NERA
ECONOMIC CONSULTING

Personal banking services market study – review of Attachment C to PIP

Prepared for Bell Gully

7 September 2023

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1. Introduction and summary

1. Question 5 of the Commerce Commission's "Market study into personal banking services - Preliminary Issues paper" dated 10 August 2023 (**"PIP"**) is:

   Do you agree with our preliminary observations of publicly available bank financial performance data (including those set out in Attachment C)? If not, please explain.

2. Those preliminary observations are (PIP [119]):

   a. On some measures, the New Zealand banking sector appears to have persistently high profitability compared to banking sectors in international peer countries; and

   b. The four largest New Zealand banks appear to persistently derive higher returns on equity than the rest of the New Zealand banking sector.

3. We have been asked by counsel to ASB, Bell Gully, to review and comment on the financial performance data set out in Attachment C.

4. In summary, we find that:

   A. Each of the financial performance measures analysed in the PIP cannot be properly understood without consideration of risk and the cost of equity.

   B. In particular:

      i. The net interest margin (**"NIM"**) does not account for the cost of equity. Accordingly, for example, NIM will increase:

         a. As interest rates increase even if the interest rate spread does not change; and

         b. As a bank's equity share increases (equity shares have been increasing in New Zealand, due to Reserve Bank of New Zealand (**"RBNZ"**) capital requirements).

      ii. Regarding return on assets (**"ROA"**) and return on equity (**"ROE"**), the Attachment C analysis underestimates the comparative riskiness to Australian banks of investing in New Zealand banks.

   C. These factors mean that:

      i. Caution is required in time series and cross-sectional (particularly international) benchmarking.[1]

      ii. If the four largest New Zealand banks do persistently derive higher ROE than the rest of the New Zealand banking sector, this:

         a. May be at least partly justified by their shareholders (Australian banks) taking on higher financial crisis risks than shareholders in other banks, with corresponding benefits to New Zealand customers;

         b. May be partly explained by the four banks generally having a lower equity share/higher leverage than the other banks; and

         c. Likely reflects (accounting) cost efficiencies – as opposed to pricing - as illustrated by the fourth column of PIP Figure 10, showing that, as expressed by the RBNZ, "the

[1] Differences in monetary policy across jurisdictions also add complexity to benchmarking. For example, the RBNZ provided $19 billion of cheap wholesale funding under the funding for lending programme, which is likely to have affected financial performance measures.

large New Zealand banks operate lower cost structures than both the small New Zealand banks and large banks in peer countries".[2]

iii. The preliminary observation that the New Zealand banking sector appears to have persistently high profitability compared to banking sectors in international peer countries is likely to be overstated.

2. The effect of equity funding

2.1. Overview

5. While there are some references to it, the PIP (including Attachment C) does not appear to comprehensively recognise the effect of equity funding on profitability measures. Although the Commission has consciously chosen not to undertake a cost of capital analysis,[3] any interpretation of ROE, ROA, and NIM should still consider the underlying components driving each measure, particularly the role of equity funding.

6. In particular, ROE and ROA are a function of leverage (the proportion of debt funding and thus the inverse of the equity funding ratio). Therefore, differences in ROE and ROA within New Zealand and between countries may be explained by differences in leverage.[4]

7. In addition, NIM is not an economic measure of profitability as it ignores the cost of equity. In effect, the measure assumes equity is free (which is clearly not the case), and thus it can increase even if the *economic* profitability of the bank has not.

8. In the rest of this section we:

   A. Set out, as context, the RBNZ's capital requirements and their impact on banks' equity shares;

   B. Decompose NIM into two components: "spread" (the difference between lending and deposit rates) and "free funding" (the proportion of lending that is equity funding and assumed by the NIM measure to be "free", multiplied by deposit rates.)[5] This decomposition illustrates that NIM is not an economic measure of profitability due to ignoring the cost of equity; and

   C. Show how differences in equity funding can affect domestic and international comparisons of ROE.

2.2. Effect of RBNZ changing capital requirements

9. A common function of central banks is to set minimum requirements for the amount of capital held by a country's banks, for the purpose of reducing exposure to shocks and providing greater banking stability.

10. The international Basel III reforms describe three forms of capital, in decreasing order of quality: Common Equity Tier 1 (CET1) capital, additional Tier 1 (AT1) capital, and Tier 2 capital.[6] Tier 1 capital will absorb bank losses first, while Tier 2 capital only tends to absorb losses once a bank is

[2] RBNZ, *Financial Stability Report*, May 2023, p. 24.

[3] PIP, [117].

[4] In contrast, "ROACE" as applied by the Commission in previous market studies adds back (after-tax) interest to the numerator and so is unaffected by leverage. This means it can be compared to the weighted average cost of capital.

[5] For brevity, the language in this sentence is a bit loose. For more precise definitions, see section 2.3 below.

[6] See BIS, *Definition of capital in Basel III – Executive Summary*, 27 June 2019, available at https://www.bis.org/fsi/fsisummaries/defcap_b3.htm, accessed 22 August 2023.

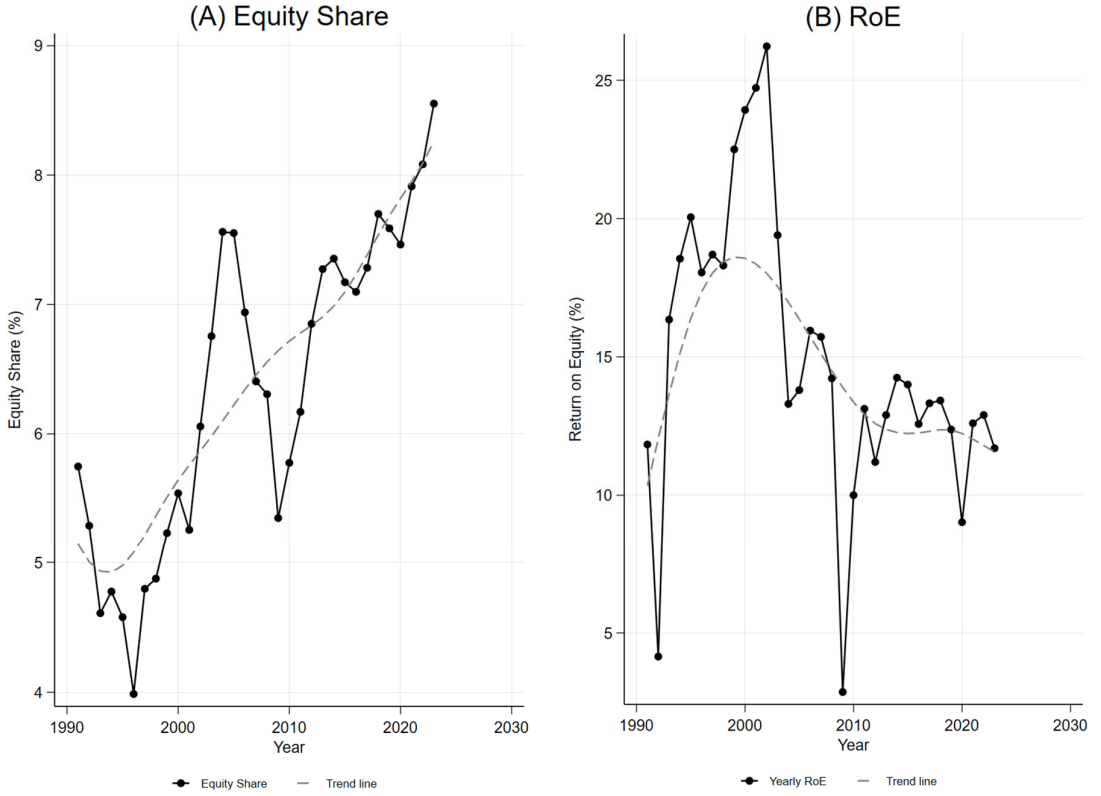
close to insolvency.[7] Central banks often set capital requirements with reference to the composition of a bank's total equity, according to their interpretation of these three forms.

