

Cost of capital determination for Chorus' price quality path for PQP1

[2021] NZCC 8

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Date of publication: 1 July 2021

Associated documents

Publication date	Reference	Title
27 May 2021	ISBN 978-1-869458-98-0	Guidelines for WACC determinations under the cost of capital input methodologies – Regulation under Part 4 of the Commerce Act 1986 and Part 6 of the Telecommunications Act 2001
27 May 2021	ISBN 978-1-869458-99-7	Chorus' price-quality path from 1 January 2022 – Draft decision

Commerce Commission
Wellington, New Zealand

WACC estimates for Chorus' price-quality path for PQP1

1. We estimate the cost of capital for regulated suppliers by estimating the costs of two sources of funding for investments (debt and equity). The cost of capital provides for an efficient regulated supplier to service its debt and provide a return to shareholders in order to attract necessary funding for investment.
2. The cost of capital is not directly observable and therefore we have to estimate it based on market data. We aim to estimate a cost of capital that will promote efficient investment in, and efficient operation of, the regulated service to promote the long-term interests of consumers.
3. Most of the parameters used to estimate the cost of capital were determined and form part of the Cost of Capital Input Methodologies (IMs).¹ However, for the debt premium and the risk-free rate, the IMs lay out the methodology for estimating these parameters using up to date market evidence. This determination implements these rules.
4. This determination specifies the weighted average cost of capital (WACC) estimates that will apply to Chorus' price-quality path (PQ path) for the first regulatory period (PQP1) consistent with the IMs.² The IMs for price-quality (PQ) regulation require us to determine mid-point estimates of vanilla and post-tax WACCs as of the first business day of the month seven months prior to the start of each regulatory period, for each regulatory period.³ We will be separately determining WACC estimates annually for the purposes of information disclosure (ID) regulation for Chorus and other local Fibre companies as specified in the ID determination.⁴
5. The only parameter that changed between the WACC applying for our draft decisions⁵ and the WACC that will apply to Chorus' PQ path for PQP1 is the risk-free rate. The average debt premium, calculated as at the 1st of June 2021, is the historical 5-year average debt premium using the debt premium estimates from debt premium reference year (DPRY) 2017 to DPRY 2021 (the four previous and current DPRYs).
6. The DPRY starts on 1 September and ends on 31 August. The IMs state that the calculation of the debt premium for a DPRY is estimated for each business day in the 12 months preceding the start of the DPRY. We have adopted DPRY 21 as the current

¹ *Fibre Input Methodologies Determination 2020*, [2020] NZCC 21, as amended by the *Fibre Input Methodologies (initial value of the financial loss asset) Amendment Determination 2020*, [2020] NZCC 24.

² PQP1 runs from 1 January 2022 to 31 December 2024.

³ Clause 3.5.1. The first business day of the month seven months prior to the start of PQP1 is 1 June 2021.

⁴ In contrast to the PQ WACCs, which are determined for each regulatory period, the ID WACCs are determined annually for each disclosure year. Under the draft ID determination and the current IMs we must determine the first ID WACC estimates for Chorus by 31 January 2022, for Enable and Northpower Fibre by 31 July 2022, and for UltraFast by 30 April 2022. However, we are currently consulting on IMs amendments which will require us to determine these estimates for all of the regulated providers by 31 January 2022.

⁵ Commerce Commission, [Chorus' price-quality path from 1 January 2022 – Draft decision, Attachment H](#) [27 May 2021].

DPRY as it is the most recent DPRY that has 12 months of data available. For all of the DPRYs we have used bond data starting on 1 September and ending on 31 August.⁶

7. The vanilla and post-tax WACC estimates for Chorus' PQ path for PQP1 are summarised in Table 1 below.

Table 1: Vanilla and post-tax WACC estimates

	Mid-point
Vanilla WACC	4.72%
Post-tax WACC	4.52%
Standard error	0.0131

8. This determination should be read in conjunction with our guidelines for estimating the WACC under the IMs.⁷ These guidelines form part of this determination. The guidelines explain our methodology for calculating WACC estimates, including:
- 8.1 the formulas used;
 - 8.2 the values for WACC parameters which are fixed under the IMs; and
 - 8.3 our methodology for determining the risk-free rate and average debt premium.

