

Asset Beta for Fonterra's Notional Business: Further Comments



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Report prepared for:

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The assistance of EY New Zealand in the preparation of certain aspects of this report is acknowledged, in particular calculation of the empirical beta estimates for the comparator companies. However, all opinions in this report are the author's alone.

Important Notice

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Auckland UniServices will not be liable for any loss or damage to any party that may rely on our report other than Fonterra Co-operative Group Limited (“Fonterra”). In addition, we have no obligation to update our report or to revise the information contained therein because of events and transactions occurring subsequent to the date of this report.

In preparing this report we have also relied on the information supplied by Fonterra, EY New Zealand and other parties. Our duties, while involving an assessment of information provided and commenting as necessary, do not extend to verifying the accuracy of the information, and we have assumed its authenticity and completeness. We have not audited the information provided, nor have we been required to do so.

The analysis assumes that Fonterra has no information or knowledge of any facts or material information not specifically noted in our report that would reasonably be expected to affect its conclusions.

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Asset Beta for Fonterra’s Notional Business: Further Comments

1 Introduction

- 1.1 This report by Auckland UniServices Ltd (“**Auckland UniServices**” or “**UniServices**”)¹ provides further comments on our assessment of the asset beta for Fonterra Co-operative Group Limited’s (“**Fonterra**” or “**Company**”) New Zealand-based commodity milk powders manufacturing business (hereafter also “**Fonterra’s Notional Business**” or “**Notional Business**”), under the assumption that the business manufactured and sold milk powder-based commodity products (referred to in the Farmgate Milk Price Manual as “**Reference Commodity Products**”, or “**RCPs**”) both on and off Global Dairy Trade (“**GDT**”).²
- 1.2 For Fonterra’s Notional Business, the raw input “cost of milk” or the farmgate milk price is set in accordance with the Farmgate Milk Price Manual (hereafter also “**Milk Price Manual**” or “**Manual**”).

2 Scope of our work

Introduction

- 2.1 Fonterra has requested that Auckland UniServices provide further commentary on the asset beta for Fonterra’s Notional Business further to:
- a. The Commerce Commission New Zealand’s (“**Commerce Commission**” or “**Commission**”) final report (Public version) titled “Review of Fonterra’s 2015/16 base price milk calculation: Dairy Industry Restructuring Act 2001”, dated 15 September 2016; and
 - b. Submissions by **Castalia** (2016), **Miraka** (2016), **Open Country Dairy** (2016) and **Synlait** (2016) in relation to the asset beta for Fonterra’s Notional Business.³

Commerce Commission’s Review of Fonterra’s 2015/16 Base Milk Price Calculation

- 2.2 The Commerce Commission (2016a) in its review of the 2015/16 Base Milk Price calculation was still unable to conclude that Fonterra’s asset beta estimate of 0.38 is practically feasible for an efficient processor. In particular, the Commission considers that more analysis of the market comparators is required to allow the Commission to determine the practical feasibility of the asset beta (Commerce Commission, 2016a, paragraph 4.47).

¹ This report is written by Dr Alastair Marsden on behalf of Auckland UniServices Ltd. References in this report to “we” or “our” refer to the opinions of Dr Alastair Marsden.

² Under this definition, the “Notional Business” is largely Fonterra’s milk powder manufacturing business, scaled up to process all milk supplied to Fonterra in New Zealand.

³ These entities are Castalia Limited, Miraka Limited, Open Country Dairy Limited and Synlait Milk Limited.