11. Prior to 2019, New Zealand banks were required to hold total capital equal to at least 10.5% of risk-weighted assets, including a 6% 'Tier 1 minimum', a 2.5% 'conservation buffer', and a 2% 'Tier 2 minimum'.[8]

12. In 2019, the RBNZ announced reforms to banks' capital requirements that will require the four largest banks to hold total capital equal to at least 18% of their risk-weighted assets, with at least 16% being 'Tier 1' capital. The new requirements will be phased in and will apply fully from July 2028.[9] The effects of this transition may have only been partially realised to date, as none of the four largest banks have reached the new minimum Tier 1 capital ratio of 16% (as of Q1 2023).[10]

13. More generally, there is a trend in New Zealand of an increasing equity share, dating back to 1990, as shown in Figure 1.

Figure 1: Equity share and ROE over time for New Zealand banks, 1991-2023



Source: NERA analysis of RBNZ bank summary (S20) data.

[7] RBNZ, *Capital Review Paper 4: How much capital is enough?*, January 2019.

[8] RBNZ, *Capital Review Paper 4: How much capital is enough?*, January 2019.

[9] RBNZ, *Capital Review – Decisions 2019,* December 2019.

[10] For example, see RBNZ, *Bank Financial Strength Dashboard*, available at https://bankdashboard.rbnz.govt.nz/capital-adequacy, accessed 24 August 2023.

14. This figure also shows an accompanying downward trend in ROE, which is not surprising given ROE is negatively related to the equity share (we return to the implications of this in section 3.4).
15. We note that an equity share is slightly different to a capital ratio, but both similarly reflect a bank's leverage:
    A. An equity share is calculated by dividing total equity by total assets, where equity is the balance sheet difference between a bank's assets and liabilities.
    B. The capital ratios regulated by RBNZ are calculated by dividing a particular form of capital (e.g. Tier 1) by a bank's *risk-weighted* assets. As a result, they are usually higher than equity shares.

2.3. Decomposing net interest margins into spread and "free funding"

16. As noted at [C12] of the PIP, NIM can be calculated using the following formula:

$$NIM = \frac{Interest\ Income - Interest\ Expense}{Interest\ Earning\ Assets}$$

17. Mathematically, this can be expressed as:

$$NIM = \frac{\overbrace{A \cdot r_A}^{Interest\ Income} - \overbrace{L \cdot r_L}^{Interest\ Expense}}{A}$$

where r_A = *interest rate received on assets*

r_L = *interest rate paid on liabilities*

A = *total interest-earning assets*

L = *total interest-bearing liabilities*

18. And this expression can be decomposed into two terms: spread, and what we call "free funding".

$$NIM = \underbrace{r_A - r_L}_{Spread} + \underbrace{S_f \cdot r_L}_{Free\ funding}$$

where r_A = *interest rate received on assets*

r_L = *interest rate paid on liabilities*

$S_f = 1 - \frac{L}{A} =$ *share of assets not funded by interest-bearing liabilities (e.g., equity)*

with the intermediate algebraic steps being as follows:

$$\frac{Ar_A - Lr_L}{A} = \frac{Ar_A}{A} - \frac{Lr_L}{A}$$

$$= r_A - \frac{L}{A}r_L = r_A - \left(\frac{L}{A}r_L + r_L - r_L\right) = r_A - (r_L - (1 - \frac{L}{A})r_L)$$

$$= r_A - r_L + S_f r_L$$

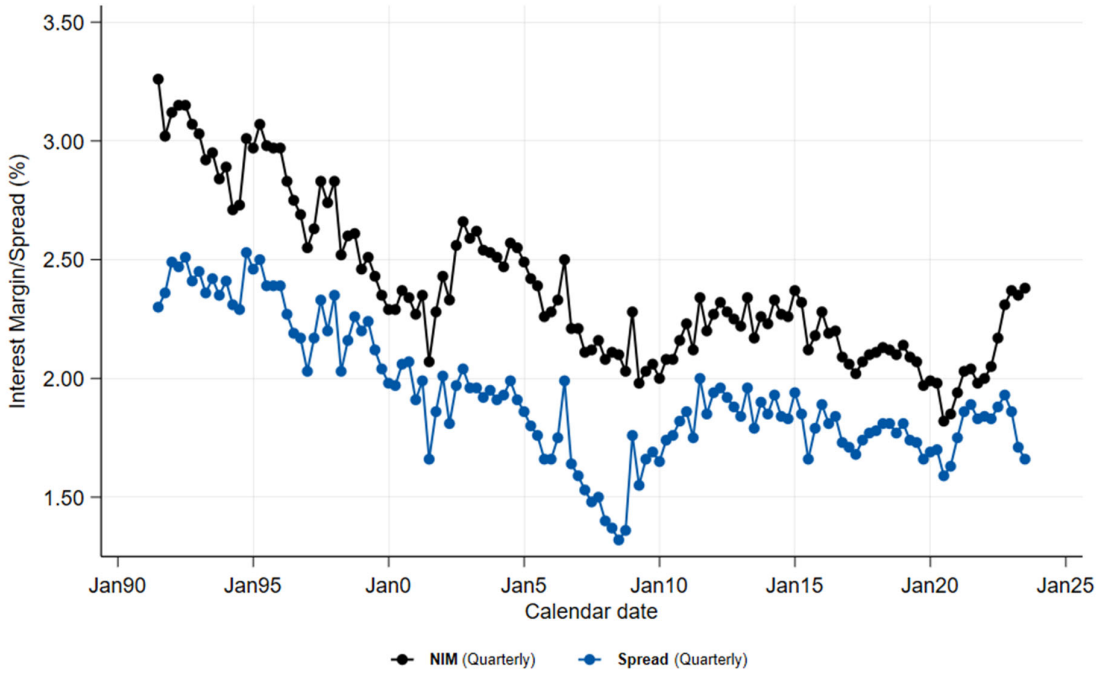
19. A bank's (or a country's) NIM will increase if either the spread term or the "free funding" term increases. And, all else equal, "free funding" will increase if:
    A. general interest rates (and therefore r_L) increase; or
    B. the bank's equity share (and therefore S_f) increases.
20. The intuition for this is that equity funding is "free" for the bank from an accounting perspective in terms of not having to pay interest on it. However, equity funding is not free from an

economics perspective. Therefore, NIM is not an economic measure of profit. Ignoring the cost of equity means a rise in general interest rates and/or equity funding can mechanically increase a bank's overall interest margin even when the bank maintains the spread on its products (i.e., r_A and r_L increase by the same amount, or do not change at all while the equity ratio changes).

21. This also means that international comparisons of NIM will show different NIMs even when the spread is the same, simply because the general level of interest rates differs between countries and/or the equity shares differ between countries. This means international comparisons of NIM are likely to be skewed. In particular, section 3.4 below shows that New Zealand's interest rates are high compared to the jurisdictions in the Commission's sample.

22. For an example of the difference between NIM and spread, Figure 2 below illustrates that the most recent increase in New Zealand banks' NIM (at the very right-hand end of the figure) was not accompanied by a corresponding increase in spread, indicating that "free funding" was the key driver of this increase.

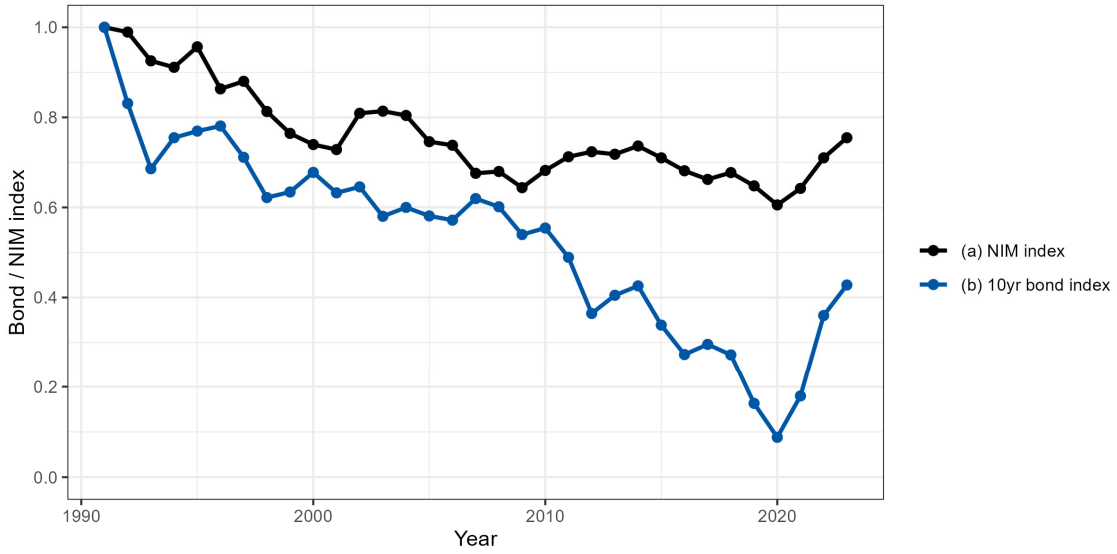
Figure 2: NIM vs spread for New Zealand banks, 1991-2023



Source: NERA analysis of RBNZ bank summary (S20) data.

