Crown financing – issues raised in further paper by Dr. Lally
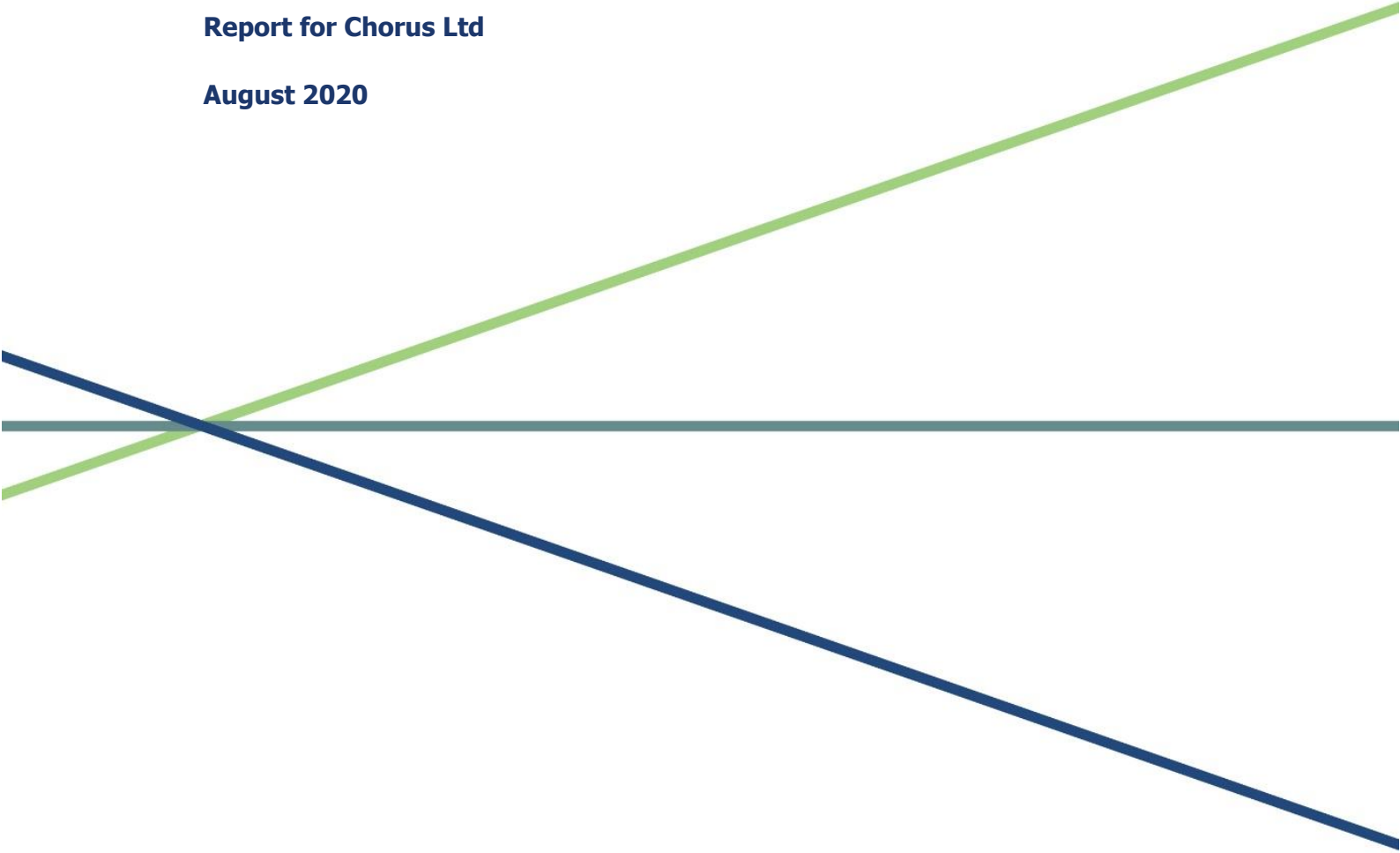
Report for Chorus Ltd

August 2020

INCENTA
ECONOMIC CONSULTING

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1.   Introduction and summary

1.1   Purpose

1.   Chorus has asked Incenta Economic Consulting (Incenta, "us" or "we") to review and respond to the additional comments of Dr Martin Lally in relation to how Crown financing should be treated when deriving the loss asset and future regulated revenues.[1] There were two principal observations or arguments that Lally has raised on this matter, which are as follows:

a.   First, he drew attention to the conclusion he reached in his earlier report that he considered that the method for adjusting for the benefit of Crown financing we advocated in our report last year was incorrect, and noted that this comment had not been responded to.[2]

b.   Secondly, Dr. Lally expressed support for adjusting the benchmark cost of debt when deriving the avoided cost of Crown financing to reflect:

i.   the fact that the majority of the Crown financing is equivalent to subordinated debt, and

ii.   to reflect differences between Chorus's actual credit rating and the benchmark applied by the Commission when estimating the WACC.

