NZCC proposed approach to targeting a nominal return on debt

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1   Introduction

1. I, Tom Hird of 14 Glen Eira Rd, Ripponlea, Victoria, have been engaged by Vector to provide advice on the New Zealand Commerce Commission's ("NZCC") proposed approach to targeting a nominal return on debt.

2. I hold the following qualifications:

   ▪ Bachelor of Economics (Honours First Class), Monash University (1989); and

   ▪ PhD in Economics, Monash University.

3. From 1990 to 2000 (both prior to, during and after the completion of my PhD in economics) I was employed by the Commonwealth Treasury. Since 2001 I have worked as a consulting adviser specialising in economics: first with Arthur Andersen, then NERA Australia and, since 2007, for my own firm, Competition Economists Group ("CEG"). I have advised private clients, regulators, and other Government agencies on a large number of cases specialising in finance theory.

4. I have more than 30 years of experience in the economic analysis of markets and in the provision of expert advice in regulatory, litigation and policy contexts. I have provided expert testimony before courts and tribunals and in numerous regulatory forums in Australia but also in the United Kingdom and New Zealand.

1.1   Report structure and outline

5. Section 2 examines the volatility of revenues under the Commission's proposed approach to compensating for nominal debt costs when inflation differs from forecast inflation at the beginning of the DPP. It explains:

   ▪ That the NZCC's proposal to adjust within regulatory period revenues will materially increase the volatility of revenues. This is likely to be undesirable for consumers, suppliers and retailers alike;

   ▪ Two alternative approaches are outlined where the adjustment is performed via the opening RAB at the beginning of the next regulatory period. These result in the same present value of revenues but much lower revenue volatility. These two approaches are:

      ▫ To roll-forward the RAB to the beginning of the next regulatory period using DPP forecast inflation applied to the debt portion of the RAB (while still using actual inflation applied to the equity portion of the RAB). This preserves the same expected profile of return of capital as the current regime; or

      ▫ To simply not index the debt portion of the RAB for inflation at all (i.e., neither for forecast inflation in the financial model nor actual inflation in the

RAB roll-forward from one DPP to the next). This is the simplest solution to model but it does bring forward the profile of return of capital relative to the current regime.

6. Section 3 explains why the draft decision's proposed approach to compensating for the nominal cost of debt will not have an NPV=0 result. In order to ensure that an NPV=0 result ensues, I consider that the NZCC should:

    ▪ Clearly state the underlying debt management strategy that the EDB is assumed to be undertaking; and

    ▪ Include direct modelling of the cost of that strategy and derive the adjustment to revenues from that modelling.

7. Doing so will illustrate why the current (within DPP revenue) adjustment is actually more complicated to implement correctly. This is because the volatility in revenues (driven by unexpected inflation and the NZCC revenue adjustment mechanism) drives corresponding volatility in debt raising. However, this debt raising occurs at a nominal rate that reflects the inflation rates at the time.

8. This means that, in fact, the very act of attempting to adjust *revenues* to account for the fact embedded debt costs are nominal forces suppliers to raise more (less) than debt funding when inflation is unexpectedly high (low). As a result, the NZCC adjustment mechanism will actually cause nominal interest rates paid by suppliers to be higher on average.

9. This is one of the reasons why I consider that an alternative solution (that adjusts the indexation of the RAB between DPPs rather than revenues within the DPP) is superior. However, if the NZCC rejects those solutions it will need to implement a materially more complex revenue adjustment formula.

2 Revenue volatility under the proposed reform

2.1 Problem definition

10. The draft decision identifies a problem with the current regulatory regime. Specifically, that the cost of embedded debt is a nominal cost but the current regulatory regime compensates for that debt 'as if' it is a real cost (i.e., 'as if' it rises and falls with actual inflation.