23. General interest rates are particularly likely to affect NIM through the "free funding" effect. Figure 3 below shows that New Zealand's 10-year government bond rates from 1991 to 2023 follow a similar trend to banks' net interest margins over the same period. This graphs indexes both series to have a 1991 base year given they have different levels. The correlation coefficient between the two variables is 0.82.

Figure 3: New Zealand annual interest rates and bank NIMs, 1991-2023



Source: NERA analysis of RBNZ bank summary (S20) and wholesale interest rate (B2) data.

24. In general, considering a bank's spread is more likely to provide information about its actual margins. However, even an increase in spread does not necessarily reflect a real price rise, as spread is still an aggregate measure and can be driven by changes in a bank's portfolio mix, fee structure, and/or non-interest costs. To give an example of each:

    A. Portfolio mix: If there is a shift in borrower preferences towards choosing longer terms for fixing the interest rate on loans, which usually means paying a higher interest rate, the bank's spread will increase even if it has not changed the prices of any of its products because customers are now choosing more expensive products – perhaps to seek greater certainty;[11]

    B. Fee structure: If the bank simultaneously lowers its fees and its rates on deposit accounts (e.g., by offering a new zero-fee and zero-interest transaction account product), its spread will also increase even if the new product is ultimately cheaper for customers because of the fee reduction; and

    C. Non-interest costs: Spread is only a measure of interest margin, not overall margin. Therefore, if a banks' other costs increase (including the cost of equity funding, as discussed below at 25-26), increasing spread is one of the main options (aside from increasing fees or other income) for a bank to recover these costs.

25. For completeness, we note that spread can also be impacted by the equity share. Since shareholders generally require a higher rate of return on their investment than depositors or other creditors, equity is a particularly expensive form of funding for banks' lending activities (relative to deposits or wholesale funding). Therefore, increasing a bank's equity share can have the effect of increasing its funding costs, although some of this cost increase may be offset by the investors requiring a relatively lower return on the now-less-risky investment.[12] When introducing

[11] This effect might be offset to some degree by bank hedging.

[12] This is known as the Modigliani-Miller offset, after the Modigliani-Miller Theorem which finds that the enterprise value of a firm should be unaffected by how that firm is financed. See Modigliani and Miller, "The Cost of Capital, Corporation Finance and the Theory of Investment", *The American Economic Review* 48, no. 3 (1958), 261-297.

increased capital requirements in 2019, the RBNZ concluded that this offset was incomplete (and thus expected the increased capital requirements to increase the cost of capital).[13]

26. The main mechanism by which a bank might pass through non-interest-related funding costs to customers is by increasing its spread. Indeed, the RBNZ predicted that the net effect of its 2019 reform of capital requirements would cause banks to increase lending margins (i.e., bank spreads) by 20 to 40 basis points.[14]

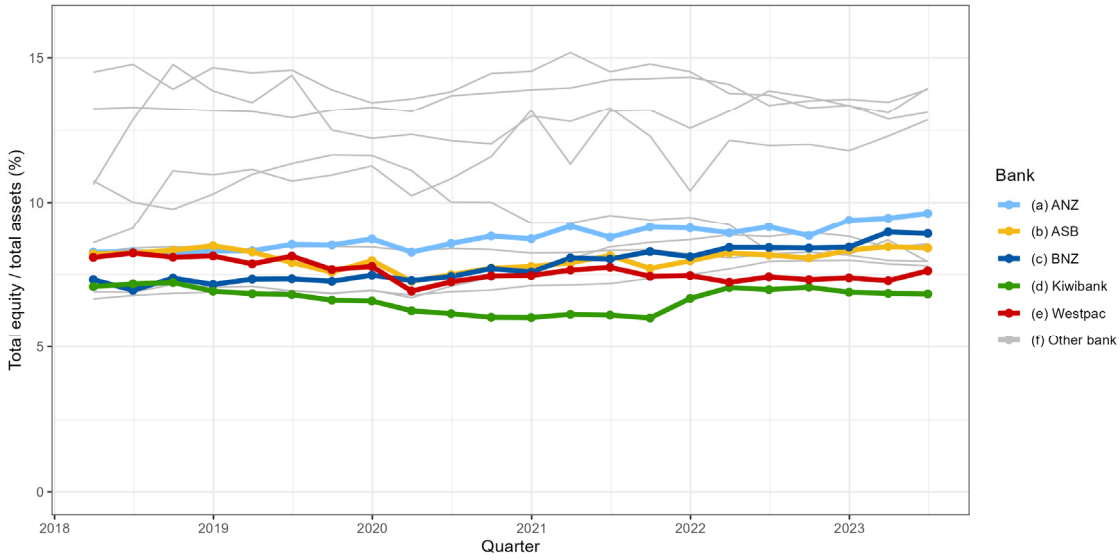
2.4. How equity funding can affect ROE comparisons

27. As noted at [C8] of the PIP, ROE depends on firm leverage such that a high ROE may simply reflect limited equity capital. Or, conversely, a high equity share will deflate a bank's ROE, all else equal. Therefore, accounting for any variation in equity shares is especially important when interpreting ROE (and ROA).

28. Figure 4 below presents a comparison of New Zealand banks' equity share over 2018 to 2023, with the four largest banks and Kiwibank highlighted. Note that Bank of Baroda and Bank of India are not pictured due to their very high equity shares (both always over 30%).

29. This figure shows that even between the largest banks in New Zealand, the equity shares vary. Furthermore, the equity shares of the four largest banks are at the lower end compared to other New Zealand banks. This can at least partially explain why their ROEs are typically higher (see Figure 5 below).

Figure 4: New Zealand banks by equity share (total equity / total assets), Q1 2018 – Q2 2023

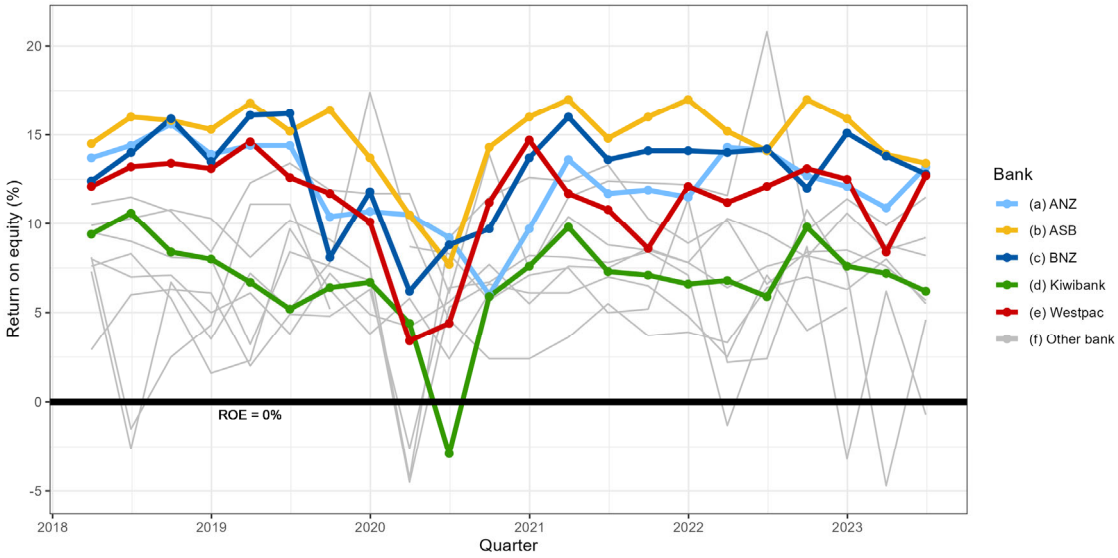


Source: NERA analysis of RBNZ Bank Financial Strength Dashboard data. Not shown: Bank of Baroda and Bank of India (both outside top of scale).

