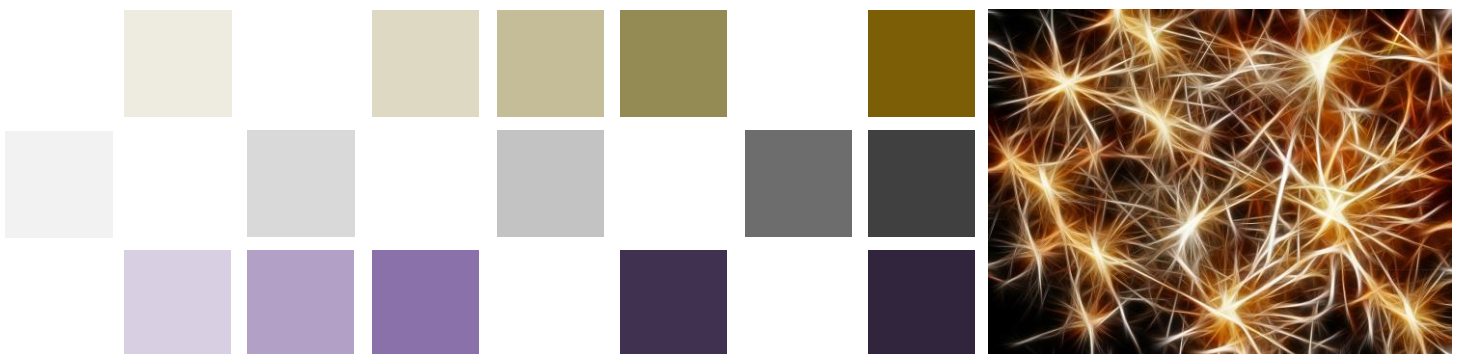


Cost of capital input methodologies— further consultation initial value of financial loss asset

Report to Chorus

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8 September 2020



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Executive summary

The Commerce Commission (the Commission) has released a further consultation paper on the initial value of the financial loss asset. Chorus has asked us to provide our opinion on whether the approach proposed will provide compensation for losses incurred by Chorus during the pre-implementation period.

It is our view that the nature of the investment decision made by Chorus was a single decision in 2011 to invest for at least the period of the initial contract with the Government. This contract set the price path to apply for a period up to 31 December 2019, which was extended by legislation to 31 December 2021. Chorus had very limited opportunity to renegotiate prices or other terms over that period. The method proposed by the Commission does not reflect the nature of the investment decision. Rather the Commission's approach treats annual incremental investments as separate decisions.

In our view, the Commission's proposed recognition of the financial impact of the investment is therefore not consistent with the legitimate expectations of investors in 2011 and does not provide compensation for the risk accepted by Chorus at the time the investment decision was made.

If the Commission persists with the approach it is proposing it should at least use long-term rates. The proposal to use five-year rates based on financing decisions is without conceptual basis. The investment decision would have reflected the characteristics of the overall investment, rather than the characteristics of the financing of the investment.

The proposed simplification to adopt a single debt risk premium based on the median loss year is infeasible as the Commission's method does not assess year-by-year losses and hence cannot identify the median loss year. We have estimated a plausible range around the actual value of the financial loss asset based on the Commission's assumptions in its example spreadsheet and prior determinations of the debt risk premium for EDBs and GPBs. This illustrates that, even if it were possible to adopt a single value, this would potentially create a non-trivial wealth transfer.

Introduction

1. Chorus has asked us to provide an opinion on whether the approach proposed by the Commerce Commission (the Commission) in its 13 August paper “Further consultation draft (initial value of financial loss asset)” will provide compensation for losses incurred by Chorus during the pre-implementation period.
2. Key questions Chorus has asked us to consider are:
 - a) The nature of the investment decision made by Chorus and how the associated risk accepted by Chorus is compensated.
 - b) The proposed period for the risk-free rate, including the appropriateness of the comparators used by the Commission.
 - c) The proposed method for calculating the debt premium based on the median loss year.
3. Chorus has also asked us to prepare mark ups to the draft Input Methodologies (IMs) (13 August version) to reflect the recommended changes in our report.