⁶ For the DPRY 2021 we have used bond data from the 12-month period ending on 31 August 2020.

⁷ Commerce Commission, [Guidelines for WACC determinations under the cost of capital input methodologies](#) [27 May 2021].

Further details regarding the WACC estimates

WACC parameter values for Chorus

9. The parameter values used to generate the mid-point WACC estimates for Chorus' PQ path for PQP1 are summarised in Table 2 below.⁸

Table 2: Values used to calculate WACC estimates for Chorus

Parameter	Estimate
Risk-free rate	0.51%
Average debt premium ⁹	1.70%
Leverage	29%
Asset beta	0.50
Equity beta	0.70
Tax adjusted market risk premium	7.5%
Average corporate tax rate	28%
Average investor tax rate	28%
Debt issuance costs	0.33%
Cost of debt	2.54%
Cost of equity	5.62%
Standard error of midpoint WACC estimate	0.0131
Mid-point vanilla WACC	4.72%
Mid-point post-tax WACC	4.52%

*The numbers are rounded to two decimal points.

⁸ All parameter values except the estimate of the risk-free rate and the average debt premium are set in the IMs.

⁹ S&P target credit rating BBB.

Risk-free rate

10. The risk-free rate reflects the linearly-interpolated, annualised, bid yield to maturity on New Zealand government bonds with a term to maturity of three years (the length of the first regulatory period). Our estimate of the risk-free rate is based on data reported by Bloomberg for the three-month period ending May 2021 in respect of the April 2023 and April 2025 maturity bonds.
11. The daily data reported by Bloomberg is linearly interpolated, annualised (to reflect the six-monthly or quarterly payment of interest) and averaged to produce the estimate of a 0.51% interest rate on New Zealand government bonds with a three year term to maturity, as estimated at 1 June 2021.¹⁰

Average debt premium

12. The average debt premium of 1.70% is the historical five-year average of the debt premium values for the current debt premium reference year (DPRY) and the four previous DPRYs, as shown in Table 3 below. DPRY 2021 is the most recent debt premium reference year. The debt premium estimates are based on a target S&P credit rating of BBB and term to maturity of five years.

Table 3: Average debt premium for Chorus suppliers (%)

	DPRY 2017	DPRY 2018	DPRY 2019	DPRY 2020	DPRY 2021	Average
Debt premium	1.70	1.75	1.65	1.70	1.70	1.70

13. As this is the first WACC determination for Chorus, we must retrospectively estimate the historical debt premium estimates to calculate the five-year historical average.¹¹ A summary of the data used and how we have applied our judgement in determining the debt premium are outlined for each DPRY below.

¹⁰ Note that the target term to maturity for the risk-free rate and debt premium are different for the first regulatory period (the risk-free rate has a term equal to the length of the regulatory period, i.e., 3 years for the first regulatory period, and the debt premium has a 5 year term). For more information see the cost of debt section of the Fibre IM final reasons paper: Commerce Commission “Fibre input methodologies: Main final decisions – Reasons paper” (13 October 2020), paras 6.81 to 6.264.

¹¹ One issue we had in retrospectively estimating the debt premiums was changing credit ratings over time. This impacts the weighting that we would apply to the debt premium observation in relation to the target credit rating (of BBB). We have aimed to mitigate this by using the credit rating for each comparator in the DPRY as at the end of each DPRY (for example, the Wellington Airport bond changes from S&P rating BBB+ to BBB effective 15/6/2020, so the bond would be classified as BBB+ by the end of DPRY 2019 and changes to BBB by the end of DPRY 2020).