[13] RBNZ, *Capital Review Paper 4: How much capital is enough?,* January 2019, para 73.

[14] Geoff Bascand, *Safer banks for greater wellbeing*, speech delivered on behalf of RBNZ on 26 February 2019.

Figure 5: New Zealand banks by return on equity, Q1 2018 – Q2 2023



Source: NERA analysis of RBNZ Bank Financial Strength Dashboard data. Not shown: Bank of Baroda and Bank of India (to ensure consistency with Figure 4).

30. Figure 4 above illustrates that there is already variation in equity shares across New Zealand banks. There is likely to be significantly more variation across different jurisdictions due to their own central bank requirements and individual bank funding strategies.

31. Different jurisdictions may also form their own view on exactly which types of capital qualify for each quality class (e.g., 'Tier 1'). For example, the RBNZ's decision paper for its 2019 reforms of capital requirements discussed how "under the international bank capital standards (in particular the 'Basel III' rules), a proliferation of funding instruments have been proposed and accepted as Tier 1 capital around the world" and noted it "raises the question of what Tier 1 instruments, other than ordinary shares, are appropriate for New Zealand."[15]

32. The net effect is that any cross-country comparison of ROE should ideally account for potential differences in equity shares and the composition of the equity funding that is being used as the denominator.

[15] RBNZ, *Capital Review – Decisions 2019,* December 2019.

3. The PIP underestimates the comparative riskiness to Australian banks of investing in New Zealand banks

3.1. Overview

33. The PIP's key Attachment C finding is that profitability measures for New Zealand banks are high compared to "international peer countries".

34. The PIP uses two techniques to assess whether risk to shareholders might justify these relatively high measures:

    A. Comparative volatility of earnings (Figure 11, Table C6 and Table C7); and

    B. Comparative equity risk premium.

35. However, neither approach is robust.

36. Furthermore, the PIP does not:

    A. Acknowledge that even the "risk free" interest rate in New Zealand is comparatively high; nor

    B. Consider the possibility that the Australian bank shareholders (CBA in ASB's case) are taking on greater risk than would be normal for bank shareholders.

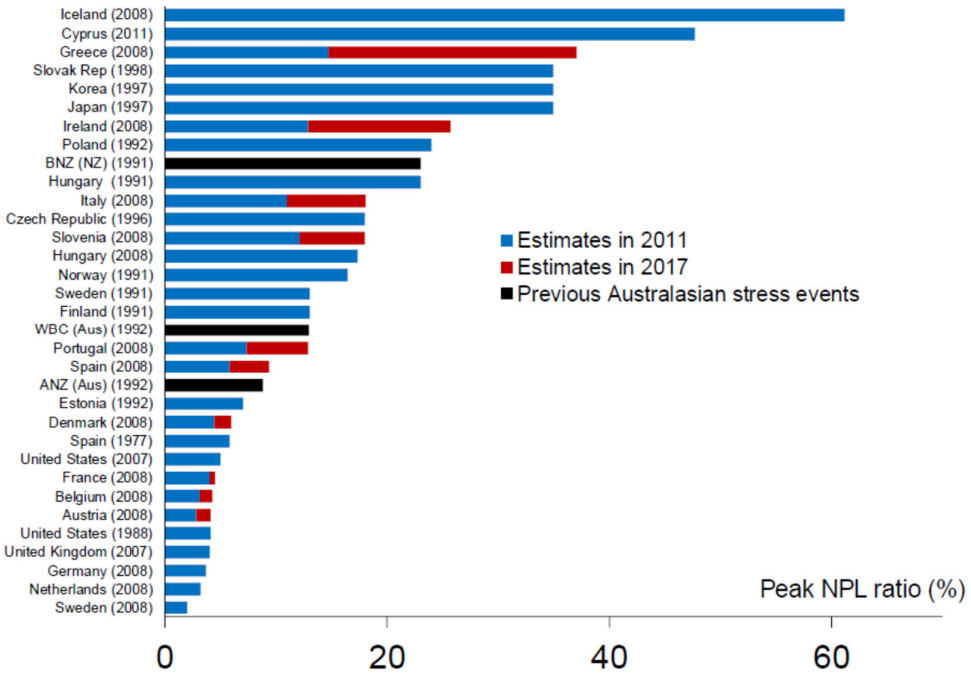
3.2. Measuring volatility of earnings

37. Banking crises are relatively rare (as illustrated for the US in Appendix A), but potentially very serious for shareholders, creditors and economies more generally.[16]

38. Banking crises also occur at different times in different countries. This is illustrated by Figure 6 below, which is taken from the RBNZ's 2019 paper, "Capital Review Paper 4: How much capital is enough?"

[16] See, e.g., Boissay, Frédéric, Fabrice Collard, and Frank Smets. "Booms and banking crises." *Journal of Political Economy* 124, no. 2 (2016): 489-538.

Figure 6: Peak non-performing loan ratios (percent) for banking crises in 1970-2017



Source: RBNZ, Capital Review Paper 4 (2019). RBNZ cites Laeven and Valencia (2012, 2018) and annual reports of BNZ, WBC, and ANZ.

39. New Zealand has not had a banking crisis since the late 1980s[17] (reflected by the 1991 BNZ entry above) and escaped relatively unscathed from the GFC. For example, in a 2018 speech RBNZ Deputy Governor Geoff Bascand noted that New Zealand's financial sector "has weathered the GFC better than most"[18]. A 2012 paper by then RBNZ Governor Alan Bollard (with Tim Ng) states that New Zealand "escaped the worst of the financial crisis".[19]

40. These features are illustrated in Figure 7 below, taken from a RBNZ explanatory note.[20]

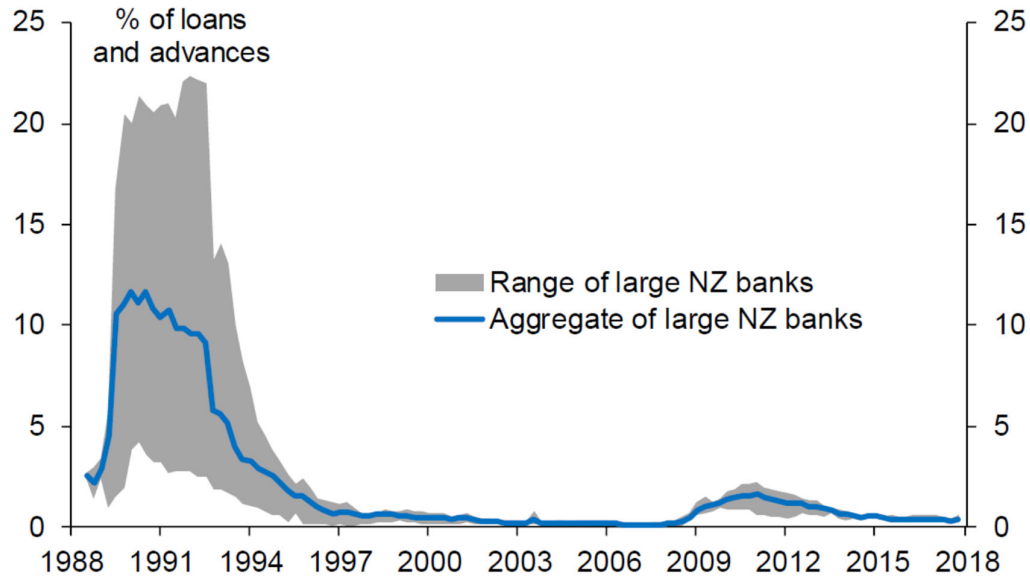
[17] Chris Hunt, "Banking crises in New Zealand – an historical perspective", *RBNZ Bulletin* 72, no.4 (2009): 26-41.

