



Grocery Market Study: Review of the NZCC Draft Report

Woolworths New Zealand Limited

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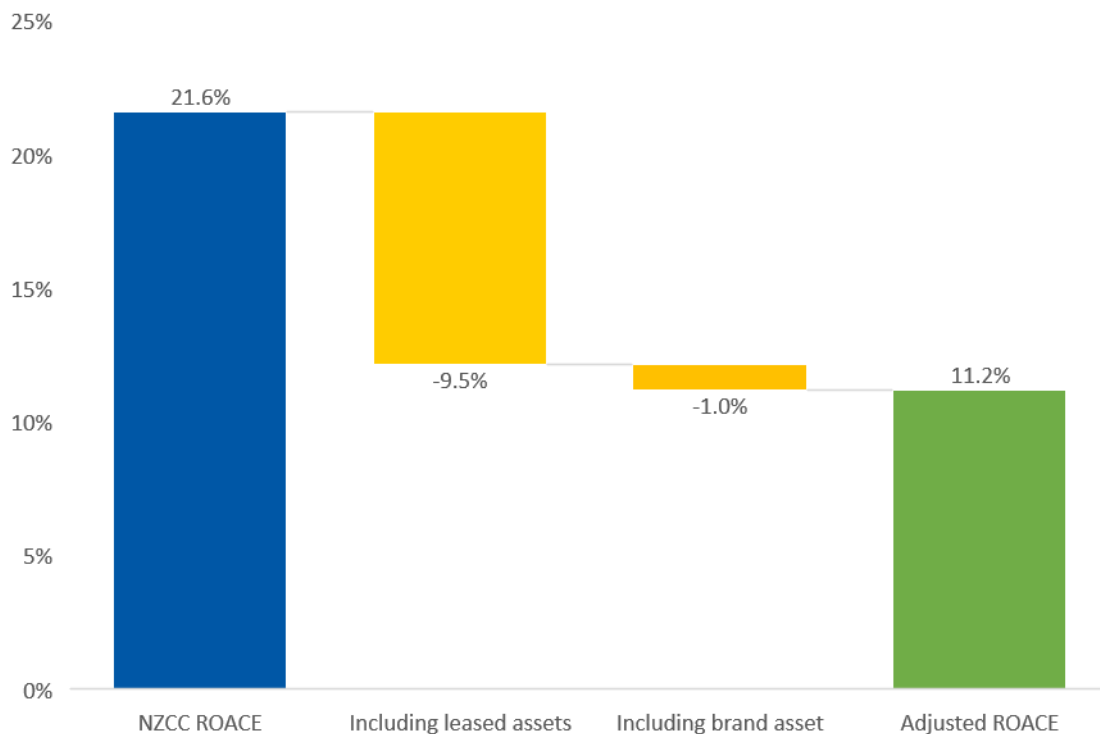
Executive Summary

- On 29 July 2021, the New Zealand Commerce Commission (“the NZCC”) released the draft report from its market study into the retail grocery sector. We have been asked by Woolworths New Zealand Limited (“WWNZ”) to review two particular aspects of the NZCC’s draft report:
 - The profitability assessment; and
 - The international price comparisons.
- Our findings are summarised below.

The NZCC’s ROACE analysis has overstated WWNZ’s profitability

- If the economic value of assets is not accurately measured, the return on average capital employed (“ROACE”) is an unreliable measure for inferring excess profits:
 - This has been recognised by overseas competition agencies such as the Australian Competition and Consumer Commission (“ACCC”), who are cautious in their application of return on capital measures (and in the case of the ACCC’s 2008 grocery inquiry, specifically placed little weight on this type of analysis).
 - For heavily depreciated assets, ROACE can be above the weighted average cost of capital (“WACC”) even if there are no excess profits being earned.
 - Empirical evidence consistent with these problems includes:
 - There is no statistical relationship between the NZCC’s price benchmarking and ROACE findings, suggesting higher prices represent higher costs, and/or there are problems with one or both measures.
 - Independent analysis by Armillary Capital of return on capital employed (“ROCE”) for New Zealand firms shows wide variation in ROCE as well as ROCE in excess of a reasonable WACC estimate for firms that would be considered to be operating in competitive markets.
 - The NZCC’s sample of comparator firms also displays a very large range for ROACE.
- The NZCC’s ROACE calculation for WWNZ is very sensitive to the treatment of goodwill, changing from 6.4 percent to 24.2 percent simply by removing it. The size of WWNZ’s goodwill and its impact means it is not appropriate to assume it entirely reflects market power rents.
- By ignoring the value of leased assets when calculating ROACE, the NZCC has materially understated the value of the assets employed to provide grocery services in New Zealand and therefore materially overstated the ROACE. An illustrative calculation including leased assets results in the calculated ROACE for WWNZ dropping from 21.6 percent¹ to 12.2 percent.
- WWNZ’s brand assets have also been inappropriately excluded. Including brand assets further reduces the ROACE to 11.2 percent. The cumulative impact of these two adjustments is shown in Figure 1 below.

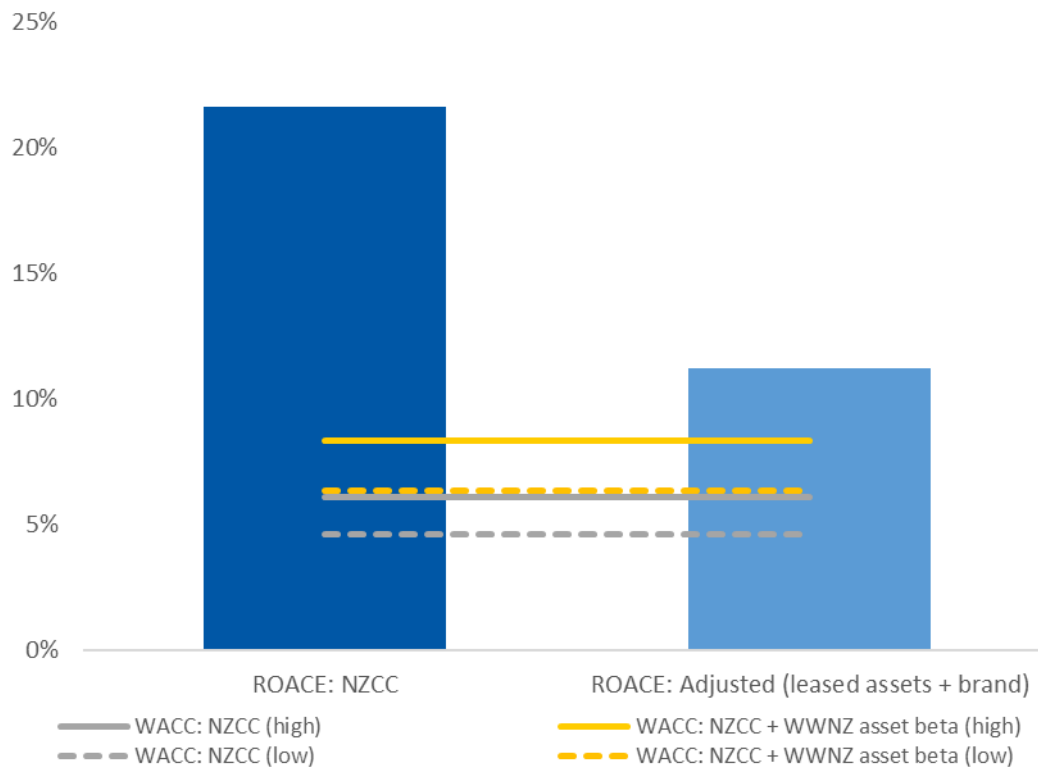
¹ Being the NZCC calculation of 24.4 percent after making an adjustment for the market value of land and buildings.

Figure 1: Cumulative impact on ROACE of including brands and leased assets

Source: NERA analysis, NZCC WWNZ ROACE Model.

The NZCC has understated WWNZ's cost of capital

- The NZCC has ignored the WACC calculation and inputs used by Woolworths Australia (“WWAU”) to set the WACC for WWNZ for commercial purposes independent of the market study. Disregarding this estimate means the NZCC either considers:
 - It is better placed to estimate WACC than WWAU, despite WWAU having a multi-billion-dollar investment in WWNZ to manage; or
 - WWAU has incentives to bias the WACC upwards.
- There is no reason to believe that WWAU has an incentive to bias upwards the WACC it uses for commercial purposes.
- Using the asset beta that has been set for WWNZ by WWAU with the NZCC's WACC parameters results in the WACC range increasing, from:
 - 4.6 percent to 6.1 percent; to
 - 6.4 percent to 8.3 percent.
- The result of using the beta set by WWAU for WWNZ and our adjustments to the ROACE calculation to include leased assets and brands are shown Figure 2 below.

Figure 2: Revised WWNZ ROACE and WACC ranges, average 2015–2019

Source: NERA analysis, NZCC WWNZ ROACE Model, NZCC WACC Estimation Model.

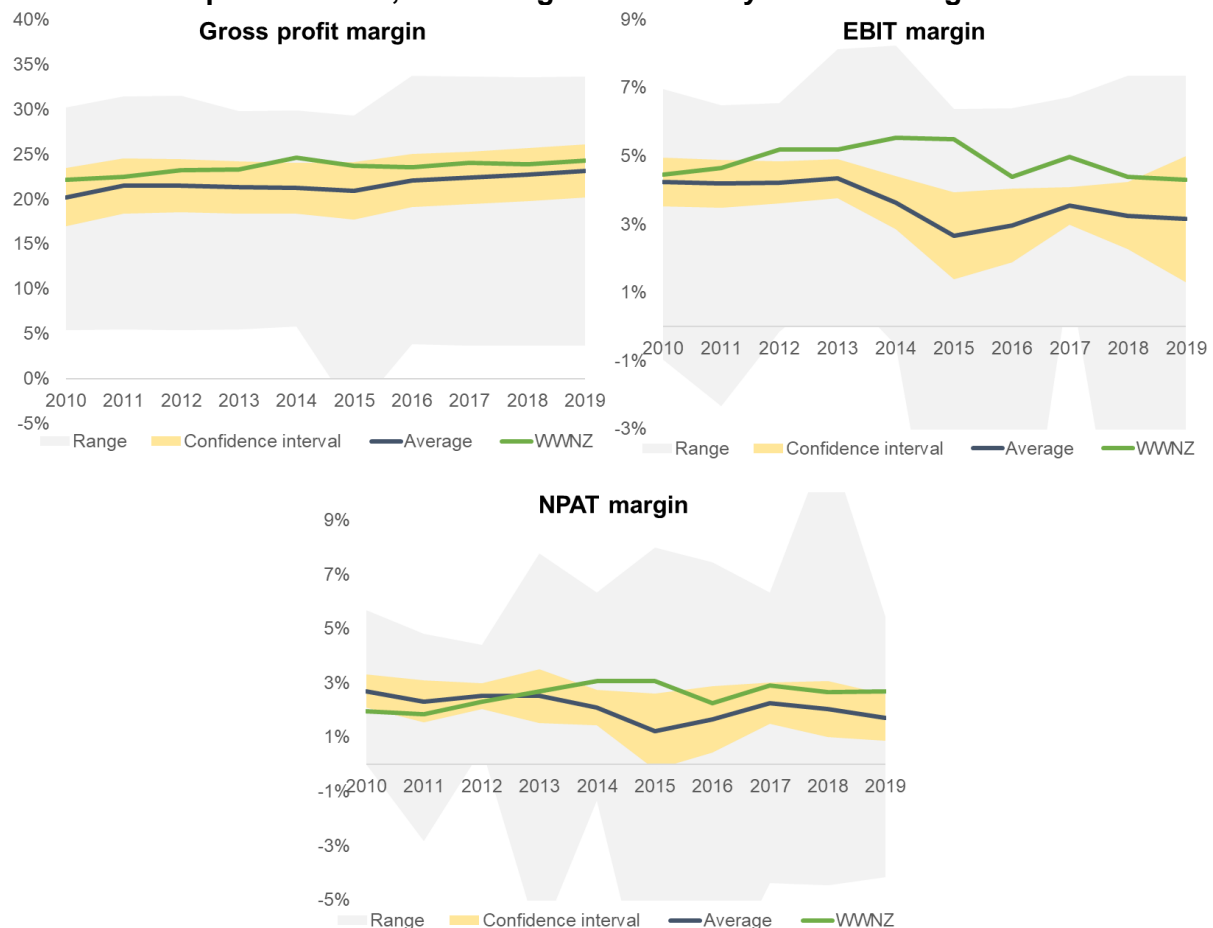
- The NZCC’s comparator sample for the asset beta is also very broad, with a range of -0.07 to 0.9 and a resultant WACC estimate range of 1.3 percent to 9.1 percent. Cross checking the NZCC and WWAU estimates by focusing on a narrower set of the likely closest comparators to WWNZ (the UK supermarkets and WWAU) shows that
 - These close comparators have betas above the comparator sample average (but within the WWAU range set for WWNZ); and
 - These betas have been increasing over time.
- This is supportive of the WWAU estimate for WWNZ and suggests that the NZCC comparator sample average may be underestimating WWNZ’s beta.

Margin analysis does not provide conclusive evidence that WWNZ’s margins are higher than comparators

- The NZCC has focussed its profit margin benchmarking on the average margins from its comparator sample. However, when this comparator sample is closely analysed, it is clear that there is a very large variability.
- A key explanation for this variation is likely to be accounting policy variation, particularly for gross profit (“GP”) margins. We understand from WWNZ that, for example, Sainsbury and Tesco include costs in their GP margin that WWNZ does not and that if WWNZ reported its margin in this manner, WWNZ’s GP margin would be less than 10 percent (well below the sample average and confidence interval we discuss below). This implies it is not meaningful to compare GP margins across companies, as an apples to apples comparison is not being made.

- Furthermore, from a statistical perspective the large variation means there is uncertainty about the “true” mean. Accordingly, it is appropriate to estimate a confidence interval around the comparator sample average. This analysis is shown in the figure below.

Figure 3: WWNZ GP and NPAT margins are not statistically significantly different from the comparator mean, EBIT margin has recently been trending downwards



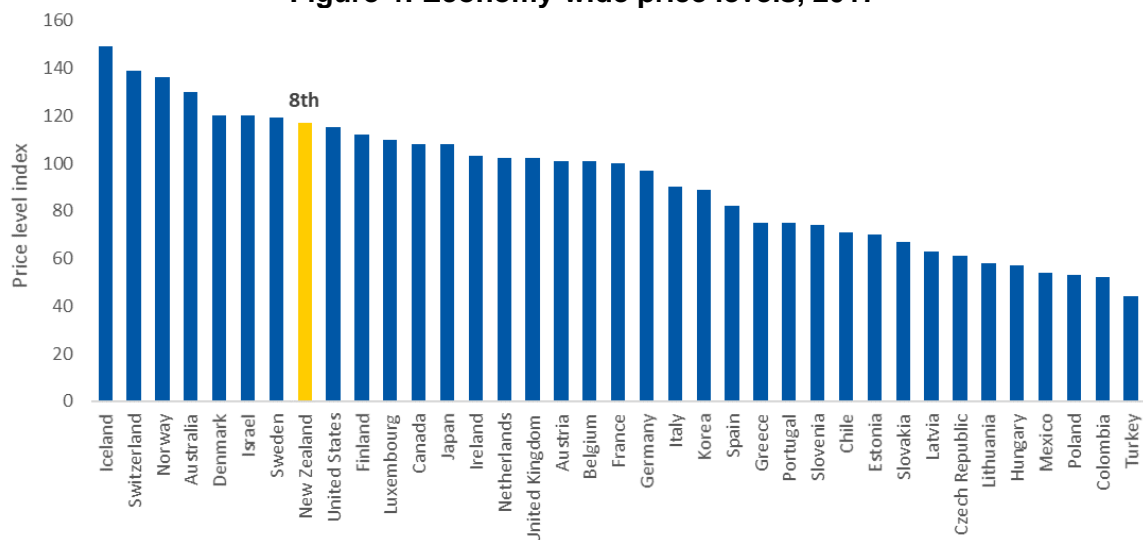
Source: NERA analysis, NZCC WWNZ ROACE and Margins Model.

- This analysis demonstrates that:
 - For GP and net profit after tax (“NPAT”), WWNZ’s margins are generally within the confidence interval (although as already discussed, it does not seem meaningful to compare GP margins across the comparator firms); and
 - For earnings before interest and taxes (“EBIT”), the WWNZ margin has historically been outside (above) the confidence interval, but it has been generally falling since 2015 and was inside the confidence interval at the end of the period.
- In addition, similar to ROACE, we find no statistically significant correlation between the food price indices used by the NZCC and margins for comparator companies. This is consistent with higher prices being related to higher costs and/or measurement issues with profit margins and price levels.

The NZCC has overstated the relative price of groceries in New Zealand

- Using the same methodology the NZCC does, but using prices across all sectors in the economy, New Zealand has the eighth most expensive prices in the OECD (see Figure 4) across all sectors. Thus, the NZCC finding (if correct) that New Zealand has the seventh most expensive food and non-alcoholic beverage grocery prices in the OECD could simply reflect that New Zealand is a high cost-to-serve country.

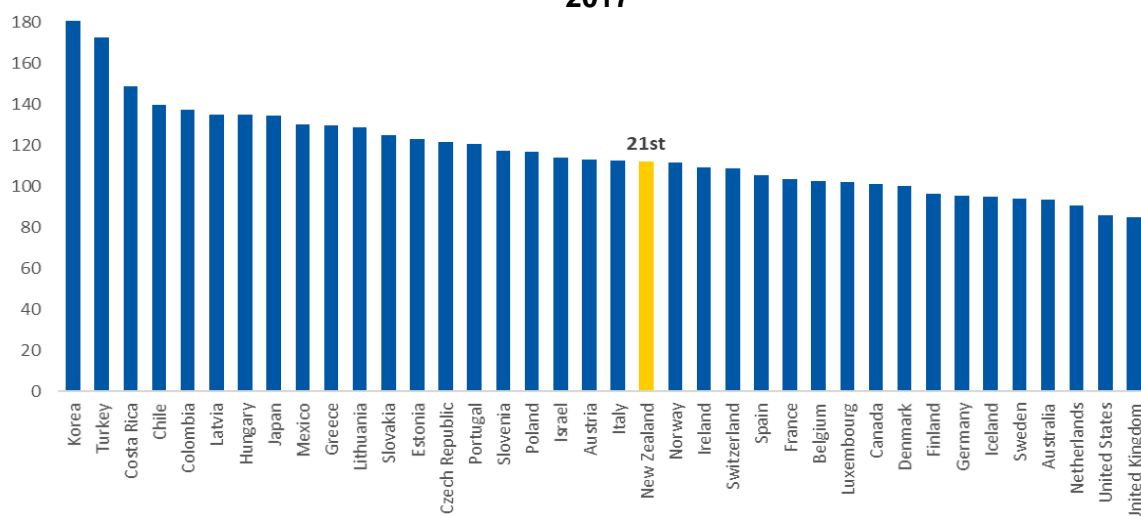
Figure 4: Economy-wide price levels, 2017



Source: OECD.Stat, 2017 PPP Benchmark results, Table 1.11: Price level indices (OECD=100).

