Response to the New Zealand Commerce Commission's draft decision for Part 4 Input Methodologies Review 2023 on the cost of capital (cross-submissions stage)

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Prepared for Vector Limited

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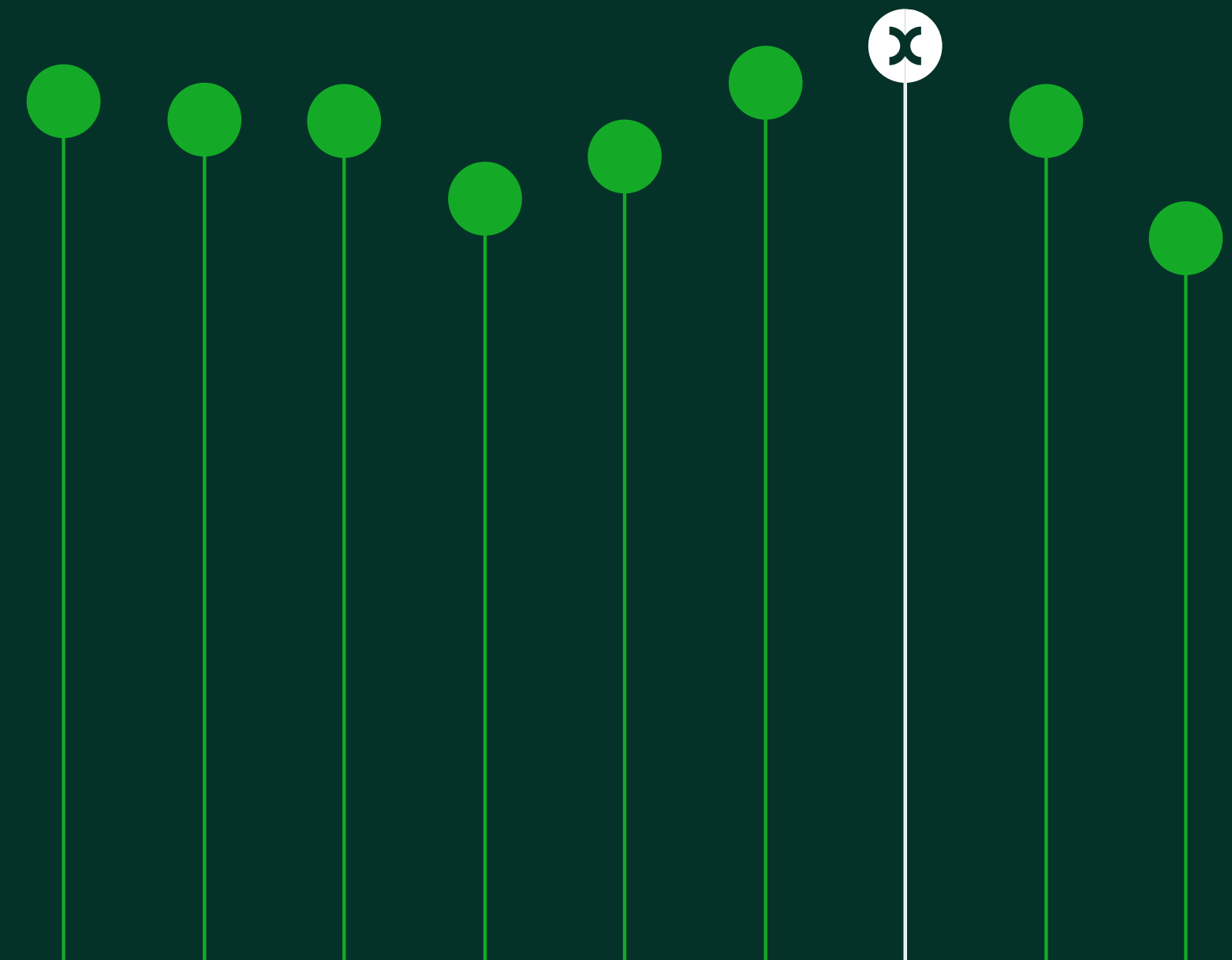

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Executive summary

The New Zealand Commerce Commission (NZCC) has recently published its draft decision (DD) on the Part 4 Input Methodologies (IMs). This includes its preliminary decisions in relation to the weighted average cost of capital (WACC) and other financing topics.[1] Following the NZCC's publications, the 'Big Six' electricity distribution businesses (EDBs)—Aurora, Orion, Powerco, Unison, Vector, and Wellington Electricity—had commissioned Oxera to respond to the NZCC's DD in relation to WACC issues. Oxera's report (Oxera July 2023 EDBs report) was submitted to the NZCC on 19 July 2023.[2]

Stakeholders have now responded to the NZCC's publication and cross-submissions have been invited. Therefore, in this report, prepared on behalf of Vector, we provide follow-up considerations on a selective list of issues. We summarise our observations below.

The cost of debt wash-up adjustment is targeted at one of two alternative definitions of the 'debt compensation issue'

We have reviewed the NZCC's proposed cost of debt wash-up adjustment and observe that stakeholders have used the term 'debt compensation issue' to define two different phenomena. One is about cash flows being backloaded as part of the NZCC's price–quality path regulation model. The other is about the deviation of the actual inflation rate from the forecast inflation rate as expected at the start of the regulatory period, and the impact of this deviation on the cost of debt compensation. The cost of debt wash-up adjustment is focused on addressing the latter, but not the former definition of the 'debt compensation issue'.

[1] New Zealand Commerce Commission (2023), 'Cost of capital topic paper. Part 4 Input Methodologies Review 2023 – Draft decision', 14 June, https://comcom.govt.nz/__data/assets/pdf_file/0024/318624/Part-4-IM-Review-2023-Draft-decision-Cost-of-capital-topic-paper-14-June-2023.pdf (accessed 4 August 2023). New Zealand Commerce Commission (2023), 'Financing and incentivising efficient expenditure during the energy transition topic paper. Part 4 Input Methodologies Review 2023 – Draft decision', 14 June, https://comcom.govt.nz/__data/assets/pdf_file/0026/318626/Part-4-IM-Review-2023-Draft-decision-Financing-and-incentivising-efficient-expenditure-during-the-energy-transition-topic-paper-14-June-2023.pdf (accessed 6 August 2023).