[18] RBNZ, *Financial Stability – risky, safe or just right?*, 13 November 2018, available at https://www.rbnz.govt.nz/news/2018/11/financial-stability-risky-safe-or-just-right

[19] Alan Bollard and Tim Ng, "Learnings from the Global Financial Crisis", *RBNZ Bulletin* 75, no. 3 (2012): 57-66.

[20] RBNZ, *Explanatory note on portfolio risk modelling in the New Zealand context*, January 2019, available at https://www.rbnz.govt.nz/-/media/project/sites/rbnz/files/regulation-and-supervision/banks/capital-review/capital-review-explanatory-note-on-portfolio-risk-modelling-in-the-new-zealand-context.pdf

Figure 7: Impaired assets as a share of gross loans and advances, large New Zealand banks, 1988-2017



Note: "large NZ banks" includes ANZ, ASB, BNZ, National Bank, and Westpac.

Source: RBNZ, Explanatory note on portfolio risk modelling in the New Zealand context (2019).

41. In contrast, as illustrated by Figure 6 many of the PIP's comparator countries had crises during the GFC. These also had long-lasting financial and real effects.[21]

42. This means that because the PIP's analysis of earnings volatility only goes back to 2010 (Tables C6 and C7)[22] or 2000 (Figure 11), the results are directionally biased in favour of a finding that New Zealand volatility is low. Indeed, when explaining what is Figure 11 of the PIP, the RBNZ (from whom Figure 11 is taken) states (page 24, emphasis added):

> *This suggests that risk does not fully explain the relatively higher returns of New Zealand banks,* ***although it should be noted that this has been a period of ongoing economic growth and strong housing market performance****.*

43. To assess comparative risk properly, a much longer time series would be required.

3.3. New Zealand's equity risk premium

44. In the PIP, the Commission uses Professor Damodaran's estimates of the equity risk premium (**"ERP"**) to assess whether the risk to shareholders might justify the relatively high ROE measures for New Zealand banks. The Commission finds there is little correlation between ERP and ROE.

45. What is striking from Professor Damodaran's analysis is that the ERP for New Zealand is the same as that for the US, Canada and Australia and lower than the ERP for the UK. On its face, this is surprising, given the smallness and relative lack of liquidity of the New Zealand equity

[21] For example, an OECD report finds that countries that experienced a banking crisis during the GFC were still experiencing a lower potential output in 2014, the time of the study. See: https://www.oecd.org/economy/growth/The-effect-of-the-global-financial-crisis-on-OECD-potential-output-OECD-Journal-Economic-Studies-2014.pdf.

[22] It can be seen from Figure 1 that the GFC-associated low point for New Zealand bank ROE was in 2009.

market compared to these other countries.[23] Indeed, in his paper Professor Damodaran states that a factor affecting the ERP is equity market liquidity.

46. In the time available to prepare this report, we have not been able to reconcile this. However, we do wonder if it might be a function of Professor Damodaran's methodology. In particular, the methodology adopted by Professor Damodaran results in a country's relative ERP being solely driven by its sovereign credit rating and the default spread estimated from the rating, such that any two countries with the same sovereign credit rating will have the same ERP.

47. In his updated report for estimating a comparable ERP for 157 different countries,[24] Professor Damodaran calculates the ERP for each country as the sum of the "base premium for mature equity markets" and the "country risk premium".

48. Professor Damodaran uses the US equity market as the benchmark for a mature market and 4.24% (the geometric average premium for stocks over Treasury bonds in the US between 1928-2021) is applied to all countries as the "base premium for mature markets".

49. The country risk premium is intended to account for the extra risk in a specific market and is based on the country's default spread charged on a government bond. However, the default spread is not country specific - rather it is simply a function of the sovereign credit rating.[25] The default spread for each country is then multiplied by the average relative volatility of equity *in emerging markets* compared to the volatility of the government bond spread of *emerging markets* (set at 1.16 for 2021).

$$Country\ risk\ premium = Default\ spread * \left(\frac{Std\ deviation\ of\ emerging\ market\ index\ (for\ equity)}{Std\ deviation\ of\ emrging\ market\ public\ sector\ bond\ index}\right)$$

50. Note that this differs from the explanation at [C71.2] of the PIP, which implies that the default spread is multiplied *"by the relative equity market volatility* ***for that market*** *[emphasis added]"*. In fact, the multiplier is the same for every country that the ERP is calculated for. Therefore, as already noted, this methodology gives the same ERP for any country that has the same sovereign credit rating.

51. Because New Zealand has a sovereign rating of Aaa, it is given a default spread of 0 and thus is assumed to have no country-specific risk. This has led to New Zealand, alongside 12 other countries (including the US) that also have a sovereign rating of Aaa, being assigned the same ERP, equating to the estimated base premium of mature markets, of 4.24% (for 2021).

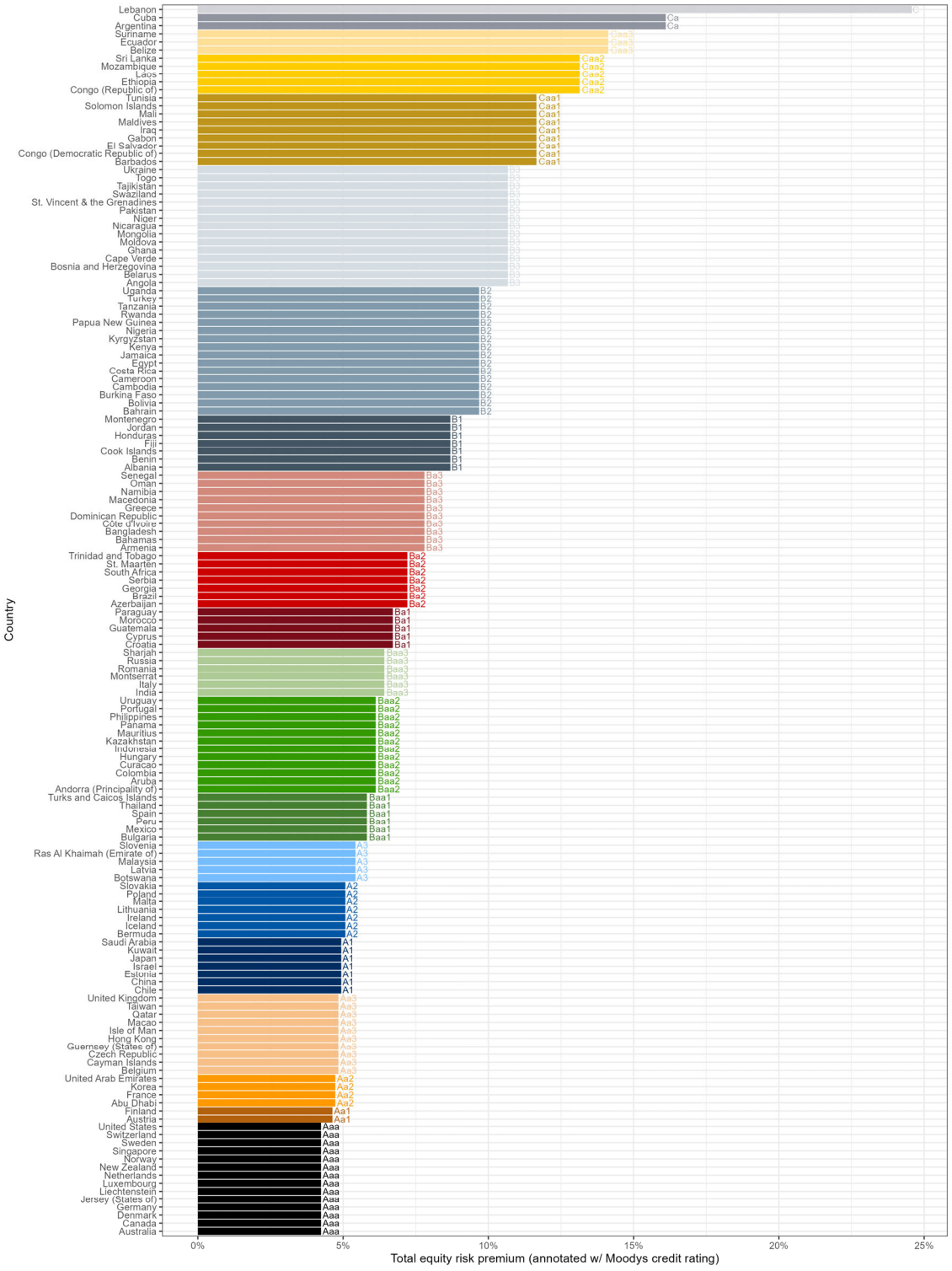
52. This lack of variation amongst countries with the same sovereign rating can be seen graphically in the figure below, which plots the ERP for every country in Professor Damodaran's sample, with colour coding for the sovereign credit rating.

