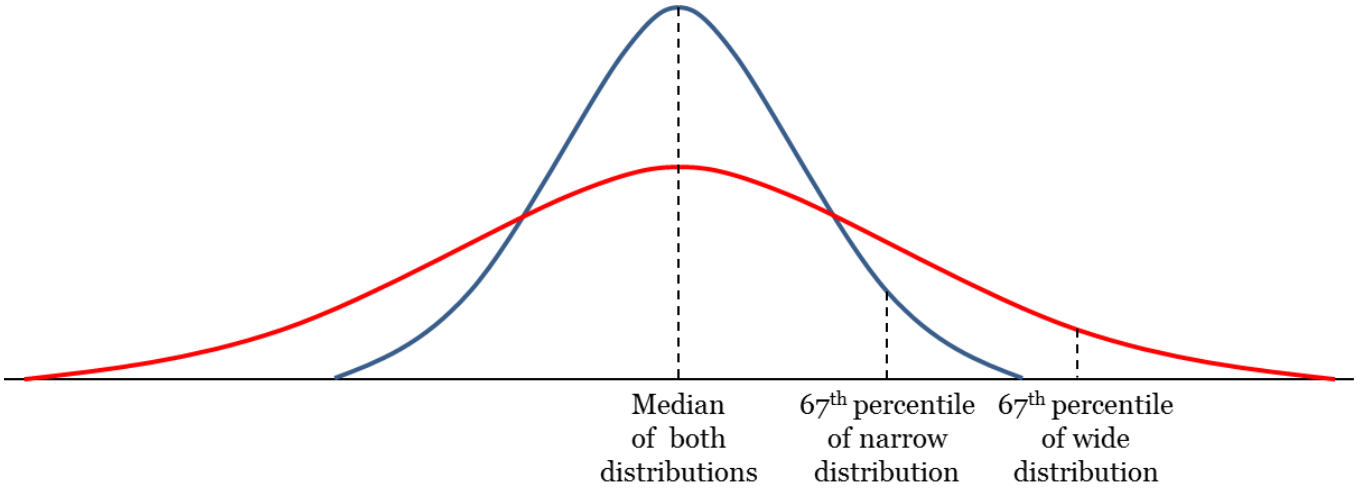
73 Commerce Commission, *Proposed amendment to the WACC percentile*, July 2104, para 6.59.

more or less neutralise the impact of the Commission's proposed adoption of the 67th percentile on the WACC.

5.2 The WACC distribution

178. In our view, the High Court's judgment questioned the *magnitude of the uplift* above the mid-point WACC. The Commission has, in our view, committed a serious mistake in confining its examination solely to the percentile adopted. In order to arrive at an appropriate estimate of the uplift above the median WACC it is necessary to determine both the distribution around the mid-point and the selection of a percentile from that distribution. This is because the 67th percentile of a "narrower" distribution (i.e., one with less uncertainty) will produce a lower uplift than the 67th percentile of a "wider" distribution, as Figure 5 illustrates.