[2] Oxera (2023), 'Response to the New Zealand Commerce Commission's draft decision for Part 4 Input Methodologies Review 2023 on the cost of capital. Prepared for the New Zealand electricity distribution businesses', 19 July, https://comcom.govt.nz/__data/assets/pdf_file/0016/323107/27Big-627-EDBs-Oxera_-Response-to-Commission27s-draft-decision-for-IM-Review-2023-on-the-cost-of-capital-Submission-on-IM-Review-2023-19-July-2023.pdf (accessed 3 August 2023).

We have also found an inconsistency between the cost of debt wash-up adjustment formula and the NZCC's allowed revenue financial modelling. Another inconsistency that we have noted is in the NZCC's stylised demonstration model. In particular, we observe that the model does not show NPV-neutrality in a baseline scenario. This observation implies that the NPV-neutrality test has not been calibrated appropriately.

Finally, we observe that the cost of debt wash-up adjustment may be introduced at a point in time where this is unfavourable for the networks. Examined over a longer period, the adjustment may be net present value (NPV)-negative for networks because they have previously been disadvantaged in environments with lower-than-expected inflation, and may not gain countervailing upside from future periods of potential higher-than-expected inflation, such that the losses and gains could balance out over time.

Our concerns in relation to the NZCC's approach to the COVID-19 data in the asset beta estimation are unaddressed by Dr Lally's follow-up paper.[3]

Dr Lally has published an additional paper in relation to the NZCC's treatment of the period affected by the COVID-19 pandemic, in the context of the estimation of the allowed asset beta. The paper describes and compares two alternative adjustments for data during the COVID-19 period: one applied by the NZCC, and the other used by Flint (2021) and TDB (2023). Dr Lally indicates that he may not agree with either approach. In addition, with reference to an illustrative model, he shows that the NZCC's allowed asset beta in the DD is an underestimate. Importantly, Dr Lally does not address the key concerns set out in the Oxera July 2023 EDBs report, as they would apply to both approaches discussed in Dr Lally's paper.[4]

[3] Lally, M. (2023), 'The impact of future COVID scenarios on beta', 22 June, https://comcom.govt.nz/__data/assets/pdf_file/0017/323117/Dr-Martin-Lally-The-impact-of-future-COVID-19-scenarios-on-beta-Submission-on-IM-Review-draft-decisions-22-June-2023.pdf (accessed 3 August 2023).

[4] Oxera (2023), 'Response to the New Zealand Commerce Commission's draft decision for Part 4 Input Methodologies Review 2023 on the cost of capital. Prepared for the New Zealand electricity distribution businesses', 19 July, https://comcom.govt.nz/__data/assets/pdf_file/0016/323107/27Big-627-EDBs-Oxera_-Response-to-Commission27s-draft-decision-for-IM-Review-2023-on-the-cost-of-capital-Submission-on-IM-Review-2023-19-July-2023.pdf, section 5B (accessed 3 August 2023).

Dr Schmalensee agrees that there is no academic evidence that the tenor to be used for the risk-free rate (RFR) estimation needs to match the length of the price control.[5]

Dr Schmalensee has prepared an additional memo for Vector in response to Dr Lally's commentary on the appropriate tenor to be used to estimate the risk-free rate (RFR). In that memo, Dr Schmalensee agrees with the statement in the Oxera report dated January 2023, that there is no clear academic precedent that the tenor of proxy instruments to be used for the RFR estimation needs to match the length of the regulatory period.[6] Considerations that Dr Schmalensee includes in his memo support the critique of Dr Lally's paper that we provided in the Oxera July 2023 EDBs report. Given that there is no academic evidence for the tenor to match the length of the price control, we maintain our recommendation for longer tenors, supported by regulatory precedent, and taking into account the indefinite maturity of equity financing within the context of long-lived network asset investments.

The NZCC's own evidence supports CEG's recommendation for longer-term debt to be used to estimate the allowed debt premium.

The NZCC reports that the weighted average debt tenor at issuance is 7.25 years across the industry, which is longer than a five-year tenor currently used to estimate the allowed debt premium. Moreover, the optimal tenor may be even longer than the one currently observed in the industry because companies may have been influenced in their financing decisions to date by the allowance methodology (that uses a five-year tenor).

In the context of estimating the allowed tax-adjusted market risk premium (TAMRP), the Chorus submission reinforces our recommendation of putting more weight on the Siegel II model.[7]

Chorus, the New Zealand telecommunications infrastructure provider, submitted a response to the NZCC DD where it recommended the total

[5] See Appendix A1.
[6] See Appendix A1 and Oxera (2023), 'Review of the NZCC's WACC setting methodology. Prepared for Aurora, Orion, Powerco, Unison, Vector, Wellington Electricity', 31 January, p. 12, https://comcom.govt.nz/__data/assets/pdf_file/0018/308502/27Big-Six27-EDBs-Oxera-report-Review-of-the-NZ-Commission27s-WACC-setting-methodology-Submission-on-IM-Review-CEPA-report-on-cost-of-capital-3-February-2023.pdf (accessed 7 July 2023).
[7] Chorus (2023), 'Submission on Part 4 input methodologies review – draft decisions', 19 July, https://comcom.govt.nz/__data/assets/pdf_file/0012/323112/Chorus-Submission-on-IM-Review-2023-Draft-Decisions-19-July-2023.pdf (accessed 3 August 2023).

market return (TMR) approach to the TAMRP. In this context, in the Oxera July 2023 report, we have highlighted that there is negative correlation between the RFR and the market risk premium (MRP). Based on this, we recommended putting more weight on the Siegel II model specification, in relation to TAMRP estimation. The correlation that we have highlighted would support the TMR approach recommended by Chorus. However, if the NZCC prefers keeping an approach that would be broadly consistent with that currently used, i.e. considering evidence from a range of TAMRP estimates, the Chorus cross-submission reinforces our recommendation of putting more weight on the Siegel II model.