[23] For evidence about the relative illiquidity of New Zealand's equity market compared to these countries, see Table 2 of Ma, Rui, Hamish D. Anderson, and Ben R. Marshall. "Risk perceptions and international stock market liquidity." *Journal of International Financial Markets, Institutions and Money* 62 (2019): 94-116.

[24] Damodaran, A., *Equity Risk Premiums (ERP): Determinants, Estimations and Implications = The 2023 Edition*, March 2023.

[25] Professor Damodaran calculates the default spread for credit ratings that are not Aaa by averaging credit default swap spreads and sovereign US$ bond spreads by rating class. This is updated annually. See the workings for Professor Damodaran's ERP estimations which can be found at, https://pages.stern.nyu.edu/~adamodar/.

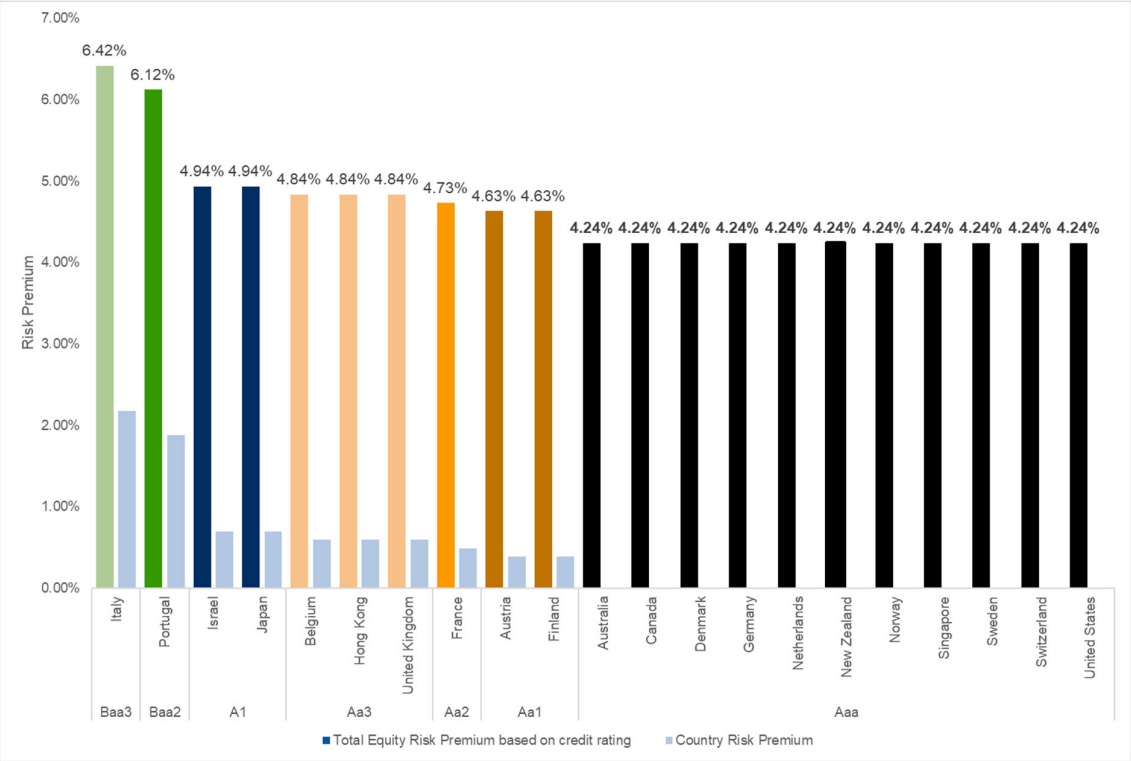
Figure 8: Total country equity risk premiums as calculated by Damodaran, 2021



Source: NERA analysis of Damodaran's 2021 estimates for equity risk premium.

53. Turning to the countries in the Commission's sample, Figure 9 below shows the ERPs for that sample with colour coding by sovereign credit rating.

Figure 9: Equity risk premium and country specific risk for countries in Figure C13 of the PIP as calculated by Damodaran, 2021



Source: NERA analysis of Damodaran's 2021 estimates for equity risk premium.

54. As the figure above shows, there is little variation in the ERPs for the Commission's sample, because there is little variation in sovereign credit ratings.

55. Given this, the Commission's analysis is not testing whether the differences in bank ROEs are explained by differences in the ERP - it is testing whether differences in banks ROEs are explained by differences in sovereign credit ratings.

56. In this regard, we note that Professor Damodaran does not give any substantive reason as to why he chooses Moody's sovereign credit rating over S&P or Fitch when calculating the ERP. This matters because there is not always alignment between credit ratings agencies. In 2021, S&P rated New Zealand AA+,[26] which is the second highest rating and is equivalent to Moody's rating of Aa1. Not having the highest rating would have resulted in New Zealand having a positive country-specific premium (because the default spread would be greater than zero) and would have also altered the ERP for other countries in the sample used in the PIP which had S&P ratings that did not correspond to their Moody's ratings.

57. Presumably on Professor Damodaran's own logic, the cost of government debt in countries with the same sovereign credit rating should also be the same. But as we discuss in the next section, the cost of the New Zealand government's debt is generally higher than that of the US, Canada and Australia, despite having the same (Moody's) credit rating. Furthermore, the cost of the New

[26] From Professor Damodaran's dataset for ERP estimations, available at https://pages.stern.nyu.edu/~adamodar/.

Zealand government's debt is also generally higher than that of the UK, despite the UK having a lower sovereign credit rating than New Zealand.

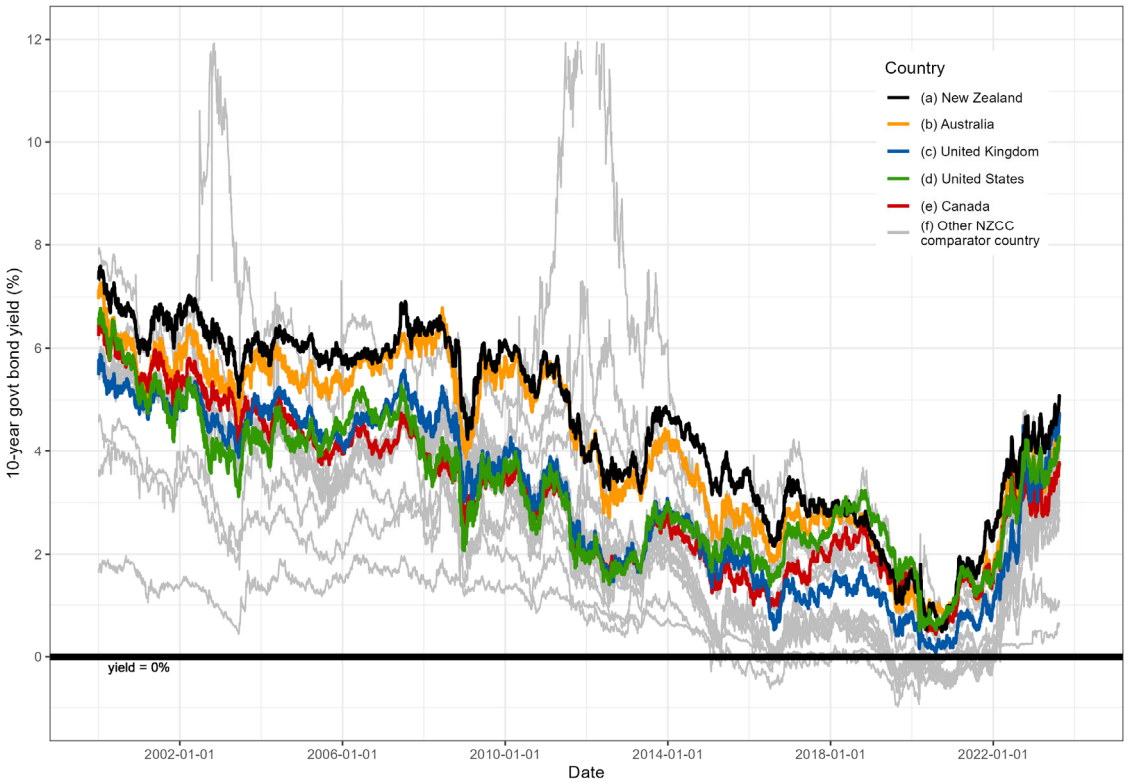
58. This calls into the question the robustness of the analysis conducted for Figure C13 of the PIP. Figure C13 seeks to understand whether variations in ERPs drive differences in observed returns. However, the Damodaran analysis assumes there is no difference in the ERP between countries whose government bonds have the same credit rating. This methodology is therefore not fit for purpose for the question the Commission is seeking to answer, since it assumes away country specific risk factors.