The Commission's approach is inconsistent with investor expectations

4. Cash flows associated with an investment and dated to different points in time are discounted (or compounded) in order adjust the cash flows to equivalent flows received at a common point in time so that the cash flows can be meaningfully compared and added. A fundamental property of the discounting (compounding) process is that the choice of the common point in time should be arbitrary, in the sense that the value of the set of cash flows calculated at any particular time differs from the value calculated at any other time only in respect of timing.
5. Another fundamental property is that discounting (or compounding) of the cash flows associated with an investment to a common point in time should produce the same result as discounting or compounding, to that common point in time, losses from the investment relative to earning a return equal to the cost of capital.
6. Both of these fundamental properties hold where the cost of capital is constant from year to year. The properties also hold where the annual cost of capital varies from year to year, provided that it is assumed that the product of year by year costs of capital for a period is equal to the compounded annual cost of capital for the whole period, that is:

$$\prod_{t=X}^{Y-1} (1 + w_{t(t+1)}) = (1 + w_{XY})^{Y-X}$$

7. This assumption, made ex ante, is consistent with there being no opportunities for arbitrage. However, ex post, with changes in the economy, it cannot be expected that, for example, the product of the annual costs of capital for each year over a period of three years, estimated at the beginning of each year, is equal to the compounded annual cost for the three year period estimated at the beginning of the period. Thus it is reasonable to make the assumption ex ante but not ex post.
8. Thus, the Commission's proposed approach to calculation of the Financial Loss Asset (FLA), which compounds cash flows using ex post estimates of the annual cost of capital that vary from year to year, cannot be expected to be consistent with either of the properties discussed above. In particular, (i) the value of the Commission's estimate of the FLA discounted to 2011 will not equal the 2011 present value of the cash flows, and (ii) the value of the Commission's estimate of the FLA will not equal the result of compounding of the losses. Furthermore, the Commission's proposed approach suggests that each annual investment (comprising of additional investment net of net revenue earned) made during the pre-implementation period was a separate decision. That position is contrary to the economic reality that the annual investments were an integral consequence of the 2011 decision. We discuss the nature of the investment decision further in the next section.
9. The Commission should use a constant cost of capital for compounding, that is, the cost of capital that was applicable in 2011, the time at which the decision was made to invest in provision of fibre services. That approach would be consistent with the two fundamental properties of discounting (compounding) and the reality of the investment decision.

10. The cost of capital over the pre-implementation period decreased from the 2011 level and therefore, for any given set of cash flows, application of the Commission's proposed approach results in a significantly lower estimate for the FLA than would result from compounding at the 2011 cost of capital. For Chorus this result is not totally obvious as the annual cash flows are in part additional investments and in part net revenues earned. However, the result is immediately obvious from consideration of the losses calculated under the BBM approach. The year by year losses would be smaller than if calculated using the 2011 rate and these smaller losses are compounded forward at lower rates. We also note that had the cost of capital increased over the pre-implementation period, the Commission's proposed approach would have resulted in a larger estimate of the FLA than by using the 2011 rate.