Figure 5 Relevance of the WACC distribution



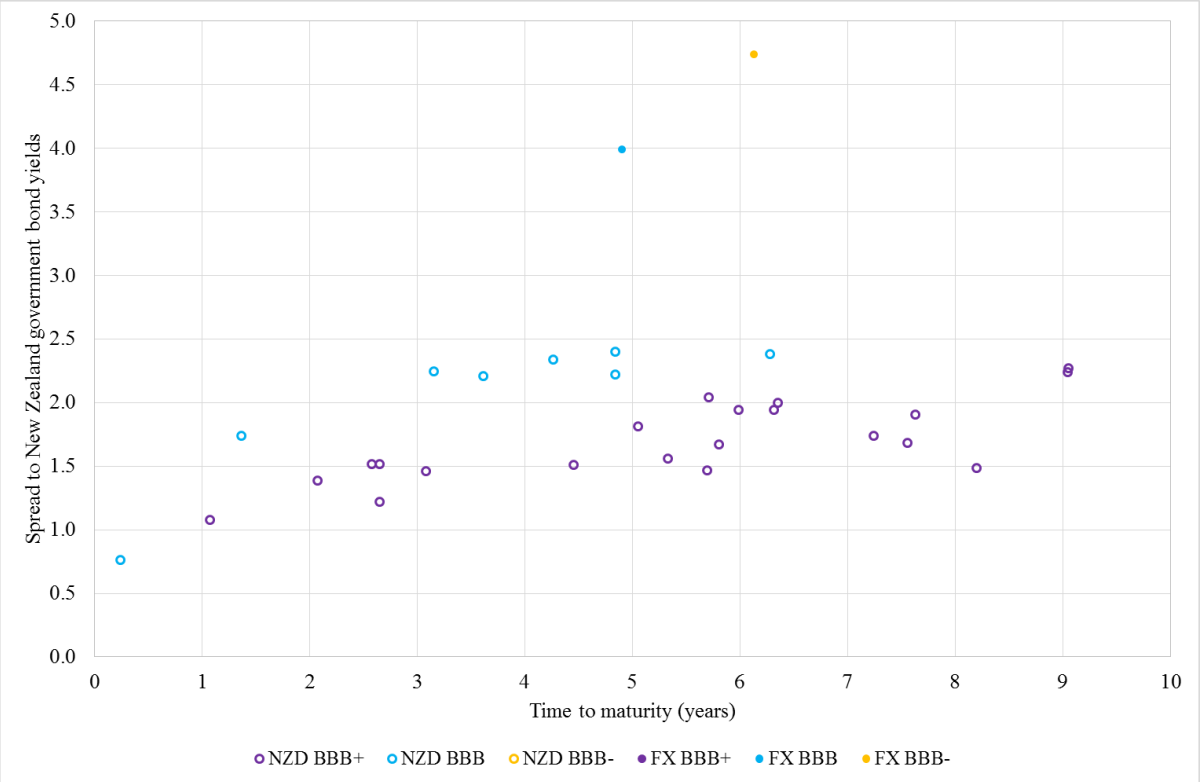
179. In our view, the Commission's assumed distribution of uncertainty is too narrow and would be widened if it was reviewed. By way of illustration, we note that the IM allowance for uncertainty in the cost of debt is, in the Commission's own words, immaterial:[74]

> *"Of the three components of the standard error of the WACC, two (in respect of the asset beta and TAMRP) relate to the cost of equity, whereas the standard error of the debt premium relates to the cost of debt. The latter has an immaterial impact on the standard error of the WACC (removing it reduces the WACC by 0.01%)".*

74 Commerce Commission, *Proposed amendment to the WACC percentile*, July 2104, footnote 89.

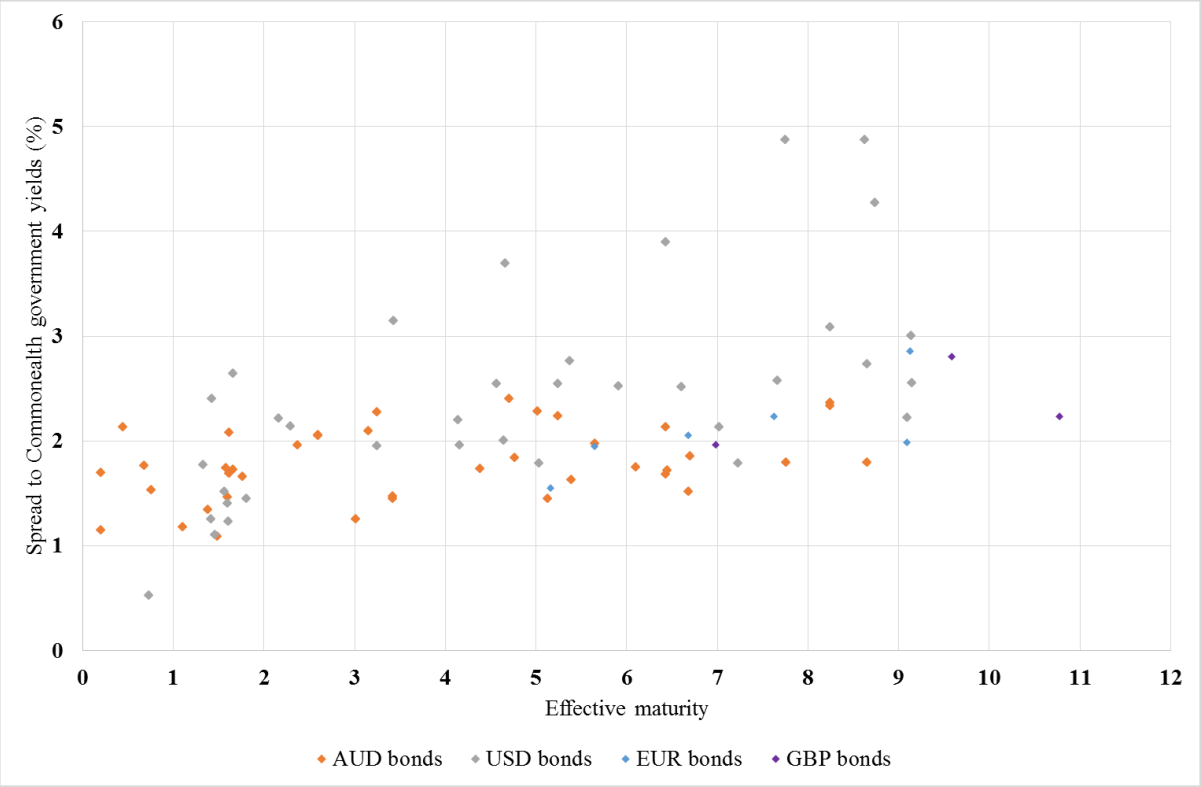
180. In actual fact, we estimate that it adds not 0.01% but 0.001%. In any event, we agree with the Commission that it is immaterial. However, the following figures demonstrate significantly more uncertainty around the true borrowing costs for a regulated BBB rated provider:

Figure 6: Risk premia on NZ corporate bonds rated BBB- to BBB+



Source: Bloomberg, CEG analysis, period covered is 3-28 February 2014, excludes issuers in the banking and finance industries, foreign currency bonds swapped to NZD.

Figure 7: Risk premia on Australian corporate bonds rated BBB- to BBB+



Source: Bloomberg, CEG analysis, period covered is 3-28 February 2014, excludes issuers in the banking and finance industries, foreign currency bonds swapped to NZD.

181. By any reasonable interpretation of these datasets, the standard error associated with estimating a cost of debt for a BBB bond at any maturity is many multiples of the standard error assumed by the Commission in the IMs.

182. We also note that the Commission's assumed distribution ignores the impact of the potential for model error in determining the WACC. This is despite the fact that the Commission accepts that there is the potential for model error in its Draft Decision. For example, it states:[75]

> *"While there is uncertainty around the true WACC, we do not agree that the mid-point is biased downwards. There is uncertainty as to whether the mid-point is biased or not. The evidence regarding the existence (and direction) of bias is hard to interpret and sometimes conflicting."*

183. This statement is in response to claims by several parties that the CAPM underestimates the returns on low beta equity. The Commission acknowledges that this is a possibility, but it argues that other considerations may offset this and the net effect is that there is no clear "downwards bias" in its estimate of the midpoint.

75 Draft Decision, p.40.

184. However, in arguing that the midpoint is not necessarily biased due to a range of offsetting potential model errors, the Commission has demonstrated that model error must add to its range of uncertainty. Even if the potential existence of model error does not systematically bias the mid-point estimate in one direction it must widen the distribution around the mid-point. Specifically, the distribution around the mid-point becomes wider, i.e., more like the "red" distribution in Figure 5.

185. Similarly, Oxera has pointed out that the Commission's estimates of uncertainty do not capture variations in market conditions over time. Specifically, the risk free rate, the market risk premium and the cost of debt will vary through time as conditions in financial markets vary. Consequently, investors' WACC will differ to that estimated by the Commission at the beginning of the regulatory period (even if the latter was estimated perfectly). Oxera clearly notes that it is the Commission's view – not its own – that such uncertainty does not need to be included in the estimate of the distribution:[76]

> *"…**in the view of the Commission**, the presence of risk such as that around the risk-free rate does not justify an uplift to the WACC estimate, as companies and investors are expected to manage risk themselves, as they would within a competitive market." [Emphasis added]*

186. The basis provided by the Commission for not including this source of uncertainty in its estimates of the distribution is, in our view, illogical. As a matter of economics there is no basis for distinguishing between the impact of changing market conditions and other ways in which the regulatory WACC allowance may fall below the return required by investors. To the extent that asymmetrical consequences exist as a result of the WACC being set too low then all the events that might give rise to those asymmetric consequences are relevant to consideration of the appropriate WACC uplift.

187. In summary, even if the Commission were correct in concluding that the uplift associated with the 67th percentile is more appropriate than the uplift associated with the 75th percentile, in order to give effect to this it requires an accurate estimate of the distribution around the midpoint. In our view, the assumed distribution in the IMs (which the Commission has not reviewed) is demonstrably too narrow. Had the Commission properly reviewed both the percentile and the distribution we consider that it would have arrived at a materially higher uplift estimate associated with the adoption of the 67th percentile. Indeed, the uplift could easily have increased despite a reduction in the percentile chosen. That is, a widening of the assumed distribution may have raised the uplift by more than the reduction in the chosen percentile reduced it.