1.2   Summary of response

1.2.1   Equations applied to allow for the Crown financing benefit

2.   In our view, with one exception,[3] the equations that we have advocated to adjust for the benefit associated with Crown financing are consistent with what Dr. Lally has proposed.[4] This issue is addressed in section 2.1, where we demonstrate that our recommended equation can be derived from the equation recommended by Dr. Lally. Accordingly, we do not consider the question of how the benefit associated with Crown

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[1]   Lally, M. (2020), Further Issues Concerning the Cost of Capital for Fibre Input Methodologies, report for the Commerce Commission, May.

[2]   Lally, M. (2020), Further Issues Concerning the Cost of Capital for Fibre Input Methodologies, report for the Commerce Commission, May, p.8, referring to: Lally, M. (2019), Review of Submissions on the Cost of Capital for Fibre Network Losses, November, p.9.

[3]   The one exception – which is relevant only to the loss asset calculation – relates to the discount rate that is used to carry-forward the benefit from Crown financing to the implementation date. Dr. Lally's method was equivalent to using the avoided cost rate for Crown financing to carry-forward the benefit rather than the WACC, which we agree with. The DCF method the Commission has recently proposed would make it straightforward to remedy this matter.

[4]   By "our equation", we are referring to the equation for the cost of capital inclusive of the Crown financing benefit that Dr. Lally attributed to us in his previous report (Lally, 2019, p.8, equation 1). In our analysis, we expressed the adjustment for the benefit of Crown financing in terms of its effect on the "return on assets" line item in the revenue requirement formula. However, we are happy with Dr Lally's conversion of our equation into the equivalent change to the cost of capital.

financing should be calculated and reflected in the calculation of regulated revenues (and the loss asset) to be an issue of material difference between us and Dr. Lally.

1.2.2   Avoided cost associated with Crown financing

3.   We agree with Dr Lally that:

a.   the subordinated nature of the Crown financing justifies adjusting the benchmark cost of debt when deriving the avoided cost of Crown financing, and

b.   the difference between Chorus's actual credit rating and the benchmark applied by the Commission would justify a further adjustment to the benchmark cost of debt – this was not a matter that we addressed in our earlier report as we were assuming that the two credit ratings were aligned.

4.   A pragmatic means of giving effect to these adjustments would be apply a BBB- credit rating when deriving the avoided cost of Crown financing (i.e., a one notch reduction from Chorus's actual credit rating, which is BBB).

5.   We acknowledge that simply applying a one-notch adjustment to the target credit rating to account for the subordinated nature of the Crown financing is different to how we advocated quantifying the benefit associated with Crown financing in our earlier report. However, on reflection and with the benefit of Lally's analysis, we now think that the method we employed in our earlier report to quantify this avoided cost – where we suggested interpreting the Crown financing as comprising two levels of subordination and seeking direct market observations for these instruments – was unnecessarily complex and posed a material risk of error.

6.   For completeness, we note that Dr Lally and us also agree that the Crown financing – irrespective of the labels applied – is fundamentally debt-like in nature, a corollary of which is that:

a.   the classifications applied by ratings agencies (which reflect the specific interests of debt providers) are not a reliable indicator of the economic character of the finance, and

b.   the "equity" share of the Crown financing cannot be classified as equivalent to a no interest preference share – a conversion to a preference share was just one of the options for Chorus at the transition date for the finance (and which option we agreed was unlikely to be exercised), and

c.   we also agreed that the other options attached to the "equity" component of the Crown financing (i.e., the option for Chorus to redeem the securities with a grant of shares and the warrants that were provided to the Crown) did not have material value.

2.   Further elaboration

2.1   Equations for determining the benefit associated with Crown financing

2.1.1   Derivation of Dr Lally's expression

7.   In this section we first show how Dr Lally's equation may be derived from first principles, and then show how the equation that Dr Lally attributed to us can be derived from that equation. We adopt the following notation below:[5]

    a. k_e = cost of equity

    b. k_d = cost of debt

    c. w = leverage.