The nature of the investment decision

11. In our January 2020 report, we described the pre-implementation period as “economically equivalent to a regulatory period” (McWha & van Zijl, 2020, paragraph 26). This language has not resonated with the Commission and we will not use it here. Nonetheless, we remain of the view that the logic underlying our description of the pre-implementation period is sound. In our opinion, the appropriate approach to determining the cost of capital relevant to the investment decision made by FFLAS providers is to consider the expectations of those investors at the time they made the investment decision.
12. Under the UFB initiative, bids were received from potential providers of FFLAS services. The resulting deeds of open access undertakings and commercial agreements established service obligations, technical standards and price caps for the period to 31 December 2019. In November 2018, these obligations were extended by legislation to 31 December 2021. We described the nature and scope of these contracts and undertakings, as explained by the Commission, in our January report (McWha & van Zijl, 2020, paragraph 30).
13. The decision to invest in FFLAS (or not) was made in 2011. The decision committed the FFLAS providers to an ongoing programme of investment in fibre and other obligations until 31 December 2019, a commitment which was extended by legislation to 31 December 2021.
14. The choices available to Chorus, and the LFCs, once they had made the initial decision and entered into the agreements with the Crown were very limited. It is not consistent with the nature of the investment decision to characterise it as a series of annual decisions; it was a single decision, made in 2011.
15. The agreement between Chorus and the Government allowed extremely limited opportunity to renegotiate prices (McWha & van Zijl, 2020, paragraph 31). The decision about whether or not to accept the risk, given the expected rate of return, was therefore made with the information that was available in 2011, looking forward over an investment horizon to 31 December 2019. It is our understanding that this decision was not reversible. Chorus therefore implicitly accepted the risk that the actual rate of return could differ from what was expected when the decision was made.
16. The Government understood that to attract investors to the UFB initiative those investors would have had to be able to expect to achieve a normal return on the investment to which they were committing. The Government Policy Statement (GPS) issued at the time confirms this understanding (New Zealand Government, 2011). The introduction to the GPS says:

The provision of efficient ultra-fast broadband infrastructure requires that businesses have the confidence and incentives to make investments in new or upgraded ultra-fast broadband infrastructure.

Particular issues arise in the way services are or may be regulated under Part 2 of the Telecommunications Act 2001. The way in which the prices, revenues and/or quality of goods and services produced by these businesses is regulated or controlled can affect their incentives to invest in new or upgraded ultra-fast broadband.

17. The economic policy objective is then stated that:

businesses have incentives to innovate and invest in new or upgraded ultra-fast broadband infrastructure for the long term benefit of end users. The Government considers that this objective will be achieved by:

1. regulatory stability, transparency and predictability giving businesses the confidence to make long-life investments;
2. regulation taking full account of the long-term risks to consumers of under-investment in new or upgraded ultra-fast broadband infrastructure.
3. ensuring that any price regulation proposed under Schedule 3 of the Telecommunications Act 2001, that may occur in the future, recognises that revenues, over the life of the assets, are sufficient to cover efficient operating costs and a normal return on, and recovery of, capital invested; and
4. ensuring any price regulation proposed under Schedule 3 of the Telecommunications Act 2001 takes into account the start-up risks associated with introduction of new technology.

18. The Government's policy in 2011 was that investors should be able to expect to achieve a normal return given the risks to which they were exposed in rolling out a new technology.

19. This interpretation is consistent with the Commission's characterisation of its task in its Draft decision – reasons paper (Commerce Commission, 2019, paragraph 5.70):

The methodology for determining the regulatory WACC component of the financial loss asset must ensure that the expected returns from investing in regulated FFLAS are similar to other investments of comparable risk, so regulated providers have incentives to innovate and invest, and are limited in their ability to extract excessive profits.

20. It is also consistent with the Commission's discussion of investor expectations with respect to pre-2011 assets (Commerce Commission, 2020, paragraph 2.75):

We believe investors would have the legitimate expectation of earning at least the opportunity cost of the assets.

21. The legitimate expectation of investors in 2011 would have been that they could earn at least the opportunity cost of all their assets, including their physical and financial assets. The expected opportunity cost of the investment is the WACC for the period to 31 December 2019, estimated immediately prior to the UFB tender, that is, at 1 May 2011.

22. Chorus accepted the risk in 2011 that the actual cost of capital might vary from their expectations, this risk is inherent in the method of estimating the WACC when an investment is made. As we have said previously, because some, and not all, of the risks have now turned out in Chorus' favour is not a reason to renege.