1 Introduction

The New Zealand Commerce Commission (NZCC) has recently published its draft decision (DD) on the Part 4 Input Methodologies (IMs). This includes its preliminary decisions in relation to the weighted average cost of capital (WACC) and other financing topics.[8] Following the NZCC's publications, the 'Big Six' electricity distribution businesses (EDBs)—Aurora, Orion, Powerco, Unison, Vector, and Wellington Electricity—had commissioned Oxera to respond to the NZCC's DD in relation to WACC issues. Oxera's report (Oxera July 2023 EDBs report) was submitted to the NZCC on 19 July 2023.[9]

Stakeholders have now responded to the NZCC's publication and cross-submissions have been invited. In this report, prepared on behalf of Vector, we provide follow-up considerations on a selective list of issues.

In the rest of the report, we cover the following topics.

- In section 2, we discuss the NZCC's inflation wash-up mechanism and the cost of debt wash-up adjustment that the NZCC introduced in the DD.
- In section 3, we respond to the additional publication by Dr Lally in relation to the NZCC's treatment of the period affected by the COVID-19 pandemic, as regards the estimation of the allowed asset beta.
- In section 4, we comment on a memo that Dr Schmalensee has prepared for Vector in response to Dr Lally's commentary on the appropriate tenor to be used to estimate the risk-free rate (RFR).
- In section 5, we point to additional evidence, supporting the recommendation by the Competition Economists Group (CEG)

[8] New Zealand Commerce Commission (2023), 'Cost of capital topic paper. Part 4 Input Methodologies Review 2023 – Draft decision', 14 June, https://comcom.govt.nz/__data/assets/pdf_file/0024/318624/Part-4-IM-Review-2023-Draft-decision-Cost-of-capital-topic-paper-14-June-2023.pdf (accessed 4 August 2023). New Zealand Commerce Commission (2023), 'Financing and incentivising efficient expenditure during the energy transition topic paper. Part 4 Input Methodologies Review 2023 – Draft decision', 14 June, https://comcom.govt.nz/__data/assets/pdf_file/0026/318626/Part-4-IM-Review-2023-Draft-decision-Financing-and-incentivising-efficient-expenditure-during-the-energy-transition-topic-paper-14-June-2023.pdf (accessed 6 August 2023).

[9] Oxera (2023), 'Response to the New Zealand Commerce Commission's draft decision for Part 4 Input Methodologies Review 2023 on the cost of capital. Prepared for the New Zealand electricity distribution businesses', 19 July, https://comcom.govt.nz/__data/assets/pdf_file/0016/323107/27Big-627-EDBs-Oxera_-Response-to-Commission27s-draft-decision-for-IM-Review-2023-on-the-cost-of-capital-Submission-on-IM-Review-2023-19-July-2023.pdf (accessed 3 August 2023).

for relying on debt with longer-term tenors to estimate the allowed debt premium.

- In section 6, we highlight consistencies between our and Chorus' recommendations to estimate the tax-adjusted market risk premium (TAMRP) with reference to the negative relationship between the RFR and the market risk premium (MRP).
- In section 7, we conclude.

2 Annual inflation wash-up mechanism and the cost of debt wash-up adjustment

In the DD, the NZCC proposed introducing a cost of debt wash-up adjustment to its existing annual wash-up mechanism, aiming to address a 'debt compensation issue' that the NZCC has identified.[10]

In its response to the DD, Vector has stated that there was not enough time available prior to the response submission deadline to fully assess the implications of the cost of debt wash-up adjustment proposed by the NZCC.[11] Vector has also raised concerns that the issue of debt compensation faced by EDBs may have been misunderstood by the NZCC.[12]

Vector has, therefore, asked us to assess whether the NZCC's proposed adjustment works as intended. The question of whether the case for intervention is justified is outside of the scope of this present assessment.

Our key finding is that stakeholders have used the term 'debt compensation issue' to define two different phenomena. One is about cash flows being backloaded as part of the NZCC's price–quality path regulation model.[13] The other is about the deviation of the actual inflation rate from the forecast inflation rate as expected at the start of the regulatory period, and the impact of this deviation on the cost of debt compensation.[14] The cost of debt wash-up adjustment is focused on addressing the latter, but not the former definition of the 'debt compensation issue'.

We have also found the cost of debt wash-up adjustment formula to be inconsistent with the NZCC's allowed revenue financial modelling. Another inconsistency that we have noted is in the NZCC's stylised demonstration model. In particular, we observe that the model does not

[10] New Zealand Commerce Commission (2023), 'Financing and incentivising efficient expenditure during the energy transition topic paper. Part 4 Input Methodologies Review 2023 – Draft decision', 14 June, para. 5.66, section 5B, https://comcom.govt.nz/__data/assets/pdf_file/0026/318626/Part-4-IM-Review-2023-Draft-decision-Financing-and-incentivising-efficient-expenditure-during-the-energy-transition-topic-paper-14-June-2023.pdf (accessed 4 August 2023).
[11] Vector (2023), 'Input Methodologies (IM) Review 2023 – Response to Draft Decision', 19 July, para. 177.
[12] Ibid. para. 178.
[13] Vector (2021), 'Vector Submission to the Commerce Commission's Open Letter on the Input Methodology Review', paras. 45–47.
[14] NZCC (2023),' Financing and incentivising efficient expenditure during the energy transition topic paper. Part 4 Input Methodologies Review 2023 – Draft decision', 14 June p. 173.

show NPV-neutrality in a baseline scenario. This observation implies that the NPV-neutrality test has not been calibrated appropriately.

Finally, we observe that the cost of debt wash-up adjustment may be introduced at a point in time where this is unfavourable for the networks. Examined over a longer period, the adjustment may be net present value (NPV)-negative for networks because they have previously been disadvantaged in environments with lower-than-expected inflation, and may not gain countervailing upside from future periods of potential higher-than-expected inflation, such that the losses and gains could balance out over time.

In the rest of this section, we cover the following issues:

- testing for NPV-neutrality (section 2.1);
- two definitions of the 'debt compensation issue' (section 2.2);
- the timing of introducing the cost of debt wash-up adjustment (section 2.3).

2.1 Testing for NPV-neutrality

For price-quality path resets, the NZCC applies an economic principle of ex ante real NPV = 0 in relation to net revenue earned by networks.[15] To be able to test whether a certain regime is consistent with this principle in practice, one needs to establish that an NPV, based on real cash flows and real WACC, is equal to zero.[16]

However, defining the real WACC is not a straightforward task by itself—the inflation rate to be used to convert a nominal allowed WACC into a real estimate needs to be chosen. The NZCC does not appear to discuss the question of inflation in its section on the cost of debt wash-up adjustment.[17] As a result, the NZCC does not clearly define how to estimate the real NPV that it intends to maintain at zero.