DPRY 2017

14. We estimated a debt premium of 1.70% for the 2017 DPRY based on the data in Table 4 below.
- 14.1 For the DPRY 2017 determination there are a lack of category (a) and (b) bonds which we would generally give most regard to in our debt premium determination. There was only one category (c) bond (Contact Energy) which has the target credit rating and remaining term to maturity. We have given most regard to this bond which supports a debt premium estimate of 1.70%.
- 14.2 The estimated debt premiums for other issuers in bond categories (e) and (f) are not inconsistent with a debt premium of approximately 1.70%, when consideration is given to the different credit ratings and terms to maturity.
- 14.3 The Nelson-Siegel-Svensson (NSS) estimate of the debt premium of 1.66% also lends support to our debt premium estimate of 1.70%.¹²

Table 4 – DPRY 2017 bond data

Details of benchmark bond

Sector	100% Govt owned	Bond credit rating	Remaining term to maturity (years)	Debt premium (%)
Fibre	No	BBB	5.0	1.70

Debt premiums ordered by bond categories specified in the IMs

Bond category	Issuer	Sector	100% Govt owned	Bond credit rating	Remaining term to maturity (years)	Debt premium (%)	Notes reference
c	CONTACT ENERGY LTD	Other	No	BBB	5.0	1.70	1
e	AUCKLAND INTL AIRPORT	Airport	No	A-	5.0	1.20	2
e	FONTERRA COOPERATIVE G	Other	No	A-	5.0	1.44	3
e	GENESIS ENERGY LTD	Other	No	BBB+	5.0	1.64	4
e	MERCURY NZ LTD	Other	No	BBB+	5.0	1.64	5
e	SPARK FINANCE LTD	Telco	No	A-	5.0	1.32	6
e	WELLINGTON INTL AIRPOR	Airport	No	BBB+	4.3	1.50	7
f	CHRISTCHURCH INTL AIRP	Airport	Yes	BBB+	5.0	1.55	8
f	TRANSPower NEW ZEALAND	Other	Yes	AA-	5.0	1.05	9
Nelson-Siegel-Svensson (NSS) estimate						5.0	1.66

Notes on bonds analysed

- 1 CENNZ 5.277 05/27/20; CENNZ 4.4 11/15/21
- 2 AIANZ 5.52 05/28/21; AIANZ 4.73 12/13/19; AIANZ 4.28 11/09/22
- 3 FCGNZ 5.52 02/25/20; FCGNZ 4.33 10/20/21
- 4 GENEPO 8.3 06/23/20; GENEPO 5.81 03/08/23
- 5 MCYNZ 8.21 02/11/20; MCYNZ 5.793 03/06/23
- 6 SPKNZ 5 1/4 10/25/19; SPKNZ 4 1/2 03/25/22
- 7 WIANZ 5.27 06/11/20
- 8 CHRINT 5.15 12/06/19; CHRINT 6 1/4 10/04/21
- 9 TPNZ 6.95 06/10/20; TPNZ 4.3 06/30/22

DPRY 2018

15. We estimated a debt premium of 1.75% for the 2018 DPRY based on the data in Table 5 below.

¹² We place primary weight on our hierarchy of bonds and use the NSS approach as an additional tool to provide an objective estimate of the term structure to determine the debt premium. For more information on the NSS approach, see Commerce Commission “Fibre input methodologies: Main final decisions – reasons paper” (13 October 2020), Attachment H.

- 15.1 We have had greatest regard to the category (a) Chorus bond, which supports a debt premium estimate of approximately 1.75%. The Chorus bond has the target credit rating and sector but the remaining term to maturity is slightly lower than the target of 5 years. Therefore, we would expect the target bond to have a slightly higher debt premium than 1.71%, supporting our debt premium estimate of 1.75%.
- 15.2 The category (c) Contact Energy and Vector bonds' debt premium estimates match the target credit rating (BBB) but the remaining term to maturity does not match the target of 5 years. Therefore, we would expect the debt premium estimates to be slightly higher (as per the Contact Energy bond) and lower (as per the Vector bond) to reflect what we would expect a 5-year term to maturity bond to exhibit. Once these expected changes to match the target criteria are considered, the estimated debt premiums are not inconsistent with a debt premium estimate of 1.75%.
- 15.3 The estimated debt premiums for other issuers in bond categories (e) and (f) are not inconsistent with a debt premium of approximately 1.75%, when consideration is given to the different credit ratings and terms to maturity.
- 15.4 The NSS estimate of the debt premium of 1.74% also supports our debt premium estimate of 1.75%.