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76 Oxera, *Input methodologies, Review of the '75th percentile' approach, Prepared for the New Zealand Commerce Commission,* 23 June 2014, p.57.

5.3 Asymmetric cash flow risks

188. This section notes that the Commission has effectively ignored asymmetric cash flow risks – the costs of which are significant, not "dealt with through cash flows"[77] and cannot be diversified away by investors. We explain that properly accounting for the expected costs of these cash flow risks would require a significant additional increment to the WACC that is not factored into the 67th percentile estimate recommended by the Commission in its Draft Decision.

5.3.1 There are two relevant sources of potential asymmetry

189. We explained in our previous report that, even if the mid-point is an unbiased estimate of the true WACC that does not mean that it is the *socially optimal* percentile for the Commission to employ. Arriving at that value requires *two* additional components to be added to the mid-point estimate:[78]

- the optimal increment to investor compensation required to reflect any asymmetry in the social costs of under versus over compensating investors ('**social cost** asymmetry'); and
- the best estimate of the expected cost of asymmetric cash-flow risks not compensated elsewhere in the Commission's input methodologies (IMs) or revenue paths ('**cash flow** asymmetry').

190. In terms of the second component, we explained in our previous report that, if there are asymmetries in the distributions of cash-flows around elements of the Commission's financial model this means that, if median forecasts/estimates are used to set prices, a business' expected revenues will not equal its expected costs.[79] We identified these sources of negative cash flow asymmetry as including:[80]

- The prospect of distribution infrastructure being stranded by new technologies before the costs of those investments have been recovered (the Commission's financial model applies straight-line depreciation over asset lives of 45-years, on average). We explained that the potential for this to occur in the next 10 to 20 years is a real concern for investors (let alone the longer run).[81]

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77 The Commission identifies this is as its preferred way of dealing with such risks in its Draft Decision. *See:* Draft Decision, p.41.

78 CEG, *Review of the use of the 75th WACC percentile, A Report for Orion,* May 2014, p.1.

79 CEG, Review of the use of the 75th WACC percentile, A Report for Orion, May 201 (hereafter: "CEG Report").

80 CEG Report, section 3.1.2.

81 CEG Report, section 4.3. Note that the fact that a stranded asset may remain in the RAB does not address this risk. For example, if electricity lines are one day "stranded" by, say, cheaper battery-based

- The prospect for low frequency but high impact events (such as earthquakes, tsunamis, etc.) to occur. Natural disasters of this type are not currently compensated for in businesses' price paths and, as we explain below, the Commission has made it clear that it will not allow lost revenues to be recovered in a customised price path (CPP).[82]
- The cash-flow risks arising from the potential costs of insolvency. The prospect of these costs being incurred by a business is related to and may increase as a result of the other factors described above, e.g., a natural disaster may prompt customers to invest in substitutes for network supplied electricity, increasing the risk of asset stranding and heightening the risk of bankruptcy.[83]
- The fact that higher than expected demand can be expected to increase profits by less than lower than expected demand reduces them due to the asymmetric responses of costs to demand. That is, the amount by which costs go up when demand is higher than expected is more than the amount by which they fall when demand is less than forecast.[84]

191. In other words we highlighted four potential sources of asymmetric cash-flow risk. We undertook some preliminary empirical work in relation to some of these potential sources of asymmetry in our previous report, which revealed the following:

- Professor Bruce Grundy observed that, based on the empirical literature, compensating for the costs of insolvency requires around 70bp to be added to the WACC in perpetuity. This represents more than 97% of the 72bp increment currently provided by the 75th percentile under the default price path (DPP).[85]
- Our preliminary modelling suggested that the expected cost of the asymmetric response of costs to divergences from forecast demand is between 6bp and 32bp. This represents between 8%-32% of the 72bp increment currently provided by the 75th percentile.[86]
- We observed that Orion's own costs in relation to the Christchurch earthquake justify a 0.66bp increment to the median WACC in perpetuity. This represents

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solutions, the fact that an EDB is able to retain those assets in its RAB does not mean that it will necessarily be able to fully recover those costs from its customers.

82 Commerce Commission, *Setting the customised price-quality path for Orion New Zealand Limited, Final reasons paper*, 29 November 2013, paragraph C5.2.

