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Ms Sue Begg
Deputy Chair
Commerce Commission
44 The Terrace
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Dear Sue

WACC estimate for DPP3 and CPI forecasts

1. Vector is writing in response to the Commerce Commission's (Commission) letter dated 17 October 2019 to Mr Graeme Peters of the Energy Networks Association (ENA).

2. In this letter we demonstrate why it was necessary for the Commission to have reconsidered aspects of the WACC IM before setting the final WACC for DPP3 on 25 September 2019. The material provided by CEG demonstrated the key assumptions for the WACC IM, namely the tax-adjusted market risk premium (TAMRP) had become compromised by the structural change to the interest rate environment in 2019. More importantly, the CEG paper also demonstrated the modelling adopted by the Commission's expert to derive the TAMRP in 2016 estimate included errors – and so the effective premium would have been different for DPP3. None of these issues were addressed in the Commission's letter to the ENA.

3. The CEG paper referenced by the ENA also highlighted a persisting disposition to the Commission's inflation forecasting which will result in forecasts higher than inflation outcomes. We consider there is still an opportunity for the Commission to address the matter of inflation forecasting for the final DPP3 decision and to remedy the structural problems to the inflation forecasting methodology adopted in the IMs. Vector has requested Dr John McDermott of Motu Economic and Public Policy Consulting to make a recommendation as to the most appropriate method for forecasting inflation particularly given the current macro-economic environment. Dr McDermott recommended the Commission adopt a hybrid approach of market-based forecasts of inflation and traditional forecasting. This is especially pressing given the change to the unexpected change to the economic environment in 2019. We recommend the Commission give serious regard to the recommendations of Dr McDermott and CEG to reform its inflation forecasting methodology for the DPP3 period as part of its IM changes. This is because the current method has a very high likelihood of continuing the systemic errors to inflation forecasting that have impacted DPPs to date.

4. In this letter Vector would like to address the following issues the Commission considered relevant in responding to the concerns raised by the ENA that:

   - addressing the ENA's concerns would require a "full review";
   - certainty of the regulatory regime would be compromised by reviewing the IM cost of capital at this stage;

- businesses had material prior opportunity to raise concerns but did not do so until a very late stage;
- the concern that the WACC is unrealistically low has not been substantiated;
- the concern over CPI forecast errors has not been substantiated;
- EDBs could have hedged WACC to be indifferent to unprecedented low risk-free rates;
- negative cashflows created by the unprecedented low Commission WACC do not create a cause for concern for EDBs; and
- existing tools and remedies already exist within Part 4 to address the concerns that have been raised.

Background

5. On 25 September 2019 the Commission determined a DPP risk free rate of 1.12% (based on observations over the 3-month averaging period ending on 30 August 2019). This is the lowest 5-year bond rate ever observed for NZ Government debt – indeed it is lower than any one-year NZ Government debt yield previously observed.

6. The IM inflation methodology over those same three months implies forecast inflation of 1.95%. When combined with the nominal risk-free rate, these derive a real risk-free rate of negative 0.81%.

   This unprecedented outcome was not only unexpected when the current IMs were being finalised in 2016 but also was unexpected even at the beginning of 2019. The following figure shows market forward expectations of the 5-year swap rate from July 2015 to the start of the DPP3 averaging period.

   Figure 1 1: Market forward expectations of 5-year swap rate in DPP averaging period

7. The above figure 1 shows the expected 5-year swap rate remained above 2% until mid-March 2019.

8. On 29 May 2019, the Commission published an Input Methodologies Issues Paper which described changes to the IMs for the DPP3. Given the Commission's willingness to amend substantive IMs for DPP3 Vector determined to submit on the reasonableness of the WACC IM for DPP3 given the fall in forecast 5-year swap rates to below 2% in March 2019. Our submission noted the IM WACC methodology adopted by the Commission should be reconsidered in the current environment due to:

   - errors in the cost of equity estimation and the appropriateness of the TAMRP;
   - the magnified impact of the sustained trend in inflation forecast errors; and
   - the magnified impact of the WACC IM compared to debt financing practices adopted by businesses.

9. Vector's submission included a report by Dr Hird from the Competition Economists Group (CEG). The ENA's letter to the Commission repeated our offer for Dr Hird to discuss and engage with the Commission on this critical matter. The CEG report included, amongst other things, the following factual matters:

   - The Commission's methodology for estimating the TAMRP is sensitive to the prevailing risk-free rate. The Commission's estimate of TAMRP was based on estimates by Dr Lally

from August 2015 (which used a 5-year risk free rate of 2.74%[1] - more than double the DPP risk free rate of 1.12%);