3.4. New Zealand's risk-free rate

59. A common measure of a country's risk-free rate is its 10-year government bond yield.[27]

60. As shown in Figure 10 below, New Zealand's risk-free rate has typically been at the high end of the Commission's 21 comparator countries over the period 2000-2023. In particular, it has remained above Australia's throughout most of this period (albeit the margin between the two countries narrows after 2018).

Figure 10: Daily 10-year govt bond yields by NZCC comparator country, 2000-2023



Source: NERA analysis of Datastream 10-year government bond data.

61. All else equal, a high risk-free rate increases the opportunity cost of capital and so increases the required return on any given investment. Therefore, some of the variation in the returns of New Zealand banks compared to other countries' banks can likely be explained by New Zealand's higher risk-free rate.

[27] See NZCC, *Market study into the retail grocery sector – final report*, 8 March 2022, para B14.

3.5. The role of the Australian bank shareholders

3.5.1. Risk allocation

62. We note there is no analysis in Attachment C of the PIP of the implications of Australian bank ownership of the four largest New Zealand banks beyond tax issues (which we return to below). In our view, Australian banks have stronger incentives than shareholders in standalone banks, and the ability, to prevent or manage crises in their subsidiaries. The Australian banks have these incentives because (among other things) they want to protect their trans-Tasman brands and because of potential spillovers of confidence in the bank as a whole across the Tasman.

63. Indeed, we note that the BNZ banking crisis in the late 1980s was associated with more general pressure on the financial system at the time,[28] yet only the New Zealand government-owned BNZ required a bail out, with the Australian-owned banks faring better.

64. The outcome is that an Australian-owned New Zealand subsidiary is more insulated from shocks than a standalone New Zealand bank, all else equal. This likely improves the New Zealand subsidiary's ability to access funding and confers resilience and stability on the New Zealand banking sector.

65. There is a cost of this to the Australian bank shareholders, which would raise the shareholders' required return on equity, all else equal.

66. For an example of this dynamic, we refer to the following text from the 10 February 2023 Treasury report on windfall taxes ([10, footnote omitted, emphasis added]):[29]

> *It is unclear why the large New Zealand banks' relatively elevated profitability has not been eroded by competition between the large New Zealand banks (i.e. why haven't the large banks' relatively low costs driven interest rate margins and fees down further?). One possibility is that the large banks' profits are not supernormal, if current levels of profitability are necessary to compensate the providers of equity for an elevated risk premium associated with general New Zealand equity investments.* ***Credit reporting agencies note the large New Zealand banks would have credit ratings 2-3 notches lower if not for the expectation of financial support from their parent bank. The parent bank, therefore, may require a higher return on their New Zealand banking operations to compensate for the higher risk.***

67. In other words, the four largest New Zealand banks' observed "external" credit ratings might be 2-3 notches higher than their "standalone" credit ratings due to the insulation effect. To quantify this benefit, we consider the marginal effect on borrowing costs of moving between an AA- credit rating (the external S&P rating of all four banks) and an A or A- rating (2-3 notches lower).[30]

68. Table 1 below is taken from a July 2009 Treasury report and shows the deposit guarantee fee implemented[31] for different credit ratings and also the underlying data used to set these fees (being the spread between US bank bonds and treasury bills, which can be used as an estimate of the different borrowing costs for different credit ratings). While this analysis was carried out in 2009 and therefore is not current, it is still informative.[32]

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[28] Chris Hunt, "Banking crises in New Zealand – an historical perspective", *RBNZ Bulletin* 72, no.4 (2009): 26-41.

[29] New Zealand Treasury, *Windfall gains in the New Zealand banking sector, and responses*, Report No. T2023/53, 10 February 2023.

[30] For a full list of NZ bank credit ratings, see https://www.rbnz.govt.nz/regulation-and-supervision/cross-sector-oversight/registers-of-entities-we-regulate/registered-banks-in-new-zealand, accessed 22 August 2023.

[31] Note that this table contain Treasury's *recommendations*. These recommended fees were implemented - see http://www.treasury.govt.nz/economy/guarantee/retail/qanda/institutions/. This particular retail deposit insurance scheme was subsequently withdrawn.

[32] New Zealand Treasury, *Cabinet paper on extending the retail deposit guarantee scheme*, Report No. T2009/1791, 31 July 2009. Note the Treasury states on page 2: "While the fee structure is not set on a fully commercial basis, the fee levels are

Table 1: Recommended deposit guarantee fee schedule for different credit ratings (excerpt from July 2009 Treasury report)

	Recommended option		Historical market rates			Current market rates
Credit rating	**Finance Companies (bpts)**	**Banks, Credit Unions, Building Societies, PSIS (bpts)**	**B-bill minus T-Bill** (for AA at 20bp) scaled up based on current market prices for US financials	**10 year median option adjusted spreads**	**Historic US commercial rates (6 mths)**	**Current US commercial rates (6 mths)**
AAA +/-	15	15	20-30	50-60	30	140
AA +	15	15		60-70		
AA	15	15				
AA-	20	15				
A+	25	20	40-60	70-80	40	250
A	30	20				
A-	40	20				
BBB+	60	25	70-100	80-150	60	490
BBB	80	30				
BBB-	100	40				
BB+	120	50	120-150	-	100	630
BB	150	60				

Source: New Zealand Treasury, Cabinet Paper on extending the retail deposit guarantee scheme (2009).

69. The fourth column of Table 1 suggests that a bank with an AA- credit rating faces borrowing costs of 20-30 basis points higher than the government, whereas a bank with an A or A- credit rating pays at least 40-60 basis points more than the government to borrow. We infer from this that upgrading from an A/A- to an AA- credit rating reduces borrowing costs by 10-40bps.

70. A more updated conversion of ratings to spreads is conducted by Professor Damodaran in his report for estimating equity risk premiums.[33] Based on his estimations as shown in Table 2 below, an AA- S&P credit rating has a corporate default spread of 1.04% and A and A- ratings have corresponding default spreads of 1.42% and 1.62% respectively, equating to a cost saving of approximately 40 to 60 basis points which is at the top end and higher than the 2009 Treasury range.

set relative to the risk of default (based on credit ratings) and reflect the likely loss given default of the different types of non-bank deposit taker."

[33] Damodaran, A., *Equity Risk Premiums (ERP): Determinants, Estimations and Implications - The 2023 Edition*, March 2023, Table 16.