> *5.83 As we assume debt costs are fixed in nominal terms (which is also our assumption underlying the hybrid cost of debt – ie, that suppliers can hedge the risk-free component of their cost of debt) there is a risk to suppliers when inflation is lower than predicted at the reset. In that situation the annual revenue wash-up could create a cash flow concern.*

> *5.84 There is no cashflow concern (but there is over-compensation) when inflation is higher than predicted, because in that situation the annual revenue wash-up creates excess revenue. This is because debt costs are fixed in nominal terms but the annual revenue wash-up in effect assumes debt costs are variable.*

2.2 NZCC proposed solution

11. The draft decision proposes the following solution.

> *5.91 We are proposing to amend the IMs for EDBs and the GTB to provide an adjustment to the annual revenue wash-up to account for debt servicing costs being fixed in nominal terms. No IM change is needed to provide for this in the case of Transpower and GDBs, as their IMs already permit us to do so at the IPP and DPP reset, respectively,344 if we decide at that point that it would promote the Part 4 purpose.*

> *5.92 When inflation is higher than expected, the annual revenue wash-up would not increase revenue for the entire amount of inflation, but rather, a lesser amount to exclude the effect inflation has on the cost of debt.*

> *5.93 Conversely, when inflation is lower than expected, the annual revenue wash-up would not decrease revenue for the entire amount of inflation.*

> *5.94 The proposed change protects suppliers from a potential revenue shortfall (overpayment) in situations where revenue would otherwise have*

been decreased (increased) by the full amount of inflation, consistent with NPV=0.

12.   The NZCC also published an illustrative model to show how this wash-up would be implemented. I have used this model to generate potential revenue impacts of the proposed approach by:

- assuming forecast inflation is always 2.0%; but

- actual inflation over a 10 year period (two DPPs) takes the same path that it has actually taken over the last 10 years;

- I have retained the NZCC assumptions about the nominal cost of debt (5%) and the real cost of equity (4.9%).

- I have assumed zero capex and an infinitely lived RAB (i.e., a stable RAB with zero capex or depreciation).

13.   The results are illustrated in Figure 2-1 below.

- The black line shows the difference between forecast and actual inflation in the relevant year;

- The red line shows the percentage change in the within DPP revenue compensation for the return on capital building block.

14.   It can be seen that the proposed approach would involve significant swings in the return on capital building block – with an almost 40% reduction occurring in year 3 of the second DPP (when actual inflation is 7.3% - 5.3% more than forecast inflation).

15.   In this year the revenue compensation for interest costs is negative within the DPP. This is because actual inflation of 7.3% is 5.3% greater than the 2% forecast inflation at the beginning of the DPP. This means that the debt portion of the RAB will grow by 7.3% not 2%. The logic of the NZCC adjustment is that this 7.3% compensation is greater than the nominal cost of debt (5%) and, therefore:

- there is no need to provide cash-compensation for the cost of debt within DPP revenues (leaving the EDB to fund that 5% interest costs with new debt); and

- in fact, it is appropriate to provide negative cash-compensation for the cost of debt in DPP revenues (in the amount of around -2.3% (=7.3%-5.0%) of the debt portion of the RAB) in order to claw back 2.3% of the RAB growth in excess of 5% nominal interest costs.