- If the Commission updated its TAMRP estimate as at 4 June 2019 (the beginning of the DPP averaging period) the estimated NZ TAMRP would be 7.5% (based on the median of the Commission's 5 estimation techniques);
- There was a mathematical error in Dr Lally's calculations which, if corrected, would have raised three of his estimates of the NZ TAMRP at the time of his report. This would have resulted in a median TAMRP of 7.3% - which would have been rounded to 7.5%.[2]
- CEG used 3 additional years of inflation data to those available in mid-2016. It calculated that, if the IM inflation forecast did not suffer from systemic error, there would have been only a 0.5% probability (1 in 200) of observing the level of overestimation of actual inflation from 2009 onwards.
- CEG recommended that, at a minimum, the Commission update its TAMRP estimate to be consistent with (measured over the same time period as) the DPP risk free rate. CEG also suggested that a more thoroughgoing review, including of IM inflation, would be appropriate.[3]

10. Now that the DPP risk-free rate averaging period is complete we asked CEG to update the Commission's five NZ TAMRP measures over the DPP averaging period. These are provided in the table below.

1 Dr Martin Lally, Review of submissions on the risk-free rate and the TAMRP For UCLL And UBA Services 13 October 2015, p. 25.

2 Ibid, p.6.

3 CEG, Dealing with negative real risk-free rates, Section 1.5: Solutions, p.10.

Table 0-1: Corrected and updated Lally (2015) estimates

	Lally (2015)	Corrected and updated	Corrected and updated (except surveys)
Ibbotson	7.1%	7.6%	7.6%
Siegel I	5.9%*	6.4%*	6.4%*
Siegel II	8.0%	9.3%	9.3%
DGM	7.4%	7.5%	7.5%
Surveys	6.8%	7.8%	6.8%
Median	**7.1%**	**7.6%**	**7.5%**
Mean	**7.0%**	**7.7%**	**7.8%**
Median (ex Siegel I)*	**7.3%**	**7.7%**	**7.6%**
Mean (ex Siegel I)*	**7.3%**	**8.1%**	**7.7%**

* The CEG original report noted that the Siegel I estimate (6.4% TAMRP) is predicated on an assumption that New Zealand investors always expect a real risk-free rate of 3.0%. This assumption is invalidated when combined with the Commission compensating EDBs for a real risk-free rate estimate of negative 0.8%. If the Siegel I method is dropped from the Commission's sample, as CEG recommended is appropriate in the current circumstances, the median/mean TAMRP becomes 7.7%/8.1%.

Addressing EDB concerns without a "full review"

11. The proposed solution CEG recommended for addressing the prevailing negative real risk-free rate for DPP3 does not require a "full review". Rather, the Commission could have retained all of its conclusions from the 2016 IM review on how to estimate TAMRP but simply update these estimates to be consistent with (i.e., measured over the same time period as) the DPP risk-free rate. This would result in an internally consistent IM estimate of the cost of equity in the current unprecedented conditions for the risk-free rate.

12. Vector also considered the Commission could have addressed the errors CEG identified in the calculation of the TAMRP by Dr Lally and reconsider the basis for including the "Siegel I" TAMRP forecast - which assumes a 3.0% positive real risk-free rate environment. This method is inconsistent with a negative 0.8% real risk-free rate output of the IMs in the current market conditions. This would have been the minimalist approach for addressing the WACC IM to current market conditions.

13. While this would not address all the EDBs' concerns, it certainly was possible without entering into detailed consultation on the entire WACC methodology. Such an approach would be entirely consistent with:

    - The Commission's previous IM reasoning and consultation – where the Commission clearly understood that the prevailing risk-free rate was an input into the TAMRP methodology it had chosen to adopt; and
    - The fact that since the Commission made its WACC determination risk free rates in New Zealand had fallen to an unprecedentedly low level.

Whether confidence and certainty in the IMs would be compromised by a review

14. The Commission's letter states:

> *"Amending the IMs without sufficient and transparent consultation is likely to create significant uncertainty for the regulatory regime, and may result in detrimental effects for consumers and businesses. The matters you raise in your letter are all contestable, and to attempt to review the WACC IM and redetermine the WACC before the end of November would likely give other stakeholders significant cause for complaint."*

15. Vector shares the concern that the IMs operate to promote certainty and that an 'out of process' review should only be implemented if there has been a material change in circumstances or facts not known at the time the IMs were previously determined.

16. The change in financial market conditions occurring after March 2019 have not been repeated at any other time since IMs were first settled. In contrast, the changes to IMs for operating leases which the Commission has indicated is an example where IMs can be flexibly changed in 2019 is in fact referring to changes to the accounting rules that had been known since 2016.

17. The cause for amending the WACC IM is equally valid as the reasons for amending the maximum forecast revenue from prices proposed in the 29 May IMs Issues Paper. For example, the proposed change for a new maximum limit for capping annual price changes for DPP3 would amend an IM before the IM had been applied in a DPP. The proposed change has sought to redefine the maximum price limit mechanism from being applied at the net allowable lines revenue to apply to gross revenue. This means a range of pass-through and recoverable costs such as transmission revenues which were not part of the original mechanism will be subject to the proposed maximum price limit despite the 2016 IM review settling on a different method.