8.   Accordingly:

$$WACC = (1 - w)k_e + w.k_d$$

9.   We now assume that the debt is structured such that a proportion *(1-p)* is senior debt and a proportion *p* is subordinated debt. Where a given quantity of debt is restructured into a senior and subordinated component, then:

    a. the interest rate payable on the senior debt must be lower compared to the interest rate prior to the restructure because these debt providers will be part of a smaller pool that has priority if the firm defaults, and so would expect a greater recovery of their principal[6]

    b. the interest rate payable on the subordinated debt must be higher compared to the interest rate prior to the restructure because these debt providers now would sit behind the senior debt providers in the case of a default,[7] but

    c. as Dr Lally points out,[8] arbitrage will ensure that the weighted average interest rate across the senior and subordinated debt will be the same as the interest rate prior to the restructure.

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[5]   The notation adopted below is consistent with the notation employed by Dr Lally, except that we use a capital-*P* in place of Dr. Lally's lower case-*p* (our lower case-*p* is a new variable).

[6]   For example, assume the firm's debt of 500 was restructured into senior debt of 300 and subordinated debt of 200. If the firm defaults with assets worth only 400, then prior to the restructure the debt providers would have recovered 80 per cent of their principal, whereas after the restructure the senior debt providers would recover all of their principal and part of the asset would be left for lower-ranking debt providers. Accordingly, the senior debt providers will be satisfied with a lower interest rate than prior to the restructure.

[7]   This is the flipside of the previous point – after the restructure, the subordinated debt providers will recover only 50 per cent of their principal compared to 80 per cent when there was a single tranche of debt, and so they will demand a higher interest rate.

[8]   Lally, M. (2020), Further Issues Concerning the Cost of Capital for Fibre Input Methodologies, report for the Commerce Commission, May, p.17.

10. In formulaic terms, this last point implies that:

$$k_d = (1-p)k_d^{Sen} + p.k_d^{Sub}$$

where the superscripts "Sen" and "Sub" denote senior and subordinated debt assuming these different tranches are in place.

11. Substituting this expression into the WACC equation:

$$WACC = (1-w)k_e + w((1-p)k_d^{Sen} + p.k_d^{Sub})$$

12. The argument that we made in our report of July last year was that the Crown financing is debt financing in nature; however, the majority of this finance is subordinated.[9] Accordingly, the economic effect on Chorus of receiving this funding is equivalent to Chorus (i) structuring its debt into senior and subordinated components, and (ii) paying a zero interest rate on the subordinated component. If a zero-cost for the subordinated debt component is inserted into the expression for WACC immediately above then the WACC for Chorus *after taking account of the benefit of Crown financing* (denoted WACC[Adjusted]) becomes:

$$WACC^{Adjusted} = (1-w)k_e + w(1-p)k_d^{Sen}$$

13. In the equation above, the subordinated debt – which is assumed to be the Crown financing – was expressed as a proportion (*p*) of the debt funding. If we denote the quantum of Crown financing as a proportion of the RAB as *P*, then:

$$P = w.p$$

$$\Rightarrow p = \frac{P}{w}$$

14. Substituting this expression for *p* into the expression for WACC[Adjusted] above yields:

$$WACC^{Adjusted} = (1-w)k_e + w\left(1 - \frac{P}{w}\right)k_d^{Sen}$$
$$\therefore WACC^{Adjusted} = (1-w)k_e + (w-P)k_d^{Sen} \tag{A}$$

15. This expression is Dr. Lally's "equation 3" from his 12 November 2019 paper,[10] which was his preferred expression. An observation that we would make is that this expression is not obviously straightforward to implement given that it requires an adjusted WACC to be calculated that takes account of the fact that, because the Crown debt is

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[9] The conclusion reached in this report is that the subordinated portion of the "debt" Crown financing and the "equity" Crown financing can be interpreted as simple subordinated debt (see section 2.2.2). Whilst 100% of the "equity" is always subordinated, the proportion of the "debt" that is subordinated will vary over time according to a prescribed formula – in relation to CIP1 finance, see Incenta Economic Consulting (2019), Chorus's actual financing cost for Crown-financed investment, July, pp.16-17.

[10] As noted earlier, our capital *P* is equivalent to Dr. Lally's lower case *p* in these equations.

subordinated, Chorus's borrowing costs are lower than would be the case if the Crown debt was equally ranking.