Figure 2-1: Revenue impacts of the proposed changes
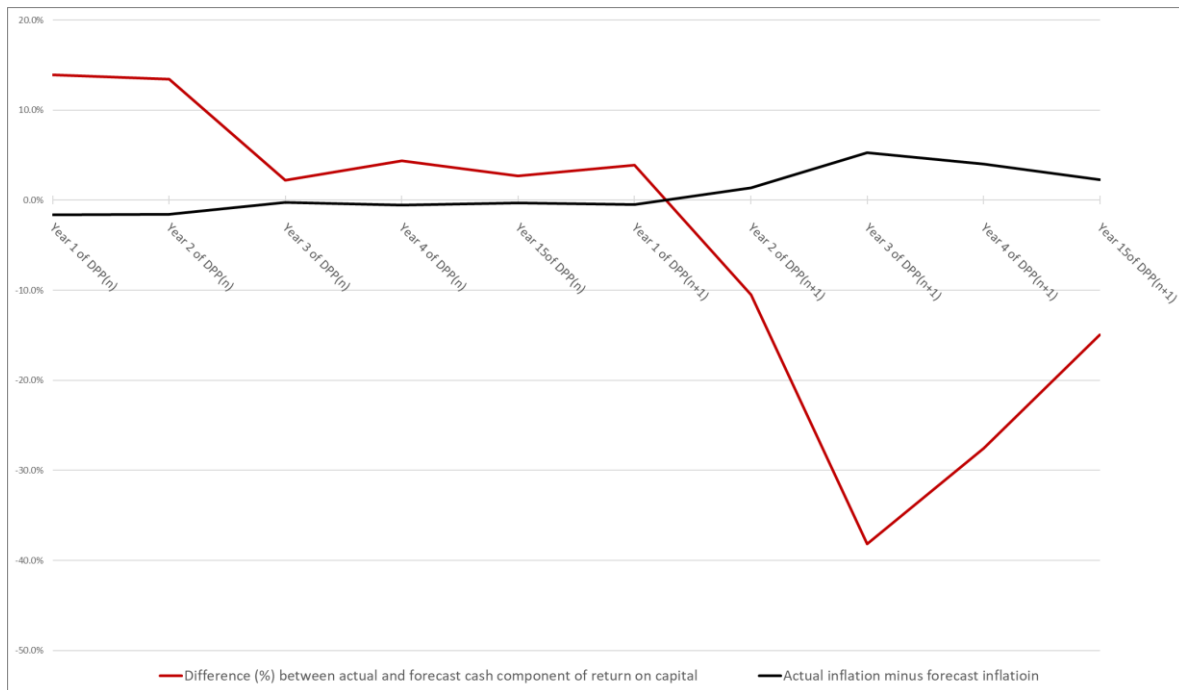
Source: CEG analysis.

16. In this context, I note that by forcing the entire adjustment for inflation forecast error into revenues the NZCC proposed adjustment will mean that:

- Unexpectedly low inflation can result in compensation for interest costs that materially exceed the actual interest costs paid by the EDB (with the surplus proceeds needing to be used by the EDB to retire debt in order to maintain target leverage).

- Unexpectedly high inflation can result in negative compensation for interest costs – which is a corollary of the fact that the EDBs are expected to fund large (nominal) increases in their RAB. In the example illustrated above, where actual inflation was 7.3%, an EDB will have negative 2.3% compensation in revenues for debt costs. This means that, in order to maintain its gearing with the growing RAB, the EDB has to fund:

  - all of its 5.0% nominal interest costs out of the proceeds of new debt; plus

  - a further 2.3% of revenue shortfall.

17. It is questionable whether it is desirable to enforce on EDBs such large and, by definition, unanticipated swings in debt raising/repayment.

18. In this regard, it is important to note that the NZCC's adjustment mechanism forces the supplier to raise high (low) levels of debt when there is unexpectedly high (low)

inflation precisely because the NZCC adjustment reduces (raises) revenues in anticipation of unexpectedly high (low) compensation in the form of RAB growth. I explain in section 3 that the NZCC adjustment mechanism does not capture and compensated for this effect and, therefore, is not NPV=0 (even accepting debt is a nominal contract).

19. I further note that these swings in return on capital can be expected to result in large, unexpected swings in revenues and prices paid by customers/retailers. Again, taking the example of a 7.3% inflation increase. If that reduces the cash return capital by 40% and the cash return on capital is 40% of total revenues then this implies a 16% reduction in revenues. The other 60% of building block costs (opex and return of capital) will rise by 5% more than expected (=1.073/1.02-1). Consequently, total revenues will fall by 13% (=16%-5%*60%).

20. In this light, the following quote from the draft decision, while not wrong, may require clarification. The "increase" in revenue of a "lesser amount" is likely to be negative.