2.3 The Commerce Commission (2016a) further noted, inter-alia, that:

- a. Auckland UniServices (2016) states that "unlike Fonterra's notional and actual business, we understand that the 'comparable' set of companies do not have the ability to make ex-post adjustments to pass through variances between the forecast and the actual milk price". However, in the Commission's view, Auckland UniServices does not sufficiently test or demonstrate the correctness of that assumption (paragraph 4.52);
- b. The Commission understands that other New Zealand dairy processors update their prices throughout the season and at the end of the season set the final milk price payable to their suppliers. Similar to Fonterra, this gives independent processors the opportunity to transfer at least some of the risks from volatile commodity prices back to their farmer suppliers (paragraph 4.53);
- c. The Commission notes that there are differences between the way the independent processors and Fonterra set their milk prices and that the independent processor seeks to match or better Fonterra's price. This is to attract and retain suppliers. However, it is not clear to the Commission how these differences would affect the residual exposure to systematic risk faced by the independent processors (paragraph 4.54);
- d. The Commission understands that processors in other markets adjust their prices for farmers' milk both during the season and at the end of the season, which can transfer commodity price risk to their suppliers. Moreover, five of the 11 companies identified in Auckland UniServices' sample of companies with "material commodity exposure" participate in the Australian [and New Zealand] dairy markets. The Commission therefore considers more analysis is required of the extent to which the notional producer's ability to transfer systematic risk is greater than for the comparator companies, such that a much lower estimate of asset beta is appropriate for the notional producer (paragraph 4.55 and footnote No 54); and
- e. Overall, the Commission's view is that Auckland UniServices have not provided sufficient information to allow the Commission to conclude that the notional producer has a sufficiently different risk exposure to those in the international sample to justify the asset beta of 0.38 adopted by Fonterra. This is a downward beta adjustment of 0.13 from the mid-point estimate of asset betas (0.51) in the comparator set (paragraph 4.56).

Limitations on the Scope of our work

2.4 The scope of Auckland UniServices' work is limited to comments on specific points relevant to paragraphs 2.1 to 2.3 above. The scope of our work is also subject to our interpretation of the term "*practical feasibility*" as set out in Section 5 of this report.

2.5 Specifically, the scope of our work does not extend to wider considerations in estimating the cost of capital for Fonterra's Notional Business, which includes:

- a. The estimation of any other parameter inputs into the cost of capital; and

- b. The purpose considerations contained in the Dairy Industry Restructuring Act 2001 (“**DIRA**”).

2.6 This report is also subject to our disclaimer and “Important Notice” on page 2 of this report.

3 Auckland UniServices’ Prior Reports

References to our Prior Report

3.1 We refer to our:

- a. Report titled “Asset beta for Fonterra’s New Zealand-based Commodity Manufacturing Businesses and Specific Risk Premium for Fonterra’s Notional Business” dated 2 December 2014 as “**Auckland UniServices Report No 1**”; and
- b. Report titled “Update on Asset Beta for Fonterra’s New Zealand-based Commodity Manufacturing Businesses and Specific Risk Premium for Fonterra’s Notional Business dated 10 April 2016 as “**Auckland UniServices Report No 2**”.

3.2 In Auckland UniServices Reports No 1 and No 2 we set out our understanding of:

- a. The definition of Fonterra’s Notional Business and **Fonterra’s Actual Business**;
- b. The pricing methodology and building blocks approach used to set the farmgate milk price under the Manual;
- c. The key differences between Fonterra’s Notional and Actual Businesses in product mix and risks faced; and
- d. An overview of the approaches to the estimation of beta and consideration of the asset beta for Fonterra’s Notional and Actual Businesses with reference to first principles analysis.

4 Structure of the remainder of our Report

4.1 The rest of our report is structured as follows:

- a. Section 5 describes our understanding of the term “*practically feasible*”.
- b. Section 6 further considers the risks faced by Fonterra’s Notional Business.
- c. Section 7 provides updated beta estimates for global dairy businesses or the sample of “comparator” companies that may be relevant to the determination of an appropriate beta estimate for Fonterra’s Notional Businesses.

- d. Section 8 comments on certain specific points raised by the Commission or in other submissions relevant to the estimation of the asset beta for Fonterra's Notional Business, which are not addressed earlier in this report.
- e. Section 9 concludes.
- f. Appendix 1 provides details on the asset betas for the comparator sample of global companies.
- g. Appendix 2 provides rolling beta estimates over the period Dec 2014 to March 2017 for Fonterra and Synlait.
- h. Appendix 3 calculates the split between Fonterra's Notional / Actual Business and the remainder of Fonterra's business ("**Value Add Business**") as at 31 July 2014.