The NZCC does test for real NPV-neutrality (i.e. it checks that the real NPV = 0) in its stylised demonstration model of the cost of debt wash-up adjustment.[18] In that model, the real WACC is defined as the nominal allowed WACC, deflated with the average expected inflation over the regulatory period, using the Fisher equation. The model shows the real NPV-neutrality of the NZCC regime when using the cost of debt wash-up

[15] New Zealand Commerce Commission (2023), 'Financing and incentivising efficient expenditure during the energy transition topic paper. Part 4 Input Methodologies Review 2023 – Draft decision', 14 June, para. 5.67.
[16] Or, equivalently, an internal rate of return (IRR), based on real cash flows, needs to be compared with the real WACC, to establish that IRR = WACC for the NPV-neutrality test to hold.
[17] Ibid., section 5B.
[18] Ibid., para. 5.80.

adjustment, assuming that inflation was expected to be 2% in every year of the regulatory period, but turned out to be 5%. However, the model does not maintain NPV-neutrality once we allow for a volatile expected inflation profile, which is likely to be a more realistic assumption.[19]

2.2 Two definitions of the 'debt compensation issue'

The NZCC has proposed to introduce a cost of debt wash-up adjustment to its existing annual wash-up mechanism, aiming to address a 'debt compensation issue'.[20] However, the term 'debt compensation issue' appears to have been used for two distinct concepts in the NZCC's publications and in stakeholders' submissions, as explained below.

2.2.1 Debt compensation issue #1

One definition of the 'debt compensation issue' is related to a cash flows mismatch (for example, see Vector (2021), as quoted by the NZCC in the IM review DD)[21]—specifically, under the NZCC's regime, allowed revenue cash flows are backloaded compared with the timing of expenditure(s). In particular, the cost of debt that the benchmark company is assumed to incur is fixed in nominal terms, while the cost of debt allowance is effectively provided in real terms, with inflation compensation being provided via regulatory asset base (RAB) indexation (i.e. at a later period). We refer to this interpretation as 'debt compensation issue #1'.

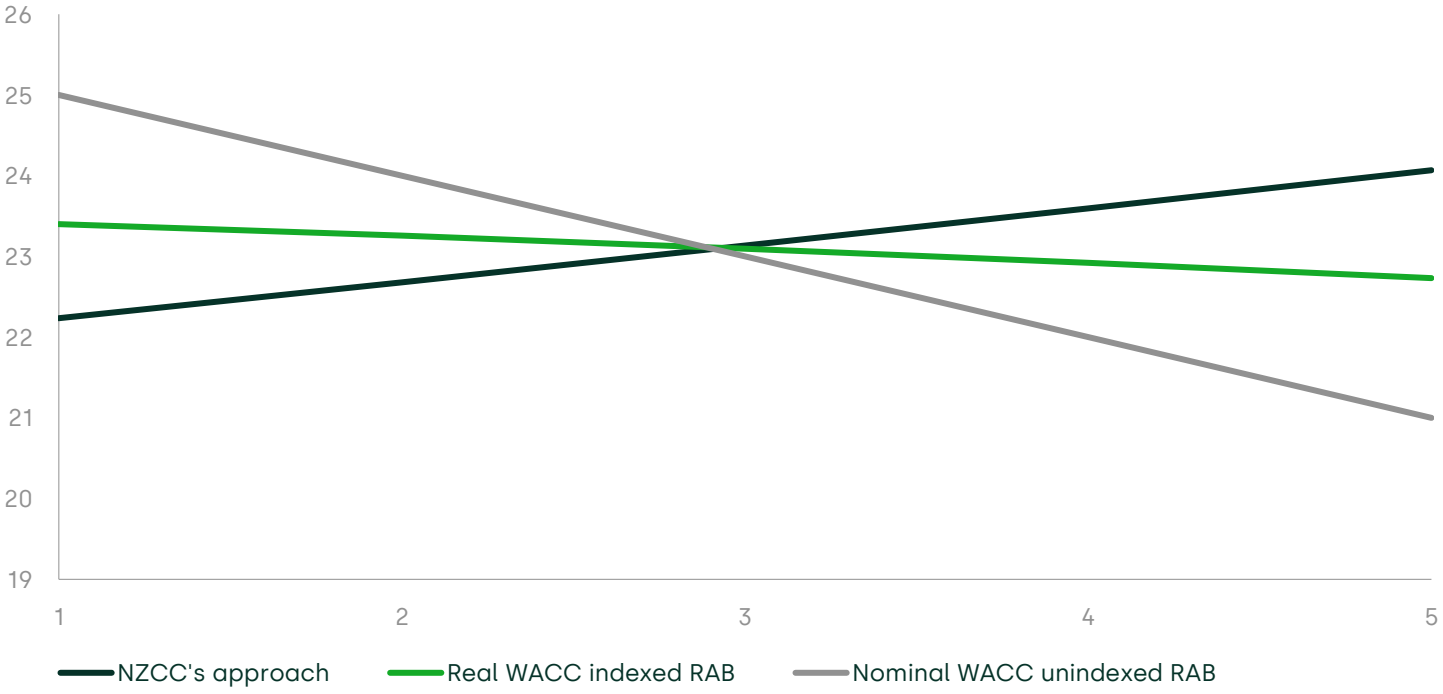
This backloaded profile of cash flows is a standard phenomenon in regimes with real WACC and RAB indexation. Although, in the case of the NZCC's regime, we observe that the effect is stronger as illustrated in the Figure 2.1 below. The strength of this effect is observed because of the modelling approach taken by the NZCC, whereby the return on capital is estimated using a nominal WACC with an indexed RAB, with a subsequent adjustment to strip out the indexed component of the return to obtain a 'real' return on capital. This does not produce the same profile of cash flows as would have been obtained had the NZCC used a

[19] For example, assuming inflation is expected to be 2% in the first two years, but is 3% in all other years of the modelled regulatory periods, the results of the NZCC's stylised model show a real IRR estimate of 5.63% compared to the real WACC of 4.1%, after the cost of debt wash-up adjustment is applied.
[20] New Zealand Commerce Commission (2023), 'Financing and incentivising efficient expenditure during the energy transition topic paper. Part 4 Input Methodologies Review 2023 – Draft decision', 14 June, para. 5.74.
[21] New Zealand Commerce Commission (2022), 'Part 4 Input Methodologies Review 2023. Process and Issues paper', 20 May, para. 5.195, https://comcom.govt.nz/__data/assets/pdf_file/0031/283864/Part-4-Input-Methodologies-Review-2023-Process-and-Issues-paper-20-May-2022.pdf (accessed 7 July 2023).

real WACC allowance with an indexed RAB. Instead, as shown below, the NZCC's approach leads to more pronounced backloading of cash flows.