18. The identification of an error in Dr Lally's calculations is a significant material issue which itself would require the conclusions in 2016 to be revisited. An out-of-cycle targeting of specific parameters of the WACC IM is not unprecedented. Indeed, the Commission completed a specific targeted review of the WACC percentile in December 2014. This review amended the WACC percentile and had the effect of the amended WACC IM applying before the commencement of the DPP2 regulatory control period prior to the scheduled review of IMs.

Whether businesses had material prior opportunity to raise concerns

19. Paragraphs 14 to 17 of the Commission's letter made several assertions to the effect that EDBs should have raised our concerns earlier.

    - Paragraph 14 refers to the extensive consultations in 2016;
    - Paragraph 15 states the present environment was a 'clear possibility' in 2016 and notes that:
        - In September 2016 the risk-free rate was as low as 1.85%;
        - By early June 2016 there were no fewer than 14 foreign governments with negative yielding debt.
    - Paragraph 16 states this supports the view that the current NZ financial environment was not 'beyond contemplation' in 2016.

- Paragraph 14 states that, even if current market conditions were not contemplated in 2016, "…there have been several years since then for EDBs to assemble the evidence if there was a compelling case for amending the WACC IM".

20. The Commission's decision in 2016 would have been different had it been aware of the following:

    - The Commission's own 2016 methodology would have given a different TAMRP now than in 2016 given the structural change in the interest rate environment;
    - The Commission would have had 3 years of additional data where its inflation forecast methodology had under-estimated actual inflation; and
    - The Commission would have been cognisant of the persistent greater downside than upside risk to actual inflation in the current market environment (see paragraphs 34 to 37 below).

21. Whether the current market environment was a 'clear possibility' in 2016 was not raised by the Commission nor its expert when settling the IMs in 2016. What is not in dispute is that current conditions were not expected in 2016 – or even at the start of 2019.[4] While some positive probability was placed on this result, it was not materially above zero in 2016. Had the Commission placed material weight on the prospect of a 1.12% risk free rate it would not have chosen the data points it used for the TAMRP.

22. It is true that 5-year government bond rates were 'in almost continuous decline' from September 2013 (3.95%) to September 2016 (1.85%). However, seven months prior to this date, on 1 May 2013, 5-year rates were 2.68% and four months after the selected date used in the letter, 5-year government bond rates were trading at 2.70%. A reasonable person looking at these two alternative dates may have been in some doubt as to whether the 'continuous decline' referred to was indicative of a likely perpetual trend. In any event, the best estimates of market expectations are shown in the forward rates in Figure 1 and these showed a clear expectation during 2016 that rates would rise to be between 2.5% and 4.0% by the DPP averaging period. By contrast, the Commission's presumption about a continuation of a downward trend between two dates is not a conventional method basis to deduce expectations in 2016 about future rate changes.

23. It is correct that, in 2016, nominal government bond rates in a number of countries were lower than in New Zealand (as is usually the case) and, more unusually, were negative in some cases. However, in those jurisdictions where there is data available, regulators had not passed on the unusually low risk-free rates one-for-one in lower estimates of the market cost of equity. The CEG report addresses precisely this issue. In sections 3.2 and 5 of that report and, in particular, Figure 3-2. Dr Hird advises:

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4 As can be seen from

Figure **1 1**, expected 5 year rates in the DPP averaging period ranged between 2.5% and 4.0% over 2016 – finishing at the high end of that range. The fall in rates to below 1.0% in August 2019 was entirely unexpected even 5 months prior – when expectations were still above 2.0%.

"…the overwhelming response by regulators has not been to pass through historically low risk-free rates into historically low allowed returns for risky equity investment in regulated business."

24. The Commission's letter refers to negative risk-free rates in May 2016. At that time there were seven EU countries that Bloomberg reports as having negative yields on 5-year bonds. These same countries had fractionally above zero yields in the previous two years. However, in all of them for which data was available, the risk-free rate in proximate regulatory decisions, as reported by CEER (2017)[5] was materially above the prevailing market rates. Regulatory risk-free rates were, on average, 2.4% above the prevailing 5-year bond rates. Even if the two oldest decisions (Germany and Austria) are excluded, the average difference is 1.9%.

Table 1: Regulatory risk-free rates vs market rates (2016)

Country	5 year market risk free rates (May 2016)	Regulatory risk free rate (CEER 2017)	Regulatory less market risk free rates	Year of decision
Austria	-0.2%	3.3%	3.5%	2013
Belgium	-0.2%	0.7%	0.9%	2017
Finland	-0.2%	2.6%	2.8%	2017
France	-0.2%	2.7%	2.9%	2017
Germany	-0.4%	3.8%	4.2%	2010
Luxembourg	-0.3%	2.2%	2.5%	2015
Netherlands	-0.3%	1.3%	1.6%	2016

Source: Bloomberg, CEER (2017).