> 5.92 When inflation is higher than expected, the annual revenue wash-up would not increase revenue for the entire amount of inflation, but rather, a lesser amount to exclude the effect inflation has on the cost of debt.

21. That is, when inflation is unexpectedly high this is likely to drive falling revenue and prices for EDB services.

2.3 Alternative solutions with less volatile prices

22. There are two alternative approaches outlined where the adjustment is performed via the opening RAB at the beginning of the next regulatory period. These result in the same present value of revenues but much lower revenue volatility. These two approaches are:

a. **Solution A**. To roll-forward the RAB to the beginning of the next regulatory period using DPP forecast inflation applied to the debt portion of the RAB (while still using actual inflation applied to the equity portion of the RAB). This preserves the same expected profile of return of capital as the current regime; or

b. **Solution B.** To simply do not index the debt portion of the RAB for inflation at all (i.e., neither for forecast inflation in the financial model nor actual inflation in the RAB roll-forward from one DPP to the next). This is the simplest solution to model but it does bring forward the profile of return of capital relative to the current regime.

23. All of the solutions, including the NZCC solution, have the common mathematical objective of seeking to align, for the debt portion of the RAB,:

a. the inflation rate used to roll-forward the RAB within the financial model used to generate annual revenues; and

b. the inflation rate used to roll forward the RAB.

24. Each of the three solutions has a different mechanism for doing this.

   ▪ The **NZCC's solution** keeps indexation of the debt portion of the RAB between DPPs based on actual inflation but (in effect) seeks to annually correct for inflation forecast errors within revenues;

   ▪ **Solution A** achieves equivalence by using financial model forecast inflation to index the debt portion of the RAB between DPPs; and

   ▪ **Solution B** achieves equivalence by setting to zero inflation indexation for the debt RAB in both the financial model and the RAB roll-forward model.

25. The advantage of Solution A and/or B is that they do not involve potentially wild swings in revenues (and therefore debt and equity raising for EDBs) from year to year. This is also likely to be advantageous to EDBs and to customers/retailers who are likely to have a preference for more stable prices than more unstable prices.

26. Solution A achieves greater stability in prices by simply applying forecast inflation to the debt RAB in both: a) the financial model used to estimate revenues; and b) the RAB roll-forward model.

27. Solution B achieves greater stability in prices by, in effect, making no use of forecast of inflation at all (in so far as arriving at an estimate of the cash compensation for debt costs). Having made no inflation forecast, there is no inflation forecast error to correct.

28. In my view, solution A or B is likely to be the most efficient in the sense that it will impose the lowest costs on suppliers in managing their debt and equity funding. It also appears likely to me that other stakeholders (end customers and retailers) are likely to prefer the lower volatility of prices under solutions A and/or B over the NZCC's proposed solution.

29. I also note that solution A or B is much simpler to correctly implement than a revenue adjustment – which I explain below the draft decisions revenue adjustment is not accurate.

2.4 Summary

30. The NZCC's proposed solution is to:

   a. Maintain the current approach where the windfall benefit/loss to an EDB from inflation forecast error is placed in the RAB at the beginning of the next regulatory period (with the cash benefits/loss spread out over a long period of time); and

b. Cancel out this windfall benefit/loss in the RAB by imposing an offsetting adjustment to revenues in a single year.

31. Solutions A and B seek to:

a. change the regulatory regime to eliminate the windfall benefit/loss that occurs in point "a" above (i.e., to ensure that there is no windfall placed in the RAB); and

b. in so doing avoid the need for a disruptive and large offsetting adjustment to revenues in a single year.

32. Solutions A and B have the advantage to consumers and EDBs of providing much more stable revenues/prices.

33. This is likely to be particularly important for EDB's facing the challenges of investing to achieve decarbonisation objectives. An EDB with an already challenging debt and equity raising profile would likely incur considerably higher costs (and be viewed by investors as riskier) under the NZCC's proposed solution.