2.1.2 Derivation of our recommended approach

16. In our work, we assumed that one would commence with the WACC that is calculated on the assumption that there was no Crown financing (i.e., a benchmark WACC), and then adjust this downwards to account for the benefit associated with Crown financing.[11] However, this outcome can be derived from a simple rearrangement of equation A above. First note that, given our notation and relationship between our *p*, *P* and *w* variables,[12] equation A can be re-expressed as:

$$WACC^{Adjusted} = (1-w)k_e + w(1-p)k_d^{Sen}$$

17. Recall that the arbitrage-free condition for debt interest rates where a quantity of debt is split into senior and subordinated debt means that:

$$k_d = (1-p)k_d^{Sen} + p.k_d^{Sub}$$
$$\Rightarrow (1-p)k_d^{Sen} = k_d - p.k_d^{Sub}$$

18. Note that in this equation, the interest rate on the subordinated debt now reflects the rate that Chorus *would be* required to pay *if* it had issued this debt commercially (and markets were well-functioning), rather than receiving this interest free (i.e., as Crown financing).

19. Substituting this last expression back into the slightly rearranged equation A yields:

$$WACC^{Adjusted} = (1-w)k_e + w(k_d - p.k_d^{Sub})$$
$$\therefore WACC^{Adjusted} = (1-w)k_e + w.k_d - w.p.k_d^{Sub}$$
$$\therefore WACC^{Adjusted} = WACC - P.k_d^{Sub} \qquad \text{(B)}$$

20. This expression can be interpreted as requiring the "return on assets" line item in the building block calculation to be calculated by:[13]

    a. commencing with the return on assets that is calculated by applying the benchmark WACC (i.e., that assumes there is no Crown financing), and

    b. then adjusts this downwards by the stock of Crown financing (the product of *P* and the *RAB* in this expression) multiplied by the interest rate that would have been

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[11]   As noted in the summary section, we actually expressed this adjustment as something that would be made to the return on assets line item in the regulated revenue calculation rather than as an adjustment to the WACC, although we are happy with Dr. Lally's reinterpretation of our argument.

[12]   Recall that we use these variables to denote the proportion of subordinated debt (Crown financing) in total debt, the subordinated debt (Crown financing) as a proportion of the RAB and leverage, so that *P = w* x *p*.

[13]   To be clear, we recommend making the appropriate adjustments to the calculation of the return on assets rather than making adjustments to the WACC given that the Crown financing as a proportion of the RAB varies materially from one year to the next. We do not interpret Dr. Lally as saying something different on this practical matter.

payable on that debt, taking account of the effect of the Crown debt being subordinated.

21.   Equation B above is one form of the equation – which was derived through a simple re-arrangement of Lally's equation 3 – that we advised and that has been applied by Chorus as well as the Commission.[14] In addition, this expression can be further rearranged as follows:

$$WACC^{Adjusted} = WACC - P.k_d^{Sub}$$
$$\therefore WACC^{Adjusted} = (1-P).WACC + P.WACC - P.k_d^{Sub}$$
$$\therefore WACC^{Adjusted} = (1-P).WACC + P(WACC - k_d^{Sub}) \qquad\qquad (C)$$

22.   Under this form of the equation, the required return on assets is equal to a normal (i.e., WACC) return on the proportion of the RAB that was financed directly by Chorus (the first part of the expression), plus an amount that reflects the residual risk that Chorus bears on the proportion of the RAB that was financed via the Crown financing (the second part of the expression). This is equation consistent with the version of the adjustment for Crown finance that we drew most attention to in our earlier report,[15] and is equivalent to Dr. Lally's equation 1,[16] although Dr. Lally concluded that this equation was incorrect. However, it has been shown that this expression can be obtained with only a simple rearrangement of Dr. Lally's preferred equation.

23.   Lastly, we also observed that Dr. Lally commented in his November paper that our equation would provide an obviously incorrect outcome in a certain case, namely where the Crown financing covered all of Chorus's debt. In this case, Chorus's cost of capital would self-evidently be its cost of equity on the share of the assets that it financed. As Dr. Lally noted, if the Crown financing covered all of Chorus's debt (so, in our notation, $P = w$), then our Equation B above for the adjusted WACC would become:

$$WACC^{Adjusted} = (1-w)k_e + w.k_d - w.k_d^{Sub}$$

24.   At first sight, this looks to provide the incorrect answer because the debt terms do not appear to fall out of the equation. However, if all of the debt were to be provided by the Crown, then the interest rate that is avoided must be the standard cost of debt – this flows from the arbitrage condition noted earlier. Thus, the equation would imply that Chorus's cost of capital would reduce to its cost of equity on the share of assets it has financed, as expected.[17] Accordingly, in contrast to Dr. Lally's concern, the expression that we recommended continues to work when extremes are tested, provided that care is taken with its application.