25. The letter suggests that EDBs and other stakeholders, in 2016, might have placed some prospect of future market conditions in New Zealand resembling, for example, market conditions in the UK and Europe.

26. The Commission's letter states there has been "*several years since then for EDBs to assemble the evidence if there was a compelling case for amending the WACC IM*". As already noted, forward rates for the DPP averaging period only fell below 2% (implying negative real IM risk free rates) in March 2019. The first opportunity to advance a reasonable case to limit the consequences of this impact was in the 29 May 2019 consultation. Indeed, the CEG recommendations would have limited the consequences of the unanticipated change to the risk-free rates on the cost of equity similar to the way regulators responded in Europe.

Whether an unrealistically low WACC has been substantiated

27. At paragraph 20 and 21 the Commission states:

[5] Council of European Energy Regulators (CEER), Report on Investment Conditions in European Countries, December 2017 available at: https://www.ceer.eu/documents/104400/-/-/fbd6a80e-5825-d1f3-fe35-bb3682b40c98

…we would expect EDB shareholders to have revised their assumptions on the returns that could be anticipated, given that the reduction in the risk-free rate incorporated into the WACC is intended to reflect an overall reduction in returns to capital across the economy. As such, shareholders of EDBs should be no more adversely affected in relative terms by this reduction than investors in other types of businesses.

As part of our ongoing DPP3 consultation process, we are not aware of any specific and reliable evidence that the current approach under-compensates EDBs such that they would have concerns with their ability to invest.

28. This statement conflicts with the Commission's 2016 IM reasons paper. In that paper, the Commission put forward a WACC methodology such that when the risk-free rate falls the TAMRP tends to rise. This was noted by CEG and is borne out by the updated IM TAMRP figures in Table 0-1.

29. The Commission determined the methodology was a reliable estimate of TAMRP in 2016. Therefore, it should be equally reliable now. The methodology is consistent with an assumption that the IM TAMRP, combined with the DPP risk free rate (as determined by the IM window), underestimates the market cost of equity by between 0.50% and 1.0%.

30. The IM methodology is specific and reliable evidence that the current approach under-compensates EDBs. The Commission may consider this is not enough under-compensation to endanger EDB's ability to invest. However, we do not consider that it is in the wider interest to enter a DPP in the expectation that EDBs will be under-compensated for their costs – which is contrary to the Part 4 purpose.

31. Moreover, in addition to under-compensation of the TAMRP there are the larger losses suffered because of under-compensation of debt portfolio costs – which is efficiently managed on a trailing average basis. In this instance average rates are much higher than the historically unprecedented rate from the DPP averaging period. The Commission suggests if a trailing average benchmark was now adopted and interest rates were rising, EDBs "would be writing to us in similar terms to your letter concerning the under-funding implicit in a 10-year trailing average". However, a trailing average for the cost of debt would be much less volatile and much more consistent with efficiently incurred costs. Therefore, the issue would not be as significant.[6]

32. The letter also refers to the 67th percentile WACC estimate as a buffer for mis-estimation risk. As noted in our submissions in 2016, we do not consider either that the 2016 midpoint WACC estimated by the Commission was the true midpoint nor that the 67th percentile uplift reflects the true level of estimation error. The level to which parameters are misaligned with actual financing costs and inflation risk is not addressed by the buffer provided by the percentile adjustment.

[6] Even in circumstances where capital expenditure is variable, debt funding costs are going to be dominated by refinancing of historical debt.

Whether CPI forecast errors have been substantiated

33. The Commission's letter states that:

> *These concerns were explored in depth at the time of the IM Review and we concluded that continuing with the existing system gave best effect to the purpose of Part 4.6…*
>
> *During the IM Review we considered alternative forecasts, and none were shown to be superior*

34. Yet even during the IM review the matter of CPI forecasting was a matter the ENA had requested be given more attention during the 2016 IM review noting extensive submissions on the topic and limited engagement by the Commission. However, the matter was not given any further significant attention by the Commission.[7] As discussed below, the conclusions reached by the Commission are at odds with inflation forecasting techniques now recommended by New Zealand Treasury.

35. There are two critical reasons for the Commission to revisit this issue:

- There has been 3 years of additional data since then, surveyed in the CEG report, and these demonstrate consistent continued underestimation of actual inflation.
  - As already noted, CEG calculated that, when including this data, if the IM inflation forecast method were truly unbiased, there would have been only a 0.5% probability of observing the degree to which it has overestimated inflation from 2009 onwards.
- The RBNZ cash rate, at 1.0%, is not only at unprecedented low levels but is close to the zero-lower bound. This creates asymmetry in possible inflation outcomes – with greater downside than upside risk to the central estimate.