23. The Commission (2020, paragraph 3.29) says “[w]e believe it is unlikely that in 2011 investors’ expectations were framed in terms of what a BBM with a 10-year horizon might have delivered....Investments were made based on commercial terms achieved through the competitive tendering process.” We agree that investments were made on commercial terms. In making that commercial decision Chorus and the other bidders would have considered what the opportunity cost of their investment was. Their best estimate of the opportunity cost was the expected value of the WACC at the time: the rate of return they expected to give up to invest in the UFB initiative.
24. The Commission notes that “the evidence before us indicates that none of the regulated providers that were parties to the UFB contracts with the Crown did in fact lock in the finance rates in 2011 for the length of their contract.” This is not relevant to parties’ legitimate expectations of earning a normal return at the time they made the investment for the length of their contract. Financing decisions take into account refinancing risk, investment decisions do not.
25. The Commission quotes Brealey, Myers and Marcus (1999) who note that there could be different opportunity cost of capital in each period’s cashflow. The Commission uses the quote to infer that a single cost of capital is only used for simplicity and is not a reflection of real-world decision making. However, the quote continues (Brealey, Myers, & Marcus, 2001, p. 347):

But we are in good company: with only rare exceptions firms decide on an appropriate discount rate and then use it to discount all project cashflows.
26. It is thus common commercial practice to use a constant discount rate for all project cashflows when assessing an investment, irrespective of the actual rate that may later prevail. However, use of a single rate is not motivated by desire for simplicity in evaluation of investment proposals; rather it is lack of knowledge of the future that leads to the assumption of a constant rate as the best estimate of actual future rates across the life of the investment.

Term should reflect investment decision

27. If the Commission does not accept that the decision by Chorus and LFCs to invest under the UFB initiative was made in May 2011, the opportunity cost of capital for compounding financial losses should be based on long term (10-year term) rates, reflecting the long-term nature of the investments. The proposal to use rates based on the next five years would seem to be without any conceptual basis.
28. For regulated industries, the Commission justifies its current approach of basing the cost of capital on the length of the regulatory period as costs can be reassessed at the end of the period. However, that reasoning did not apply during the pre-implementation period.
29. It is normal in corporate financing to separate the investment decision from the financing decision. The Commission is used to basing its regulatory cost of capital decisions on the financing decisions it observes, which are likely, at least in part, to be a consequence of the regulatory framework it administers. The Commission accepts this causality (Commerce Commission, 2020, paragraph 3.16.1). However, in this case, the UFB bidders were deciding whether to invest in FFLAS, not how to finance the existing and incremental investments.
30. We noted in the previous section that investors would consider the expected return from an investment relative to the opportunity cost. The opportunity cost of capital would reflect the characteristics of the investment, including the term of the investment. The financing decision is made separately from the investment decision, and depends on different factors including the entity's appetite to accept refinancing risk.
31. If the Commission maintains the view that the financing decision is relevant, it is our view that the balance of evidence presented by the Commission does not suggest that the decision to adopt annual financing with a term of 5 years is appropriate. For example:
 - a) The 2010 survey of debt issued by infrastructure providers which found an average term of around 7 years.
 - b) Chorus' actual debt raising behaviour which the Commission describes as shifting to longer term bond issuances of 7 to 10 years.
 - c) The Commission notes that issuances by LFCs may reflect their other activities, rather than the behaviour of a stand-alone FFLAS provider.
32. We note, however, that if entities then make decisions around financing risk that lead them to use derivatives to manage that risk position that is not relevant to determining the opportunity cost of capital in the pre-implementation period.