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[14]   This is equivalent to our "equation 2": Incenta Economic Consulting (2019), Chorus's actual financing cost for Crown-financed investment, July, p.10.

[15]   This is equivalent to our "equation 1": Incenta Economic Consulting (2019), Chorus's actual financing cost for Crown-financed investment, July, p.10. We noted in our earlier paper that our equations 1 and 3 were equivalent (see p.2, footnote 4).

[16]   Lally, M. (2019), Review of Submissions on the Cost of Capital for Fibre Network Losses, November, p.8.

[17]   That is, if there is no other debt for the Crown financing to be subordinated to, then it is in the same position as standard debt.

2.1.3   Carry-forward rate for the Crown financing benefit

25.   The one area where our advice last July differed to Dr. Lally's conclusions relates to how the benefit associated with Crown financing that is received in any year is carried-forward to the implementation date when calculating the loss asset. Whilst this was not an issue that we addressed directly, the implication of our recommended method of allowing for the benefit of Crown financing would imply that:

   a.   the annual benefit from Crown financing would flow through into the loss calculated for that year in question, and

   b.   being part of the annual loss, the Crown financing benefit would be carried forward to the implementation date at the benchmark (unadjusted) WACC.

26.   Dr Lally demonstrated, however, that the correct method would be to calculate and carry-forward the loss excluding consideration of the Crown financing using the benchmark (unadjusted) WACC, but that the benefit of Crown financing should be carried forward at the interest rate relevant to the avoided finance.[18] The effect of Dr. Lally's position is that the benefit ascribed to Crown financing in the loss calculation would be reduced and so the loss asset would be larger.

27.   We agree with Dr. Lally that the correct carry-forward rate would be the interest rate that would have been payable on the avoided finance.

2.2   Avoided cost associated with Crown financing

2.2.1   Avoided cost of Crown financing vs. benchmark cost of debt

28.   As remarked earlier, Dr. Lally has concluded that, whilst the Crown financing is fundamentally debt-like, there are two factors that would cause a difference between the avoided cost of Crown financing and the benchmark cost of debt that is assumed in the WACC.

   a.   First, the subordinated nature of much of the Crown financing would cause the avoided cost to be higher than the benchmark cost of debt (which is based on senior debt).

   b.   Secondly, that the benefit to Chorus from the Crown financing would reflect Chorus's actual credit rating, which was lower than the benchmark credit rating the Commission has proposed assuming in the WACC calculation (BBB vs. BBB+).

29.   We agree with Dr. Lally that the subordinated nature of the Crown financing means that the benefit to Chorus is higher than would be the case if the debt was not subordinated. This was a key conclusion of our earlier report, which we discuss further below.

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[18]   Lally, M. (2019), Review of Submissions on the Cost of Capital for Fibre Network Losses, November, p.12. The Commission referred to this method as the "stand alone avoided financing cost method" in the IMs draft decision.

30.   In addition, we agree with Dr. Lally that the benefit that Chorus has obtained from the Crown financing (and, equivalently, the risk that it has been able to transfer to the Crown) inherently will reflect its own credit rating rather than the benchmark assumption made by the Commission when deriving the WACC. This was not an issue that we addressed in our earlier report as we were assuming that the Commission's benchmark credit rating was BBB, which would have aligned with Chorus's actual rating.

2.2.2   Update to our position on the benefit from subordination

31.   However, in our previous report we went further than Dr. Lally and observed that the structure of the Crown financing could be interpreted as containing two levels of subordinated debt (which we label below as *senior* subordinated and *junior* subordinated debt), and suggested that a different avoided cost interest rate should be derived for each level of debt and combined into a weighted average (together with the portion of the Crown financing that ranks equally with Chorus's standard debt). After having considered this issue further, and with the benefit of Dr. Lally's analysis, we now think that the suggestion that multiple levels of subordinated debt be assumed is:

   a. unnecessarily complex, and

   b. poses a substantial risk of error.