5 Our interpretation of the term "practically feasible".

- 5.1 The Commerce Commission (2016a) in its review of the 2015/16 Base Milk Price calculation is still unable to conclude that Fonterra's asset beta estimate of 0.38 is practically feasible for an efficient processor.
- 5.2 Auckland UniServices interprets the term "*practically feasible*" in the context of the scope of our work to mean does the asset beta for Fonterra's Notional Business reflect the allocation of systematic risks borne by the processor (i.e., Fonterra's Notional Business) and suppliers (farmers) in accordance with the "rules" to set the milk price under the Milk Price Manual.
- 5.3 In essence, we assume that the Commerce Commission considers the allocation of risks between Fonterra's Notional Business and suppliers in accordance with the Milk Price Manual is "*practically feasible*" and consistent with DIRA. Accordingly, the asset beta should reflect those systematic risks borne by Fonterra's Notional Business in accordance with the Milk Price Manual.

6 Risks faced by Notional Business

Changes to the Milk Price Manual

- 6.1 We understand the only key change to the Milk Price Manual further to Auckland UniServices Report No 2 is that the milk price is now set under the Manual for a business that sells all RCPs both on and off-GDT.⁴
- 6.2 This means that Fonterra's Notional Business is exposed to risks of:
- a. Under-recovery or over-recovery of actual costs relative to "efficient costs" prescribed under the Milk Price Manual (some of which, however, may reflect Fonterra's actual costs);
 - b. The consequences of any differences between Fonterra's actual RCP asset base and the asset base prescribed in the Milk Price Manual; and
 - c. The consequence of differences between Fonterra's Notional Business' funding decisions (and therefore its cost of capital) and that of the assumed Milk Price Manual.

Cash flows risks faced by the Notional Business

- 6.3 The net cash flows⁵ risk faced by Fonterra's Notional Business are [also see Lally 2016 (a)]:

$$\text{NCF} = \text{EOTH} - \text{AOTH}$$

Where:

NCF = net cash flow.

EOTH = ex-ante efficient costs other than the purchase of milk for a business that sells RCPs with sales on and off GDT.

AOTH = actual costs other than the purchase of milk.

- 6.4 Lally (2016a, page 9) argues that this cost risk is more likely to be "negative beta". Hence Lally (2016a) concludes the appropriate beta for Fonterra's Notional Business is:

$$\text{Beta Notional Business} = 0.34 (0.35) - \text{VR} + \text{MR},$$

⁴ Auckland UniServices Report No 2 is based on the Milk Price Manual as at the Effective date of 1 August 2015. At that date, the Milk Price Manual assumed all sales of WMP, SMP and AMF were undertaken on GDT. In Auckland UniServices Report No 2, we concluded that the consequence of RCP sales both on and off GDT compared to sales on GDT was a non-systematic risk. Apart from this change highlighted above, we understand there have been no other material changes to the Manual from 1 August 2015 that might impact on our assessment of the asset beta for Fonterra's Notional Business.

⁵ For simplicity, this assumes Fonterra's Notional Businesses has *no assets*. Accordingly, the definition of net cash flow (NCF) allowance does not include any allowance for the return "on" and return "of" capital.

Where:

- 0.34 = The Commerce Commission’s asset beta estimate for price capped Electricity Lines Businesses (“ELBs”) (now updated to 0.35 in the Commerce Commission (2016b) Input Methodologies review decisions);
- VR = a deduction for lower demand risk faced by revenue-capped firms compared to price-capped firms; and
- MR = an increment for the deletion of milk price risk.

- 6.5 In Auckland UniServices Report No 2 we expressed the view that “cost risk” could be both positive or negative. However, on the basis that the empirical evidence on any difference between the beta for revenue-capped and price-capped firms is inconclusive, Lally (2016a) concludes the estimated beta for Fonterra’s Notional Business should equal the Commerce Commission’s asset beta for ELBs.
- 6.6 Overall Dr Lally’s point estimate of the asset beta of Fonterra’s Notional Business is circa 0.03 below Auckland UniServices asset beta of 0.38. This assumes that Lally (2016a) would increase his asset beta point estimate to 0.35 in line with the increase in the Commission’s view of the asset beta for ELBs in the Commission’s (2016b) Input Methodologies Review Decisions.

Are betas for Electricity Lines Businesses valid comparators?