Table 2: Default spreads by credit rating class, January 2023 (excerpt from Damodaran ERP report)

S&P Bond Rating	*Moody's Sovereign Rating*	*Sovereign Default Spread*	*Corporate Default Spread*
AAA	Aaa	0.00%	0.70%
AA+	Aa1	0.49%	0.77%
AA	Aa2	0.60%	0.85%
AA-	Aa3	0.73%	1.04%
A+	A1	0.86%	1.23%
A	A2	1.04%	1.42%
A-	A3	1.47%	1.62%
BBB+	Baa1	1.96%	1.81%
BBB	Baa2	2.33%	2.00%
BBB-	Baa3	2.69%	2.21%
BB+	Ba1	3.06%	2.42%
BB	Ba2	3.68%	3.13%
BB-	Ba3	4.40%	3.84%
B+	B1	5.51%	4.55%
B	B2	6.73%	5.26%
B-	B3	7.95%	7.37%
CCC+	Caa1	9.17%	9.47%
CCC	Caa2	11.02%	11.57%
CCC-	Caa3	12.24%	13.68%
CC+	Ca1	13.75%	14.52%
CC	Ca2	14.68%	15.77%
CC-	Ca3	15.25%	16.53%
C+	C1	16.25%	17.51%
C	C2	17.50%	18.50%
C-	C3	19.00%	20.00%

Source: Professor Damodaran, annual update paper on equity risk premiums (2023).

71. In summary, an Australian-owned New Zealand subsidiary is more insulated from shocks than a standalone New Zealand bank, all else equal. This likely improves the New Zealand subsidiary's ability to access funding and confers resilience and stability on the New Zealand banking sector.

72. There is a cost of this to the Australian bank shareholders, which would raise the shareholders' required return on equity, all else equal.

3.5.2. Utilisation of imputation credits

73. [C79] of the PIP refers to the possibility that tax treatment of Australian shareholders might explain the relative performance of the New Zealand banking sector. We think this is a relevant factor. As the RBNZ has stated:[34]

> *The Australian shareholders of the large New Zealand banks may require higher risk-adjusted returns on equity than shareholders of other banks. This is possible due to differences in the tax treatment of returns to shareholders in New Zealand and Australia. In particular, imputation credits received by Australian shareholders on dividends from New Zealand banks are not transferrable to the Australian*

[34] RBNZ, *Financial Stability Report*, May 2023, p. 24.

> *tax system.[13] In this instance, large banks would be expected to be more profitable than those in the rest of the sector, even in a competitive market.*

74. Footnote 13 reads:

> *Australian shareholders receive imputation credits with dividends from Australian banks, which reduces their tax burden and increases their after-tax return. However, the imputation credits received on dividends from New Zealand banks are not transferrable to the Australian system. Hence, Australian shareholders in banks with New Zealand operations require a higher return on equity from the New Zealand operations to receive the same after-tax return as the return on Australian operations.*

75. This issue is considered by Australian economic regulators who apply a version of the capital asset pricing model (**"CAPM"**) that does not assume imputation credits can be fully utilised[35] (in contrast to the Commission, which uses a version of the CAPM that assumes imputation credits are fully utilised). The parameter that captures utilisation is referred to in the Australian discourse as 'gamma'. Gamma is a multiplier that represents the "value of imputation credits", which is determined by the rate at which they are *distributed* and *utilised*. All else equal, a lower utilisation of imputation credits will result in a lower gamma value, and accordingly a higher ***pre-tax*** cost of capital.

76. Accordingly, we might expect, all other things being equal, the pre-tax returns of New Zealand banks to be higher than Australian banks, as the pre-tax cost of equity for a New Zealand subsidiary of an Australian bank would be higher than the pre-tax cost of equity for an Australian bank with Australian shareholders that can utilise imputation credits. In effect, the same post-tax return would require a higher pre-tax return for investors that cannot utilise imputation credits.

77. To illustrate the materiality of an inability to utilise imputation credits, we consider the impact of varying gamma in a recent determination by the Australian Energy Regulator (**"AER"**) of the weighted-average cost of capital of an Australian electricity distributor. [36]

    A. In its determination, the AER applied a gamma of 0.59 and the pre-tax nominal cost of equity was estimated at 5.74%.

    B. Applying a gamma of 0 (i.e., no distribution or utilisation of imputation credits) would have instead resulted in a cost of equity of 7.12%.

    C. Applying a gamma of 1 (i.e., full distribution and utilisation of imputation credits) would have instead resulted in a cost of equity of 5.04%.

78. Put simply, an inability to utilise imputation credits would have hypothetically increased the cost of equity by 41% (2.08pp) compared to a full utilisation scenario. Although these calculations were conducted in a very different context (a regulated electricity distribution network), we mention them here to provide a sense for the significance of tax treatment.

[35] This is known as the "Officer model". See Lally, Martin. "Regulatory revenues and the choice of the CAPM: Australia versus New Zealand." *Australian Journal of Management* 31, no. 2 (2006): 313-331.

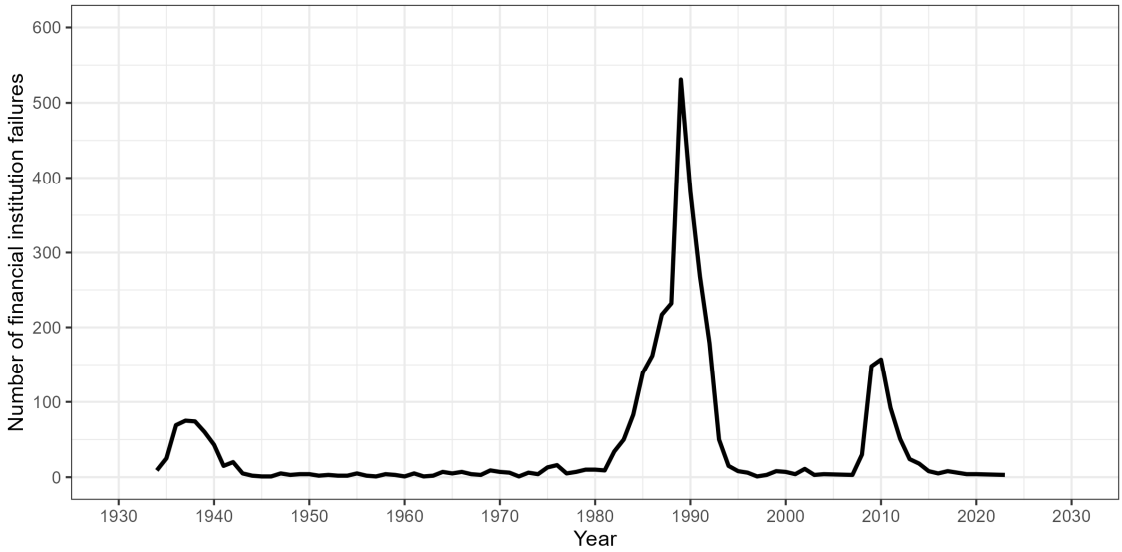
[36] AER, *CitiPower distribution determination – 2021-26 – Final decision – Post-tax revenue model*, 30 April 2021. The calculations reported here were done by NERA using a spreadsheet published on the AER's website (the AER's original calculations reported WACC and did not vary gamma).

Appendix A. U.S. financial institution failures

79. Here we include some supplementary analysis to demonstrate that banking crises are relatively rare, but can be very serious in magnitude.

80. Figure 11 below illustrates the number of U.S. financial institution failures each year from 1934 to 2023 (including all FDIC-insured U.S. commercial and savings banks, but not including credit unions). It shows three mass failure events, roughly corresponding to the Depression-era recession of 1937-38; the Savings & Loan Crisis that peaked in the late 1980s; and the GFC of the late 2000s.

Figure 11: Annual U.S. financial institution failures, 1934-2023



Source: NERA analysis of FDIC BankSuite bank failures and assistance data.

81. Figure 12 plots these same failures according to nominal deposit value. It shows the GFC was by far the most significant mass failure event in terms of the *size* of the failed banks (although adjusting for inflation would somewhat flatten this spike relative to earlier years). It also reveals a new spike in 2023 caused by the failures of three relatively large U.S. banks (First Republic Bank, Signature Bank, and Silicon Valley Bank).

Figure 12: Deposit value of failed U.S. financial institutions (nominal), 1934-2023

Source: NERA analysis of FDIC BankSuite bank failures and assistance data.

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