Debt risk premium

33. The Commission is proposing to adopt a “simplification” of the method for estimating the debt risk premium proposed by Dr Lally of using the debt premium for the median loss year for all cost of capital estimates.
34. However, the Commission’s approach to estimation of the FLA does not involve estimation of year-by-year losses and therefore does not result in the identification of the median loss year. The discounted cash flow approach that the Commission has now proposed to use will simply indicate a net cash flow position for each year of the pre-implementation period.
35. Even if we accepted that the median net cash flow position is the best approximation for the median loss year in the pre-implementation period, there is no basis for an a priori belief that the median loss year would coincide with a central value for the debt risk premium. To adopt an assumption of a single value for the debt risk premium would potentially create a non-trivial wealth transfer.
36. Dr Lally estimated that adopting the median loss year debt premium would result in only a small error (0.7%) in the total compounded loss (Lally, 2019, p. 8). Dr Lally’s estimate assumed that both losses and debt risk premia were monotonically decreasing over the period. His conclusion is a function of these assumptions.
37. We have made an alternative estimate based on the Commission’s spreadsheet example as provided with the further consultation paper, and adjusting only the debt risk premium. For illustrative purposes only, we have used the series of debt risk premia that the Commission estimated for EDBs and/or GPBs from 2011 to 2020 (see Appendix A). This should not be taken as a suggestion that these are the appropriate premia for FFLAS.
38. We made three estimates of the financial loss asset. One using the actual series of premia, one using the minimum value and finally the maximum value. This shows that there is a plausible range around the actual value of the financial loss asset based on the Commission’s other assumptions of -3.3% to +4.1%. This is a non-trivial range of possible outcomes and demonstrates that, even if such a simplification were available, the Commission should use the debt risk premium relevant to the WACC estimation date.

Recommended approach

39. For clarity, we set out below our recommended approach to determining the cost of capital for the pre-implementation period.
- a) The risk-free rate should be the rate estimated to apply as at 1 May 2011, and the term should match the expected term of the period, that is to 31 December 2019 (8.7 years). The estimate is the average of one month of daily observations prior to 1 May 2011.
 - b) The debt premium is the estimated prevailing rate for seven-year corporate bonds as at 1 May 2011. Alternatively, if the Commission considers that the appropriate term for the smaller LFCs is shorter than seven years, a five-year term could be adopted with a TCSD allowance that assumes Chorus issues 50% of its debt for a ten year term. We have not considered the appropriate term for the smaller LFCs. Using a one month average prevailing rate is consistent with the approach in the other input methodologies at the time. The premium should reflect a BBB credit rating.
 - c) The asset beta is 0.65.
 - d) Financial leverage is 40%.
 - e) TAMRP is 7.0%.
 - f) An uplift to the 75th percentile is given to reduce the risk of underestimation of WACC to 25% and to align with reasonable expectations as at May 2011 of there being such an uplift.
40. We also recommend an allowance for stranding risk consistent with the proposed approach in the post-implementation period.

References

- Brealey, R. A., Myers, S. C., & Marcus, A. J. (1999). *Fundamentals of corporate finance*. Irwin / McGraw-Hill.
- Brealey, R. A., Myers, S. C., & Marcus, A. J. (2001). *Selected material from Fundamentals of Corporate Finance, Third Edition with additional material from Fundamentals of Corporate Finance, Alternate Fifth Edition, Essentials of Corporate Finance, Second Edition*. McGraw-Hill Higher Education.
- Commerce Commission. (2019). *Fibre input methodologies: Draft decision - reasons paper*.
- Commerce Commission. (2020). *Fibre input methodologies: further consultation draft (initial value of financial loss asset) - reasons paper*.
- Commerce Commission. (2020). *Telecommunications Fibre input methodologies further consultation draft decisions Illustration of DCF financial loss asset calculation*.
- Lally, M. (2019). *Review of submissions on the cost of capital for fibre network losses*. Capital Financial Consultants Ltd.
- McWha, V., & van Zijl, T. (2020). *The cost of capital input methodologies for fibre*.
- New Zealand Government. (2011, October 12). Statement to the Commerce Commission concerning incentives for businesses to invest in ultra-fast broadband infrastructure. *New Zealand Gazette*(No 155, page 4440), Notice No 7120.