Table 5 – DPRY 2018 bond data

Details of benchmark bond

Sector	100% Govt owned	Bond credit rating	Remaining term to maturity (years)	Debt premium (%)
Fibre	No	BBB	5.0	1.75

Debt premiums ordered by bond categories specified in the IMs

Bond category	Issuer	Sector	100% Govt owned	Bond credit rating	Remaining term to maturity (years)	Debt premium (%)	Notes reference
a	CHORUS LTD	Fibre	No	BBB	4.2	1.71	1
c	CONTACT ENERGY LTD	Other	No	BBB	4.7	1.59	2
c	VECTOR LTD	EDB/GPB	No	BBB	6.8	2.01	3
e	AUCKLAND INTL AIRPORT	Airport	No	A-	5.0	1.25	4
e	FONTERRA COOPERATIVE G	Other	No	A-	5.0	1.55	5
e	GENESIS ENERGY LTD	Other	No	BBB+	5.0	1.61	6
e	MERCURY NZ LTD	Other	No	BBB+	5.0	1.66	7
e	MERIDIAN ENERGY LIMITE	Other	No	BBB+	6.0	1.62	8
e	SPARK FINANCE LTD	Telco	No	A-	5.0	1.43	9
e	WELLINGTON INTL AIRPOR	Airport	No	BBB+	3.3	1.56	10
f	CHRISTCHURCH INTL AIRP	Airport	Yes	BBB+	4.6	1.63	11
f	TRANSPOWER NEW ZEALAND	Other	Yes	AA-	5.0	1.15	12
Nelson-Siegel-Svensson (NSS) estimate					5.0	1.74	

Notes on bonds analysed

- 1 CNUNZ 4.12 05/06/21
- 2 CENNZ 4.4 11/15/21
- 3 VCTNZ 4.996 03/14/24
- 4 AIANZ 5.52 05/28/21; AIANZ 4.28 11/09/22
- 5 FCGNZ 5.9 02/25/22; FCGNZ 4.33 10/20/21; FCGNZ 5.52 02/25/20; FCGNZ 4.42 03/07/23
- 6 GENEPO 4.14 03/18/22; GENEPO 8.3 06/23/20; GENEPO 5.81 03/08/23
- 7 MCYNZ 8.21 02/11/20; MCYNZ 5.793 03/06/23
- 8 MERINZ 4.53 03/14/23
- 9 SPKNZ 4 1/2 03/25/22; SPKNZ 5 1/4 10/25/19; SPKNZ 4.51 03/10/23
- 10 WIANZ 5.27 06/11/20
- 11 CHRINT 6 1/4 10/04/21
- 12 TPNZ 4.3 06/30/22; TPNZ 6.95 06/10/20; TPNZ 5.448 03/15/23