This phenomenon of cash flows timing mismatch provides another reason for financeability testing—despite the NPV-neutrality of the buildings blocks of the allowed revenue, companies may experience cash flow difficulties under the NZCC regime.

Figure 2.1 Illustrative cashflows (a sum of depreciation and return on capital) under different RAB–WACC regimes (notional $)



Note: Illustrative model assumes an opening RAB of 100 that is fully depreciated over five years, a nominal WACC of 5% and inflation of 2%. The y-axis is truncated to begin at notional $19 to highlight the difference in the profile of cash flows under the regimes.
Source: Oxera analysis.

It does not appear that the NZCC's proposed cost of debt wash-up adjustment is targeted at addressing the 'debt compensation issue #1'.

2.2.2 Debt compensation issue #2

Another definition of the 'debt compensation issue' is related to the deviation of the actual inflation rate from the forecast inflation rate, as

expected at the start of the regulatory period. The NZCC describes it as follows:[22]

[…] the annual revenue wash-up for inflation can cause [price–quality] PQ-regulated suppliers (other than GDBs) to earn excess revenue when inflation is higher than expected and have a revenue shortfall when inflation is lower than expected.

In particular, while the cost of debt that the benchmark company is assumed to incur is fixed in nominal terms, the cost of debt allowance changes with inflation (via the inflation wash-up mechanism and RAB revaluation). As a result, in the absence of the cost of debt wash-up adjustment that is being introduced as part of this DD, companies would get additional nominal returns on the debt-financed proportion of the RAB when inflation is high, while the nominal cost of debt financing remains fixed, and vice versa when inflation is lower than the forecast. We refer to this as the 'debt compensation issue #2'.

The NZCC's proposed cost of debt wash-up adjustment is targeted at addressing the 'debt compensation issue #2'. In fact, the NZCC is explicit about its proposed adjustment not being related to the cash flow timing issue by stating that it would be required irrespective of the RAB indexation mechanism:[23]

Our proposed change to the annual revenue wash-up would be required irrespective of the form of indexation applied to suppliers (e.g. full indexation, hybrid indexation or no indexation).

The exact formula for the cost of debt wash-up adjustment, as proposed by the NZCC in its DD, is specified in Box 2.1 below.

[22] New Zealand Commerce Commission (2023), 'Financing and incentivising efficient expenditure during the energy transition topic paper. Part 4 Input Methodologies Review 2023 – Draft decision', 14 June, para. 5.81.
[23] Ibid., footnote 338.

Box 2.1 Cost of debt wash-up adjustment formula

CoD wash-up = Opening RAB x Lev x CoD – Opening RAB x Lev x RCoD

In which:

Opening RAB is Opening RAB before revaluations

Lev stands for leverage;

CoD stands for nominal cost of debt;

RCoD stands for revised cost of debt which is calculated as:

RCoD = (1 + CoD) / (1 + forecast inflation) * (1 + outturn inflation) - 1

Source: New Zealand Commerce Commission (2023), 'Financing and incentivising efficient expenditure during the energy transition topic paper. Part 4 Input Methodologies Review 2023 – Draft decision', 14 June, p. 230.

It is our understanding that the RCoD component (multiplied by the opening RAB and leverage) is meant to be equivalent to the allowance that the company receives via nominal WACC allowance and RAB indexation. CoD component (multiplied by the opening RAB and leverage) is meant to represent the amount of financing costs that the benchmark company incurs. In which case, the cost of debt wash-up adjustment formula would conceptually correctly define the difference between the two components, and thereby addresses the 'debt compensation issue #2'. Specifically, when outturn inflation is lower than the forecast, the adjustment leads to a positive addition to the revenue wash-up, fixing the 'debt (under-)compensation issue #2'. When the outturn inflation is higher than the forecast, the adjustment takes away from the wash-up allowance, fixing the 'debt (over-)compensation issue #2'.

However, we observe two inconsistencies in the NZCC's proposal and analysis.

First, we find that the formula for the RCoD component is inconsistent with the basis for the return on capital allowance in the NZCC's financial modelling.[24] In a single year in the financial modelling, the return on capital allowance is calculated as (nominal WACC * RAB – forecast inflation * RAB). Therefore, for the RCoD component to be consistent with the allowance modelling, the formula needs to be (CoD – forecast inflation) instead of (1 + CoD) / (1 + forecast inflation).

Second, we observe an inaccuracy in the NZCC's demonstration model showing the cost of debt wash-up adjustment and testing it for real NPV-neutrality. We understand that it is the NZCC's intention that there is no 'debt compensation issue #2' if the outturn inflation matches forecasts, even without the cost of debt wash-up adjustment. However, the model does not show NPV-neutrality in such a baseline scenario.[25] This observation implies that the NPV-neutrality test has not been calibrated appropriately.