- 6.7 In Auckland UniServices Reports No 1 and No 2, we used asset betas for ELBs as “reference points” for the asset beta of Fonterra’s Actual and Notional Businesses.
- 6.8 Dr Lally’s (2016b) also addresses the question of using asset betas for ELBs as suitable comparators for Fonterra’s Notional Business. He concludes that ELBs are suitable comparators, where ELBs have similar systematic risk profiles even although they are different industries and ELBs are regulated. Lally (2016b, page 8) states:

“So, suitable comparators must have similar systematic risk but this does not require similarity on all (or even any of the) dimensions that underlie systematic risk. The ELBs are of this type in relation to the Notional Business.”

- 6.9 Auckland UniServices agrees with Lally (2016b) that ELBs provide suitable comparators where ELBs and Fonterra’s Notional Business have similar systematic risk profiles. This is where the Milk Price Manual enables Fonterra to make ex-post adjustments to pass through variances between forecast and actual performance to the milk price.

7 Updated beta estimates for Global Dairy Businesses

- 7.1 **Table 1** provides a summary of updated rolling asset betas for the periods ending April 2016 to March 2017 for a sample of companies with some broad characteristics that are similar to Fonterra’s commodities and ingredients business.
- 7.2 The asset beta estimates calculated by EY New Zealand, follow the approach in the Commerce Commission (2016b) Input Methodologies Review Decisions, with:

- a. Weekly beta estimates using 2 years of data, averaged across each relevant pair of trading days; and
- b. Four-weekly beta estimates using 5 years of data, averaged across each pair of trading days.

Table 1: Summary of asset beta estimates						
Weekly estimate using 2 years data (No tax)	All periods	Period ended				
		31/03/2017	6/01/2017	14/10/2016	22/07/2016	29/04/2016
Average	0.52	0.50	0.50	0.53	0.52	0.54
Median	0.51	0.49	0.49	0.51	0.53	0.52
25th percentile	0.37	0.33	0.34	0.37	0.35	0.40
40th percentile	0.45	0.43	0.44	0.47	0.46	0.46
60th percentile	0.55	0.53	0.54	0.57	0.55	0.58
75th percentile	0.71	0.67	0.67	0.72	0.72	0.72
Four-weekly betas using 5 years data (No tax)	All periods	Period ended				
		31/03/2017	6/01/2017	14/10/2016	22/07/2016	29/04/2016
Average	0.48	0.49	0.48	0.48	0.51	0.51
Median	0.52	0.50	0.51	0.49	0.52	0.51
25th percentile	0.37	0.34	0.37	0.38	0.41	0.41
40th percentile	0.45	0.44	0.46	0.42	0.46	0.47
60th percentile	0.55	0.56	0.56	0.54	0.56	0.57
75th percentile	0.64	0.65	0.62	0.61	0.63	0.61

Source: EY New Zealand analysis of betas and UniServices analysis

- 7.3 **Table 2** splits the beta estimates into companies with “material commodity exposure”, “commodity & brand exposure” and “brand exposure” as set out in Auckland UniServices Report No 2.

Table 2: Summary of asset beta estimates						
Weekly beta (No tax)	All periods	31/03/2017	6/01/2017	14/10/2016	22/07/2016	29/04/2016
Material Commodity Exposure						
Average	0.51	0.50	0.50	0.52	0.50	0.52
Median	0.50	0.50	0.49	0.50	0.52	0.51
Both Commodity & Brand Exposure						
Average	0.50	0.48	0.47	0.50	0.51	0.52
Median	0.47	0.47	0.47	0.47	0.48	0.45
Brand Exposure						
Average	0.54	0.52	0.53	0.54	0.55	0.56
Median	0.56	0.55	0.57	0.57	0.59	0.60
Four-weekly beta (No Tax)	All periods	31/03/2017	6/01/2017	14/10/2016	22/07/2016	29/04/2016
Material Commodity Exposure						
Average	0.49	0.44	0.42	0.49	0.55	0.55
Median	0.55	0.56	0.56	0.54	0.53	0.53
Both Commodity & Brand Exposure						
Average	0.49	0.46	0.47	0.49	0.51	0.52
Median	0.46	0.48	0.48	0.45	0.46	0.47
Brand Exposure						
Average	0.50	0.53	0.51	0.47	0.49	0.49
Median	0.51	0.50	0.50	0.49	0.52	0.51
Combined Two and Four-weekly beta	All periods	31/03/2017	6/01/2017	14/10/2016	22/07/2016	29/04/2016
Material Commodity Exposure						
Average	0.50	0.47	0.46	0.51	0.53	0.53
Median	0.52	0.51	0.52	0.52	0.53	0.53
Both Commodity & Brand Exposure						
Average	0.49	0.47	0.47	0.49	0.51	0.52
Median	0.47	0.47	0.47	0.47	0.47	0.47
Brand Exposure						
Average	0.52	0.52	0.52	0.51	0.52	0.52
Median	0.52	0.50	0.51	0.52	0.54	0.55