DPRY 2019

16. We estimated a debt premium of 1.65% for the 2019 DPRY based on the data in Table 6 below.
 - 16.1 We have had greatest regard to the category (a) Chorus bond, which supports a debt premium of approximately 1.65%. The Chorus bond has the target credit rating and sector but the remaining term to maturity is lower than the target of 5 years. Therefore, we would expect the target bond to have a higher debt premium than 1.57%, supporting our debt premium estimate of 1.65%.
 - 16.2 The category (c) Contact Energy and Vector bonds' debt premium estimates match the target credit rating (BBB) but the remaining term to maturity does not match the target of 5 years. Therefore, we would expect the debt premium estimates to be slightly higher (as per the Contact Energy bond) and lower (as per the Vector bond) to reflect what we would expect a 5-year term to maturity bond to exhibit. Once these expected changes to match the target criteria are considered, the estimated debt premiums are not inconsistent with a debt premium estimate of 1.65%.
 - 16.3 The estimated debt premiums for other issuers in bond categories (e) and (f) are not inconsistent with a debt premium estimate of approximately 1.65%, when consideration is given to the different credit ratings and terms to maturity.
 - 16.4 The NSS estimate of the debt premium of 1.61% also supports our debt premium estimate of 1.65%.

Table 6 – DPRO 2019 bond data**Details of benchmark bond**

	Sector	100% Govt owned	Bond credit rating	Remaining term to maturity (years)	Debt premium (%)
Benchmark bond	Fibre	No	BBB	5.0	1.65

Debt premiums ordered by bond categories specified in the IMs

Bond category	Issuer	Sector	100% Govt owned	Bond credit rating	Remaining term to maturity (years)	Debt premium (%)	Notes reference
a	CHORUS LTD	Fibre	No	BBB	3.2	1.57	1
c	CONTACT ENERGY LTD	Other	No	BBB	4.7	1.44	2
c	VECTOR LTD	EDB/GPB	No	BBB	6.0	1.93	3
e	AUCKLAND INTL AIRPORT	Airport	No	A-	5.0	1.12	4
e	FONTERRA COOPERATIVE G	Other	No	A-	5.0	1.28	5
e	GENESIS ENERGY LTD	Other	No	BBB+	5.0	1.71	6
e	MERCURY NZ LTD	Other	No	BBB+	5.0	1.65	7
e	MERIDIAN ENERGY LIMITE	Other	No	BBB+	5.0	1.50	8
e	SPARK FINANCE LTD	Telco	No	A-	5.0	1.24	9
e	WELLINGTON INTL AIRPOR	Airport	No	BBB+	5.0	1.58	10
f	CHRISTCHURCH INTL AIRP	Airport	Yes	BBB+	5.0	1.54	11
f	TRANSPower NEW ZEALAND	Other	Yes	AA-	5.0	1.06	12
Nelson-Sigel-Svensson (NSS) estimate					5.0	1.61	

Notes on bonds analysed

- 1 CNUNZ 4.12 05/06/21
- 2 CENNZ 4.63 11/15/22
- 3 VCTNZ 4.996 03/14/24
- 4 AIANZ 3.64 04/17/23; AIANZ 4.28 11/09/22; AIANZ 5.52 05/28/21; AIANZ 3.97 11/02/23
- 5 FCGNZ 4.42 03/07/23; FCGNZ 5.9 02/25/22; FCGNZ 5.08 06/19/25
- 6 GENEPO 5.81 03/08/23; GENEPO 4.14 03/18/22; GENEPO 5 04/03/25
- 7 MCYNZ 5.793 03/06/23
- 8 MERINZ 4.53 03/14/23
- 9 SPKNZ 4.51 03/10/23; SPKNZ 4 1/2 03/25/22; SPKNZ 3.94 09/07/26
- 10 WIANZ 5.27 06/11/20; WIANZ 5 06/16/25
- 11 CHRINT 6 1/4 10/04/21; CHRINT 5.53 04/05/27
- 12 TPNZ 5.448 03/15/23; TPNZ 4.069 09/16/22; TPNZ 4.3 06/30/22; TPNZ 3.823 03/06/25