2.3 The timing of introducing the cost of debt wash-up adjustment

Finally, we observe that the cost of debt mechanism is introduced at a time when companies could reasonably expect to benefit from higher allowances without the introduction of the cost of debt wash-up adjustment. The NZCC has pointed out that prior to the current high-inflation period, outturn inflation has been consistently lower than the forecast within the regime, leading to energy suppliers being underfunded on the debt costs.[26] However, at the present time of high inflationary pressures in New Zealand and internationally, outturn inflation may be more likely to be above the forecast, creating an opportunity for networks to benefit from 'the debt compensation issue #2'. In fact, the NZCC suggests that it expects this to be the case, stating: 'during the current regulatory period, inflation has been higher than expected and this will result in overcompensation for EDBs and GPBs'.[27]

Examined over a longer period, it may, therefore, be NPV-negative for networks if the NZCC introduces the cost of debt wash-up adjustment

[24] We used the NZCC's financial model for the DPP3 for our analysis. New Zealand Commerce Commission (2019), 'Electricity Distribution Businesses Price-Quality Regulation 1 April 2020 DPP Resent Financial model. Final Determination', 27 November v1.
[25] In particular, we observe a real IRR of 6.01% vs real WACC of 4.1% without the cost of debt wash-up adjustment in cell D77 in tab 'EDB & GDB current' if we assume that the actual inflation equals the forecast of 2% in every year of the regulatory period.
[26] New Zealand Commerce Commission (2023), 'Financing and incentivising efficient expenditure during the energy transition topic paper. Part 4 Input Methodologies Review 2023 – Draft decision', 14 June, paras. 5.85–5.87.
[27] New Zealand Commerce Commission (2023), 'Financing and incentivising efficient expenditure during the energy transition topic paper. Part 4 Input Methodologies Review 2023 – Draft decision', 14 June, para. 5.86.

now. This is because they have previously been disadvantaged in environments with lower-than-expected inflation, and will not gain countervailing upside from periods of potential higher-than-expected inflation, such that the losses and gains could balance out over time.

3 Asset beta

Following the submission of responses to the NZCC's DD, including Oxera's response,[28] Dr Lally published a follow-up paper on the treatment of the COVID-19 period for the estimation of asset beta.[29]

Specifically, this follow-up paper describes and compares two alternative adjustments for data during the COVID-19 period.

1 The first approach, as adopted by the NZCC in the DD, estimates conditional betas for COVID-19 and non-COVID-19 periods separately and arrives at a single beta using probability-based weights for the two periods.
2 The second approach, as preferred by Flint (2021) and TDB (2023), applies probability-based weights to the share price data during COVID-19 and non-COVID-19 periods to generate a single beta estimate.

Dr Lally indicates that he may not agree with either approach:[30]

The merits of applying such treatment to selected events are contentious, especially when the probability of a recurrence of the event is so hard to estimate and any such recurrences may be materially more or less severe.

Nonetheless, he concludes that the second approach is preferable to the first. This is because according to Dr Lally, the first approach as used by the NZCC appears to be based on the 'false' assumption that the variance of the market returns is the same during both COVID-19 and non-COVID-19 periods.[31] Using an illustrative example, Dr Lally explains that, assuming the variance of market returns is higher during the

[28] Oxera (2023), 'Response to the New Zealand Commerce Commission's draft decision for Part 4 Input Methodologies Review 2023 on the cost of capital. Prepared for the New Zealand electricity distribution businesses', 19 July, https://comcom.govt.nz/__data/assets/pdf_file/0016/323107/27Big-627-EDBs-Oxera_-Response-to-Commission27s-draft-decision-for-IM-Review-2023-on-the-cost-of-capital-Submission-on-IM-Review-2023-19-July-2023.pdf (accessed 3 August 2023).
[29] Lally, M. (2023), 'The impact of future COVID scenarios on beta', 22 June, https://comcom.govt.nz/__data/assets/pdf_file/0017/323117/Dr-Martin-Lally-The-impact-of-future-COVID-19-scenarios-on-beta-Submission-on-IM-Review-draft-decisions-22-June-2023.pdf (accessed 3 August 2023).
[30] Lally, M. (2023), 'The impact of future COVID scenarios on beta', 22 June, https://comcom.govt.nz/__data/assets/pdf_file/0017/323117/Dr-Martin-Lally-The-impact-of-future-COVID-19-scenarios-on-beta-Submission-on-IM-Review-draft-decisions-22-June-2023.pdf (accessed 3 August 2023), p. 2.
[31] Another 'false' assumption that Dr Lally notes is the that expected returns are equal in the COVID-19 and no-COVID-19 scenarios. Ibid., p. 4.

COVID-19 period, the resulted weighted average beta would have been higher than that estimated by the NZCC. In other words, Dr Lally is concluding that the NZCC's asset beta as per the DD is an underestimate.

Importantly, Dr Lally does not address the key concerns set out in the Oxera July 2023 EDBs report,[32] and those concerns largely apply to both approaches discussed in Dr Lally's follow-up paper.[33]

These concerns can be summarised as follows:

- although the NZCC follows regulatory precedent from the UK aviation sector in its approach to the COVID-19 returns treatment, this approach is currently under appeal, and it is against many other regulatory precedents;
- the NZCC's estimate is sensitive to the assumptions that it makes about the length and frequency of future pandemic-like events;
- while being sensitive to the assumptions on the length and frequency of the pandemic-like events, the NZCC's estimate is also sensitive to the choice of the assumptions on the representative pandemic and non-pandemic periods within the historic period;
- the NZCC double-counts the impact of the pre-pandemic asset beta estimate;
- the NZCC does not explain its choice of the point estimate within the range;
- as a result of the approach it has taken in its DD, the NZCC introduces a large degree of subjectivity that undermines the robustness of the analysis and introduces regulatory risk;
- using the NZCC's standard approach (i.e. the approach used prior to this DD) would apply the same treatment to the observations during the COVID-19 pandemic, which is a common approach to allowing for outliers that contain important information about market risk.

[32] Oxera (2023), 'Response to the New Zealand Commerce Commission's draft decision for Part 4 Input Methodologies Review 2023 on the cost of capital. Prepared for the New Zealand electricity distribution businesses', 19 July, section 5B, https://comcom.govt.nz/__data/assets/pdf_file/0016/323107/27Big-627-EDBs-Oxera_-Response-to-Commission27s-draft-decision-for-IM-Review-2023-on-the-cost-of-capital-Submission-on-IM-Review-2023-19-July-2023.pdf (accessed 3 August 2023).

[33] As explained in the list below, some concerns are not related to the treatment of the COVID-19-period data, but other methodological choices that the NZCC has made (e.g. choosing a point estimate within the range).

The detailed discussion on these concerns can be found in section 5B of the Oxera July 2023 EDBs report prepared in response to the NZCC's DD.

4 Tenor for the risk-free rate

Vector has commissioned Dr Schmalensee to comment on Dr Lally's March 2023 paper,[34] which the NZCC relied on, to prepare for the DD. This is due to the role that Dr Schmalensee's paper played in the regulatory discussions of the appropriate tenor for the allowed RFR in Australia and New Zealand regulatory determinations. The text of Dr Schmalensee's memo is reproduced in appendix A1.