36. Accordingly, the proposed inflation forecasts for DPP3 will entrench a sustained period of more than 13 years of systemic error to inflation forecasts. Since CEG noted the asymmetrical risk to inflation forecasts in its July 2019 report, the RBNZ has cut the cash rate a further 0.50% and, in its reasons, explained:[8]

> *The Committee agreed that the balance of risks to achieving its consumer price inflation and maximum sustainable employment objectives* ***was tilted to the downside****, although members placed different emphasis on the sensitivities to these risks.*

37. More significantly, in May 2019 the NZ Treasury reviewed its own estimates of medium-term inflation and real risk-free rates. In that analysis it was observed that market participants were more focussed on the risk of deflationary shocks than inflationary shocks. Treasury suggested

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7 Commerce Commission, IM Review WACC Workshop 7 September 2016 transcript - "the other matter that actually wasn't on the agenda today that we and others have submitted on, which is very important for our ENA members, is the issue of CPI forecasting." Mr De Boer (ENA) p.188.

8 https://www.rbnz.govt.nz/news/2019/08/official-cash-rate-reduced-to-1-percent

that this meant nominal bonds now had negative inflation risk[9] - thereby depressing their yields below the hypothetical CAPM risk free (zero risk) return.

38. NZ Treasury's estimate of the short to medium term (out to 2035) inflation rate was 1.55% (substantially below the IM 5-year estimate of 1.95%) and its estimate of the real long-term risk-free rate was 2.3% (in a range of 1.8% to 3.5%).[10]

39. Vector requested Dr John McDermott of Motu Economic and Public Policy Research to opine on the most appropriate approach for forecasting inflation, especially beyond the two-year RBNZ forecast horizon. In his note, Dr McDermott noted the suboptimality of presuming inflation forecasts naturally trending to the mid-point of the RBNZ target. Rather, his note recommends the Commission use the same approach as recommended by New Zealand Treasury to use a hybrid of market-based and forecast inflation projections. Dr McDermott's recommendation recognises the growth in liquidity of New Zealand's inflation indexed bond market. Attached to this letter is a copy of advice from Motu Economic and Public Policy Research.

40. Vector submits that this evidence, especially in combination with the unprecedented low nominal 5-year government bond yields, is enough for the Commission to review its inflation forecast method for DPP3. Otherwise the protracted period of inflation underperformance will continue across three DPP periods.

41. The letter also states:

> *Our main policy decision was and is to provide an ex post real return which provides protection for suppliers against inflation turning out differently than forecast and keeps prices constant in real terms for consumers.*
>
> *As we noted at the time, it is not the comparison of the forecast CPI to actual CPI that matters, but the comparison to the implicit inflation forecast inherent in the WACC.*

42. There are two critical points these statements do not address:

- First, the claimed 'protection' is never present in relation to debt funding. Debt is funded in nominal terms and bond holders do not allow Vector to reduce their coupons when the Commission over-forecasts inflation. Yet, Vector's nominal compensation for the cost of debt is reduced when the Commission over-forecasts inflation; and
- Second, even for the cost of equity, this is only a valid defence of the IM forecast if it can be said to accurately reflect implicit inflation forecast inherent in the risk-free rate. Even if this was a reasonable assumption in 2016, given the evidence surveyed above, it is

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9 Treasury, Risk-Free Discount Rates, and CPI inflation, Assumptions for Accounting Valuations 21 May 2019 . 22. "*Breakeven inflation may differ due to an inflation risk premium. This risk premium could be positive (increasing breakeven inflation compared to forecast inflation) or negative (reducing breakeven inflation). It has been commented (internationally) that the premium used to be positive, as the main concern was inflation shocks (upwards),* ***but now the premium is generally negative, as the main concern is demand shocks and protecting the nominal return****."*

10 Ibid, pp27-28

clearly an unreasonable assumption as it relates to the DPP risk-free rate averaging period.

43. The Commission has suggested EDBs could manage the nominal debt risk by using inflation indexed bonds. There are a few reasons why this is not practical. If EDBs issued inflation indexed bonds the real interest rates in this debt would reflect historical average real debt costs – not the real cost estimated in the Commission's DPP. Moreover, there is no liquid market for 5-year inflation swaps in New Zealand. And, even if there was, the Commission would have to base its IM forecast on the swap rates for EDBs to use these to hedge inflation forecast error.

Whether EDBs could/should have hedged

44. The letter appears to argue that EDBs should have hedged their debt portfolios in such a manner that their base rate debt obligations reset every 5 years at the prevailing 5-year swap rates in the DPP averaging period. Hedging in this manner is an artificial construct linked specifically to the design of the regulatory framework and the design of the WACC IM. The shortcoming with the Commission's approach is that there is no assurance of obtaining a good hedge (where risk premiums and risk-free rates are inversely correlated). The approach is at odds with international regulators which adopt trailing averages for periods of 10 years or more as a more efficient model for debt financing. The overseas approach aligns with normal commercial treasury management where varying markets and products are used to construct a debt portfolio.