- The NZCC finds that including alcohol and tobacco in grocery prices pushes New Zealand's ranking to sixth highest amongst OECD countries. We think it is incorrect to include alcohol and tobacco in the measure of grocery price levels, due to countries' varying excise taxes on these products and varying policies globally on where these products are sold. In addition, the NZCC itself proposed to exclude these products in its Preliminary Issues Paper for this market study.
- The NZCC relies on market exchange rates to make international comparisons, while we think that there is justification for using PPP rates. Our reconstructed price level index using the PPP exchange rate puts New Zealand 21st out of OECD countries (see Figure 5) compared to seventh using the market exchange rate. The interpretation of this alternative index is that there are 20 OECD countries whose relativity between grocery price levels and economy wide price levels is "worse" (higher) than the relativity for New Zealand.

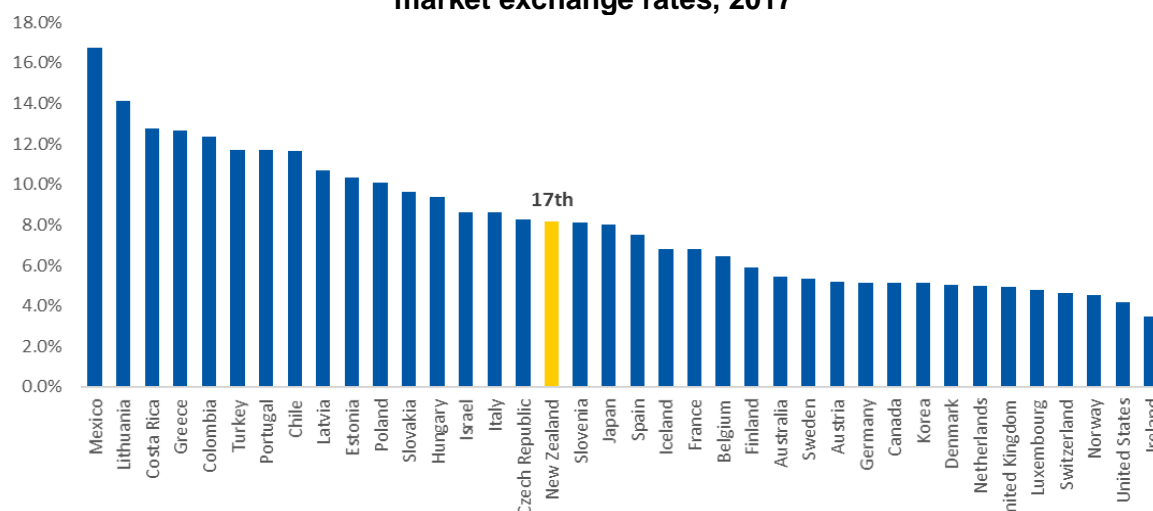
Figure 5: Grocery price level indices excluding alcohol and tobacco using PPP rates, 2017



Source: OECD.Stat, 2017 PPP Benchmark results, Table 1.11: Price level indices (OECD=100).

- The NZCC critiques the results of our earlier analysis using product-level price rankings, stating the methodology used may limit the influence of very cheap or expensive goods that might be a large share of expenditure, and that averages across prices should have been used. However, a central feature of our methodology is to avoid assuming a fixed basket of goods across countries. Instead, our methodology ranks the prices of individual goods and displays the distributions of rankings, such that countries with cheaper prices by item will rank lower.
- The NZCC makes a statement in the Chapter 3 summary that New Zealanders appear to spend a relatively high proportion of their income on groceries. However, the analysis performed by the NZCC is simply of expenditure per capita (i.e., with no relativity to income). When analysing the expenditure per capita as a percent of GNI per capita for OECD countries, New Zealand ranks 17th using market exchange rates (see Figure 6) and 14th using PPP rates.² This compares to the NZCC finding that New Zealand ranks fifth on expenditure per capita across OECD countries.

Figure 6: Expenditure on groceries per capita as a percent of GNI per capita using market exchange rates, 2017



Source: World Bank, ICP 2017 results and World Bank DataBank, World Development Indicators.

² The results are similar when we also use other metrics to represent income.

1. Introduction

1. On 29 July 2021, the New Zealand Commerce Commission (“**the NZCC**”) released the draft report from its market study into the retail grocery sector. We have been asked by Woolworths New Zealand Limited (“**WWNZ**”) to review two particular aspects of the NZCC’s draft report:
 - a. The profitability assessment; and
 - b. The international price comparisons.
2. Our key findings are that the NZCC has:
 - a. Overstated the profitability of WWNZ’s grocery business; and
 - b. Overstated how expensive groceries are in New Zealand, both in terms of price levels and the proportion of income that is spent on groceries.
3. The NZCC has canvassed a range of options to deal with the issues it considers it has identified in its draft report, some of which are quite intrusive (e.g., mandatory wholesaling or even vertical disintegration). While the NZCC has stated that performing a cost benefit analysis is outside the scope of the market study, as the expert competition agency of the government it seems appropriate for the NZCC to give some consideration to the costs as well as the benefits of the reform options it proposes.
4. In this regard, as we explain in this report, the NZCC’s analysis in the draft report, which places a large emphasis on profitability and price comparisons, overstates any issues.
5. The rest of this report is laid out as follows:
 - a. Section 2 reviews the NZCC’s return on average capital employed (“**ROACE**”) analysis;
 - b. Section 3 reviews the NZCC’s analysis of the weighted average cost of capital (“**WACC**”);
 - c. Section 4 reviews the NZCC’s profit margin analysis; and
 - d. Section 5 reviews the NZCC’s international price and food expenditure benchmarking.

2. The NZCC's ROACE analysis has overstated WWNZ's profitability

6. In this section of our report we discuss:

- a. The conceptual difficulties in using ROACE to infer whether excess profits are being earned, with a particular focus on how ROACE is influenced by the age and depreciation profile of the assets. As we show, applying ROACE to heavily depreciated assets results in a high ROACE even if only normal returns are being earned.
- b. The measurement difficulties that make it difficult to infer that a ROACE above WACC reflects excess returns. Within the NZCC's own comparator sample and independent analysis of ROCE for New Zealand firms, the return on capital varies greatly and is often above any reasonable measure of WACC.
- c. That the ROACE calculation is extremely sensitive to the NZCC's decision to exclude goodwill, which combined with recent and current overseas grocery transactions resulting in significant goodwill, casts doubt on the calculated ROACE.
- d. In the present context, a proper application of the NZCC's approach would include leased assets and brands in the capital base. Appropriately accounting for leased assets reduces the NZCC's calculated ROACE to 12.2 percent. Accounting for brand assets further reduces ROACE to 11.2 percent.

2.1. Conceptual difficulties with using ROACE to infer excess returns

7. The return on capital employed ("ROCE") measures returns, based on the assets employed to generate those earnings. ROACE is similar to ROCE, but uses the average of capital employed at the start and end of the period for a better estimate of the value of assets used to generate earnings in that period.³
8. The NZCC finds that ROACE appears to be significantly and persistently above its estimate of the normal return for a grocery business in New Zealand, being its estimate of WACC.^{4,5} In the case of WWNZ, the NZCC finds that over the period 2015–2019, WWNZ had an average ROACE of 21.6 percent compared to the NZCC's WACC estimate of 4.6 percent to 6.1 percent.⁶
9. As a profitability measure, ROACE is very sensitive to the valuation of the assets and also how depreciated the assets are. Because of this, it can be an unreliable measure of whether excess returns are being earned in a market.
10. In this subsection we set out:
 - a. The conceptual problems with inferring excess returns from a ROACE in excess of WACC (section 2.1.1);
 - b. An illustrative example of how heavily depreciated assets will show a ROACE in excess of WACC even when there are no excess returns (section 2.1.2);

³ We discuss ROACE and some sources only discuss ROCE, but for the conceptual issues we discuss here, ROACE and ROCE are equivalent.

⁴ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, pg.7.

⁵ We note that the NZCC calculates a post-tax ROACE in order to compare it a post-tax WACC.

⁶ See Figure 16.

- c. Empirical evidence which suggests the NZCC's ROACE analysis is unreliable. Specifically:
 - i. There is no relationship between the NZCC's price benchmarking results for food and non-alcoholic beverages and measured ROACE, which is consistent with high prices being due to high costs (and thus not resulting in excess returns) and/or a problem with either the ROACE or price benchmarking analysis (section 2.1.3.1).
 - ii. Independent analysis by Armillary Capital of ROCE for New Zealand firms, which shows wide variation in ROCE as well as ROCE in excess of a reasonable WACC estimate for firms that would be considered to be operating in competitive markets (section 2.1.3.2).
 - iii. The NZCC's sample of comparators firms also displays a very large range for ROACE (section 2.1.3.3).

2.1.1. ROACE is heavily influenced by asset values and the depreciation profile

- 11. Overseas competition agencies have been cautious in the use of ROACE for competition analysis, as meaningful results rely on being able to ascribe an economically meaningful value to the capital base and the measured ROACE depends heavily on the depreciation profile used. For example:
 - a. The UK Competition Commission's (predecessor to the Competition Markets Authority (CMA))⁷ 2013 *Guidelines for market investigations* state:^{8,9}

Whatever measure of profitability is used, the calculation of profitability for the purposes of competition analysis is often not straightforward because of the need to obtain an appropriate value for capital employed, as described below. In industries with a relatively low level of tangible assets, such as service and knowledge-based industries, the book value of capital employed may bear little relationship to the economic value because of the presence of significant intangibles. In some cases, the replacement cost of assets may be different from historical costs due to the length of time elapsed and changes in asset prices and efficient technologies over time.

Similarly, a return on capital approach, whether return on equity or return on capital employed (ROCE), requires an economically meaningful value for the capital base which may not accord with the value ascribed in the financial records.
 - b. Similarly, the ACCC decided that it could not draw "significant conclusions" from its return on funds employed ("ROFE") analysis in its 2008 supermarkets inquiry, stating (page 111, emphasis added):^{10,11}

⁷ The UK Competition Commission was abolished in 2014 to merge with the Office of Fair Trading in a new body, the Competition Markets Authority.

⁸ UK Competition Commission, *Guidelines for market investigations: Their role, procedures, assessment and remedies – Annex: Market characteristics and outcomes*, April 2013, para.12-13, available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/284390/cc3_revised.pdf.

⁹ We understand that the UKCC guidelines have been adopted by the CMA.

¹⁰ ACCC (2008), *Report of the ACCC inquiry into the competitiveness of retail prices for standard groceries*, July 2008, pg.111, from: <https://www.accc.gov.au/system/files/Grocery%20inquiry%20report%20-%20July%202008.pdf>

¹¹ ROFE is similar to ROCE. The ACCC did not calculate ROFE but used values from Woolworths' and Coles' public annual reports. At the time of the market study, Woolworths Australia defined funds employed as "net assets excluding net tax balances, provision for dividends and net debt, and assets and liabilities as a result of hedging per AASB 139 Financial Instruments: Recognition and Measurement." See: https://www.woolworthsgroup.com.au/icms_docs/183555_Annual_Report_2008.pdf

The ACCC agrees that care is needed when interpreting ROFE as it is heavily influenced by the value of the underlying assets and the extent of depreciation. Given this, the ACCC considers that significant conclusions cannot be drawn from ROFE.

12. The NZCC states at [C42] that it is not clear why the ACCC and UK competition regulator did not use ROACE as a measure of profitability in later studies of the grocery sector:¹²

The more recent UK and ACCC studies did not state why they had not used ROACE and TIRR for their profitability assessment. We are not aware why this was the case.

13. However, in 2008 the ACCC stated:¹³

Both MSCs provided the ACCC with confidential calculations that they submitted demonstrated much lower ROFE—after adjusting for factors such as leasing and depreciation—of around 15 per cent to 20 per cent for 2006–07. The ACCC agrees that care is needed when interpreting ROFE as it is heavily influenced by the value of the underlying assets and the extent of depreciation. Given this, the ACCC considers that significant conclusions cannot be drawn from ROFE.

14. This suggests that the ACCC considered ROFE to be unreliable in that process, in response to the submissions from Coles and Woolworths Australia (later cited by the NZCC at [C49]) that ROFE would be inflated due to Woolworths having heavily depreciated assets and Coles leasing a lot of its buildings. Likewise, as we discuss in this report, both of these issues (depreciation and leasing) mean ROACE is likely inflating WWNZ's returns.
15. There are also potential issues with using ROACE in industries that are "asset light" like retail.¹⁴ These "asset light" companies invest in intangible assets like human capital, R&D and brand value, the effectiveness of which can drive profits in current and future periods, but the assets may not be recognised for accounting purposes.¹⁵ This may mean that the numerator of the ROACE calculation increases, without recognising the capital employed in the denominator, increasing ROACE. We return to the issue of brands in Section 2.4. A similar point holds for companies that lease, rather than own their assets, since this will similarly make them more "asset light".
16. The NZCC discusses the conditions needed for using ROACE at [C39-40] of the draft report, and the drawbacks of using ROACE at [C48-C49].¹⁶ However, [C50] of the draft report states that the adjustments the NZCC made to book values are sufficient to reflect economic costs, even if not

¹² NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para C42.

¹³ ACCC (2008), *Report of the ACCC inquiry into the competitiveness of retail prices for standard groceries*, July 2008, pg.111, from: <https://www.accc.gov.au/system/files/Grocery%20inquiry%20report%20-%20July%202008.pdf>

¹⁴ Oxera (2014), *Something for nothing? Returns in low-asset industries*, March 2014, pg.1.

¹⁵ Oxera (2014), *Something for nothing? Returns in low-asset industries*, March 2014:

"One source of such additional liabilities is where companies invest in 'intangible assets', such as brand value, R&D or customer acquisition. These investments may not meet the accounting criteria for recognition on the balance sheet, but they are very similar in nature to tangible assets. Investment is made today in the expectation of making a return tomorrow. Therefore, today, investors will expect returns on investments from previous years. This can be addressed by 'capitalising' certain operating costs—for example:

- training costs could be capitalised into knowledge assets;
- R&D costs could be capitalised into IP assets;
- marketing costs could be capitalised into brand-value assets.

While they are not 'assets' for accounting purposes, these liabilities and assets are otherwise very similar to those for an asset-intensive business—profits in current and future periods will be driven by the level and effectiveness of investments made in prior periods.

¹⁶ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para C48-C49.

precise, and that the results are unlikely to be materially impacted by measurement errors in these adjustments.¹⁷

17. For the reasons discussed below, we disagree.

2.1.2. Illustrative example showing that depreciated assets will have ROACE > WACC even when there are no excess returns

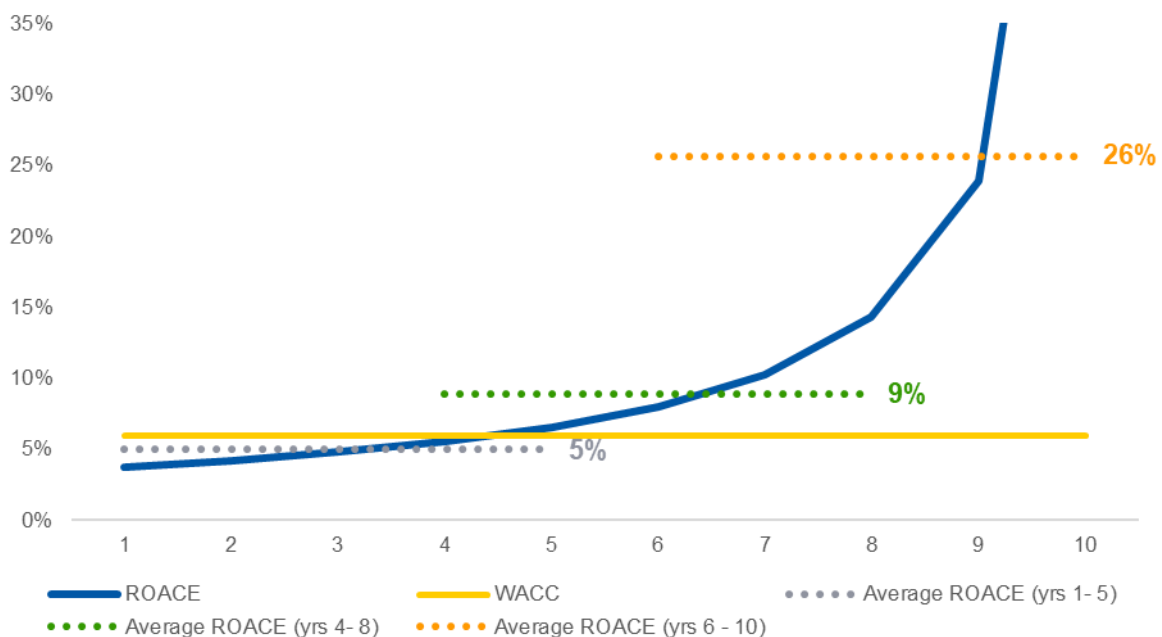
18. To illustrate the depreciation point, we present a simple example of an asset that earns no economic rents over its life (i.e., NPV=0 and therefore the cashflows cover the cost of capital and no more). Consider an asset with the following characteristics:

- Initial cost = \$100
- WACC = 6.1 percent
- Economic life = 10 years
- Annual cash flow = \$13.59 (being the amount that sets NPV = 0 over the 10-year life)
- Straight line depreciation = \$10 per year

19. A comparison of the annual ROACE vs WACC is set out in Figure 7 below. We have also overlaid the average ROACE calculated over the first five years, the middle five years and the final five years of the asset's life. This figure illustrates that, even when there are no excess returns:

- ROACE rarely equals WACC;
- ROACE will generally be above WACC in the later part of the asset's life; and
- Calculated ROACE gets extremely high when the assets are heavily depreciated.

Figure 7: Illustrative comparison of annual ROACE vs WACC over the life of a single depreciable asset that earns no excess returns



Source: NERA analysis.

Note: The y-axis has been truncated and does not show the ROACE of 72 percent in the final year of the asset's life.

¹⁷ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para C50.

20. Thus, for heavily depreciated assets, ROACE is likely to provide little informative value as to whether an asset is earning excess returns. Specifically, the simple example in Figure 7 demonstrates that once an asset is 40 percent of the way through its life,¹⁸ ROCE will be greater than WACC.
21. This simple analysis ignores the fact that firms have both depreciable and non-depreciable assets. However, introducing a non-depreciable asset does not change the finding, as it is how depreciated the *depreciable assets* are (as opposed to total assets) that drives whether ROACE > WACC.
22. To illustrate this more concretely, we have modified the above simple example to include both a depreciable and non-depreciable asset, in proportion to WWNZ's depreciable and non-depreciable assets. Specifically, we can divide the WWNZ balance sheet figures used by the NZCC in its ROACE calculation (i.e., excluding goodwill and intangibles) into depreciable¹⁹ and non-depreciable assets.²⁰ The data in Table 1 below is based on data provided by WWNZ and shows averages over 2015-2019.

Table 1: WWNZ total assets: depreciable vs non-depreciable (2015 – 2019 averages)

Asset type	Undepreciated value (\$m)	Proportion of total assets (undepreciated)	% depreciated
Non-current fixed assets	1,660	63%	62%
Current assets	681	25%	0%*
Land	310	12%	4%**

Source: NERA analysis of WWNZ data. * Current assets are not depreciated. **We understand from WWNZ that land consists of 'Development Properties' with no depreciation, and 'Freehold Properties' with some depreciation. Freehold is the majority and is depreciated very slowly (between 25-50 years). Note: numbers have been rounded.

