Regulatory precedents for setting the WACC within a range

A RESPONSE TO ISSUES RAISED BY ECONOMIC INSIGHTS

Introduction

On 23 June 2014 the Commerce Commission (the Commission) published a number of expert reports as part of its ongoing review of the appropriate percentile estimate of the weighted average cost of capital (WACC). Among these was a report by Economic Insights, which reviewed a number of regulatory decisions, from a range of overseas jurisdictions, on the choice of WACC point estimate from within a range.[1]

Economic Insights raised a number of issues in relation to the analysis presented in our report to Transpower entitled *Evidence on the WACC percentile*.[2] In that report we argued that, contrary to NZIER's claims, there are several recent examples of UK regulators allowing rates of return well above the midpoint of the WACC range and, in several instances, significantly higher than the 75th percentile.

The key contentions made by Economic Insights are that:

- Our study does not provide a like-for-like comparison of WACC decisions by the Commission and overseas regulators.
- In order to perform a like-for-like comparison, it is necessary to:
  - Examine the basis points deviation from the midpoint of the regulator's range, rather than the WACC percentiles selected by various regulators.
  - Ensure that all the WACC decisions are presented in a common form, e.g. on a nominal vanilla basis.
- When comparisons across jurisdictions are made on a nominal vanilla basis, the adjustments by the Commission are on average markedly higher than for the regulatory decisions in most other jurisdictions, including the UK.

Transpower has asked us to consider Economic Insights' study and respond to the key contentions raised. We consider that Economic Insights' conclusions are

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1 Economic Insights, Regulatory Precedents for Setting the WACC within a Range, 16 June 2014.

2 Frontier Economics, Evidence on the WACC percentile, May 2014.

not well founded and should not be relied on by the Commission. Our main conclusions are the following:[3]

- Economic Insights' claim that we have not undertaken a like-for-like comparison of WACC decisions across jurisdictions is incorrect and assumption-driven.
- Economic Insights' comparison of the basis points adjustments made by different regulators is misleading under the current circumstances, where the width of the WACC ranges in the various regulatory decisions considered are very dissimilar.
- Economic Insights' conclusion that the Commission's WACC allowances have been generous compared to those of other regulators, including those from the UK, arises entirely from the flawed methodology chosen by Economic Insights to compare decisions.
- A more appropriate way of comparing decisions is to examine the WACC percentiles adopted by different regulators.
- Economic Insights has produced no reliable evidence that the Commission has been over-generous in WACC allowances compared to overseas regulators. On the contrary, as our previous analysis has shown, the Commission has either been in line with, or in some cases less generous than, other regulators in terms of its choice of WACC percentile and in terms of its estimates of certain parameters.

Key issues raised by Economic Insights

In its report Economic Insights makes four criticisms of our analysis. These are summarised below:

- First, Economic Insights claims that the WACC percentiles adopted by overseas regulators cannot be compared directly with the 75th percentile used by the Commission because overseas regulators percentiles' are from a uniform distribution, whereas the Commission's percentile is from a normal distribution. For this reason, any comparison across jurisdictions should examine the **basis points deviation** from the midpoint of the regulator's range, rather than the **WACC percentiles** selected by various regulators.
- Second, Economic Insights claims that it is not clear that all of the WACC decisions presented in our report are defined in the same way: some of the WACCs reported are defined on a real pre-tax basis, whereas others are defined real vanilla terms. Reporting WACCs in nominal vanilla terms results

[3] Note that given the time available to draft our response, we have not had the opportunity to check all of the data from the regulatory decisions reported by Economic Insights.

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in a lower range for the WACC for most UK decisions compared with decisions by the Commission.

- Third, in terms of a basis points adjustment to the midpoint of the range, Economic Insights claims that the adjustments by the Commission are on average markedly higher than for the regulatory decisions in most other jurisdictions, including the UK.
- Fourth, Economic Insights claims that it is notable that the energy regulator for Great Britain, Ofgem, has adopted a lower estimate than in previous decisions and in its most recent decision adopted an estimate that was some 22 basis points below the midpoint of the range for the nominal vanilla WACC based on choosing the lowest point of the range for the cost of equity.

The next section addresses each of these claims in turn.