DPRO 2020

17. We estimated a debt premium of 1.70% for the 2020 DPRO based on the data in Table 7 below.
 - 17.1 We have had greatest regard to the category (a) Chorus bond, which supports a debt premium estimate of approximately 1.70%. The Chorus bond has the target credit rating and sector but the remaining term to maturity is lower than the target of 5 years. Therefore, we would expect the target bond to have a higher debt premium than 1.62%, supporting our debt premium estimate of 1.70%.
 - 17.2 The category (c) Contact Energy and Vector bonds' debt premium estimates match the target credit rating (BBB), and the Vector bond matches the remaining term to maturity of 5 years, whereas the Contact Energy bond is slightly above the 5-year target term to maturity. These bonds support our debt premium estimate of 1.70%.
 - 17.3 The estimated debt premiums for other issuers in bond categories (e) and (f) are not inconsistent with a debt premium of approximately 1.70%, when consideration is given to the different credit ratings and terms to maturity.
 - 17.4 The NSS estimate of the debt premium of 1.68% also supports our debt premium estimate of 1.70%.

Table 7 – DPRY 2020 bond data

Details of benchmark bond

	Sector	100% Govt owned	Bond credit rating	Remaining term to maturity (years)	Debt premium (%)
Benchmark bond	Fibre	No	BBB	5.0	1.70

Debt premiums ordered by bond categories specified in the IMs

Bond category	Issuer	Sector	100% Govt owned	Bond credit rating	Remaining term to maturity (years)	Debt premium (%)	Notes reference
a	CHORUS LTD	Fibre	No	BBB	2.2	1.62	1
c	CONTACT ENERGY LTD	Other	No	BBB	5.2	1.60	2
c	VECTOR LTD	EDB/GPB	No	BBB	5.0	1.90	3
e	AUCKLAND INTL AIRPORT	Airport	No	A-	5.0	1.16	4
e	FONTERRA COOPERATIVE G	Other	No	A-	5.0	1.51	5
e	GENESIS ENERGY LTD	Other	No	BBB+	5.0	1.70	6
e	MERCURY NZ LTD	Other	No	BBB+	4.0	1.57	7
e	MERIDIAN ENERGY LIMITE	Other	No	BBB+	5.0	1.48	8
e	SPARK FINANCE LTD	Telco	No	A-	5.0	1.27	9
e	WELLINGTON INTL AIRPOR	Airport	No	BBB+	5.0	1.56	10
f	CHRISTCHURCH INTL AIRP	Airport	Yes	A-	5.0	1.34	11
f	TRANSPOWER NEW ZEALAND	Other	Yes	AA-	5.0	1.04	12
Nelson-Siegel-Svensson (NSS) estimate					5.0	1.68	

Notes on bonds analysed

- 1 CNUNZ 4.12 05/06/21
- 2 CENNZ 3.55 08/15/24
- 3 VCTNZ 4.996 03/14/24
- 4 AIANZ 3.97 11/02/23; AIANZ 3.64 04/17/23; AIANZ 3.51 10/10/24
- 5 FCGNZ 4.42 03/07/23; FCGNZ 5.08 06/19/25
- 6 GENEPO 5.81 03/08/23; GENEPO 5 04/03/25
- 7 MCYNZ 5.793 03/06/23
- 8 MERINZ 4.88 03/20/24; MERINZ 4.53 03/14/23; MERINZ 4.21 06/27/25
- 9 SPKNZ 3.37 03/07/24; SPKNZ 4.51 03/10/23; SPKNZ 3.94 09/07/26
- 10 WIANZ 5.27 06/11/20; WIANZ 5 06/16/25
- 11 CHRINT 4.13 05/24/24; CHRINT 6 1/4 10/04/21; CHRINT 5.53 04/05/27
- 12 TPNZ 5.448 03/15/23; TPNZ 3.823 03/06/25

DPRY 2021

18. We estimated a debt premium of 1.70% for the 2021 DPRY based on the data in Table 8 below.

18.1 We have had greatest regard to the category (a) Chorus bond, which supports a debt premium of approximately 1.70%. The Chorus bond has the target credit rating and sector but the remaining term to maturity is significantly lower than the target of 5 years (and just above our minimum cut-off of one-year term to maturity). Therefore, we would expect the target bond to have a much higher debt premium than 1.46%, supporting our debt premium estimate of 1.70%.