23. Thus, on average over the period 2015-2019 the undepreciated historic cost of WWNZ's depreciable assets was \$1.66b and the cost of its non-depreciable assets was \$990m. Redoing the analysis underlying Figure 7 using these values for the depreciable and non-depreciable assets yields Figure 8. In this figure we have also netted off WWNZ's average current liabilities over the period when determining the capital employed. This demonstrates the inclusion of the non-depreciable assets (netting off current liabilities) does not change the point at which ROACE > WACC, but it does scale the ROACE down after the tipping point such that the difference between ROACE and WACC is not as drastic. This is intuitive – if the issue is caused by depreciation, having fewer depreciable assets mitigates the problem.²¹

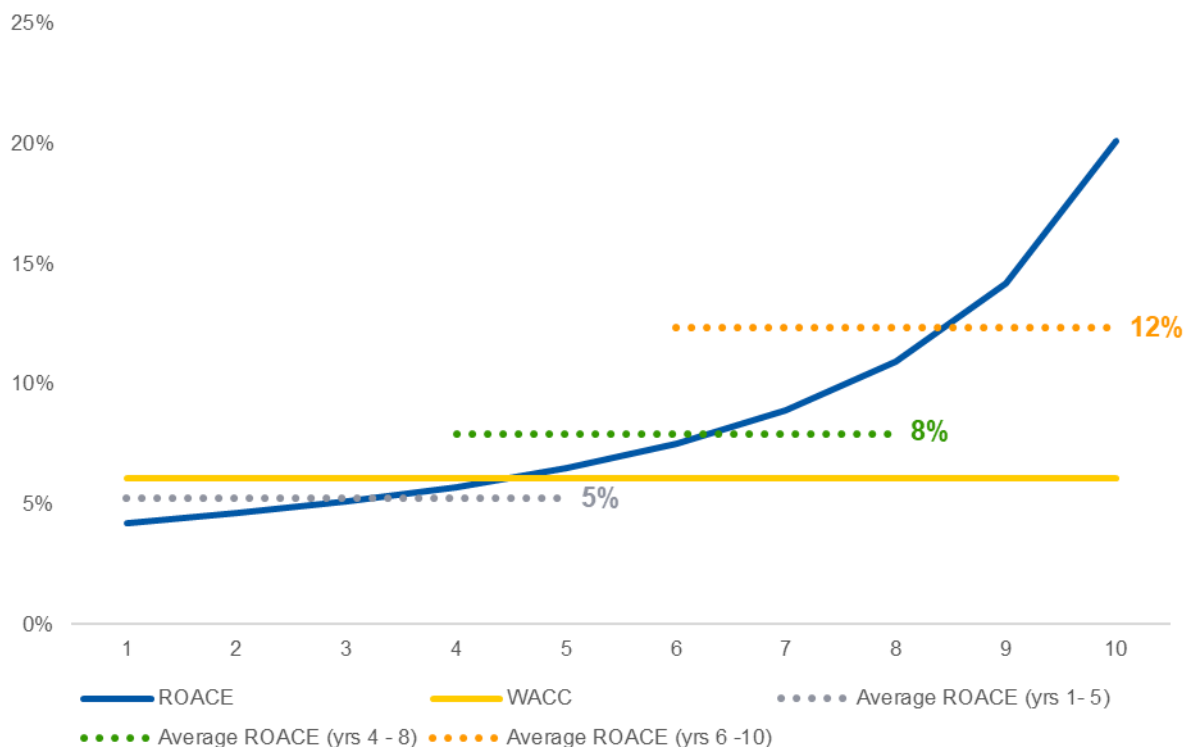
¹⁸ I.e. 4/10 years.

¹⁹ Being Leasehold improvements, Plant & Equipment and Software.

²⁰ Being freehold and development properties.

²¹ Specifically, if the only asset was non-depreciable, then ROACE = WACC and the ROACE line is flat across time. When there is both a depreciable and non-depreciable asset, the flat line and curve are added together. So adding a non-depreciable asset pulls the curve back towards the flat line, but does not change where the ROACE line crosses the WACC line.

Figure 8: Illustrative calculation of ROACE vs WACC for firm with depreciable and non-depreciable assets in the same proportions as WWNZ, that earns no excess returns



Source: NERA analysis.

24. In the case of WWNZ, Table 1 above shows its depreciable assets were on average 62 percent depreciated over the period 2015–2019, being the period the NZCC is focused on for ROACE. Our simple model demonstrates that once depreciable assets are more than 40 percent depreciated, ROACE will be greater than WACC. This suggests at least some of the excess returns the NZCC is finding are an artefact of the impact that depreciation has on ROACE.
25. In addition, this illustrates that the NZCC's comparison of ROACE between firms is problematic, as the differences the NZCC finds could be at least partly explained by differing depreciation profiles. For example, the NZCC's methodology would find a high ROACE for a firm with old assets and low ROACE for a firm with new assets, even if both firms had the same pricing and assets.

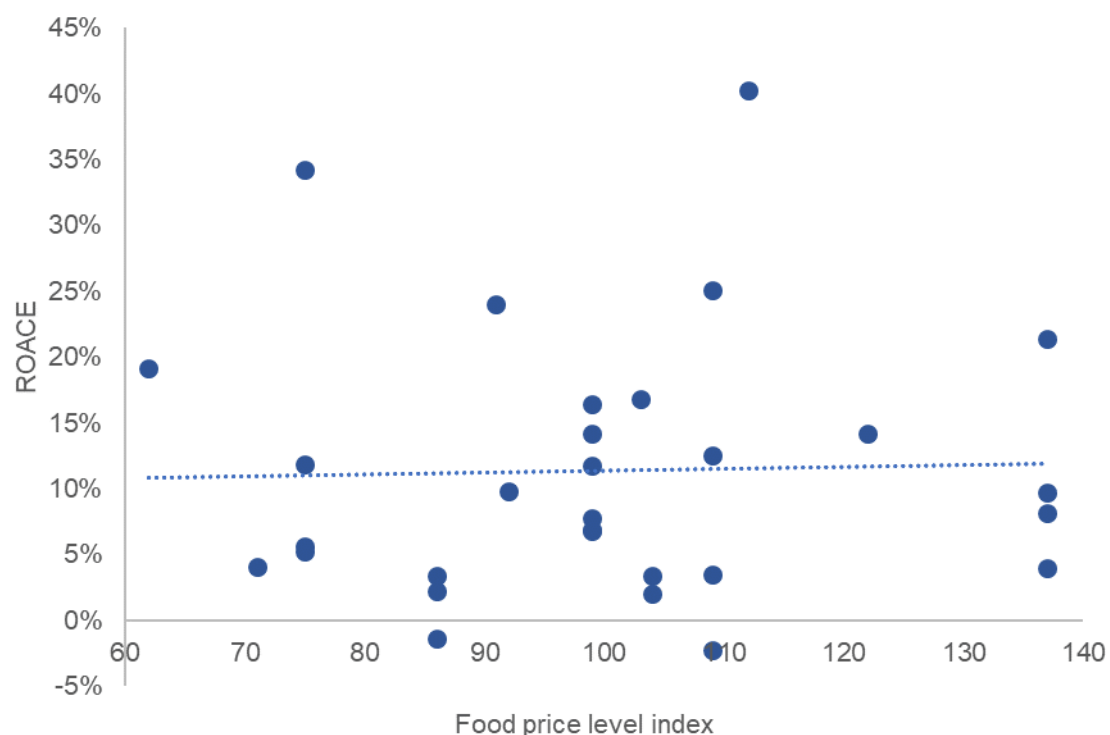
2.1.3. Empirical analysis suggesting ROACE is an unreliable measure for inferring excess returns in the present case

26. The difficulties with using ROACE are further illustrated by:
 - a. The lack of a relationship between the NZCC's price level benchmarking and it's international ROACE benchmarking.
 - b. The variation of ROCEs calculated by Armillary, e.g., consistently high ROCEs in industries we would expect to be competitive.
 - c. Variability in ROACE across NZCC's own sample.

2.1.3.1. No relationship between price level indices and ROACE

27. There is no clear link between the results of the NZCC's ROACE and food price level index analyses. If a higher ROACE indicated that grocery companies were earning excess profits, we might expect to observe a positive correlation between the ROACE of grocery retailers and the food price level index in the countries they are based in.
28. Figure 9 shows the 2015–2019 average ROACE for comparator companies in the NZCC sample, and the 2017 OECD 'Food and non-alcoholic beverages' price level index of the country the company is based in. There is no statistically significant correlation between ROACE and the food price level index.²² This could be because:
- Price levels are not actually related to profit (which would make sense if prices vary due to different cost drivers); and/or
 - One or both of the ROACE or price index measures are problematic (i.e., there should be a positive relationship but there is not one found).

Figure 9: No statistically significant correlation between average ROACE (2015–2019) and the OECD food and non-alcoholic beverages price level index (2017) for comparator companies



Source: NERA analysis, NZCC WWNZ ROACE and Margins Model, OECD.Stat, 2017 PPP Benchmark results, Table 1.11: Price level indices (OECD=100).

2.1.3.2. The ROCEs calculated by Armillary show that industries we would expect to be competitive have consistently high ROCEs

29. Armillary Private Capital regularly calculates ROCE for 114 New Zealand companies and Crown Entities as a measure of business effectiveness and capital efficiency. There is a wide range of

²² I.e., the correlation between the series is not significantly different from zero. The correlation between the two series is 0.028, but this is not significant as the p-value is 0.88.

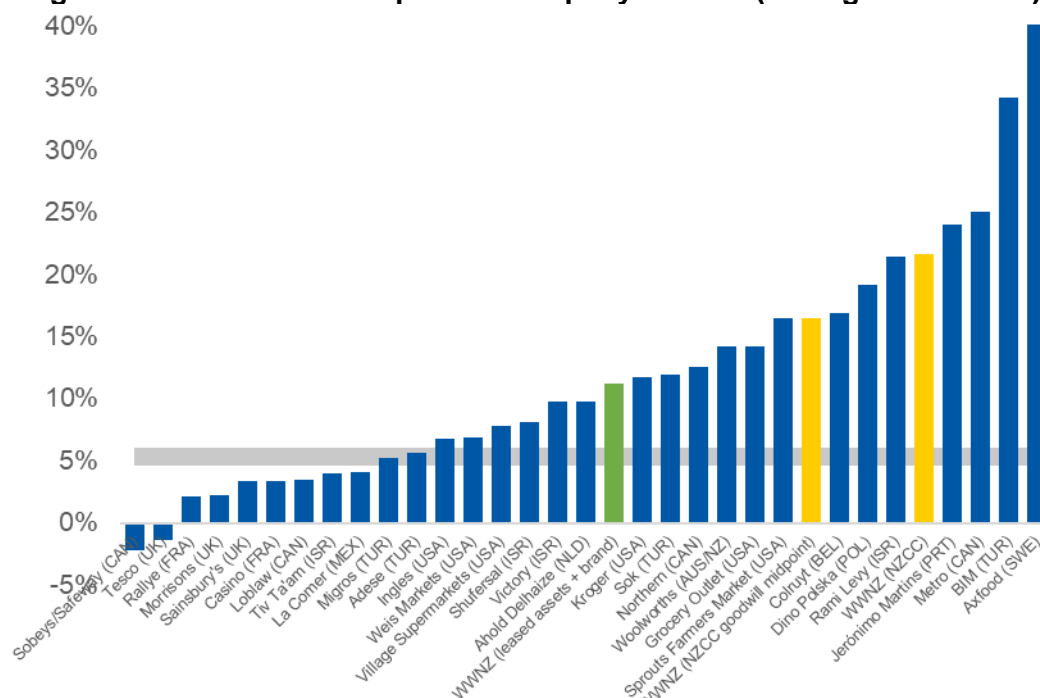
ROCEs for these companies, even when looking at the average over three years (from -1,134 percent to 165 percent).²³

30. In the Armillary analysis, retail companies we might expect to face significant competitive pressure have consistently high ROCEs,²⁴ Briscoes Group (44.3 percent), Hallenstein Glasson (67.9 percent), Kathmandu (18.7 percent), Michael Hill (18.2 percent), and The Warehouse Group (16.1 percent).²⁵ Additionally, the 'Consumer Products and Services' sector has the highest 2019 median ROCE out of all the sectors in the analysis.

2.1.3.3. There is variability in ROACEs across the NZCC's own sample of comparator companies

31. There is a wide range and variation in the 2015–2019 average ROACE for the companies in the comparator sample used by NZCC, as shown in Figure 10 (we explain the derivation of the WWNZ (leased assets + brand) bar in section 2.3 below). Additionally, a majority of the comparator companies have a ROACE well above the WACC range used by NZCC for groceries in New Zealand, while some have a ROACE below the NZCC's WACC.²⁶ While the WACC for the international companies is likely to be different, this suggests that either:
- Most international grocery companies are making excess returns; or
 - ROACE in excess of WACC is not a reliable indicator of excess returns.

Figure 10: WWNZ and comparator company ROACE (average 2015–2019)



Source: NERA analysis, NZCC WWNZ ROACE Model.

Note: The 'WWNZ (leased assets + brand)' value has been adjusted to include leased assets and brand assets (see section 2.3) where the other values have not, so they may not be directly comparable.

²³ Armillary Private Capital (2020), *Return on Capital Employed – Review of 2019 Returns*, 2020.

²⁴ Three-year average ROCE.

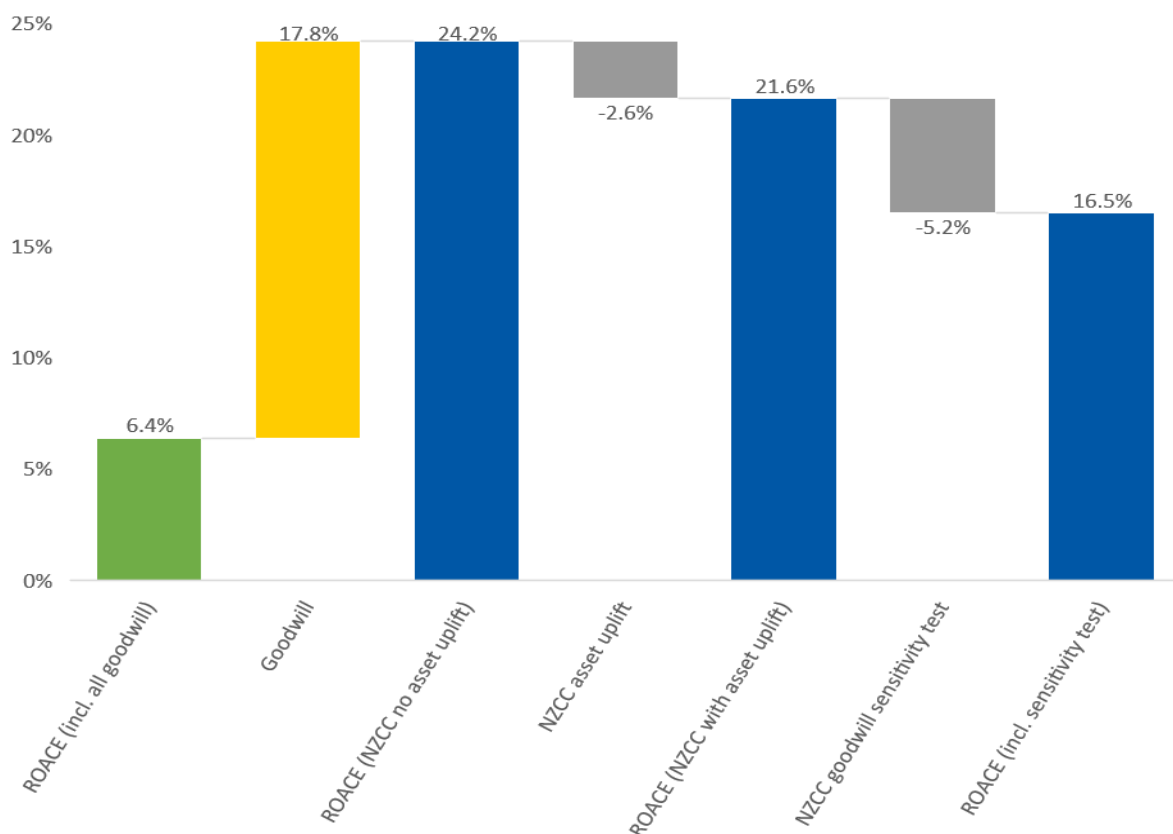
²⁵ Armillary Private Capital (2020), *Return on Capital Employed – Review of 2019 Returns*, 2020.

²⁶ Out of the 30 comparator companies, nine have a ROACE below the NZCC WACC range, two have a ROACE within the range and 19 have an ROACE above the range.

2.2. The ROACE calculation is very sensitive to the treatment of goodwill

32. By far and away the largest single item on the balance sheet of WWNZ is goodwill. For example, for FY19 goodwill accounted for \$2.3b out of total assets of \$4.0b.²⁷ Even more starkly, when Woolworths acquired the New Zealand business of Foodland in 2005 (what is now WWNZ), Woolworths paid \$2.5b for a business with a net book value of \$300m.²⁸ This resulted in a goodwill balancing figure of \$2.2b.
33. As a result, the NZCC's ROACE calculation is very sensitive to the treatment of goodwill. The NZCC therefore needs to be very cautious before attributing the entirety of the goodwill to a competition issue. Figure 11 below demonstrates this sensitivity, showing that the calculated return for WWNZ goes from 6.4 percent to 24.2 percent simply by excluding goodwill. The NZCC then makes an adjustment to account for the market value of land and buildings, which reduces this number to 21.6 percent. The NZCC then conducts a sensitivity by adding back unaccounted for goodwill of \$300m, which reduces the ROACE to 16.5 percent. As we set out shortly, this sensitivity still materially understates the value of WWNZ's assets.

Figure 11: Cumulative impact on ROACE of goodwill compared to NZCC adjustments (2015–2019)



Source: NERA analysis, NZCC WWNZ ROACE Model

²⁷ For FY20 goodwill accounted for \$2.3b out of total assets of \$5.4b. The bulk of the increase in total assets between FY19 and FY20 was because of a change in the treatment of leases under IFRS 16, as we discuss in section 2.3 of this report. But goodwill remains by far and away the largest single item on the balance sheet.

²⁸ Restated in accordance with IFRS 3.

34. As the NZCC acknowledges, the 6.4 percent is the return that WWNZ's owners are receiving, as the goodwill represents the amount they paid for the business.²⁹ Therefore, there is gap of almost 18 percentage points between the return shareholders are earning and the ostensible return the assets are generating.
35. To illustrate that the NZCC needs to be cautious assuming all goodwill is market power rents, two recent data points in the grocery sector are informative:
- a. **Amazon acquisition of Whole Foods:** Out of the USD 13.2b that Amazon paid for Whole Foods in 2017, USD 9b (68 percent) was accounted for as goodwill.³⁰ Prior to the acquisition, Whole Foods had been reported as "struggling in an intensely competitive environment".³¹ We have reviewed various news articles about the acquisition, and have not seen any evidence or claim that Whole Foods was operating in markets that were not workably competitive. Rather the discussion has been about synergies and growth opportunities for Amazon.
 - b. **Morrisons sale to private equity:** Morrison Supermarkets, the fourth largest supermarket chain in the UK, has been subject to a private equity bidding war in the first half of 2021.³² The current leading offer is worth GBP 7b,³³ which is GBP 2.8b higher than Morrison's 2021 net asset book value of GBP 4.2b.³⁴ Being the fourth player in the market makes it unlikely that this premium reflects an expectation that Morrisons is earning market power rents. Rather news articles about the acquisition generally attribute this premium on acquisition price to Morrisons property portfolio and deals with Amazon to supply Amazon Prime members.³⁵
36. In its draft report, the NZCC rejected all but one of WWNZ's arguments for including goodwill in the asset base, accepting arguments around market value but rejecting points related to depreciation, leases and synergies.³⁶
37. Regarding depreciation, the valuation should be the depreciated replacement cost of the assets in question, which is essentially the position the NZCC sets out. However, this rests on the depreciation being used reflecting economic depreciation (i.e., the change in the market value of assets) rather than accounting depreciation. As we set out in section 2.1.2 above, even with the correct depreciation allowance, the calculated ROACE varies materially year to year and will exceed WACC when the assets are heavily depreciated, even if no rents are being earned.
38. Regarding leases, we discuss this issue at length in section 2.3 below.