Responses to issues raised by Economic Insights

Comparability of percentiles from different jurisdictions

A key contention made by Economic Insights is that it is misleading to compare the WACC percentiles adopted by the Commission and overseas regulators. This is a foundational point as it is the grounds on which Economic Insights recommends its alternative approach for comparing regulatory decisions across countries: the examination of the basis point adjustment applied to the midpoint of the range.

Economic Insights considers the comparison of percentiles to be misleading because, when estimating its WACC range, the Commission assumes that the true WACC is drawn from a normal distribution; whereas, according to Economic Insights, overseas regulators' estimates are "in effect estimates from a uniform distribution where every observation has the same weight" (p.ii).[4]

We make two observations in relation to this issue raised by Economic Insights:

Firstly, unlike the Commission, overseas regulators are not explicit in their decisions about the assumed WACC distribution. Indeed, it is not at all clear that regulators overseas think about their WACC ranges in terms of formal statistical distributions. The Commission is fairly unique in specifying that its belief is that the WACC is normally distributed. Economic Insights itself recognises this

[4] In its report to the Commission, Oxera makes a similar assumption. See Oxera, Input methodologies: Review of the '75th percentile' approach, 23 June 2014, section 3.5.

point. When discussing the differences between other regulators and the Commission when specifying a WACC range, Economic Insights states (p.4):

> Where ranges are determined [by regulators overseas] they are usually not in the form of a formal statistical distribution. They may be expressed as an interval of plausible forecasts or valid estimates. The New Zealand Commerce Commission is exceptional in that it makes use of a normal distribution and an assumed standard error for the WACC to calculate a range defined by the 25th and 75th percentiles.

As overseas regulators are typically silent on the question of the distribution of the true WACC, Economic Insights' suggestion that all overseas WACC decisions are in effect estimates from a uniform distribution is purely assumption-based and has no basis in fact.

Secondly, although the Commission, and some other regulators, refer to "percentiles", they are not percentiles in the usual statistical sense of relating to statistical distributions. The Commission **assumes** that the WACC is normally distributed, and employs **assumed** standard error values to develop its range. This was recognised by the High Court in its judgment:[5]

> [1450] In the light of advice from Professors Myers and Franks the Commission acknowledged that its use of standard errors had involved the making of judgements (rather than the pure application of statistical estimation techniques). It also involved assumptions about the probability distributions of the estimates. Consequently, the resulting confidence intervals and percentile figures should not be considered as having the precision that is implied by the terminology.
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> [1451] While much of the discussion before us ignored this caution, in the end it may be said that the Commission used what it called standard errors and a percentile range in a way so as to arrive at a WACC estimate that it considered was likely to comfortably overestimate the WACC. Calling that estimate the 75th percentile is, by our assessment, really a shorthand form of reference, recalling the provenance of that estimate, but not intended to be taken as statistically precise. Nevertheless submissions, understandably and unavoidably, made use of expert advice framed in terms of the statistical properties of standard errors and percentile ranges.

The Commission's approach attempts to formalise how the uncertainty around its central estimate is quantified, and the device the Commission uses to do this is a statistical distribution. That does not mean that the WACC is in fact normally distributed.

When comparing New Zealand and overseas practice on the choice of WACC point estimate, it is unhelpful to think of those estimates as belonging to formal statistical distributions. This is the key error in Economic Insights' analysis. Doing so complicates the exercise unnecessarily, conveys a false sense of rigour and precision and, in the present case, has resulted in Economic Insights choosing an inappropriate methodology for comparing decisions.

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5 Wellington International Airport & Ors v Commerce Commission [2013] NZHC 3289.

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It is more helpful to recognise that, irrespective of how explicit their assumptions about the underlying WACC distribution, the Commission and most UK regulators choose point estimates well above the midpoint of their estimated ranges for essentially the same reason: to minimise the risk of large social losses from underinvestment in essential infrastructure.

In particular, the Commission and many UK regulators:

- recognise that, when estimating WACC, there is uncertainty about the value of the true WACC;
- represent this uncertainty using an estimated WACC range;
- choose a point estimate from within this range; and
- when doing so, recognise that the social welfare losses arising from setting the allowed return too low will very likely outweigh the welfare harm from setting the allowed return too high.