From this memo, we observe that Dr Schmalensee agrees with the statement in the Oxera report dated January 2023, that there is 'no clear precedent academic or otherwise on the term that should be used to compute the risk-free rate'.[35]

Dr Lally's March 2023 paper acknowledges Dr Schmalensee's concern that his 1989 paper did not, in fact, set a precedent for the appropriate term of the RFR. Nonetheless, Dr Lally explains:[36]

'Secondly, despite Schmalensee (2022) denying credit for this proposition, I consider that credit to him is warranted. [...] under certainty over everything except future interest rates, Schmalensee (1989) proves that NPV = 0 for any choice of depreciation schedule if the allowed rate of return set at the beginning of a regulatory cycle has a term equal to the regulatory cycle.

[...] Clearly, Schmalensee's (1989) focus was upon the depreciation schedule when he showed that the NPV = 0 result held for any depreciation schedule so long as the allowed rate was for a term matching the regulatory period. He therefore viewed the requirement for the allowed rate of return to match the regulatory cycle as a mere ancillary assumption to his Invariance Proposition. This was entirely legitimate, but it still remains true that he has proved a second proposition without him intending to do so: NPV = 0 if the term for the allowed cost of capital matches the regulatory cycle.

[34] Lally, M. (2023), 'Review of submissions on the risk-free rate and the cost of debt', 17 March, https://comcom.govt.nz/__data/assets/pdf_file/0025/318463/Dr-Martin-Lally-Review-of-submissions-on-the-risk-free-rate-and-the-cost-of-debt-17-March-2023.pdf (accessed 3 August 2023).

[36] Lally, M. (2023), 'Review of submissions on the risk-free rate and the cost of debt', 17 March, pp. 5–6, https://comcom.govt.nz/__data/assets/pdf_file/0025/318463/Dr-Martin-Lally-Review-of-submissions-on-the-risk-free-rate-and-the-cost-of-debt-17-March-2023.pdf (accessed 3 August 2023).

This is an argument that we have already shown to be problematic. As explained in the Oxera July 2023 EDBs report,[37] Dr Lally's model does not require the cost of capital to be a one-period cost of capital, despite showing the desirable result of NPV = 0 with a one-period cost of capital. Instead, the model would show NPV = 0 with any cost of capital, as long as the allowed rate of return matches it in each period.

Furthermore, Dr Schmalensee's memo cites his discussions with an MIT colleague, Professor Stewart Myers, where the latter has shown that '[i]f a regulatory commission decides to allow a return R, and adjusts the utility's prices frequently enough that the utility always earns R on a book basis, then the utility will always earn the same true return R'.[38] This is consistent with the result above, i.e. the NPV = 0 principle would hold with any cost of capital, as long as the allowed rate of return matches it in each period. In other words, as we have explained in the Oxera July 2023 EDBs report, Dr Lally's model does not prove, but rather assumes, the appropriate term for the cost of capital.

In his memo, Dr Schmalensee is also explicit that: 'They [Oxera] are correct that my 1989 paper establishes no such precedent [which would establish the term that should be used to compute the risk-free rate]'. This suggests that the NZCC has to make a choice about the appropriate tenor of the instruments to be used for the RFR where there is no uniquely correct source to rely on, such that it would be appropriate to consider a range of precedents. The selection of a term for the risk-free rate that is longer than the length of the regulatory period may reflect other considerations, such as the indefinite maturity of equity financing for long-lived network assets that can have residual asset lives of several decades.[39] As we have shown in the Oxera July 2023 EDBs report, in the vast majority of regulatory determinations that we reviewed, a term longer than five years was used.[40]

[37] Oxera (2023), 'Response to the New Zealand Commerce Commission's draft decision for Part 4 Input Methodologies Review 2023 on the cost of capital. Prepared for the New Zealand electricity distribution businesses', 19 July, section 2C, https://comcom.govt.nz/__data/assets/pdf_file/0016/323107/27Big-627-EDBs-Oxera_-Response-to-Commission27s-draft-decision-for-IM-Review-2023-on-the-cost-of-capital-Submission-on-IM-Review-2023-19-July-2023.pdf (accessed 3 August 2023).
[38] From Richard Schmalensee to Mark Toner, Re: Dr. Martin Lally's Review of Submissions on the Risk-Free Rate and the Cost of Debt, 31 July 2023. See Appendix A1.
[39] Oxera (2023), 'Response to the New Zealand Commerce Commission's draft decision for Part 4 Input Methodologies Review 2023 on the cost of capital. Prepared for the New Zealand electricity distribution businesses', 19 July, section 2C.
[40] Oxera (2023), 'Response to the New Zealand Commerce Commission's draft decision for Part 4 Input Methodologies Review 2023 on the cost of capital. Prepared for the New Zealand electricity distribution businesses', 19 July, Table 2.1 and para. 2.28.

5 Tenor for the debt premium

In its submission in response to the NZCC's DD, CEG has argued that the allowed debt tenor should be increased from five years to ten years in the NZCC regime.[41] The CEG suggestion has relied on analysis of the relationship of debt betas and debt tenor. We have not examined the issue of debt betas in relation to the NZCC regime, but we agree with the conclusion that a longer tenor in setting the allowed debt premium would be consistent with the market evidence. Specifically, we observe that the market data for the New Zealand energy networks supports a debt tenor assumption of longer than five years, with the weighted average debt tenor at issuance being 7.25 years across the industry, as per the NZCC's assessment.[42]

As we have highlighted in our submission in the discussion of the term credit spread differential (TCSD) allowance, there is no evidence that debt of ten years or longer would be inefficient.[43] Furthermore, the current weighted average tenor that is observed for debt by New Zealand energy networks at issuance may be affected by circularity at present. In other words, it is plausible that companies may not issue longer-term debt in part because the debt financing allowance methodology does not encourage them to do so.

Currently, longer debt tenors (i.e. longer than five years) are renumerated through the TCSD allowance. If the debt tenor for the (baseline) debt premium was raised to ten years, it would eliminate the need for any TCSD allowance under the current tenor cap of ten years. We have submitted in our July 2023 report that the ten-year cap is not sufficiently substantiated and there is currently no reason to believe that debt tenors of longer than ten years are inefficient.[44] Hence, it may be reasonable to both raise the baseline debt tenor as well as augment the TCSD allowance cap, to allow companies a wider choice of debt instruments—potentially aligning more closely with the asset lives in the sector.