²⁹ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para C157.

³⁰ Securities and Exchange Commission, "Amazon.com, Inc. Form 10-K for Fiscal Year Ended December 31, 2017." EDGAR, 2017. Available at <https://www.sec.gov/Archives/edgar/data/0001018724/000101872418000005/amzn-20171231x10k.htm>.

³¹ *Whole Foods: A Year To Forget*, Forbes, 7 November 2016. Available at: <https://www.forbes.com/sites/gurufocus/2016/11/07/whole-foods-a-year-to-forget/?sh=55c7fbc62de>

³² Jack Barnett, *Morrisons takeover could trigger breakup, analysts warn*, City A.M., 13 July 2021. Available at: <https://www.cityam.com/morrisons-takeover-could-trigger-breakup-analysts-warn/>

³³ *UK's Morrisons Agrees To CD&R's \$9.54B Takeover Offer*, Competition Policy International, 19 August 2021. Available at: <https://www.competitionpolicyinternational.com/uks-morrisons-agrees-to-cdrs-9-54b-takeover-offer/>

³⁴ Wm Morrison Supermarkets PLC Annual Report and Financial Statements 2020/21.

³⁵ James Davey and Kate Holton, *Analysis: Property, cash and Amazon: Why buyout firms are battling to buy UK's Morrisons*, Reuters, 7 July 2021. Available at: <https://www.reuters.com/business/retail-consumer/property-cash-amazon-why-buyout-firms-are-battling-buy-uks-morrisons-2021-07-06/>

³⁶ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para C157.

39. Regarding synergies, the NZCC argues that synergies are not a cost incurred in providing grocery services³⁷ and that in a workably competitive market synergies would be passed through over time.³⁸ This does not, however, mean that the NZCC is right to ignore synergies in its profitability analysis. By excluding synergies, the NZCC is implicitly assuming that the entire amount of goodwill is market power rents. At the other end of the spectrum, the NZCC could either capitalise the value of synergies in goodwill or remove the synergies from the firm's net cashflows (e.g., increase opex by the annual synergy amount). If the NZCC is concerned that synergies should be passed through over time, it should at least recognise them for a time (i.e., somewhere in between the two extremes).
40. Our point regarding goodwill is that when goodwill is such a large proportion of the asset base, it is not appropriate to assume it is largely market power rents, particularly given the grocery transaction examples cited above where there was significant goodwill in situations where the output markets appear competitive.

2.3. Excluding leased assets from capital employed understates the assets being used to provide grocery services

2.3.1. Introduction

41. Prior to IFRS 16 being introduced in 2020, the accounting treatment of a lease depended on whether it was characterised as a "capital" or "operating" lease, with the former being recorded on the balance sheet and the latter not. Under IFRS 16, all (material) leases are now treated as being on-balance sheet as an asset (the asset being the right to use the asset for the period of the lease) and a liability (the liability being the requirement to pay future rents).³⁹
42. Most of WWNZ's stores are leased, and this has also historically been the case, including when the business was owned by Foodland. As a result, there is a material volume of assets that prior to FY20 were not recognised as assets in WWNZ's accounts. For example, in FY20 the lease asset on WWNZ's balance sheet is \$1.1b, which is approximately 24 percent of WWNZ's assets (or 46 percent if goodwill is excluded, as the NZCC argues is appropriate). Leased assets thus comprise a substantial proportion of the assets used to provide grocery services by WWNZ. As we describe in this section, the NZCC has substantially underestimated the assets employed to provide grocery services by not including leased assets in the asset base for its ROACE calculations. Indeed, the UK CMA has specifically recognised that ROACE calculations can be distorted where firms choose to lease a material proportion of their assets and these assets do not appear on the balance sheet.⁴⁰
43. The NZCC states its approach to assessing economic profitability is an economic one [3.14]:

³⁷ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para C157.4.

³⁸ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para C157.5.

³⁹ New Zealand External Reporting Board (EXAB), *New Zealand Equivalent to International Financial Reporting Standard 16 Leases* (NZ IFRS 16), February 2016. Available at: <https://www.xrb.govt.nz/accounting-standards/for-profit-entities/nz-ifs-16/>

⁴⁰ The CMA noted the following in the profitability methodology appendix of the funerals market investigation, which was produced prior to IFRS 16 when operating leases did not appear on the balance sheet:

ROCE percentages can sometimes be distorted, for example where firms choose to lease a material portion of their assets, and these leases are classified as operating leases for the purposes of financial reporting.

CMA (2020), *Funerals Market Investigation: Final report - Appendix Q: Profitability Methodology*, para 30(a), 18 December 2020, available at: <https://www.gov.uk/cma-cases/funerals-market-study>

Economic profit is calculated using the economic costs of the resources used in the business and is benchmarked against the opportunity cost of investing the assets (or capital) employed elsewhere. This differs to an accounting concept of profit, which is aimed more at estimating financial surplus in a period and uses accounting conventions such as for non-cash expenses

44. We agree that economic profitability is the appropriate lens to apply for a competition assessment. However, it has been misapplied by the NZCC with respect to leased assets. The NZCC characterises the argument to include leases as being an accounting issue brought about by the recent change in accounting standards that require leases to be capitalised and included as assets. Given the NZCC's focus is economic profit, it therefore considers no adjustment is required. Specifically, at [C76], the NZCC states:

However, we do not consider including the leases in total assets employed is appropriate when assessing economic profit:

These changes arise from changes in the accounting standards. As noted, we are only interested in the economic value of assets and not accounting standards.

Given the value of the lease asset will always be closely matched by the value of the liability, the two tend to cancel each other out.

These accounting changes did not come into effect until the 2020 year. This is outside of the time period in which we are examining profitability

45. As we set out in the rest of this section, the NZCC's premise for not capitalising leased assets is flawed. Specifically, including leased assets in the asset base provides a better reflection of economic value of the assets being deployed to provide grocery services.

2.3.2. An economic approach to assessing profit would include the value of leased assets

46. As noted above, the NZCC claims that the issue of including leases in the asset base only arises due to a change in accounting standards and that the NZCC is only interested in the economic value of assets. This contrasts with the NZCC's position during the fuel inquiry, where it noted the following:⁴¹

We agree there is an arguable case for including the present value of the lease payments within capital employed although it does not seem to be an adjustment which BP Plc or the other fuel firms typically make.

47. The economic question the NZCC is asking itself is whether the assets being used to provide groceries are earning excess returns. Leasing in economic terms is an alternative method of financing the purchase of an asset. In this sense a lease is similar in economic effect to taking on debt to buy an asset, and indeed would be economically equivalent if the lease covered the entire life of an asset.
48. These assets are being deployed to provide groceries, but are not counted as part of the capital deployed under the NZCC's methodology. How firms choose to finance their activities should not alter the NZCC's findings of whether the assets are generating excess returns.
49. By not capitalising leases, decisions on how businesses finance themselves will alter the measure of returns - businesses that choose to lease assets rather than own them will show higher returns under the NZCC's approach than businesses that own their own assets. This has implications for the NZCC's assessment of returns in market studies, as it will be more likely to find excess returns in industries where leasing is common practice.
50. The NZCC also appears to imply that including leased assets will not impact the returns calculation materially as a matching liability is created which closely matches the value of the

⁴¹ NZCC (2019), *Market study into the retail fuel sector - Final report*, 5 December 2019, para C234.5.

asset. It is correct that a liability is created. However, this liability does not offset the increased asset base in the ROACE calculation. This can be demonstrated by examining the NZCC's ROACE calculation.⁴²

$$\text{ROACE} = \frac{\text{Net Profit after Tax} + (\text{Net Interest Expenses} \times (1 - \text{Corporate Tax}))}{\text{Average Assets Employed}}$$

Where: $\text{Net Interest Expenses} = \text{Interest Expenses} - \text{Interest Income}$

$\text{Average Assets Employed} = (\text{Total Assets} - \text{Goodwill} - \text{Current Liabilities} + \text{Interest Bearing Current Liabilities})$
taken at the start and end of the financial year

51. This shows that only current liabilities⁴³ are subtracted from total assets. Lease obligations that are due outside the current year are non-current liabilities, which are not subtracted from total assets to derive capital employed.⁴⁴ This is essentially recognition that non-current liabilities (which include debt finance and long-term lease obligations) are a form of finance and thus should not be netted off when assessing the assets that have been employed by a firm.⁴⁵
52. When IFRS 16 was introduced, the International Accounting Standards Board (IASB) produced a number of numerical examples demonstrating that ROACE is lower (under IFRS 16) for firms with leased assets. The analysis gives examples for a hypothetical airline, retailer and distributor.⁴⁶ The impact is largest for the retailer (11.5 percent down to 10.2 percent),⁴⁷ given retailers lease a large proportion of their retail space using leases that were off balance sheet prior to IFRS 16. The retail example has obvious parallels with the current situation.

2.3.3. The accounting standards were changed to more accurately reflect the economic value of a firm's assets

53. The previous accounting standards undervalued, from an economic perspective, the assets employed when there is significant leasing of assets. The change in accounting standard means accounting values more accurately reflect economic value. This is essentially the justification the IASB gave for changing the accounting standard:⁴⁸

IFRS 16 will result in a more faithful representation of a company's assets and liabilities and greater transparency about the company's financial leverage and capital employed

And:⁴⁹

The IASB concluded that recognising assets and liabilities in essence for all leases provides a more faithful representation of the financial position of a company and greater transparency about the

⁴² NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para C46.

⁴³ Being those that are due within 12 months. See: New Zealand External Reporting Board (EXAB), *New Zealand Equivalent to International Accounting Standard 1 Presentation of Financial Statements* (NZ IAS 1), November 2007, para.61&71. Available at: <https://www.xrb.govt.nz/accounting-standards/for-profit-entities/nz-ias-1/>

⁴⁴ The lease liability is part of current and non-current financial liabilities, depending on the timing of lease payments. See See ISAB (2016), p 42 and NZ IAS 1, para.71. Based on the NZCC's formula, which adds back interest bearing current liabilities, we have assumed the current proportion of the lease liability does not affect capital employed, as it would net out by being subtracted as part of current liabilities and then added back as an interest bearing liability, given an interest expense is recognized for leases under IFRS 16.

⁴⁵ International Accounting Standards Board, *IFRS 16 Leases – Effects Analysis*, January 2016 ("ISAB (2016)"), p 27.

⁴⁶ See ISAB (2016).

⁴⁷ ISAB (2016), p 94.

⁴⁸ ISAB (2016), p 5.

⁴⁹ ISAB (2016), p 22.

company's financial leverage and capital employed. This is expected to enable investors and analysts to better assess the financial position and financial performance of a company

54. The IASB further noted that the previous accounting standard (IAS 17) did not provide a complete picture of the assets (emphasis added):⁵⁰

Applying IAS 17, most leases were not reported on a lessee's balance sheet. Consequently, a lessee did not provide a complete picture of:

- (a) the assets it controlled and used in its operations; and*
- (b) the lease payments that, economically, it could not avoid.*

55. A key benefit cited by IASB of including leased assets was that it would avoid the need for investors and analysts to make adjustments to financial statements to account for off balance sheet leases. Indeed, prior to 2015 Moody's credit rating methodology made adjustments to the financial statements that essentially assumed that the entity had taken on debt to buy the asset.⁵¹
56. IFRS 16 in some sense therefore simply enshrined the adjustments that investors and analysts were already making to obtain a more complete view of the economic value of the assets (and liabilities) of firms.

2.3.4. Accounting for leased assets in the ROACE calculation has a material impact

57. There are two possible approaches to estimate the impact of leases on ROACE:
- a. Include the midpoint amount of goodwill that related to leases (\$605m, from a range of \$530m–\$680m),⁵² but otherwise do not alter the ROACE calculation; or
 - b. Use the annual lease payment to calculate a proxy ROACE calculation where the leased assets are capitalised.
58. The former approach gives a range of ROACE over 2015–2019 of 15.8 percent to 10.7 percent with an average of 13.3 percent compared to the NZCC's estimate of 21.6 percent, a reduction of 8.3 percentage points. We note this approach is only a proxy and would materially understate the value of leases today, which currently stand at \$1.1b.
59. Regarding the latter approach, we have undertaken an illustrative calculation of WWNZ's ROACE when leased assets are capitalised and included in the asset base. To do this, we have taken WWNZ's actual lease expense for the years 2010–2019 and made a simple adjustment to include the leased assets in capital employed:⁵³
- a. The lease expense is multiplied by 6.2 to obtain the lease asset value, where 6.2 is the lower bound lease multiple that WWNZ submitted should be used in its proposed goodwill

⁵⁰ ISAB (2016), p 22.

⁵¹ In 2015 Moody's changed methodology to one that has a similar in outcome to IFRS16 in that recognizes while leases are a form of finance, they can provide more flexibility than taking on debt and buying an asset. Thus the lease asset and liability would have a slightly different value compared to an assumption that the firm has borrowed and bought the asset. See ISAB (2016), p 25.

⁵² See NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para C156.2

⁵³ The methodology for these adjustments generally follows NZ IFRS 16 for the initial measurement of lease assets and liabilities, and the methodology used by Moody's to account for off balance sheet leases prior to IFRS 16. See: Moody's (2015), *Cross-Sector Rating Methodology: Financial Statement Adjustments in the Analysis of Non-Financial Corporations*, June 2015. Available at: https://www.moody.com/researchdocumentcontentpage.aspx?docid=PBC_181430

- adjustment.⁵⁴ We understand this is the multiple implicit in WWNZ's 2020 audited financials, which have capitalised leased assets in line with IFRS 16.
- b. The lease expense is removed from opex;
 - c. An interest expense is added back, equivalent to the WWNZ incremental cost of borrowing of 5.1 percent multiplied by the new lease asset;^{55,56} and
 - d. The difference between the interest expense and the lease expense is included as lease depreciation.
60. Doing this results in an average ROACE for the period 2015–2019 of 12.2 percent, compared to the NZCC's calculation of 21.6 percent, a reduction of 9.5 percentage points.⁵⁷
61. This adjustment to ROACE is illustrative and not meant to be precise. To properly calculate ROACE under IFRS 16, lease assets would need to be valued. We understand from WWNZ that restating historic accounts properly for IFRS 16 would not be possible in the timeframe of the market study. However, as the methodology we are using is similar to what Moody's used historically prior to IFRS 16,⁵⁸ we are confident that it is helpful in illustrating the potential effect on ROACE.
62. The impact of including leased assets in the capital base can also be illustrated by examining the change in ROACE between 2019 and 2020. This is because WWNZ's 2020 accounts were completed under IFRS 16 while the 2019 accounts were not. Therefore the 2020 accounts have capitalised leased assets while the 2019 accounts do not. Because the NZCC's model includes a ROACE calculation for 2020 (which it excludes from its reporting to remove the impact of COVID), we can thus see the impact of capitalising leases by looking at the change in the NZCC's calculated ROACE between 2019 and 2020. Figure 12 below shows the NZCC's calculated ROACE drops dramatically between 2019 and 2020.
63. This is a counterintuitive result given WWNZ's profit increased between 2019 and 2020 (the NZCC calculated NPAT margin for WWNZ increased from 2.67 percent to 2.82 percent). We understand this was driven by higher than normal sales, particularly during lockdown. Thus, we should find that ROACE increases between 2019 and 2020. If we use our ROACE series pre 2020, which capitalises leased assets and thus is consistent with WWNZ 2020 accounts, we instead find that ROACE increases between 2019 and 2020, which is the expected result. This is demonstrated in Figure 12.

⁵⁴ The upper bound was 8. See C156.2 of NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021.

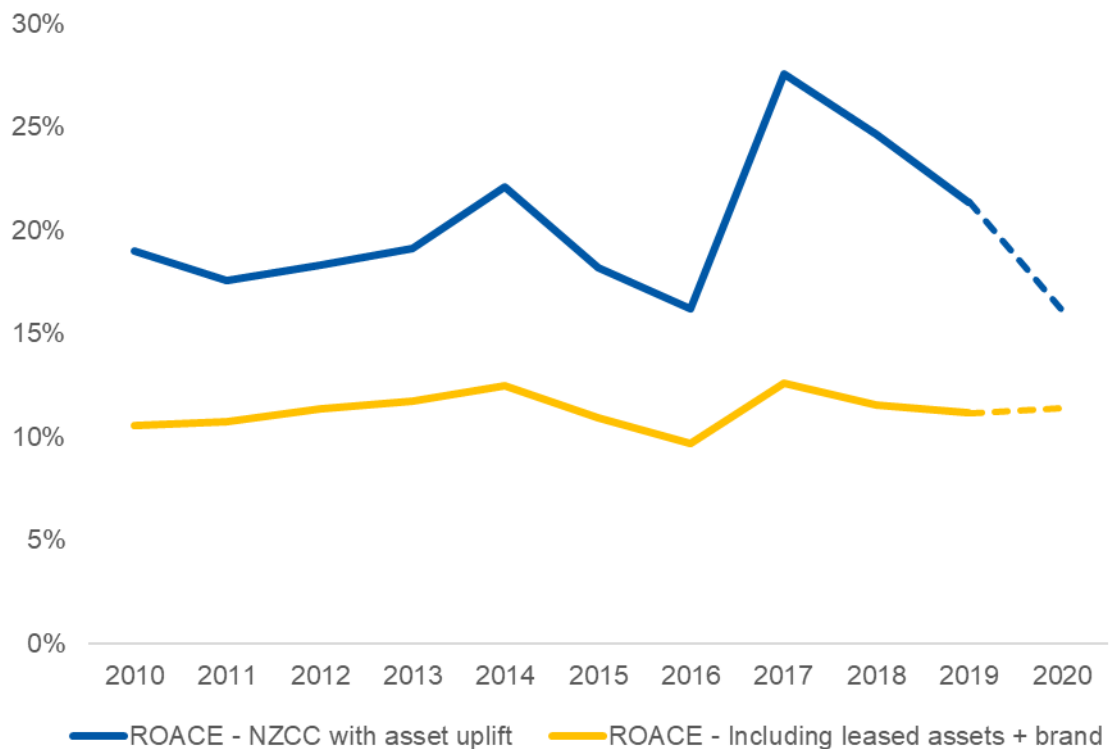
⁵⁵ In 2020 WWNZ's weighted average incremental cost of borrowing was 5.1%. See: Woolworths New Zealand Group (2020), *Annual Report*, 28 June 2020, p 11

⁵⁶ The lease asset is generally equivalent to the lease liability and the incremental cost of borrowing can be used for the lease interest rate. NZ IFRS 16 states that for initial measurement, the lease asset is valued at cost (i.e., the value of the lease liability plus any initial direct costs), and the lease liability is calculated as the present value of lease payments, discounted by the interest rate implicit in the lease. If this cannot be determined, then the lessee's incremental borrowing rate should be used. See: New Zealand External Reporting Board (EXAB), *New Zealand Equivalent to International Financial Reporting Standard 16 Leases* (NZ IFRS 16), February 2016, para.26. Available at: <https://www.xrb.govt.nz/accounting-standards/for-profit-entities/nz-ifs-16/>

⁵⁷ Specifically, $21.62 - 12.16 = 9.46$.