In our March 2014 report entitled *Evidence in support of setting allowed rates of return above the midpoint of the WACC range*, we presented several statements by UK regulators that articulate their rationale for selecting point estimates well above the midpoint of the range.[6] We refer the Commission to our March 2014 report for this evidence.

Finally, hypothetically, even if regulators in different countries did develop their WACC ranges, and selected point estimates, explicitly using formal statistical distributions — such that precise comparisons of percentiles between regulators became difficult — it still remains true that UK regulators have, and continue to, choose values well above the midpoint. This is the essential point that the Commission should take into account in its deliberations.

Representation of WACC decisions on a common basis

Economic Insights has claimed that, in order to ensure comparability between WACC decisions, it is necessary to express all the decisions on a common basis in terms of the treatment of taxation and inflation. Economic Insights favours a nominal vanilla formulation of WACC.

Such transformations to a common form are necessary only when comparing decisions in terms of basis point adjustments relative to the midpoint of the range (per Economic Insights' approach). However, if the comparison of WACC decisions is performed instead on the basis of percentiles, as we have done, it is unnecessary to represent the ranges and point estimates on a common basis in order to make like-for-like comparisons. This is because the Xth

6 Frontier Economics, Evidence in support of setting allowed rates of return above the midpoint of the WACC range, March 2014.

percentile from a real pre-tax WACC range, re-expressed in nominal vanilla terms, is mathematically equivalent to the X^{th} percentile from the same range represented on a nominal vanilla basis. This is demonstrated by the illustrative example presented in the Appendix to this note.

As we explain in the next section, unless the width of the estimated WACC ranges in the different decisions considered are similar, it is very misleading to make comparisons between decisions in terms of basis point adjustments relative to the midpoint. This condition is not satisfied in the current circumstances. The more preferable approach is to compare the percentiles adopted by different regulators to ensure that differences in the width of ranges do not distort the comparisons between decisions. As we compare percentiles in our analysis, in our opinion it is unnecessary to restate the WACC decisions on a common basis.

Adjustments to the midpoint applied by the Commission and other regulators

Economic Insights has compared regulatory decisions by examining the basis point adjustment relative to the midpoint of the range in each decision. Having applied this approach, Economic Insights concludes that the adjustments applied by the Commission are on average markedly higher than the adjustments applied by regulators in other jurisdictions, including the UK.

There are two problems with this approach:

Firstly, as noted in our May 2014 report, it is very difficult to make robust, direct comparisons between the level of returns allowed by UK regulators and the Commission because of country-specific circumstances.[7] These country-specific circumstances might include differences in: the level of interest rates; the size of risk premiums; inflation expectations; and in exposures to political, regulatory and country risks. Comparing percentiles, which are 'normalised' measures, overcomes this problem.

Secondly, Economic Insights' approach of comparing basis points adjustments does not account for the fact that some WACC ranges are significantly broader than others. Economic Insights' approach would only be appropriate if the width of the range in each decision considered was similar. However, in practice the width of the WACC ranges in the sample of decisions available varies significantly, thus distorting the picture and resulting in the incorrect conclusion that the Commission has been over-generous in its rate of return allowances.

Figure 1 reproduces a comparison of UK and New Zealand WACC decisions prepared by Oxera.

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7 Frontier Economics, Evidence on the WACC percentile, May 2014.