83 CEG Report, section 4.4.

84 CEG Report, section 4.1.

85 CEG Report, section 4.4.

86 CEG Report, section 4.1.

more than 90% of the 72bp increment currently provided by the 75th percentile under the DPP.[87]

192. In other words, the above factors alone appeared to more than justify the existing the 72bp increment currently provided by the 75th percentile under the DPP. In fact, they suggested that increment may *not be enough* to adequately compensate investors. At the very least, one cannot escape the conclusion that these cash-flow risks are very significant and have the potential to have a sizeable impact upon businesses' expected returns.

5.3.2 The Commission effectively ignores these risks

193. The discussion of asymmetric cash flow risks in the Commission's Draft Decision is relatively perfunctory. It neither offers any of its own opinions or analysis on the expected cost of those risks, nor makes any reference to the material set out in our previous report (and summarised above). Rather, it addresses these arguments around the asymmetry of cash flows by simply stating that:[88]

> *"…catastrophic events and other asymmetric risks are best dealt with in cash flows, not WACC."*

194. We observed in our first report that, insofar as the expected costs of natural disasters is concerned, if the regulator allows a business to recover all of the additional costs it incurs and the revenues that it loses (e.g., through "full pass through" provisions or a wider industry levy), then no further compensation would be required to address the asymmetric cash-flows.[89] That is, the risk would have been "dealt with in cash flows".

195. However, the Commission does not "deal with" all of the asymmetric cash flow risks arising from natural disasters such as earthquakes in this way. The Commission prevented Orion from recovering the losses it incurred arising from lower than expected revenues – some $60m in total.[90] The Commission also made it clear in its final decision on Orion's CPP application that that no compensation would be

87 CEG Report, section 4.2.

88 Draft Decision, p.42.

89 Similarly, if businesses' are able to fully insure against every conceivable natural disaster – either by taking out insurance policy with an external provider or by self-insuring (i.e., setting aside funds) – and those costs can be included in their revenue allowances, then the asymmetry again disappears. However, neither of these conditions applies in this particular instance, based on Orion's experience following the Canterbury earthquakes. *See:* CEG Report, section 4.2.1.

90 The Commission's calculation took into account lower than forecast 2013 actual revenues, used the projection of Orion's 2010 DPP price path and used the DPP cost of debt to calculate the 2014 present value. *See:* Commerce Commission, *Setting the customised price-quality path for Orion New Zealand Limited, Final reasons paper*, 29 November 2013, footnote 329.

provided – either *ex-ante* or *ex-post* – for lower-than-forecast revenues arising from catastrophic events in the future.[91]

196. In other words, the Commission has elected *not* to deal with the expected costs of lower-than-forecast revenues arising from future catastrophic events through cash flows. Moreover, the Draft Decision makes no material reference whatsoever to the three other types of asymmetric cash flow risks described in our previous report and repeated above. That is, the Commission does not explain if or how it deals with the asymmetric consequences of divergences in forecast demand, the prospects of asset stranding and the costs of insolvency through cash flows.

197. For those reasons, we do not consider that the Commission has placed nearly enough emphasis on the important matter of asymmetric cash flow risks. It is not sufficient for it to say that these matters "should" be dealt with in the cash flows; it is incumbent on it to actually do so and, in our opinion, it has not. Moreover, the Commission cannot eschew engaging upon this matter by asserting that a "diversified investor" would require "minimal or no compensation for such risks". As we explain below, that contention is wrong.

5.3.3 Diversification does not make these risks go away

198. We observed above that the only source of asymmetric cash flow risk that the Commission directly addresses in its Draft Decision is the potential cost of natural disasters. During the course of that analysis, the Commission repeats an assertion that it made on many occasions throughout Orion's CPP application process. Namely, it states that:[92]

> *"The impact of the Canterbury earthquakes would have only a minor impact on a diversified investor, and that such an investor would require minimal or no compensation for bearing such risks".*

199. In other words, the Commission is saying that it does not have to deal with the expected costs of lower than expected revenues arising from natural disasters, since a diversified investor would not require compensation for such matters. This contention is incorrect as a matter of finance theory. It is certainly the case that an investor can reduce her individual exposure to this form of cash flow risk through diversification. But that *does not make the costs to the business disappear*.

200. In much the same way, a single claim stemming from a motor vehicle accident will have only a modest effect upon the cash-flows of an insurance company. It will have "diversified" its risks across a large pool of customers and so, for every client that

91 Commerce Commission, *Setting the customised price-quality path for Orion New Zealand Limited, Final reasons paper*, 29 November 2013, p.136.