45. There is no reasonable approach that would have allowed EDBs to have hedged against current market circumstances leading to the Commission adopting an unprecedented (negative) real risk-free rate (or -0.8%). Further The significant volume of debt raised by New Zealand suppliers means it is not reasonable to expect all debt for the forthcoming regulatory period to be raised in a narrow window.

46. More importantly, hedging only captures the cost of debt portion of the WACC IM. There is no equivalent way to hedge the IM cost of equity allowance (assumed to be 58% of funding). Nor is there any way to hedge bias in the IM inflation forecast or, even, simple errors in the IM forecast (even if they are not the result of ex ante bias). The debt margin would only be hedged if EDBs only issued debt for a five year period in the WACC IM observation window. This would create issues with investors, markets, ratings agencies and effective risk management.

Managing negative cash-flows

47. The Commission's letter acknowledges, the negative real risk-free rate along with strong capex demands will lead to many EDBs having negative cash-flows over the DPP period. The Commission suggests EDBs can still fund these investments by borrowing and raising new equity.

48. Faced with such lumpy investment profiles, it is not uncommon for infrastructure businesses to raise additional capital through debt or equity raising, or through retained earnings, to fund that investment rather than being able to finance it solely from operating cash flows.

49. Vector does not dispute that capital can be funded other than through operating cash-flows. However, once cash-flows turn negative the only two options available are new debt and new equity.

50. First, there are the direct costs of equity raising from the market which are much higher than debt raising costs. The IM's include zero compensation for such costs. The basis for this decision was summarised in the 2016 Topic 4 reasons paper as follows:

> *539. We disagree with these submissions, and consider that an allowance for equity issuance costs is not required. We note that:*
>
> > *539.1 Equity capital is normally available into perpetuity and does not need regular refinancing.*
> >
> > *539.2 Each company chooses what proportion of its profits it will retain in the businesses. Retaining profits can be used to finance growth in the asset base without incurring issuance costs.*
> >
> > *539.3 In general, given the characteristics of New Zealand EDBs, their ownership, and their capacity to contribute additional equity, there is no evidence of a material issue regarding equity raising costs.*

51. This reasoning presumes equity can always be raised from retained earnings without the need to incur issuance costs. However, in the current (unexpected and unprecedented) circumstances where retained earnings cannot be relied on then new equity will incur issuance costs.

52. We also note businesses can sustain prolonged periods of negative cash-flows provided that they can convince investors that their long-term prospects are sufficiently bright – such that the business can return their investment plus a risk premium. However, the risk premium demanded for investing in a business with prolonged negative cash-flows is always larger than the risk premium demanded for investing in otherwise the same business that has positive cash-flows. Just as long-term bonds are riskier than short term bonds, businesses whose cash-flow profile is heavily backloaded are riskier than businesses with strong near-term cash-flows.

53. This is recognised in the finance literature. As noted by Brealey Myers and Allen[11], a firm with large capex relative to cash-flow will have an elevated asset beta – and this will raise the cost of equity raised to fund the capex.

> *Suppose that an electric utility commits to build a large electricity-generating plant. The plant will take several years to build, and the cost is fixed. Our operating leverage formula still applies, but with PV (future investment) included in PV (fixed costs). The commitment to invest therefore increases the plant's asset beta. Of course PV (future investment) decreases as the plant is constructed and disappears when the plant is up and running. Therefore the plant's asset beta is only temporarily high during construction.*

54. In other words, an EDB with large capex and negative cash flow will have an elevated asset beta – at precisely the time that they are having to raise funds from the market.

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[11] Brealey, Myers and Allen, Principles of Corporate Finance, Tenth Edition, McGraw-Hill/Irwin, 2011, p.223 footnote 14.

Whether existing tools and remedies already exist within Part 4 to address the concerns that have been raised

55. At paragraph 33, the Commission's letter states:

> *It remains our firm view that existing tools and remedies already exist within Part 4 to address the concerns raised in your letter. A business can apply for a quality re-opener and/or a CPP where it does not consider that a DPP meets its specific needs. Such mechanisms can be tailored to meet the specific needs of businesses and the long-term interests of consumers, while also providing the flexibility to generally deal with the key concerns that you have identified to date.*

56. We would welcome the opportunity to discuss how a quality re-opener and/or a CPP can address the primary issues we have – which relate to CAPM WACC parameters, systemic errors to the IM inflation forecast methodology and unnecessary exposure to inflation risk.

Summary

57. We consider the matters we have raised in this letter highlight the extent to which financial market conditions have changed since 2016 which warranted serious consideration of the WACC IM for DPP3. Some matters raised in our submissions such as the errors in the TAMRP estimate used to inform the WACC IM are magnified by the current financial market conditions.