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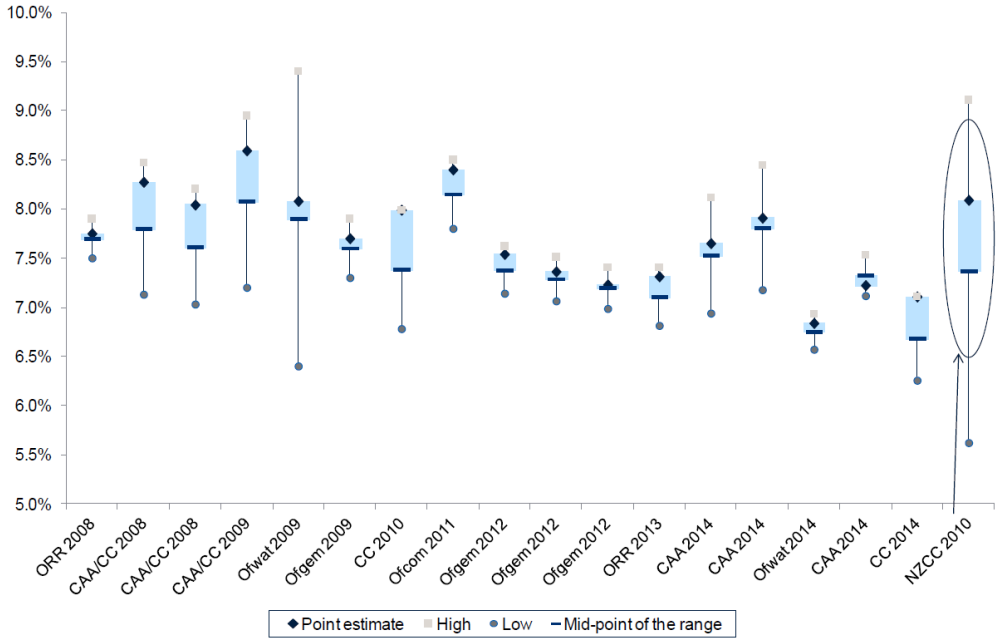
Figure 1: Comparison of UK and NZ WACC decisions



Source: Oxera, Input methodologies: Review of the '75th percentile' approach, 23 June 2014, p.22.

The chart shows that the width of the WACC ranges in most recent UK regulatory decisions:

- vary significantly between one another; and
- have generally been considerably narrower than the Commission's range.

The width of the estimated WACC range represents the regulator's uncertainty over the WACC estimate. The greater the uncertainty, the wider is the range. In principle, the basis points adjustment should be in proportion to the uncertainty over the estimate.[8] If the objective is to minimise the risk of setting the allowed return too low, it would be inappropriate for a regulator that is very uncertain over its WACC estimate (i.e. represented by a 'wide' range) to apply the same basis points adjustment as a regulator that is relatively more certain over its estimate (i.e. one with a 'narrow' range).

The Commission's basis points adjustment, which Economic Insights implies is generous, or markedly higher than the adjustments made by overseas regulators, is simply a reflection of the fact that the Commission's range is relatively wide. Economic Insights has ignored this point. In our view:

8 Hence, it is more meaningful to assess the reasonableness of the final point estimate in terms of a percentile within the range, as this takes account of the width of the range, rather than the absolute basis points adjustment.

- a comparison of the basis points adjustments made by different regulators (under the current circumstances) is very misleading;
- a comparison based on percentiles is more appropriate;
- the Commission's use of the 75th percentile is in line with, and in some cases below, the percentiles adopted by regulators overseas; and
- given the width of the Commission's range, the basis points adjustment resulting from adoption of the 75th percentile of the estimated WACC range is reasonable.

Recent WACC decision by Ofgem

Economic Insights cites a recent decision by Ofgem as an example (in fact, the *only* example) of a UK regulator that has adopted a point estimate below, rather than above, the midpoint of its range. This characterisation is misleading.

The WACC range referred to by Economic Insights was an "indicative" range published by Ofgem on **4 March 2013** in a Strategy Decision document for the first RIIO electricity distribution price control.[9] The purpose of the Strategy Decision was to provide stakeholders with guidance on how Ofgem intended to approach the forthcoming price control. Ofgem did not publish, in that document, its views on the appropriate point estimate, given the very early stage of the price control process.

The final point estimate referred to by Economic Insights was published by Ofgem at the conclusion of a formal consultation process on the appropriate methodology for assessing the equity market return.[10] That point estimate was published on **17 February 2014**, nearly a full year after the release of the Strategy Decision.

In the intervening period, the UK's Competition Commission (now the Competition and Markets Authority) had undertaken a detailed assessment of WACC in relation to Northern Ireland Electricity, and had published a Provisional Determination on the matter on **12 November 2013**. Ofgem considered it prudent to re-examine its own analysis in light of the Competition Commission's provisional findings. During its review, Ofgem considered the latest market evidence available (including evidence since the publication of its Strategy Decision the previous year) and studied the approach followed by the Competition Commission in its Provisional Decision. It also sought advice from experts and views from interested parties. Ofgem finally concluded that it should

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9 Ofgem, Strategy decision for the RIIO-ED1 electricity distribution price control: Final decision, 4 March 2013.