32.   In terms of the *complexity*, the fact that the Crown effectively holds both the senior and junior subordinated debt means that the weighted average interest rate that would be payable across these two levels of debt should equate to the interest rate payable on standard subordinated debt (i.e., where there is just a single tranche of subordinated debt). This result flows from the arbitrage-free conditions discussed in the previous section. This means that it is equally valid – and much more straightforward – simply to treat all of the subordinated Crown financing as simple subordinated debt. We return to how this should be quantified below.

33.   In terms of the *risk of error*, as discussed below, we found it challenging to derive an estimate of the margin differential for standard subordinated debt, and found this task to be even more difficult in relation to junior subordinated debt. Thus, any estimates would be imprecise and potentially affected by material premia for illiquidity relative to other instruments, which are sources of potentially material error.[19]

34.   In addition, where multiple classes of subordinated debt are assumed, substantial care is required when estimating the margin differential for the first level of subordinated debt. This is because when a given quantity of subordinated debt is divided up into classes, the interest rate payable in each class of subordinated debt will change as a consequence – that is, the interest rate payable on the first tranche of subordinated debt would be expected to be lower than for simple subordinated debt, whereas the interest rate on the second level of subordinated debt would be higher.[20] This suggests that a simple estimate

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[19]   We observed the potential for our preliminary estimates for the margin differential for these instruments to contain material premia for illiquidity in our earlier report: Incenta Economic Consulting (2019), Chorus's actual financing cost for Crown-financed investment, July, paras 11 and 38.

[20]   This is an implication of the arbitrage-free condition noted by Dr. Lally and discussed in paragraph 9, above.

of the interest rate applicable for subordinated debt cannot be applied to the senior tranche where multiple levels are assumed, rather a more complex estimation method is required.[21] We now think it is likely that the method we applied to derive our preliminary estimates was in error on this point.

2.2.3 Our current view

35. An implication of the discussion above is that the avoided cost of debt should commence with:

    a. a benchmark cost of debt, but calculated on the basis of Chorus's actual credit rating, and

    b. then adjusted upwards to factor in the effect of subordination (being both the additional cost of this finance, and the additional benefit to Chorus due to this aspect of the Crown financing).

36. In terms of the <u>subordination adjustment</u>, our report last year provided a preliminary estimate of the difference between the margin payable on subordinated debt and senior debt of approximately 47 basis points, which was based upon the direct observation of yields on traded debt securities. However, this method has shortcomings, most importantly that the very limited issuance of subordinated debt in New Zealand requires the use of information from overseas capital markets. Our preliminary estimate was based only on US financial firms, and even then the sample size was modest and there was material variation in the observed margin across the sample, implying a degree of imprecision.[22]

37. It may be possible to improve the precision of the estimate of the margin difference for subordinated debt that is obtained by direct market observation, although the absence of material issuance in New Zealand means that a reliance on information from overseas capital markets would remain inevitable. Alternatively, our report also noted that credit ratings agencies typically assign a 1-notch differential between the rating for an issuer's senior debt and subordinated debt, and we demonstrated in the context of the US financial firms that this margin differential was quite close to our direct estimate of the margin differential.[23] Accordingly, a more pragmatic approach for deriving the avoided cost associated with Crown financing – and one that is more able to link to the conditions

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[21] What this suggests is that if separate margins are to be derived for subordinated and junior subordinated debt, then the margin for the senior subordinated debt component must be derived only from firms that also have junior subordinated debt. However, our margins for subordinated debt were derived from firms that most likely only had a single tranche of subordinated debt, junior subordinated debt being relatively rare.

[22] Our sample included all subordinated debt bonds that were issued by financial companies between 2011 and 2019 with a term at issuance of approximately 10 years and that were in the broad BBB rating band, which delivered a sample of 17 (there were a large number of unrated issues). We focussed on the yield of the subordinated bonds at issuance as the reported yields after that date were often erratic. Our method, and the variation in the estimated margin across the sample, was set out in: Incenta Economic Consulting (2019), Chorus's actual financing cost for Crown-financed investment, July, pp.19-21.

[23] Incenta Economic Consulting (2019), Chorus's actual financing cost for Crown-financed investment, July, p.20 (footnote 35).

in New Zealand capital markets as well as the firms of interest – is simply to apply the one-notch credit rating differential to account for the effect of subordination. This would imply calculating the benefit of Crown financing on the basis of benchmark BBB- rated debt.