58. We are deeply disappointed these matters were not engaged with by the Commission or addressed by the Commission before it made its WACC determination on 25 September 2019. More importantly some of these matters were not addressed in the response to the ENA which had referenced the report of CEG as requiring urgent attention.

59. The Commission will finalise the DPP3 on 27 November 2019. For this decision we encourage the Commission to consider its approach for inflation forecasting given the impact that persistent bias in these forecasts has had over DPP1 and DPP2 on allowable revenues. The available evidence suggests there is a materially better method to forecast inflation for the DPP which should be adopted by the Commission to ensure it meets its obligations to meet the Part 4 purpose.

Yours sincerely

Simon Mackenzie
Chief Executive Officer

Copy to:

- Graeme Peters, ENA
- Hamish Grant-Fargie, MBIE

The Reserve Bank's Inflation Forecasting Process Prepared for Vector Limited

John McDermott*
Motu Economic and Public Policy Research

SUMMARY: For inflation forecasts of horizons of three years or more, the Reserve Bank of New Zealand simply assumes that inflation will be at the midpoint of its target band. That is, it assumes inflation will be two percent. Alternative approaches are: (i) use the median of consensus forecasts, (ii) use an adjusted-breakeven inflation forecast (from financial market prices), (iii) use a hybrid median consensus and breakeven forecast (each with a 50 percent weight). The most appropriate approach would be the hybrid approach.

1. The forecasting process for inflation

The Reserve Bank Act requires the Bank to keep inflation low and stable. Specifically, the Bank is required to keep inflation between 1 and 3 percent over the medium term, with a focus on keeping future inflation near two percent.

To achieve its target the Reserve Bank changes interest rates with the intent of changing demand conditions within the economy. These changing conditions, in turn, influence price setting behaviour and ultimately inflation.

The Reserve Bank has a highly sophisticated forecasting process that links the Bank's policy rate decisions and strategy to the requirements to meet the inflation target. These forecasts are published in the *Monetary Policy Statement* each quarter.

Typically, the Bank produces a set of forecasts that show inflation reaching two percent after around two years. The timing of around two years reflects the view that monetary policy decisions take time to be fully transmitted through the economy.

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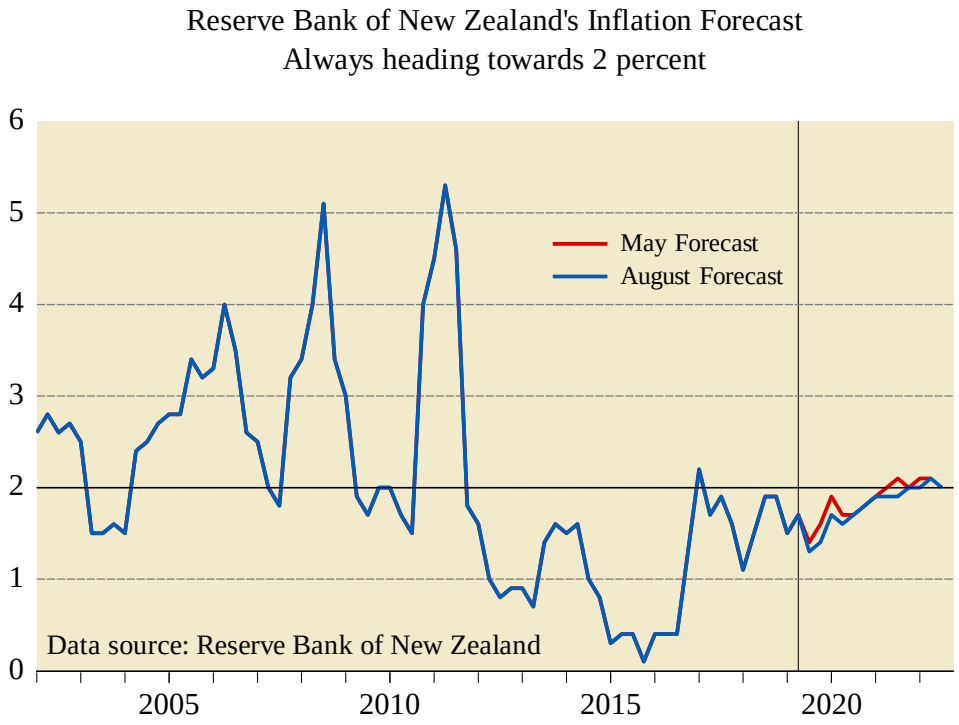
No matter what has happened in the economy, the inflation forecasts will always be displayed as heading towards two percent over a period of two years. The feature of the Bank's forecast "always heading towards two percent" can be clearly seen in the graph below. The Reserve Bank has adopted this approach to clearly demonstrate its commitment to achieving the inflation target.