Appendix A Illustration of debt risk premium error

41. Table 1 shows the results from the Commission’s spreadsheet (Commerce Commission, 2020) with changes made to the debt risk premium to reflect the series shown in Table 2. We have compared the value of the financial loss asset (FLA) calculated in the example using the actual series of premia with the FLA value using the maximum premium value recorded in the period, and the minimum value. The dollar values are dependent on the assumed cashflows in the example, but the percentage differences illustrate the potential magnitude of the error if a single value were used for the debt risk premium

Table 1 Financial loss asset at implementation date, example illustration, \$000

	Actual debt premium series	Constant at maximum value (2.55%)	Constant at minimum value (1.45%)
FLA at implementation	229.73	239.07	222.20
% difference to actual		+4.1%	-3.3%

Based on the Commerce Commission example spreadsheet released 13 August 2020 and the debt premia estimates in Table 2.

Commission determinations

42. Table 2 records debt premia determined by the Commission for information disclosure purposes for GPBs with a June year end from 2011 to 2019. While not directly comparable to FFLAS, because the term, credit rating and purpose of the estimates are different, they are illustrative.

Table 2 Previous Commission determinations of the debt premium for gas pipeline businesses for information disclosure based on a 5 year term and BBB+ rating

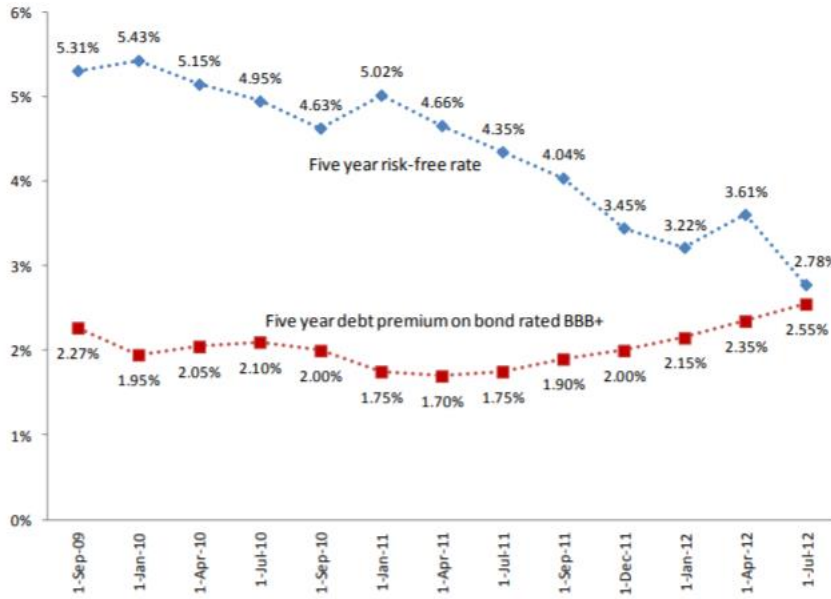
Estimation date	Debt premium	Source
01/07/2011	1.75	Determination of the Cost of Capital for Information Disclosure Year 2012 for Transpower New Zealand Limited, Suppliers of Gas Pipeline Services, and Suppliers of Specified Airport Services (June year-end) Under Part 4 of the Commerce Act 1986, Pursuant to Decisions 709, 711, 712 and 713 Decision Number 727
01/07/2012	2.55	Cost of capital determination for information disclosure year 2013 for Transpower, gas pipeline businesses and specified airport services (with a June year-end) [2012] NZCC 20
01/07/2013	1.85	Cost of capital determination for information disclosure year 2014 for Transpower, gas pipeline businesses and suppliers of

		specified airport services (with a June year-end) [2013] NZCC 12
01/07/2014	1.75	Cost of capital determination for information disclosure year 2015 for Transpower, gas pipeline businesses and suppliers of specified airport services (with a June year-end) [2014] NZCC 19
01/07/2015	1.53	Cost of capital determination for information disclosure year 2016 for Transpower, gas pipeline businesses and suppliers of specified airport services (with a June year-end) [2015] NZCC 20
01/07/2016	1.70	Cost of capital determination for information disclosure year 2016 for Transpower, gas pipeline businesses and suppliers of specified airport services (with a June year-end) [2016] NZCC 15
01/07/2017 ¹	1.65	Cost of capital determination for disclosure year 2018 for Transpower, gas pipeline businesses and suppliers of specified airport services (with a June year-end) [2017] NZCC 19
01/07/2018	1.60	Cost of capital determination for disclosure year 2019 For Transpower, gas pipeline businesses and suppliers of specified airport services (with a June year-end) [2018] NZCC 11
01/07/2019	1.65	Cost of capital determination for disclosure year 2020 For Transpower, gas pipeline businesses and suppliers of specified airport services (with a June year-end) [2019] NZCC 8
01/07/2020	1.45	Cost of capital determination for disclosure year 2021 For Transpower, gas pipeline businesses and suppliers of specified airport services (with a June year-end) [2020] NZCC 15