92 Draft Decision, p.43.

lodges a claim, there will be many others that do not. But, once again, the fact that the insurance company has diversified its cash flow risk *does not make the cost of that "individual claim" go away*.

201. For that reason, even though an insurance company can spread its risks across a large pool of customers that does not mean it will give away insurance policies for free. The premiums that it will charge each customer must necessarily cover at least the expected cost of the insured risk. Otherwise, the company would expect to pay out more in claims than it would collect from the customer in premiums and quickly find itself in bankruptcy.

202. In other words, even if an insurance company – the quintessential "diversified investor" – required minimal or no margin on its WACC for assuming cash flow risks (itself a questionable proposition), it *must still cover its expected costs*. In exactly the same way, to attract investment (even from diversified investors), a regulated business must be expected to earn revenues that are at least equal to its expected costs. The Commission's current approach risks violating this fundamental regulatory principle.

203. Namely, the expected cost of lower-than-expected revenues is unambiguously greater than zero and yet the Commission has refused to provide any compensation for those cash flow risks. All other things being equal, this will mean that a regulated business' expected revenues will be less than its expected costs. In principle, this is no different from the insurance company in our previous example selling insurance policies for less than the expected costs of the insured risk. This simply would not happen in practice.

5.3.4 Summary

204. The expected costs of asymmetric cash flow risks are material to regulated businesses and extend well beyond those associated with natural disasters – the only category that the Commission focuses upon. These risks are not "dealt with through cash-flows" and the Commission's suggestion that those associated with natural disasters can be ignored because a diversified investor would require minimal or no compensation is wrong as a matter of finance theory.

205. It follows that if the Commission wants a business to have an expectation that it can earn a return equal to any particular percentile, then it must select something higher than that level. Otherwise, the asymmetric cash-flow risks describe above will push average returns below that level. The analysis contained in our previous report suggests that the WACC percentile may need to *increase* from the 75th percentile to account for these factors and there seems to be little basis for it to decrease.

5.4 Summary and implications

206. In our opinion, the Commission has ignored or given insufficient consideration to several other matters that are highly relevant to its choice of WACC percentile. It has articulated no convincing reasons for overlooking these matters – all of which suggest that the 75th percentile may actually be too low; namely:

- the Commission has not considered potential shortcomings in the specification of the TCSD and its cost of debt calculation – in our assessment, addressing those matters may significantly increase the mid-point WACC estimate and, in turn, the WACC implied by any particular percentile;
- the Commission implicitly acknowledges that it has not comprehensively accounted for all relevant forms of uncertainty when specifying the distribution around the mid-point WACC – this means that its distribution is too narrow and will under-estimate any percentile it is seeking to estimate; and
- the Commission has disregarded asymmetric cash-flow risks – the expected costs of which we estimate as being very material, are not completely "dealt with through cash-flows" (which the Commission's claims to be its favoured approach) and cannot be eliminated through investor diversification.

207. In our view, if the Commission had taken proper account of these highly germane factors, it may well have concluded that the WACC percentile needed to increase. At the very least, it would have recognised that there was no sound basis to reduce the WACC percentile from its current level.

6 Conclusion

208. This section provides our overall conclusion, in light of the material and analyses that we have set out in the previous sections of this report. Specifically, we address the following question from NZ Airports:

> *"In light of your answers to the above questions, does the Commission have a sound basis for its Draft Decision?"*

209. Our answer to this question is: "no". As we set out in the previous sections, the Commission's Draft Decision:

- rests on the unsound assumption that the 75th percentile has no special standing as the status quo, and therefore seeks to answer the wrong question (question 1, section 2);
- is unduly influenced by analysis that inappropriately adopts a pure consumer welfare standard, which is inconsistent with the legislative purpose statement (question 2, section 3);
- is informed by evidence and analysis that contains serious methodological errors and inconsistencies and provide no basis for the recommended reduction (question 3, section 4); and
- is made without considering other factors that are highly germane to the selection of the WACC percentile and suggest a higher estimate is appropriate (question 4, section 5).

210. In our opinion, once the errors in and omissions are recognised, it is apparent that the Commission does not have a sound basis to reduce the WACC percentile for energy businesses. Indeed, it seems quite plausible that, if the above matters were properly assessed, the Commission would conclude that the current WACC estimate is too low – even with the application of the 75th percentile. It is also apparent that, to the extent the analytical framework is subsequently applied to airports, there are a number of deficiencies that will first need to be addressed.