[41] Competition Economists Group (2023), 'Response to 2023 IM draft decision on cost of capital', July, p. 21.
[42] New Zealand Commerce Commission (2023), 'Cost of capital topic paper. Part 4 Input Methodologies Review 2023 – Draft decision', 14 June, p. 40.
[43] Oxera (2023), 'Response to the New Zealand Commerce Commission's draft decision for Part 4 Input Methodologies Review 2023 on the cost of capital', 19 July, p. 29.
[44] Ibid.

6 Tax-adjusted market risk premium

In its response to the NZCC's DD, Chorus, the New Zealand telecommunications infrastructure provider, commented on the approach to TAMRP.[45] In particular, Chorus considered that '[d]eriving the tax adjusted market risk premium (TAMRP) as a residual from a stable [total market return] TMR is preferable to the current NZCC's approach'.[46] As one of its reasons, in support of moving to such an approach, Chorus cites that the TMR approach implies a more stable cost of capital allowance over time.

In the Oxera report for the 'Big Six' from January 2023, we provided academic evidence supporting negative correlation between the market risk premium (MRP) and RFR.[47] Based on that evidence, we recommended that the NZCC puts more weight on the Siegel II method.[48] Siegel II is one of the methods that the NZCC takes into account when setting the TAMRP allowance, which assumes a negative relationship between the MRP and RFR.

This negative correlation would support an alternative approach such as the TMR. However, if the NZCC prefers keeping an approach that would be broadly consistent with that currently used, i.e. considering evidence from a range of TAMRP estimates, the Chorus submission reinforces our recommendation of putting more weight on the Siegel II model.

[45] Chorus (2023), 'Submission on Part 4 input methodologies review – draft decisions', 19 July, https://comcom.govt.nz/__data/assets/pdf_file/0012/323112/Chorus-Submission-on-IM-Review-2023-Draft-Decisions-19-July-2023.pdf (accessed 3 August 2023).
[46] Ibid., p. 2.
[47] Oxera (2023), 'Review of the NZCC's WACC-setting methodology. Prepared for Aurora, Orion, Powerco, Unison, Vector, Wellington Electricity', 10 November 2022—reviewed on 31 January 2023, Box 3.1, https://comcom.govt.nz/__data/assets/pdf_file/0018/308502/27Big-Six27-EDBs-Oxera-report-Review-of-the-NZ-Commission27s-WACC-setting-methodology-Submission-on-IM-Review-CEPA-report-on-cost-of-capital-3-February-2023.pdf (accessed 3 August 2023).
[48] Chorus also observes that its recommended 'TMR approach' is consistent with the Siegel II method, in principle. Chorus (2023), 'Submission on Part 4 input methodologies review – draft decisions', 19 July, para. 9, https://comcom.govt.nz/__data/assets/pdf_file/0012/323112/Chorus-Submission-on-IM-Review-2023-Draft-Decisions-19-July-2023.pdf (accessed 3 August 2023).

7 Conclusions

To summarise, in this report, we have evidenced the following conclusions.

- The cost of debt wash-up adjustment is targeted only at one of the definitions of the 'debt compensation issue' that was used by stakeholders. There are also inconsistencies in the NZCC's formula and analysis, and the adjustment may potentially be introduced at such a time that would make the allowances over a long-term period NPV-negative.
- Dr Lally's follow-up submission on the approach to the COVID-19 data treatment for the asset beta estimation does not address our concerns in relation to the NZCC's approach. Our concerns would apply to both approaches discussed in Dr Lally's paper.
- There is further support for our previous assessment that there is no clear academic evidence for the NZCC to rely on, in relation to its choice that the tenor of the instruments used to estimate the RFR should match the length of the (five-year) price control. Accordingly, we reiterate our recommendation that it is reasonable to consider a longer tenor for the instruments that are used to estimate the RFR.
- The NZCC's own evidence supports a debt tenor of longer than five years for the estimation of the allowed debt premium, with the average tenor at issuance in the industry being 7.25 years.
- Chorus' response recommending the TMR approach reinforces our recommendation for taking into account the negative relationship between the RFR and the MRP. This relationship supports our recommendation for the NZCC to put more weight on the Siegel II model in its TAMRP estimation.

A1 Dr Schmalensee's memo

This appendix reproduces the text of Dr Schmalensee's memo that he prepared for Vector in response to Dr Lally's assessment of the tenor of government bonds to be used for the RFR.

I appreciate the opportunity to reply to Dr. Lally's latest attempt to use my 1989 *Journal of Regulatory Economics* paper to support his argument that if a regulator determines a regulated firm's cost of capital every T years, it must use T-period bonds in that determination. I lack the time and, at this point, the patience to provide a detailed critique of Dr. Lally's latest argument, but I want to make it clear that, as I indicated in my two submissions to the Australian Energy Regulator (AER), I agree with the assertion by Oxera (2023, section 2.3) that there is "*no clear precedent academic or otherwise on the term that should be used to compute the risk-free rate.*" They are correct that my 1989 paper establishes no such precedent.

As I noted in the first of my submissions to the AER, when I showed a draft of my 1989 paper to my MIT colleague Stewart Myers, he pointed me to 1972 paper of his in the *Bell Journal of Economics and Management Science* in which he had asserted the same basic result, though without proof:

> If a regulatory commission decides to allow a return R, and adjusts the utility's prices frequently enough that the utility always earns R on a book basis, then the utility will always earn the same true return R. (note 38).

Myers clearly asserts that this statement is true for *any* regulator-determined R, and he implicitly asserts that it is true regardless of how depreciation is computed. The final statement, that "the utility will always earn the same true return R" is equivalent to the NPV=0 principle. All this is perfectly consistent with my 1989 paper. The only mention of periodicity in Myers' assertion is the requirement that "the utility *always* earns R on a book basis," where *always* must mean whenever depreciation is charged and the accounting ("book basis") rate of return is computed.

From Richard Schmalensee to Mark Toner, Re: Dr. Martin Lally's Review of Submissions on the Risk-Free Rate and the Cost of Debt, 31 July 2023.

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