43. Figure 1 and Figure 2 illustrate similar information in graph form and are drawn from the Commission's determinations.

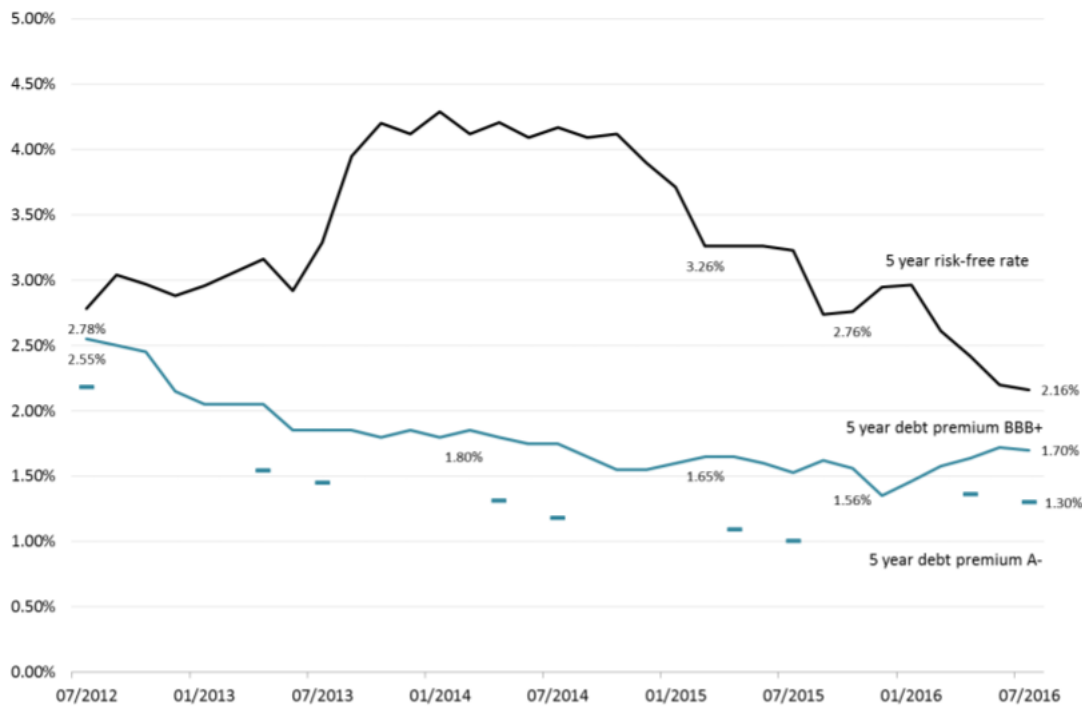
¹ The Commission amended its approach from 2017 to use the average estimated debt premium for the most recent five years. In this table, the estimate given is for that year only.

Figure 1 Changes in the five-year risk-free rate and debt premium for BBB+ bonds



Source: Cost of capital determination for information disclosure year 2013 for Transpower, gas pipeline businesses and specified airport services (with a June year-end) [2012] NZCC 20

Figure 2 Changes in the five-year risk-free rate and debt premium over time



Source: Cost of capital determination for information disclosure year 2016 for Transpower, gas pipeline businesses and suppliers of specified airport services (with a June year-end) [2016] NZCC 15

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