18.2 The category (c) Contact Energy and Vector bonds' debt premium estimates match the target credit rating (BBB) but the remaining term to maturity does not match the target of 5 years. Therefore, we would expect the debt premium estimates to be slightly higher (as per the Contact Energy bond) and lower (as per the Vector and Wellington Airport bonds) to reflect what we would expect a 5-year term to maturity bond to exhibit. Once these expected changes to match the target criteria are considered, the estimated debt premiums are not inconsistent with a debt premium estimate of 1.70%.

- 18.3 The estimated debt premiums for other issuers in bond categories (e) and (f) are not inconsistent with a debt premium of approximately 1.70%, when consideration is given to the different credit ratings and terms to maturity.
- 18.4 The NSS estimate of the debt premium of 1.72% also supports our debt premium estimate of 1.70%.

Table 8 – DPROY 2021 bond data

Details of benchmark bond

Benchmark bond	Sector	100% Govt owned	Bond credit rating	Remaining term to maturity (years)	Debt premium (%)
	Fibre	No	BBB	5.0	1.70

Debt premiums ordered by bond categories specified in the IMs

Bond category	Issuer	Sector	100% Govt owned	Bond credit rating	Remaining term to maturity (years)	Debt premium (%)	Notes reference
a	CHORUS LTD	Fibre	No	BBB	1.2	1.46	1
c	CONTACT ENERGY LTD	Other	No	BBB	4.5	1.42	2
c	VECTOR LTD	EDB/GPB	No	BBB	5.2	1.69	3
c	WELLINGTON INTL AIRPOR	Airport	No	BBB	5.3	2.07	4
e	AUCKLAND INTL AIRPORT	Airport	No	A-	4.6	1.25	5
e	FONTERRA COOPERATIVE G	Other	No	A-	5.0	1.53	6
e	GENESIS ENERGY LTD	Other	No	BBB+	5.1	1.54	7
e	MERCURY NZ LTD	Other	No	BBB+	3.0	1.34	8
e	MERIDIAN ENERGY LIMITE	Other	No	BBB+	5.3	1.37	9
e	SPARK FINANCE LTD	Telco	No	A-	5.0	1.09	10
f	CHRISTCHURCH INTL AIRP	Airport	Yes	BBB+	5.0	1.75	11
f	TRANSPower NEW ZEALAND	Other	Yes	AA-	5.0	0.83	12
Nelson-Siegel-Svensson (NSS) estimate					5.0	1.72	

Notes on bonds analysed

- 1 CNUNZ 4.12 05/06/21
- 2 CENNZ 3.55 08/15/24
- 3 VCTNZ 3.45 05/27/25
- 4 WIANZ 5.06/16/25
- 5 AIANZ 3.51 10/10/24
- 6 FCGNZ 5.08 06/19/25; FCGNZ 4.42 03/07/23; FCGNZ 4.15 11/14/25
- 7 GENEPO 5.04/03/25
- 8 MCYNZ 5.793 03/06/23
- 9 MERINZ 4.21 06/27/25
- 10 SPKNZ 3.37 03/07/24; SPKNZ 3.94 09/07/26
- 11 CHRINT 4.13 05/24/24; CHRINT 5.53 04/05/27
- 12 TPNZ 3.823 03/06/25; TPNZ 2.73 03/14/24; TPNZ 1.735 09/04/25

Changes in the risk-free rate and debt premium over time

19. The risk-free rate and the debt premium on bonds change over time. Changes in the risk-free rate and debt premium estimates are illustrated below. Figure 1 shows, as at 1 June 2021, changes over time in the:

- 19.1 five-year risk-free rate from our historical determinations in other regulated sectors;
- 19.2 a new series for the three-year risk-free rate; and
- 19.3 debt premiums and 5-year average debt premiums on bonds rated BBB, BBB+ and A- with a term of five years from our historical debt premium determinations.

Figure 1: Changes in the five-year debt premiums and three-year risk-free rate over time