When economic conditions change, the Bank does not change its medium-term inflation forecast, but rather it alters its Official Cash Rate (OCR) projections. The OCR path is adjusted after each policy meeting to force demand conditions to change just enough to guarantee that inflation hits two percent within two years.



In effect, the Bank chooses its OCR path so that its forecast of inflation "looks good". And the only inflation forecast that looks good is one that displays inflation already on target or in which inflation is approaching the target at an appropriate pace.

2. Forecasting Biases

The motivation behind the Reserve Bank's approach to forecasting inflation is to help communicate its goals and demonstrate its commitment to those goals. Showing an inflation path that always hits two percent while allowing variation in its OCR path is an ideal way to support its communication strategy. However, this is not the usual way one would go about forecasting inflation, and so it should not be interpreted in the same way as forecasts generated by standard statistical models.

Comparing the Bank's approach of generating inflation forecasts to a standard econometric method reveals that the Bank's approach generates larger forecast errors.[1] Table 1 reproduces the results from this evaluation and shows, specifically, that beyond a one-year horizon the Bank's approach generates larger forecast errors.

Despite the Bank's approach being dominated by standard methods, the Bank's inflation forecasts generally out-perform those generated by private sector forecasters.[2] In large part because many of those forecasters have been trained at the Bank and often try to mimic its forecasts. The longer the forecast horizon the more likely private sector forecasters simply adopt the Reserve Bank forecast.

Table 1. Mean forecast errors for inflation

Forecasting method	Quarters ahead							
	1	2	3	4	5	6	7	8
Reserve Bank	0.04	0.13	0.16	0.23	0.26	0.28	0.36	0.42
Statistical model	0.06	0.08	0.13	0.21	0.20	0.22	0.23	0.25

3. The typical suboptimality of inflation forecasts

Given the vast amount of information in the world and the enormous number of ways of employing it, it should hardly be surprising to find that inflation forecasts are not optimal. No forecaster can claim their forecasts as the best that could possibly be achieved given all the information that exists. This is especially true for the Reserve Bank, which is forecasting for the purpose of communicating its goals, rather than trying to produce a minimum error forecast.

With this in mind, if one wanted to achieve a "best" inflation forecast that could be used unbiasedly as a regulatory benchmark or a business planning tool, then one should use a combination of forecasts.[3] Given that more than a dozen competing forecasts of New Zealand inflation are available on a quarterly basis, then it is possible that any one of them contains useful information absent in the others. Therefore, rather than discard all but one forecast, it would be better to incorporate them into an overall combined forecast. There are many ways in which the competing forecasts can be combined, but a simple way that works well on New Zealand data is to take the median forecast. This approach has been shown to deliver a superior forecasting performance. [4]

An alternative, and increasing popular, method of generating long-horizon inflation forecasts is to use financial market pricing. This provides a neutral assessment of inflation by financial market participants

[1] Reid, G. (2016), "Evaluating the Reserve Bank's Forecasting Performance," *Reserve Bank of New Zealand Bulletin*, 79(13), August 2016.
[2] Lees, K. (2016), "Assessing Forecasting Performance," *Reserve Bank of New Zealand Bulletin*, 79(10), June 2016.
[3] The theoretical underpinning for forecast combinations comes from Bates, J. M. and C. W. J. Granger (1969), "The Combination of Forecasts," *Operations Research Quarterly*, 20, 319-325.
[4] Lees, K. (2016), "Assessing Forecasting Performance," *Reserve Bank of New Zealand Bulletin*, 79(10), June 2016.

who have a pecuniary interest in assessing the correct inflation outcomes. We can do this by comparing the yield on inflation-index bonds to those of conventional bonds.[5] The increased liquidity on the New Zealand inflation index bond market has improved considerably over the past seven years making this a more sensible option than would have been the case previously.[6]

The New Zealand Treasury needs to make long horizon inflation forecasts for its determination of the long-term risk-free rates in the context of superannuation asset valuations.[7] Using ideas similar to the ones in this note, the Treasury came to the conclusion that an appropriate way to formulate a long-horizon inflation forecast is to use a 50 percent weighting to each of a standard forecast of inflation and an adjusted-breakeven inflation forecast.

The 50 percent weighting approach used by the Treasury seem to be the fairest and most pragmatic approach available and it would be helpful if this approach was standardized across all state agencies.

[5] Details on inflation-indexed bonds and how there work can be found on the Treasury website (https://debtmanagement.treasury.govt.nz/government-securities/inflation-indexed-bonds).

[6] The market value of New Zealand issued inflation-indexed bonds now stands at $14 million making up nearly 20 percent of the government bon market.

[7] The New Zealand Treasury (2019), *Risk-Free Discount Rates and CPI Inflation: Assumptions for Accounting Valuations*, 21 May 2019.