⁵⁸ ISAB (2016)

Figure 12: Illustration of the erroneous drop of ROACE between FY19 and FY20 under the NZCC's calculation which excludes leased assets



Source: NERA analysis, NZCC WWNZ ROACE Model.

2.4. Brands are a cost incurred in providing grocery services

64. The NZCC's logic for excluding brand assets is the same as its argument for excluding goodwill. At [C69], the NZCC states:⁵⁹

Given the similarities to goodwill, and in keeping with our approach of removing goodwill from the assets employed, we have removed the intangible brands asset. This asset does not represent a specific asset that is being employed to generate earnings

65. It is very hard to understand why the NZCC does not consider brands to be assets that are employed to generate earnings. Whether brands are built or acquired, they are a necessary cost incurred in competing for grocery shoppers in workably competitive markets.

66. Indeed, in the retail fuel market study the NZCC found that a brand (internally generated or acquired) attracts customers to retail sites, and therefore included Z Energy's cost of rebranding as an intangible asset in calculating Tobin's q :⁶⁰

The cost of internally-generated brands is not included in the financial statements – although purchased ones are. A known brand should attract additional customers to the retail sites, regardless of whether it is developed internally or acquired. We therefore include the cost of Z Energy's 2011 rebrand as one of its intangible assets – although we note this likely includes tangible assets (for example, signage and branded canopies) which may therefore be double-counted. This will tend to inflate the denominator in Tobin's q , so our final estimate will be too low.

⁵⁹ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para.C69

⁶⁰ NZCC (2019), *Retail fuel market study – final report*, December 2019, para.C106

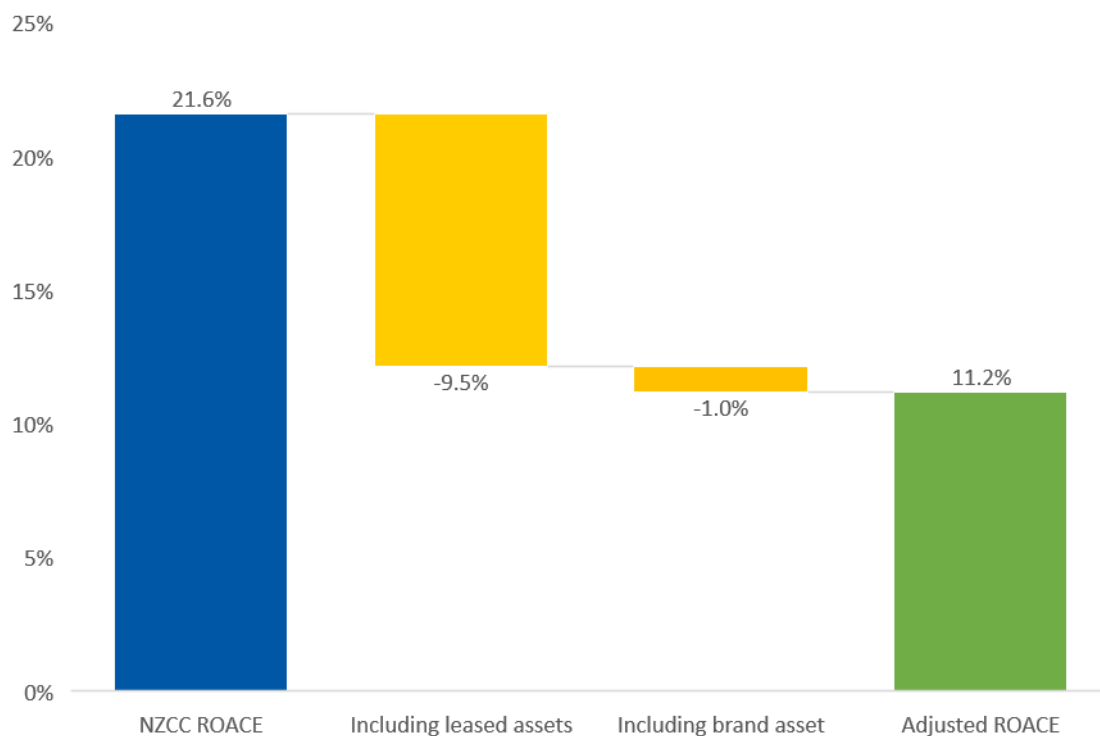
67. Adding WWNZ's intangible brand asset back into capital employed decreases average ROACE by a further roughly one percentage point.

2.5. Summary of ROACE analysis

68. In this section we have described why ROACE is an unreliable measure for inferring a firm is making excess returns when a firm has heavily depreciated assets, as is the case for WWNZ. This is because ROACE will generally be well in excess of the WACC when a firm's assets are heavily depreciated, even if the firm is earning no excess returns over the life of the assets.

69. In addition, the NZCC's calculated ROACE, by ignoring the value of leased assets and brands, overstates ROACE by approximately 10.4 percentage points. The impact of these adjustments is shown in Figure 13 below.

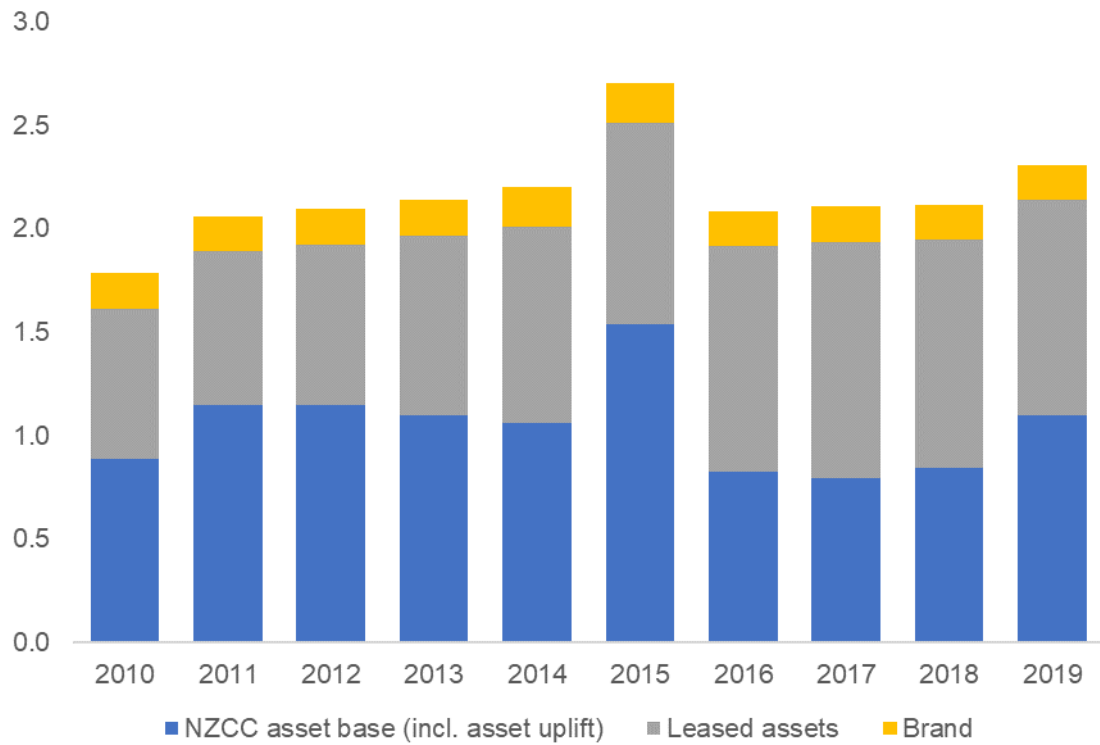
Figure 13: Cumulative impact on ROACE of including brands and leased assets



Source: NERA analysis, NZCC WWNZ ROACE Model. Note: Figures may not sum due to rounding.

70. This large difference is driven by a substantial increase in the asset base when leased assets and brand assets are included. Figure 14 below shows the difference in the asset base.

Figure 14: WWNZ capital employed (\$m), 2010–2019



Source: NERA analysis, NZCC WWNZ ROACE Model.

3. The Commission has understated WWNZ's cost of capital

71. The NZCC has estimated the WACC for groceries by using the approach it has developed for regulated infrastructure businesses. It applied this same approach in the fuel market study.
72. In a regulated context the WACC is an input into the “building blocks model” (“BBM”) that is used by the NZCC to directly set the prices regulated businesses can charge.⁶¹ An increase in WACC therefore directly increases the prices a regulated business can charge. The WACC is also generally one of the most significant determinants of prices, since infrastructure businesses are capital intensive and the WACC determines the return on capital that these businesses are allowed to earn.
73. Therefore, regulated businesses are incentivised to argue for a higher WACC. It is thus important in a regulated context that the regulator reaches an independent and unbiased view on WACC.
74. In the present context, the WACC is essentially used to *assess* prices rather than *determine* prices. A higher WACC in this context means that the NZCC is *less* likely to find a competition issue. Conversely, a lower WACC means the NZCC is *more* likely to find a competition issue.

3.1. WWNZ's internal WACC estimates are likely to be an unbiased estimate of its WACC

75. As part of its normal commercial operations, WWNZ's parent company WWAU sets a WACC for WWNZ. This is used for monitoring the performance of the WWNZ business, impairment testing and forms part of the basis for setting the investment hurdle rates used to make investment decisions.
76. It is not clear why WWAU (or WWNZ) would have any incentive to inflate this number. For WWAU, it wants to understand the performance of the New Zealand business, so will want an accurate WACC estimate. If the WACC was overstated, it could lead to erroneous conclusions that the business was underperforming (returns below WACC), when in fact the business was performing satisfactorily. Likewise, if it underestimated WACC it might erroneously conclude that a poor performing business was actually outperforming.
77. WWNZ submitted the NZCC the details of the WACC which is set for WWNZ by WWAU. The WACC that WWAU has set for WWNZ for commercial purposes ranges between [] percent and [] percent as at 29 November 2020. The document describes the estimated WACC as follows:
The selected WACC is considered to appropriately reflect the level of risk associated with the with the underlying cash flows underpinning the Strategic Plan
78. Following the NZCC's detailed discussion of its own WACC estimation, at [C140] the NZCC discusses and essentially dismisses the WACC estimates submitted by grocery retailers. The NZCC notes that the estimates are between one percent and two percent higher than its own estimate of 4.6 percent to 6.1 percent and that this is primarily driven by the grocery retailers using substantially higher asset betas. The difference in asset betas between the NZCC and what WWAU uses when setting WWNZ's WACC are set out in Table 2 below.

⁶¹ Technically, depending on the form of regulation, the control may be on the total revenue the firm can earn.

Table 2: Comparison of asset beta used by NZCC and that used internally by WWAU to set WWNZ's WACC

	NZCC grocery estimate	WWAU internal estimate for WWNZ
Low	0.4	[]
High	0.5	[]

Source: WWNZ, NZCC WACC Estimation Model.

79. Other than at [C140], the WACC and input parameters submitted by the grocery retailers do not feature in the draft report, and thus have essentially been ignored by the NZCC. This raises an important issue in the present context and for future market studies. In dismissing the WACC estimates and inputs put forward by the grocery retailers the NZCC is either:
- Second guessing the commercial decision making and rationality of the grocery retailers by substituting its own estimate; or
 - Using its own estimate/parameters because it believes the grocery retailers have submitted biased estimates.
80. As already noted, it is not clear why a WACC estimate prepared for internal purposes independently of the market study would be biased upwards, given the incentives a firm faces when setting its WACC.⁶²
81. This just leaves the possibility that the NZCC prefers its own WACC estimate to one calculated by a business that invested \$2.5b in WWNZ in 2005 and continues to invest in WWNZ. Given this significant investment, WWAU has a strong commercial incentive to estimate the WACC for WWNZ accurately. If the NZCC prefers its own WACC estimate, we think it is important that it explains the reasons why.
82. Table 3 shows the results of combining WWAU's estimate of the beta for WWNZ with the NZCC's other WACC parameters.

Table 3: WACC calculations (2015–2019)

	NZCC		WWNZ asset beta set by WWAU	
	Low	High	Low	High
Risk-free rate	2.34%	2.70%	2.34%	2.70%
Debt premium	1.67%	1.67%	1.67%	1.67%
Leverage	10%	30%	10%	30%
Asset beta	0.40	0.50	[]	[]
TAMRP	7.0%	7.5%	7.0%	7.5%
Tax rate	28%	28%	28%	28%
Debt issuance costs	0.2%	0.2%	0.2%	0.2%
Post-tax WACC	4.6%	6.1%	[]	[]

Source: NERA analysis, NZCC WACC Estimation Model, [].

83. Figure 15 and Figure 16 below show the various WACC and ROACE estimates discussed in this report. They illustrate that while a gap between the updated ROACE and WACC still exists, it is

⁶² While firms are incentivised to set a hurdle rate greater than WACC, this does not mean they have an incentive to set the WACC they use at a value greater than its true value.

dramatically reduced if leased assets and brands are accounted for in ROACE and WWNZ's internal beta estimate is used.

Figure 15: Revised WWNZ ROACE and WACC ranges, 2010–2019

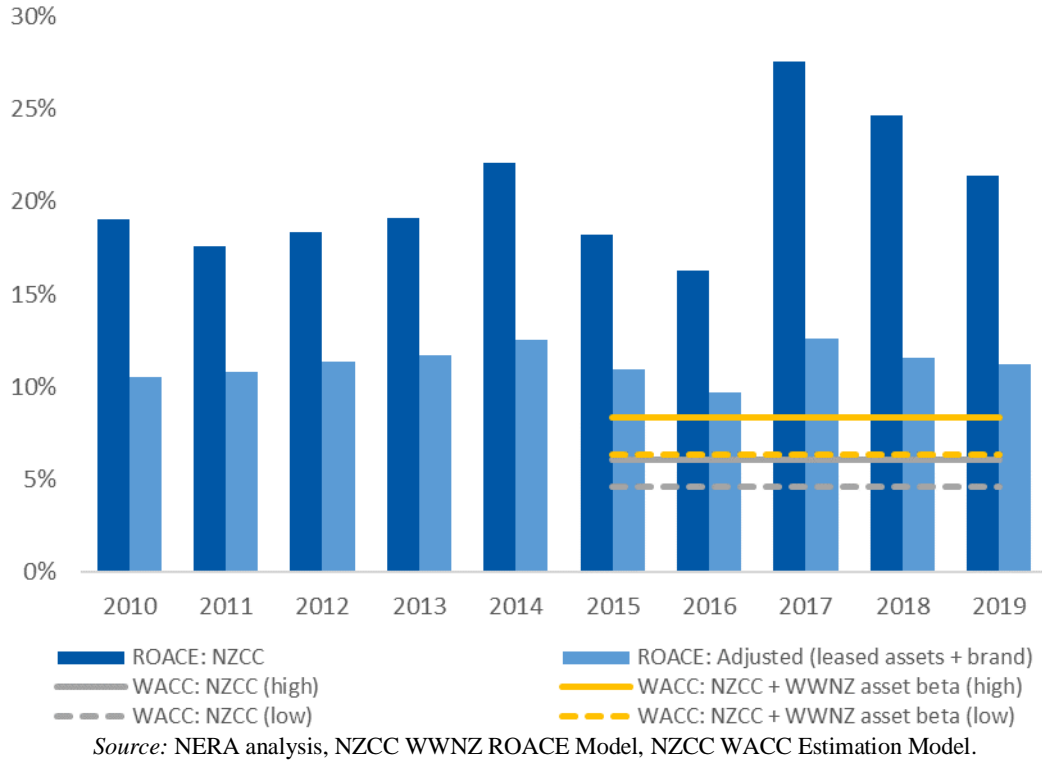
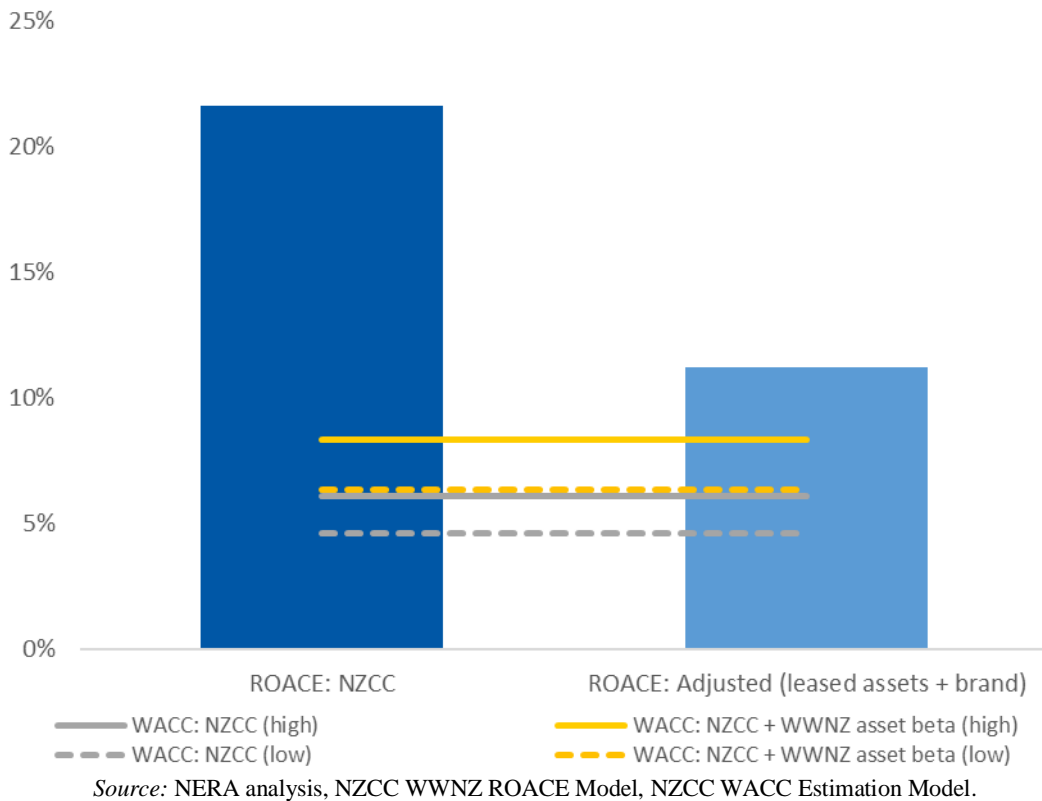