34. By way of illustration, an unexpected drop in revenues equal to circa 5.3% of the debt portfolio (associated with an inflation rate of 5.3% above forecast) would cause an equivalent and unexpected increase in required debt funding – precisely at a time when interest rates are likely to be high (due to unexpectedly high inflation).

35. If this outcome combined with an exogenously large demand for funding for decarbonisation investment it is reasonable to be concerned that financeability issues could arise.

3 NZCC adjustment is not currently NPV=0

36. I do not consider that the draft decision's proposed approach to compensating for the nominal cost of debt will have an NPV=0 result. In order to ensure that this is the case, I consider that the NZCC should:

   ▪ Clearly state the underlying debt management strategy that the EDB is assumed to be undertaking; and

   ▪ Include direct modelling of the cost of that strategy and derive the adjustment to revenues from that modelling.

37. By way of illustration, note that a supplier maintaining a constant debt leverage ratio must:

   ▪ Refinance maturing debt with new debt; and

   ▪ Fund RAB growth with new debt (in proportion to the leverage ratio).

38. This raises the important question of how to model the impact of higher (lower) than expected inflation on nominal debt costs. In this regard there is an important distinction between:

   a. the cost of embedded debt at the beginning of the DPP; and

   b. the cost of new debt raised during the DPP in order to fund:

      i. Refinancing of embedded debt as it falls due;

      ii. RAB growth due to positive net capex; or

      iii. RAB growth due to inflation indexation of the RAB.

39. The NZCC's proposed adjustment appears to implicitly assume:

   a. that the value of embedded debt at the beginning of the DPP has a fixed nominal interest rate over the entirety of the DPP (i.e., does not change as that debt is refinanced); and

   b. that unexpected RAB growth due to unexpected inflation forecast error does not need to be funded at higher annual interest costs reflective of the higher inflation rates in that year (and *vice versa*). This is despite the fact that:

      i. the NZCC's adjustment mechanism forces the supplier to raise high (low) levels of debt when there is unexpectedly high (low) inflation precisely because the NZCC adjustment reduces (raises) revenues in anticipation of unexpectedly high (low) compensation in the form of RAB growth.

ii. solution A and solution B do not have this problem because they do not reflect unexpectedly high (low) inflation in higher RAB growth and, therefore, there is no need for offsetting reductions (increases) in revenues when inflation is unexpectedly high (low).

40. It may be that assumption a) can be justified on the basis that suppliers should have a pay fixed receive floating swap for the full value of embedded debt at the beginning of the DPP.

41. Assumption b) cannot be justified. Consider an unexpected 7.3% inflation outcome compared to a 2% forecast. In this case, the supplier must raise unexpected new debt worth 5.3% of their debt portfolio in order to maintain target leverage (noting that the NZCC adjustment forces this debt raising by lowering revenues in the face of unexpected inflation). This debt will be raised at the prevailing cost of debt – which might be as high as circa 10% given the inflationary environment. Because this debt raising is, by definition, unexpected it could not be hedged by an interest rate swap taken out at the beginning of the DPP,

42. Once incurred, this nominal cost of debt is embedded in the suppliers' interest costs until the debt expires. Moreover, this is true even if, by the time of the next DPP, inflation expectation have returned to 2% and the prevailing cost of debt has returned to 5%.

43. However, the NZCC's proposed regime would fail to capture the higher interest costs on that debt (raised to fund RAB growth/negative revenue adjustment) under the NZCC solution.

44. This is a serious concern with the accuracy of the NZCC adjustment as it currently stands. The solution to this problem is to:

a. Adopt either solution A or solution B; or

b. Amend the NZCC proposed method to both:

i. derive a more complicated adjustment formula for the within DPP revenue adjustment; and

ii. keep track of higher embedded debt costs (associated with unexpectedly high (low) debt raising in high (low) inflation environments) in future DPP allowances for the cost of debt. (I note that moving to a trailing average cost of debt that is weighted to take account of actual RAB growth in each year would be one way to resolve this problem).