10 Ofgem, Decision on our methodology for assessing the equity market return for the purpose of setting RIIO-ED1 price controls, 17 February 2014.

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change its approach to WACC and give greater (though not entire) weight to the influence of current market conditions in relation to the equity market return. It also determined that it should make a downward adjustment to the real cost of equity to reflect a structural shift in measured inflation. That shift was caused by a 2010 change to the methodology used by the Office of National Statistics when collecting the data used to compile the Retail Price Index. These factors resulted in a new assessment of the appropriate cost of equity, which Ofgem expressed as a point estimate rather than a range.

Given that:

- nearly a full year had elapsed between the publication of Ofgem's original range and the eventual point estimate;
- Ofgem went through a formal consultation process to review its methodology and estimates during that time;
- the review took account of new market evidence and regulatory precedent, as well as reflected in the estimation of real returns the effect of a 2010 change to the way retail price inflation in the UK is measured; and
- Ofgem changed its WACC methodology as a consequence of the review,

it is misleading to characterise the point estimate published by Ofgem in February 2014 as belonging to the same determination as that which gave rise to its range. It would be more accurate to characterise Ofgem's point estimate as a refinement or update of an earlier decision, taking account of new information and circumstances. It is certainly misleading to equate the process that Ofgem followed as equivalent to the process that other UK regulators undertake when determining a WACC, whereby a range is published, and a point estimate chosen, **contemporaneously within the same regulatory decision**.

Appendix: Representation of WACC on a common basis

This appendix presents an illustrative example (Table 1) that demonstrates that like-for-like comparisons between WACC decisions can be made, without representing estimates in a common form, as long as comparisons are made using percentiles.

Table 1: WACC transformations: illustrative example

Parameter	Lower bound	60th percentile	80th percentile	Upper bound
Cost of equity	7.0%	8.2%	8.6%	9.0%
Cost of debt	4.0%	4.6%	4.8%	5.0%
Gearing	50.0%	50.0%	50.0%	50.0%
Corporate tax rate	30.0%	30.0%	30.0%	30.0%
Inflation rate	2.5%	2.5%	2.5%	2.5%
Pre-tax, real	**7.0%**	**8.2%**	**8.5%**	**8.9%**
Vanilla, nominal	**8.1%**	**9.1%**	**9.4%**	**9.7%**

Source: Frontier Economics

Table 1 presents a hypothetical WACC range (lower bound to upper bound), and the elements (cost of equity, cost of debt, gearing, corporate tax rate, inflation rate), which, when combined together result in the lower and upper bounds of the range. The table presents the WACC range first in pre-tax real form. The range is then transformed to a vanilla nominal form.

As well as presenting the lower and upper bounds, the table presents the 60th and 80th percentiles of the range, on a pre-tax real basis, by combining the individual elements of the WACC. This results in:

- A pre-tax real WACC at the 60th percentile of 8.2%; and
- A pre-tax real WACC at the 80th percentile of 8.5%.

We also calculate the nominal vanilla equivalents of these values, which results in:

- A vanilla nominal WACC at the 60th percentile of 9.1%; and
- A vanilla nominal WACC at the 80th percentile of 9.4%.

In order to show that the WACC **percentile** remains the same, irrespective of how the WACC is defined, we solve for the 60th and 80th percentile values of the vanilla nominal WACC range using the following formula:

$$Upper\ bound\ -\ (1-Xth\ percentile)(Upper\ bound\ -\ Lower\ bound)$$

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This calculation results in:

- A vanilla nominal WACC at the 60th percentile of 9.1%; and
- A vanilla nominal WACC at the 80th percentile of 9.4%,

which are identical to the values obtained by transforming the pre-tax real values into nominal vanilla terms, as per Table 1.

This example shows that the X^{th} percentile from a real pre-tax WACC range, re-expressed in nominal vanilla terms, is mathematically equivalent to the X^{th} percentile from the same range represented on a nominal vanilla basis. Therefore, it is unnecessary to convert all WACC decisions into a common form in order to make like-for-like comparisons between decisions, provided the comparisons are made using percentiles.