Figure 16: Revised WWNZ ROACE and WACC ranges, average 2015–2019



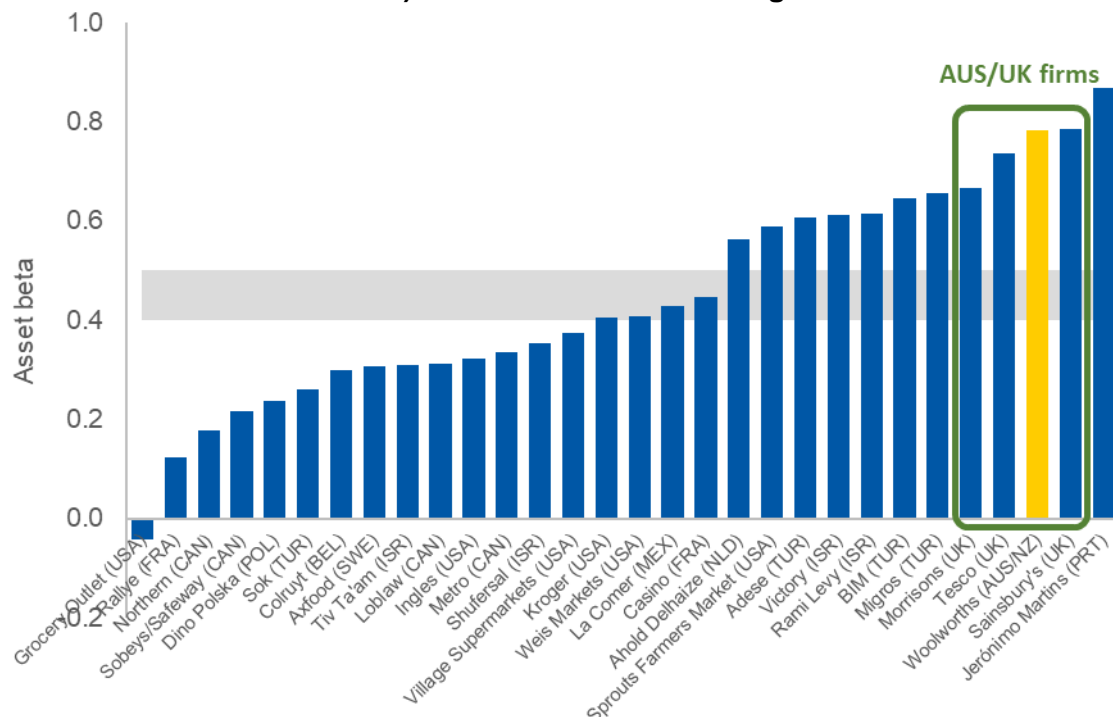
3.2. The NZCC beta comparator sample results in a very broad range

84. The sample of comparison company asset betas is very broad. The purpose of constructing a comparator sample is to try and reduce statistical noise in beta estimation by building a sample of comparable firms, where “comparable” essentially means that it is reasonable to believe that the firms all have a similar true underlying beta. In other words, differences in estimated betas are only largely due to statistical noise. Building a large sample should thus wash out this statistical noise and give a better estimate of the true beta.
85. By contrast, adding firms that are not comparable, in the sense that they would not be expected to have the same underlying beta, adds irrelevant information (as opposed to reducing statistical noise) and thus can skew the sample and bias the beta estimate.
86. The NZCC has estimated the beta it uses to assess returns for 2015–2019 using two five-year time periods: 2010–2014 and 2015–2019. Across these two windows, the firm level beta estimates vary from -0.07 to 0.9. This a very broad range, illustrated by the fact that using the bottom end of the range into the lower bound WACC would give a WACC of 1.3 percent and the top end of the range into the upper bound WACC would give 9.1 percent.
87. The WWAU estimates for WWNZ use data between 2016 and 2020.⁶³ Thus the NZCC estimates for the 2015–2019 period are most comparable. Figure 17 shows the average of weekly and four-weekly asset betas for each company in the NZCC sample for this period.
88. The breadth of the asset beta range raises questions about the comparability of each data point in the set. For example, it is possible that the types of products being sold vary quite widely across the dataset, and accordingly the share prices of the companies in the dataset differ in how they move compared to the overall economy they are in. In this regard, it is quite noticeable that:
 - a. There is a notable break in the series at around 0.45–0.55 where asset betas jump up around 0.1, although we have not tested the statistical significance of this break; and
 - b. There is a cluster of companies in the UK and Australia right at the top end of the distribution. These are countries that have many similarities to New Zealand, and we might expect grocery retailers in these countries to have similar systematic risk to those in New Zealand.

⁶³ [

]

Figure 17: Comparator company asset beta (average weekly and four-weekly, 2015–2019) and NZCC asset beta range



Source: NERA analysis, NZCC WACC estimation model.

89. The 2015–2019 average (weekly and four-weekly) asset beta of the UK and Australian companies in the NZCC sample is 0.74, which is very similar to the [] of the range WWAU estimates for WWNZ of []. The average of these companies taking the NZCC approach of using the last two five-year periods (encompassing the period in which it is assessing returns and the five years prior) is 0.63. This is above the NZCC beta range and [] of the WWAU range for WWNZ
90. This cross-check is thus supportive of the WWNZ internal beta estimate being reasonable and the NZCC estimate being too low.
91. An additional cross-check is to focus on the empirical beta for Woolworths group, the parent company of WWNZ that also operates supermarkets in Australia. The NZCC conducted this cross-check in its analysis but did not mention the results in the Draft Report. Figure 18 below is screen cap from the NZCC grocery market study WACC model spreadsheet, which shows the figures underlying table C3 of the draft report (i.e., the comparator sample averages) along-side the estimates for Woolworths group. This shows that on the NZCC's own calculations the beta for Woolworths is materially above the range it has selected. We also note that the beta the NZCC estimates for WWAU by taking the average over the 2010–2014 and 2015–2019 periods is [] as the lower bound set by WWAU for WWNZ.

Figure 18: NZCC grocery market study WACC model asset beta calculations
WACC Estimation Model: Retail Grocery Market Study

Summary of asset beta and leverage results for grocery market comparator sample

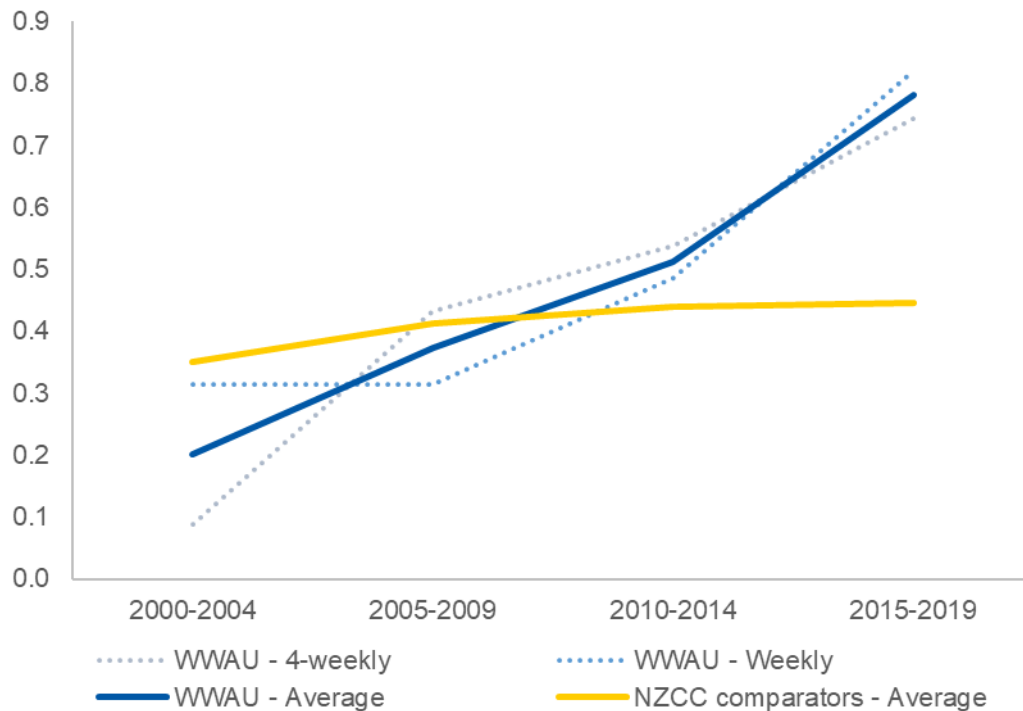
All Sample	2000-2004	2005-2009	2010-2014	2015-2019
Number in sample	20	22	25	30
Weekly asset beta	0.37	0.42	0.43	0.46
Four-weekly asset beta	0.34	0.41	0.45	0.44
Average weekly and four-weekly asset beta for 2010-14 and 2015-19 periods				0.44
Low End Range Asset Beta				0.40
High End Range Asset Beta				0.50
Leverage	24.2%	20.1%	19.4%	22.4%
Average leverage for the 2010-14 and 2015-19 periods				20.9%
				20.0%

Result for Woolworths - WOW	2010-2014	2015-2019
4 weekly asset beta	0.54	0.74
Weekly asset beta	0.49	0.82
Average weekly and four-weekly asset beta for 2010-14 and 2015-19 periods		0.65

Source: NZCC WACC Estimation Model

92. Interestingly, the empirical WWAU asset beta is also materially higher in 2015–2019 compared to 2010–2014. Looking at the NZCC estimates for WWAU reveals a clear trend that the asset beta for WWAU has been increasing over time, as shown in Figure 19 below.

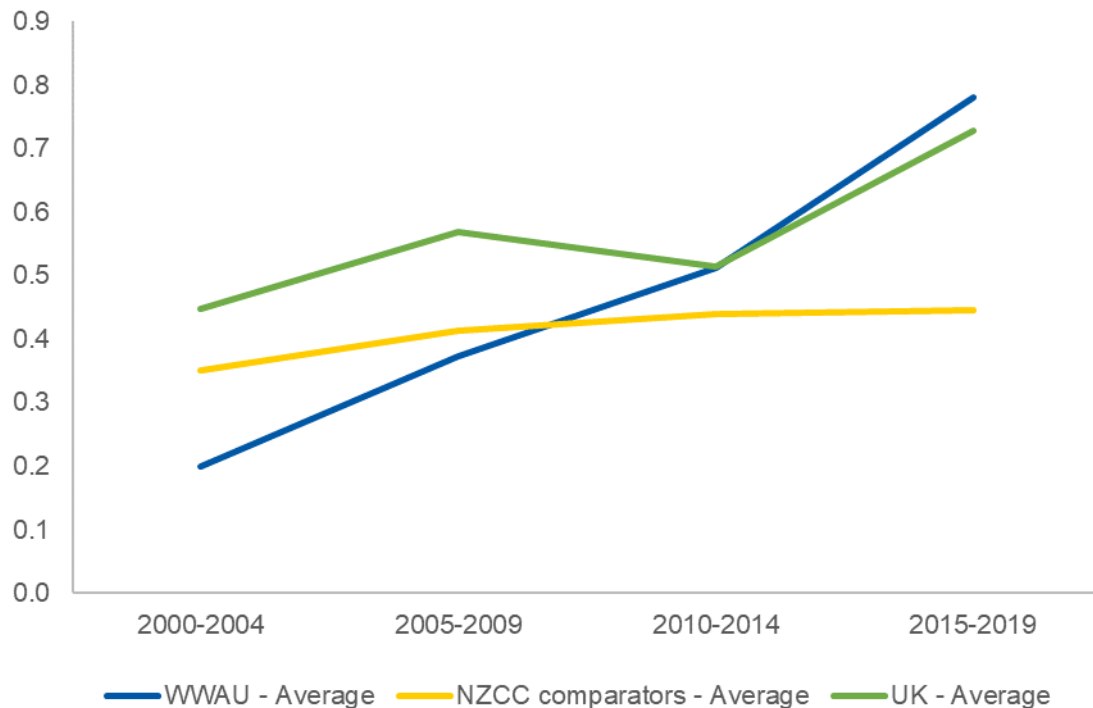
Figure 19: NZCC estimation of the WWAU asset beta for different time periods



Source: NERA analysis, NZCC WACC estimation model.

93. Figure 20 shows that a similar but less pronounced trend is observed for the UK supermarkets in the NZCC sample,⁶⁴ whereas the NZCC's overall comparator sample average has remained relatively stable over the same time frame.

Figure 20: Average of weekly and four-weekly betas for: WWAU, UK firms in NZCC comparator sample and NZCC comparator sample



Source: NERA analysis, NZCC WACC estimation model.

94. Given that:

- The NZCC is estimating a WACC to assess returns over the 2015–2019 period;
- 2015–2019 betas are materially higher than 2010–2014 betas for a narrow set of the likely closest comparators; and
- The WWAU asset beta has been rising over time;

There is a risk that the NZCC's approach is underestimating the return investors required for investing in WWNZ over the 2015–2019 period.

95. In summary:

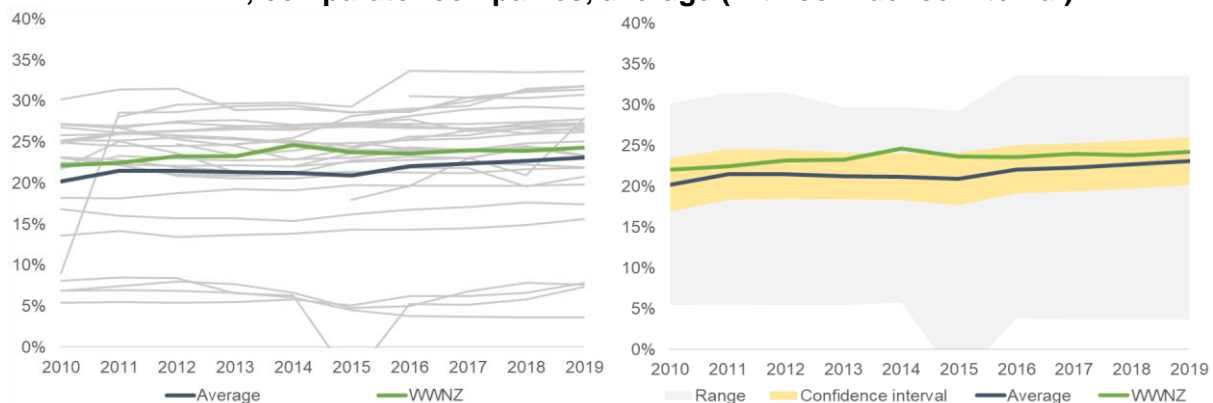
- The NZCC's comparator set is very broad, which raises questions as to whether the included firms are truly comparable; and
- Looking at a narrower sample (WWAU and the UK supermarkets) as a cross check is supportive of the asset beta that WWAU sets for WWNZ and suggests that the NZCC comparator sample average may be underestimating WWNZ's beta.

⁶⁴ Specifically, a similar trend is observed for Tesco while both Sainsburys and Morrisons have a spike in the 2005–2009 period. In all cases, the 2015–2019 beta is materially higher than the 2010–2014 beta.

4. Distribution of comparator margins

96. There is a broad variance in profit margins of comparator companies, which means we need to be cautious in making comparisons to the margins of WWNZ. Indeed, a key explanation for this variance, particularly for the GP margin, could be differences in accounting policy among the firms in the sample. This suggests that the NZCC may not be making an apples with apples comparison.
97. For each of the three different margins, the NZCC assesses WWNZ margins against the average profit margin across all the comparator companies. The NZCC finds that WWNZ's profit margins have been higher than the international comparator average, and they have been consistently higher over time.
98. Using an average profit margin across all firms and across time does not show the range and distribution of these profit margins. As Figure 21, Figure 22 and Figure 23 show, these margins vary significantly between companies and over the time period, which means simply comparing WWNZ's margins to the average can be misleading, as the mean may not be of much informative value. From a statistical perspective, the large variation means there is uncertainty about the "true" mean. Accordingly, it is appropriate to construct a confidence interval around the mean, to account for the variation within the data.⁶⁵
99. The right-hand side graph in these figures show that for gross profit margin and NPAT margin, the WWNZ margin is within the confidence interval of the comparator sample average margin in the majority of years. This implies that in most years the WWNZ margin is not significantly different to the international comparison average. With respect to the EBIT margin, while it falls outside the confidence interval for a large part of the period, it has been trending down since 2015 and is within the confidence interval by the end of the period.

**Figure 21: Gross profit margin:
WWNZ, comparator companies, average (with confidence interval)**



Source: NERA analysis, NZCC WWNZ ROACE and Margins Model.

⁶⁵ Confidence intervals are a range that gives a sense of how precisely a sample statistic estimates the true value of a parameter (i.e. in this case the average ROACE). Using a 95 percent confidence interval, broadly speaking we can be 95 percent confident that the true population mean is in the confidence interval. We can also use confidence intervals to test if a given value is statistically significantly different to the sample mean. If the value is within the 95 percent confidence interval, we cannot say that the value is significantly different to the mean (at a 95 percent confidence level).

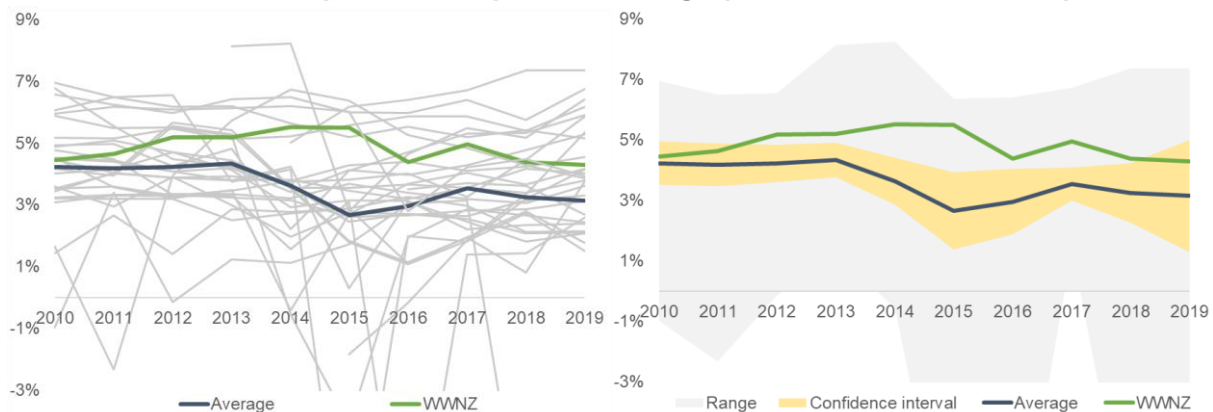
The confidence interval using a t-distribution (for a sample size of less than 30) is estimated as follows:

$$CI = \text{sample mean} \pm t - \text{score of confidence level} \times \frac{\text{sample standard deviation}}{\sqrt{\text{sample size}}}$$

E.g. for gross profit in 2010 the confidence interval is:

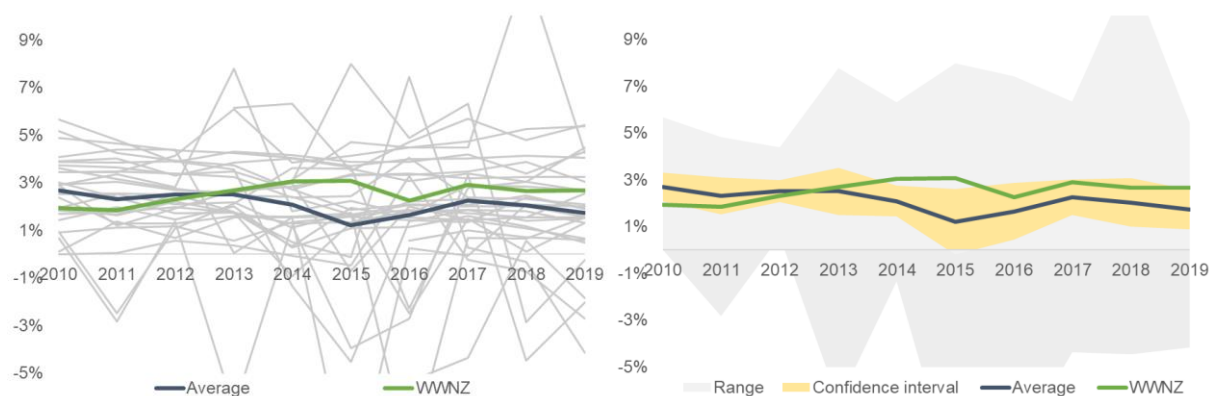
$$CI = 20.2\% \pm 2.069 \times \frac{0.077}{\sqrt{24}} = (17.0\%, 23.4\%)$$

**Figure 22: EBIT margin:
WWNZ, comparator companies, average (with confidence interval)**



Source: NERA analysis, NZCC WWNZ ROACE and Margins Model.

**Figure 23: NPAT margin:
WWNZ, comparator companies, average (with confidence interval)**



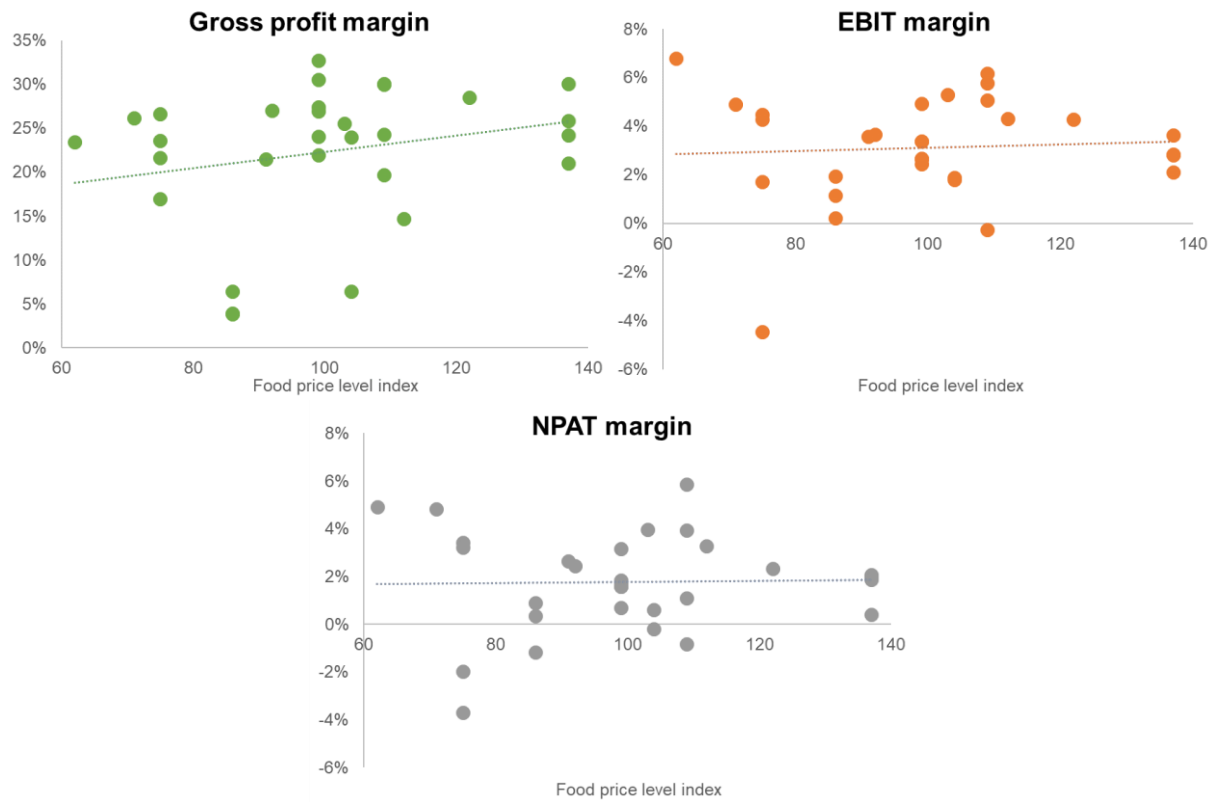
Source: NERA analysis, NZCC WWNZ ROACE and Margins Model.

100. Figure 21 shows that there are four firms that have gross profit margins below 10 percent, noticeably lower than the other firms across the entire time period. These are the three comparator companies from the UK and one from France.⁶⁶ We understand that WWNZ is providing a submission explaining that gross profit is an unreliable cross-company comparative measure due to varying accounting practice regarding what costs are included. Specifically, we understand that if WWNZ categorised costs in the same manner as the UK companies, it would report a GP margin of less than 10 percent. This suggests that an apples with apples comparison is not being made and therefore comparing GP across companies is not meaningful.
101. There is also no statistically significant correlation between any of the three profit margins (gross profit margin, EBIT margin, and NPAT margin) and the OECD food price level index used by the NZCC.⁶⁷ Figure 24 shows the correlation between the food price level index and the three profit margin measures.

⁶⁶ Morrisons, Tesco, Sainsbury's and Rallye.

⁶⁷ Gross profit margin: correlation coefficient = 0.24, p-value = 0.21. EBIT margin: correlation coefficient = 0.06, p-value = 0.75. NPAT margin: correlation coefficient = 0.02, p-value = 0.91

Figure 24: Three measures of profit (2015–2019) and the OECD food and non-alcoholic beverages price level index (2017) for comparator companies do not have statistically significant correlations



Source: NERA analysis, NZCC WWNZ ROACE and Margins Model, OECD.Stat, 2017 PPP Benchmark results, Table 1.11: Price level indices (OECD=100).

5. The Commission has overstated the relative price of groceries in New Zealand

102. As noted by the NZCC, making international price comparisons is not straightforward and there are many complicating factors that warrant caution when drawing conclusions from outcomes of any analysis doing so. Indeed, the World Bank and Eurostat (who develop purchasing power parities (“PPPs”) with the OECD) both caution against using international price level measures for precise rankings.⁶⁸ Acknowledging such, we address some issues which complicate and affect the outcomes of these analyses in Chapter 3 of the NZCC’s draft report.
103. The NZCC analyses various datasets to compare grocery prices internationally. It considers two datasets (from the OECD and World Bank International Comparison Program (“ICP”)) to be the most reliable, and therefore we focus our discussion on the analysis of these, noting that outcomes using each dataset are quite similar.⁶⁹ Both of these datasets contain data from the respective agencies’ international comparison programs to calculate PPPs, which most recently released results for the year 2017.⁷⁰ Therefore, all analysis results are as of 2017.
104. The NZCC states that its analysis finds New Zealand to rank sixth highest out of OECD member countries in terms of grocery prices when including alcohol and tobacco products and seventh highest when excluding these.⁷¹ It also finds that New Zealand’s expenditure per capita on grocery products was at least the fifth highest in the OECD.⁷²
105. Regarding the analysis of grocery prices, the NZCC applies price level indices (“PLIs”) prepared and published by the OECD and ICP. These PLIs are constructed by taking the category-level PPP for the category of interest⁷³ (for example, food and non-alcoholic beverages) and dividing by a market exchange rate. As noted by the ICP:⁷⁴
- PPPs are calculated based on the price of a common basket of goods and services in each participating economy and are a measure of what an economy’s local currency can buy in another economy.*
106. A more detailed description of PPP calculations is provided in footnote 73 of this report, but take for example two simple, illustrative PPPs for a single good:

⁶⁸ World Bank, *Purchasing Power Parities for Policy Making*, 2021, p 4. Eurostat, “Statistics Explained Glossary: Price Level Index”, available at: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Price_level_index_\(PLI\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Price_level_index_(PLI))

⁶⁹ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para 3.92.

⁷⁰ OECD.Stat, Eurostat-OECD PPP Programme, *2017 PPP Benchmark results*, available at <https://stats.oecd.org/Index.aspx?DataSetCode=PPP2017>. World Bank, *ICP 2017 results*, available at <https://www.worldbank.org/en/programs/icp>.

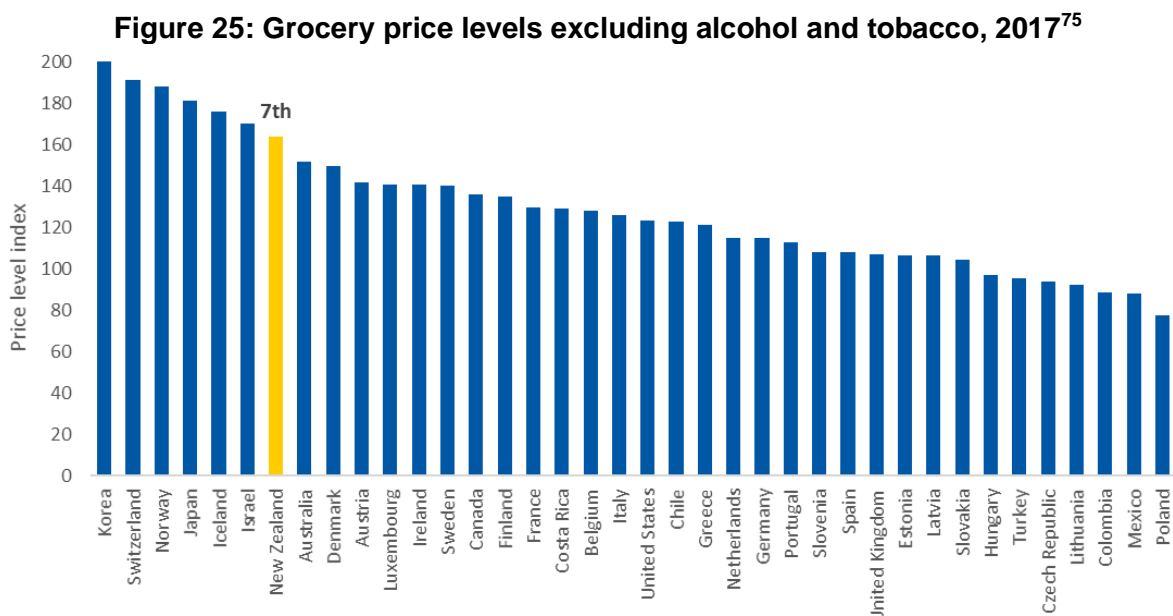
⁷¹ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para 3.101.

⁷² NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para 3.103.

⁷³ The OECD describes the calculation of PPPs as such: “The calculation is undertaken in three stages. The first stage is at the product level, where price relatives are calculated for individual goods and services. A simple example would be a litre of Coca-Cola. If it costs 2.3 euros in France and 2.00\$ in the United States then the PPP for Coca-Cola between France and the USA is 2.3/2.00, or 1.15. This means that for every dollar spent on a litre of Coca-Cola in the USA, 1.15 euros would have to be spent in France to obtain the same quantity and quality - or, in other words, the same volume - of Coca-Cola. The second stage is at the product group level, where the price relatives calculated for the products in the group are averaged to obtain unweighted PPPs for the group. Coca-cola is for example included in the product group “Softdrinks and Concentrates”. And the third stage is at the aggregation levels, where the PPPs for the product groups covered by the aggregation level are weighted and averaged to obtain weighted PPPs for the aggregation level up to GDP (in our example, aggregated levels are Non-alcoholic beverages, Food...). The weights used to aggregate the PPPs in the third stage are the expenditures on the product groups as established in the national accounts.”

⁷⁴ World Bank, International Comparison Program, available at <https://www.worldbank.org/en/programs/icp>.

- a. PPP for Mexico: $\text{Mex\$}20 / \text{USD\$}1.10 = \text{PPP\$}18.18$
 - b. PPP for New Zealand: $\text{NZD\$}1.50 / \text{USD\$}1.10 = \text{PPP\$}1.36$
107. As the example shows, these PPP values are still not easily comparable, as they are derived using a fixed base. Once these PPPs are constructed (which is much more complicated than for the single-good illustration here), they are converted into a common currency to compare using exchange rates, such as USD.
108. Continuing the example above, we convert the two PPPs for the single good to USD using illustrative market exchange rates:
- a. PLI for Mexico: $\text{PPP\$}18.18 / 20.31 * 100 = 89.5$
 - b. PLI for New Zealand: $\text{PPP\$}1.36 / 1.45 * 100 = 93.8$
109. So, New Zealand's price level index for this single good is higher than Mexico's. While these are single-good level PLIs, this same basic methodology is used to derive category-level PLIs. These are the PLIs applied by the NZCC to compare price levels.
110. Put simply, these price level indices show the amount of local currency it takes to purchase the same basket of goods or services across countries, translated into a common currency using the market exchange rates.
111. Figure 25 below analyses the same data as the NZCC's Figure 3.8 of grocery price levels using the ICP dataset (excluding alcohol and tobacco), showing the price level indices across countries instead of the percentage difference in price levels relative to New Zealand.
112. From here onward, we refer to "grocery price levels" meaning food and non-alcoholic beverages *excluding alcohol and tobacco*. We discuss our exclusion of these products in Appendix A.



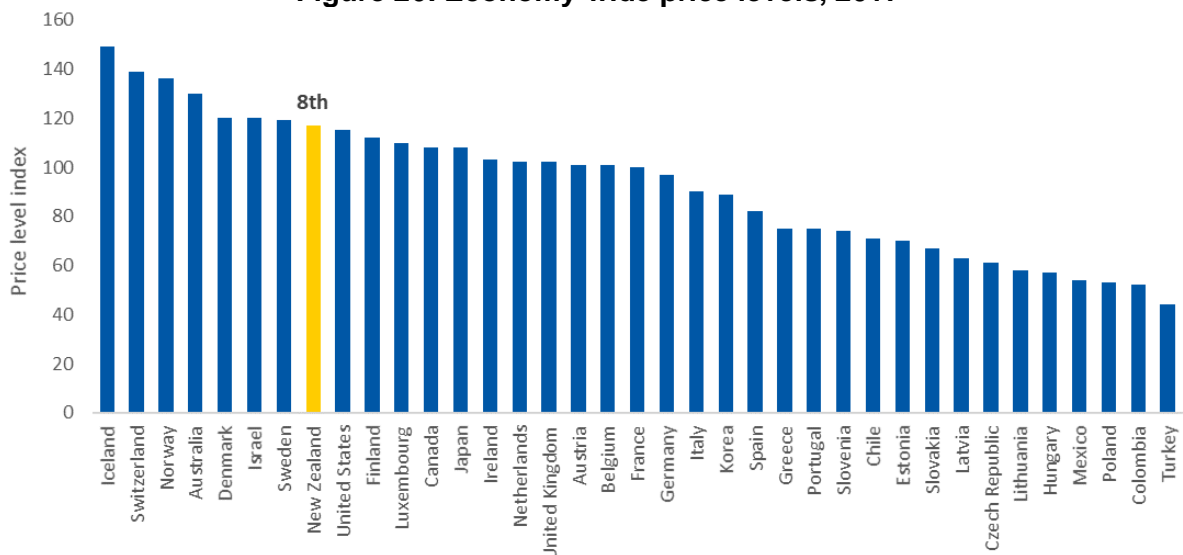
Source: NERA analysis of World Bank, ICP 2017 results.

⁷⁵ New Zealand also ranks seventh using OECD data.

5.1. On the NZCC's approach, New Zealand is an expensive place overall

113. As noted above, the NZCC finds that the 2017 price level of groceries in New Zealand ranked sixth highest including alcohol and tobacco, seventh highest without. The OECD dataset used by the NZCC also includes price level indices for the overall economies of these countries, which is useful to look at to understand whether it is simply grocery prices that are (according to the NZCC's analysis) on the higher end compared to other OECD countries, or goods and services across the economy at large (according to this dataset and methodology). The economy-wide PLI includes all national account inputs for GDP, and therefore aggregates all markets in an economy.
114. As shown in Figure 26 below, using the OECD data, New Zealand ranks eighth among OECD countries at the economy level, just below that of groceries alone. Using the ICP data, New Zealand ranks seventh – the same as when ranking groceries alone.

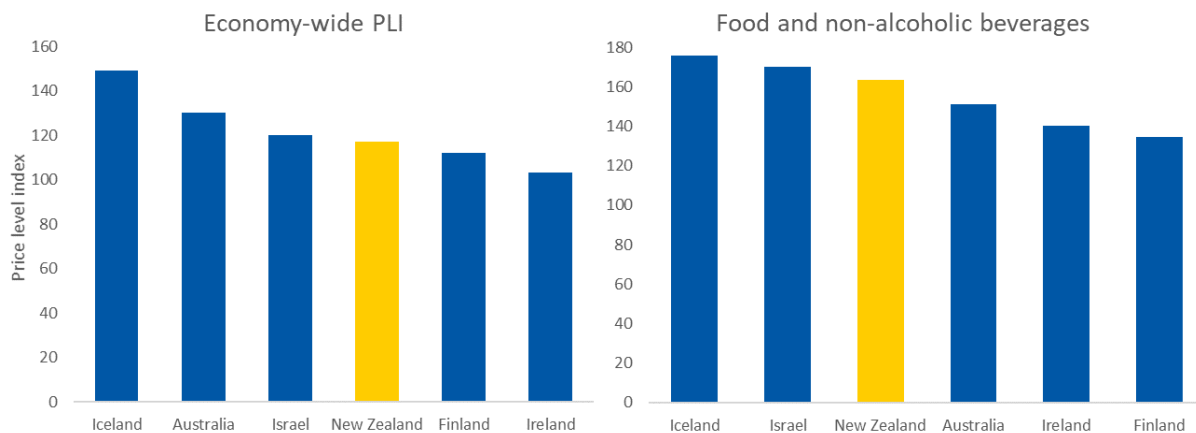
Figure 26: Economy-wide price levels, 2017



Source: NERA analysis of OECD.Stat, 2017 PPP Benchmark results, Table 1.11: Price level indices (OECD=100).

115. This is consistent with the proposition that the costs of providing goods and services in New Zealand are generally high due to factors such as our geographic isolation, lack of scale, etc. Thus, when the NZCC finds that New Zealand has the seventh most expensive food and non-alcoholic beverage grocery prices in the OECD, this could simply be because New Zealand is a high cost-to-serve country.
116. Additionally, Figure 27 presents the economy-wide PLIs against grocery PLIs for the comparator countries selected by the NZCC at [3.114]. This shows that New Zealand lands roughly in the middle in both of these price level comparisons, albeit New Zealand ranks slightly higher in grocery price levels.

Figure 27: Economy-wide price levels and grocery price levels for NZCC comparator country sample, 2017



Source: NERA analysis of OECD.Stat, 2017 PPP Benchmark results, Table 1.11: Price level indices (OECD=100).

5.2. The NZCC has overstated how expensive groceries in New Zealand are

5.2.1. It is not correct to include alcohol and tobacco products in an analysis of grocery prices

117. Including alcohol and tobacco in the PLIs pushes New Zealand to the sixth highest PLI across OECD countries rather than the seventh, using the OECD dataset.
118. We think it is incorrect to include alcohol and tobacco in the measure of grocery price levels, due to countries' varying excise taxes on these products and varying policies globally on where these products are sold:
 - a. Many countries permit hard alcohol to be sold in grocery stores, while New Zealand does not; and
 - b. Some countries, like France and Spain, do not permit tobacco to be sold in supermarkets, while New Zealand does;
119. In addition, the NZCC itself proposed to exclude these products in its Preliminary Issues Paper for this market study.⁷⁶
120. The NZCC has used the results including alcohol and tobacco in its headline figures for its "International price comparisons" section, without noting as such.⁷⁷ Additionally, the NZCC presents its analysis of price levels across its selected comparator countries using these prices, which push New Zealand to being second highest out of six, rather than third highest out of six when alcohol and tobacco are excluded.⁷⁸
121. Finally, the NZCC has not properly weighted the indices to combine food, non-alcoholic beverages, alcoholic beverages and tobacco. The methodology used to weight the indices does not correctly represent the price differences across the categories and therefore underweights

⁷⁶ NZCC, *Market study into the retail grocery sector: Preliminary issues paper*, 10 December 2020, p 9.

⁷⁷ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para. 3.78.

⁷⁸ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, Figure 3.10 and paras 3.115-3.116.

alcohol and tobacco (see Appendix A for details). Correcting to properly weight the indices further confirms that these categories should not be included in an analysis of grocery prices.

5.2.2. The NZCC relies exclusively on market exchange rates

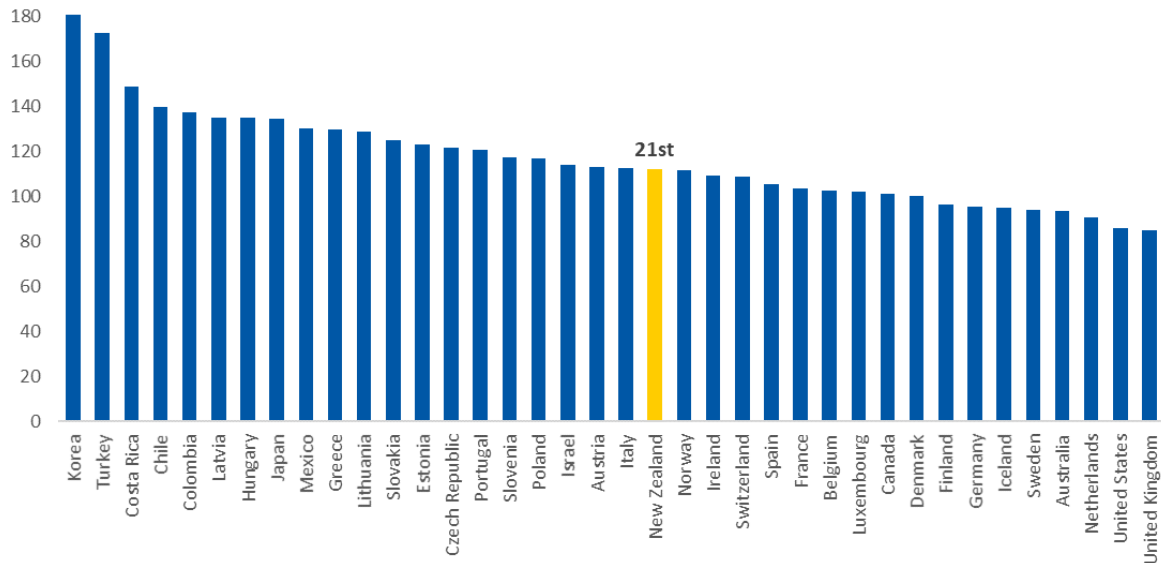
122. The NZCC relies on PLIs which are constructed by applying a market exchange rate, and reviews expenditure per capita on food and beverages using a market exchange rate.
123. The NZCC has stated that it does not apply PPPs in its analysis because:⁷⁹
- We consider that grocery products are largely tradeable and therefore the alternative PPP method for converting currencies would not be an appropriate method. We also note that PPP methods might reduce the price effects we are interested in if the expenditure items are sufficiently large as they are themselves obtained using price-level indices from the country in question.*
124. However, we find that these reasons for excluding PPPs entirely can be refuted for the following reasons:
- a. Statistics NZ defines the “supermarket and grocery stores” industry as non-tradable.⁸⁰
 - b. Across OECD countries, food and non-alcoholic beverages make up, on average, eight percent of expenditure as a percent of GDP.⁸¹ Therefore, grocery expenditure should not have an undue influence on overall PPP rates.
125. For these reasons, we think there is a justification for applying PPP and perhaps a blended market/PPP rate.
126. To test the effect of using PPPs versus market exchange rates, we reconstruct the PLIs using economy-wide PPP rates. While the PLIs using a market exchange rate convert the category-level PPPs to a common currency (US dollars), using the PPP exchange rates as the denominator gives us a ratio of category-level PPP to economy-level PPP.
127. What this ratio indicates is whether the price level for the category is higher or lower relative to the general price level in the country. Put another way, these ratios do not compare economies with differing incomes and preferences against each other, but instead give a sense of whether, within any given economy, the price level for that category of goods or services is in line with the general price level. Figure 28 shows these relative price levels using an economy-wide PPP rate as the denominator. New Zealand’s rank amongst OECD countries moves down to 21st, meaning that 20 OECD countries have higher food prices relative to their general economy prices than New Zealand.

⁷⁹ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para 3.90.

⁸⁰ Statistics NZ, *The tradable sector and its relevance to New Zealand’s GDP*, 3 July 2013, p 28.

⁸¹ Note also that New Zealand’s expenditure on food and non-alcoholic beverages is eight percent of GDP as well (using World Bank data). This expenditure proportion is used as the weighting within the economy-wide PPP rates.

Figure 28: Grocery price level indices excluding alcohol and tobacco using PPP rates, 2017⁸²



Source: NERA analysis of OECD.Stat, 2017 PPP Benchmark results, Table 1.11: Price level indices (OECD=100).

128. We also show the effects of applying PPP on an analysis of expenditure per capita on groceries in section 5.4.

5.3. Response to NZCC comments on NERA analysis

129. The NZCC states at [3.95] that it does not consider the results of NERA’s 4 February *Grocery price benchmarking* report “likely to be reflective of differences in pricing levels between countries”.

130. The NZCC’s first critique is our use of PPP instead of market exchange rates. As stated in our report and discussed in section 5.2.2 above, we find that using PPP rates is appropriate for grocery retailing. Additionally, and also noted in our report, the NZCC has applied PPP exchange rates for international comparisons before.⁸³

131. The NZCC’s second critique of the NERA report is the ranking methodology used:⁸⁴

The ranking mechanism may limit the influence of very cheap or expensive goods that might be a large share of expenditure, meaning that the median ranking of prices may not represent consumer experiences at grocery stores. Further, consumers generally purchase a range of grocery items, not a single “median” item, so there is a strong rationale for using averages across grocery items as the appropriate measure of central tendency.

132. There are two approaches to price benchmarking, both of which are valid and have informative value:

- Assume a fixed basket and create an index, such as the PLIs based on category-level PPPs used by the NZCC; or
- Do not assume a fixed basket and look at distribution of price rankings.

⁸² New Zealand ranks 22nd when using ICP data.

⁸³ See, for example, NZCC, *International Price Comparison for Retail Mobile Telecommunications Services 2013*, March 2014, p 3.

⁸⁴ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para 3.125.

133. Because the data applied in the NERA analysis is product-level data, rather than category level such as the ICP and OECD data, we can apply a methodology which avoids the need to assume a fixed basket. The approach NERA has used instead takes all products for which prices are available in each city and then ranks those products by price level across countries and distributes the ranks.
134. Because of different preferences and incomes, the typical consumer grocery basket is likely to vary across countries. Even within a country, consumer heterogeneity may make it difficult to define what is “typical”. We do not know what these typical (or other) baskets are, which raises a material risk of the price comparison results being skewed by irrelevant prices.
135. The NZCC states that “consumers generally purchase a range of grocery items, not a single ‘median item’”, which is true and is not a critique that is reflective of the methodology used. The median is simply used to order the box and whisker distributions of all ranks. The methodology explicitly takes into account that consumers buy a range of items, which is why the distribution of product price rankings is shown. Moreover, the ranking methodology does not give more weight to more expensive or less expensive items as to not skew the relative levels when these items may have different levels of importance across economies.
136. For example, the price level ranking for rice and the price level ranking for steak are given the same weight. A country which, on balance, has more items which cost less money than the equivalent item in a comparator country (regardless of the importance of that item in the country’s culture or relative price difference between the items) will rank lower than the other country.
137. National statistical agencies do not publish their product-level prices, and therefore our methodology cannot be undertaken using data from one of these. The product-level price data collected by the Economist Intelligence Unit is passed through a series of internal checks to ensure accuracy.⁸⁵

5.4. Expenditure and proportion of income spent on groceries

138. The NZCC states in its Chapter 3 summary (emphasis added):⁸⁶
- ... New Zealanders appear to spend a relatively high **proportion of their income** on groceries.*
139. The basis for this statement is unclear – the NZCC’s report does not provide any empirical analysis for the statement. The NZCC’s report does include analysis showing that New Zealand ranks fourth (using OECD data) or fifth (using ICP data) in terms of expenditure per capita on food (analysis which is subject to the same critiques we outline above). However, this does not justify the NZCC’s claim that New Zealanders spend a high proportion of their income on groceries.
140. To better understand the relative proportion of income spent by New Zealanders on groceries, we have identified New Zealand’s rank in expenditure on groceries per capita as a percent of gross national income (GNI) per capita.⁸⁷ Although GNI per capita is a broad measure, it will broadly capture the differences in relative income levels between economies. Doing this calculation, using market exchange rates as the NZCC has done, results in New Zealand having a rank of 17th out of OECD countries as shown in Figure 29. We additionally show the outcome using GNI per

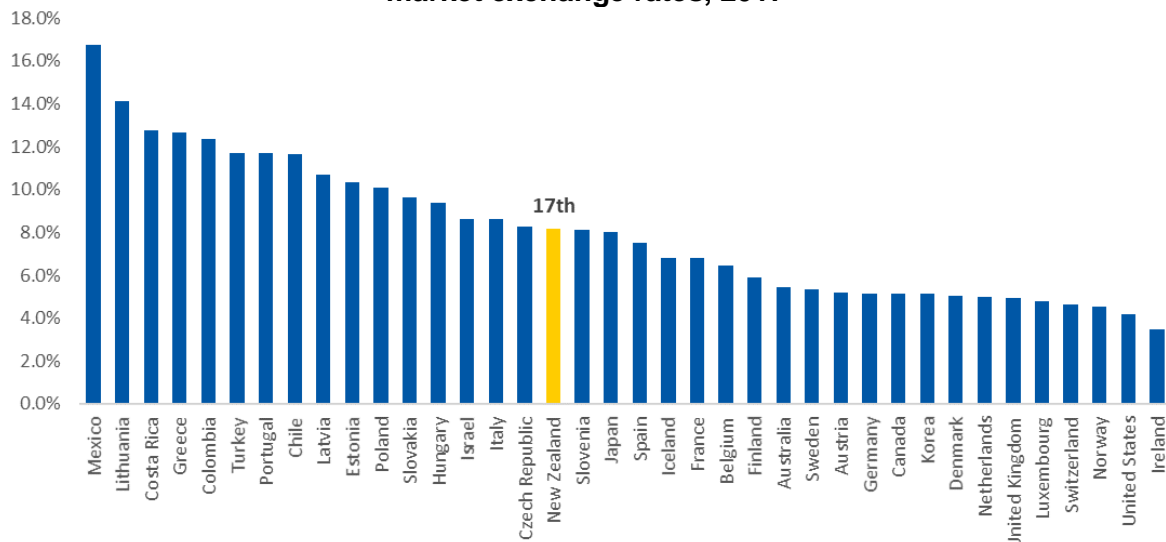
⁸⁵ The Economist Intelligence Unit, *City Data*. Available at <https://www.eiu.com/n/solutions/citydata/>.

⁸⁶ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, p 35.

⁸⁷ As defined by the OECD as “gross domestic product, plus net receipts from abroad of compensation of employees, property income and net taxes less subsidies on production.”

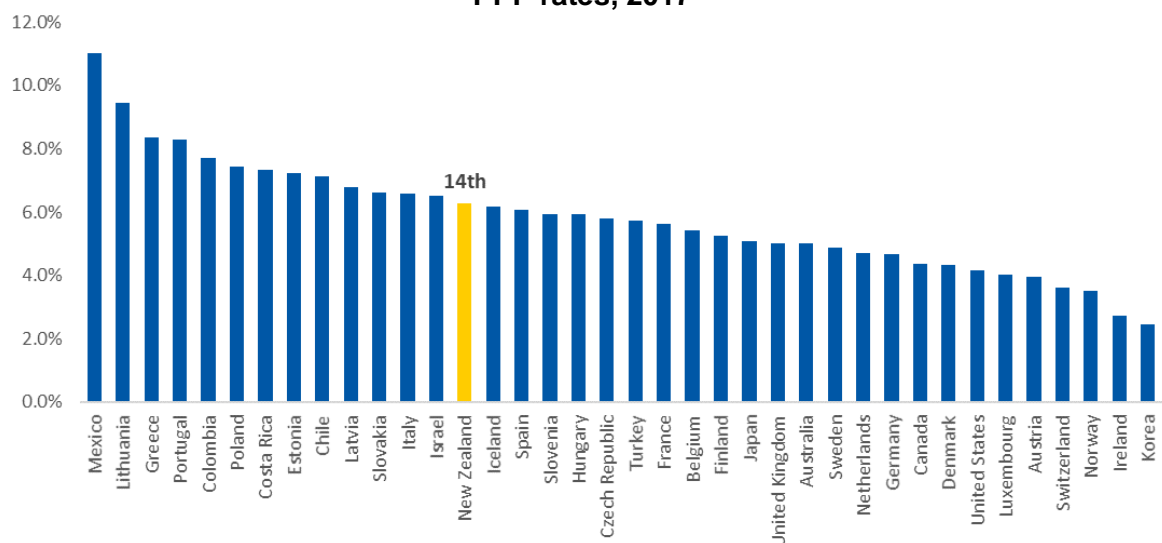
capita and expenditure per capita on food and non-alcoholic beverages using PPP exchange rates in Figure 30, which places New Zealand at 14th.

Figure 29: Expenditure on groceries per capita as a percent of GNI per capita using market exchange rates, 2017⁸⁸



Source: NERA analysis of World Bank, ICP 2017 results and World Bank DataBank, World Development Indicators.

Figure 30: Expenditure on groceries per capita as a percent of GNI per capita using PPP rates, 2017⁸⁹



Source: NERA analysis of World Bank, ICP 2017 results and World Bank DataBank, World Development Indicators.

141. To sense check our results, we have also run this same analysis using a variety of metrics to represent income. Table 4 below shows New Zealand's respective rank using each metric, data source, and exchange rate.

⁸⁸ New Zealand ranks 16th using OECD data, but note that GNI is not available from the OECD for Iceland. OECD.Stat, Aggregate National Accounts, SNA 2008: Disposable income and net lending/borrowing.

⁸⁹ New Zealand ranks 15th using OECD data, but note that GNI is not available from the OECD for Iceland. OECD.Stat, Aggregate National Accounts, SNA 2008: Disposable income and net lending/borrowing.

Table 4: New Zealand's rank amongst OECD countries for expenditure capita as a percent of various income metrics

	GNI per capita ⁹⁰	GDP per capita ⁹¹	Actual individual consumption per capita ⁹²	Household expenditure per capita ⁹³	Household disposable income per capita ^{*94}
Market exchange rates					
<i>World Bank</i>	17	18	19	19	<i>n/a</i>
<i>OECD</i>	16	17	19	19	16
PPP rates					
<i>World Bank</i>	14	15	19	16	<i>n/a</i>
<i>OECD</i>	15	15	18	18	11

Source: NERA analysis of World Bank Data and OECD data.

Note: * Household disposable income is only available from the OECD, and the OECD data is missing this measure for Iceland, Israel, and Turkey. Therefore, New Zealand's rank should not be interpreted as like-for-like with the other metrics. In addition, Israel ranks higher than New Zealand in all other metrics data are available for, while Iceland also ranks higher than New Zealand using Actual Individual Consumption and Household Expenditure when using PPP rates.

⁹⁰ OECD data for GDP per capita can be found at “2. Disposable income and net lending - net borrowing” at <https://stats.oecd.org/index.aspx?queryid=60702>. World Bank data can be found at <https://databank.worldbank.org/source/world-development-indicators>.

⁹¹ OECD data for GDP per capita can be found at “1. Gross Domestic Product” at <https://stats.oecd.org/index.aspx?queryid=60702>. World Bank data can be found at <https://databank.worldbank.org/source/icp-2017>.

⁹² OECD data for Actual individual consumption per capita can be found at <https://stats.oecd.org/Index.aspx?DataSetCode=PPP2017>. World Bank data can be found at <https://databank.worldbank.org/source/icp-2017>.

⁹³ OECD data for household expenditure per capita can be found at “1. Gross Domestic Product” at <https://stats.oecd.org/index.aspx?queryid=60702>. World Bank data can be found at <https://databank.worldbank.org/source/icp-2017>.

⁹⁴ OECD data for household disposable income per capita can be found at “National Accounts at a Glance: 5. Households” at <https://stats.oecd.org/Index.aspx?DataSetCode=NAAG>.

Appendix A. The NZCC has improperly weighted its price level indices when including alcohol and tobacco

A1. To develop the weighted indices for groceries including food, non-alcoholic beverages, alcoholic beverages and tobacco, the NZCC states that:⁹⁵

To compare prices across a range of products, we had to create a combined index of:

- 1. the separate index for food and non-alcoholic beverages;*
- 2. the index for alcohol; and*
- 3. the index for tobacco.*

To do this, we took an average of the indices for each category, weighted by their share of expenditure, to obtain a combined price level for all products.

A2. However, the NZCC takes one step before combining these indices which alters its results. Instead of using the PLIs for each category as presented by the OECD/ICP, the NZCC first normalises the original PLIs around New Zealand by dividing each category PLI for OECD countries by New Zealand's PLI (and multiplying by 100).

A3. This has the effect of making the PLI for New Zealand 100 in each category, such that:

- a. the PLI for any other country is represented as a percent difference from New Zealand; and
- b. the weights for each category do not affect New Zealand's new price level index.⁹⁶

A4. For example, a country with a PLI five percent higher than New Zealand's in the relevant category would be 105. This has the effect of muting the impact on the combined index of any product for which New Zealand is particularly expensive. This is illustrated starkly by considering tobacco, where New Zealand has a price level index of 379, the highest of any OECD country.⁹⁷ When the tobacco PLIs are normalised, all other OECD countries have a PLI between zero and 100, which does not accurately scale with PLIs for food or alcohol as the tobacco PLIs have been truncated to nearly 25 percent of their original levels (i.e., $100/379$) while the PLIs in the other categories do not differ as greatly from their original level (for example, New Zealand's food and non-alcoholic beverage PLI is 131).⁹⁸

A5. When using the PLIs presented in the raw data, rather than the normalised PLIs, New Zealand's rank for the combined index of food, alcoholic beverages and tobacco is much higher, with New Zealand ranked third instead of the ranking of sixth as calculated by the NZCC.

⁹⁵ NZCC (2021), *Market study into the retail grocery sector – Draft report*, 29 July 2021, para D28-D29.

⁹⁶ I.e. with the PLIs normalized, the expenditure weighted PLI for New Zealand is 100 regardless of what expenditure weights are used.

⁹⁷ OECD.Stat, 2017 PPP Benchmark results, Table 1.11: Price level indices (OECD=100).

⁹⁸ For reference, the PLI 90th percentile for food is 145, for alcohol is 165, and tobacco is 212.

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