Source: EY New Zealand analysis of betas and UniServices analysis

7.4 Tables 1 and 2 above are consistent with:

- a. The empirical point estimate of asset beta (based on average and median estimates) across the entire comparator sample (including Fonterra) of circa 0.51 as reported in Auckland UniServices Report No 2⁶; and

⁶ Auckland UniServices Report No 2, paragraph 5.11 states “In Auckland UniServices’ view the updated empirical evidence suggests a point estimate asset beta (using the Hamada no-tax formula) for a dairy company with both commodity and value added components would likely fall in the range of between 0.41 and 0.61. This estimate broadly spans the range of the rolling average / median asset betas using daily, weekly and monthly data in the table above for the “Material Commodity Exposure” and “Both Commodity & Brand Exposure” sample groups.”

- b. An empirical point estimate asset beta of between circa 0.49 and 0.52 for companies with both “commodity & brand exposure” and “brand exposure” (based on the average of the combined weekly and four-weekly data estimates).

7.5 **Appendix 1** provides details on the betas for the individual companies in the comparator sample.

Betas for comparator companies having a Milk Price Mechanism similar to Fonterra?

7.6 In the sample of our companies, Auckland UniServices understands there are no truly comparative companies that set prices for their raw commodity under a price setting arrangement and “rules based” Milk Price Manual identical to Fonterra’s commodity based Notional Business. In particular, and based on further discussions with Fonterra, we are not aware of any listed companies that, like Fonterra, have the ability to make ex-post adjustments to pass through all variances between forecast and actual performance to the milk price.

7.7 Castalia (2016, Sept, page 1) also states that:

“Dr Marsden and Dr Lally estimate the asset beta based on the notional processor being ‘close to riskless’—on the basis that Fonterra passes on almost all commodity price risk to farmers. However, Dr Marsden and Fonterra both acknowledge that no processor replicates Fonterra’s approach of passing on almost all commodity price risk to farmers. While there are some exceptions, our research finds the same result.”⁷

7.8 Castalia (2016, Table 3.1, pages 8-9) does, however, provide examples of some international processors that allocate commodity price risk back to farmers. In respect of Table 3.1 of Castalia’s report, only Danone (a listed entity) is included in our sample of comparator companies to update empirical beta estimates. In respect of Danone, Castalia (2016, page 9) notes that:

“The milk price in French contracts between producers and dairy companies passes on limited price fluctuations to farmers”.

7.9 The Commission understands, however, that:

⁷ We note that Castalia (2016) continues in the same paragraph:

.....Since Fonterra has a dominant market position, the way it allocates risks is not relevant. Further, since virtually every processor shares in the risk of commodity price fluctuations, the notional processor should be assumed to do the same. Indeed, there are good conceptual reasons why processors would share in commodity price risk since they have the best information and ability to manage it. We would be surprised if the Commission found that a risk allocation that is inconsistent with that replicated in markets worldwide would be considered to be practically feasible under DIRA—and we understand Open Country’s legal counsel agree with this view.”

In Auckland UniServices’ view this is a framing issue. A different allocation of systematic risks between Fonterra’s Notional Business and its suppliers under the Milk Price Manual may clearly impact the asset beta.

- a. Processors in other markets also adjust their prices for farmers' milk both during the season and at the end of the season, which can transfer risk, including commodity price risk, to their suppliers. The Commission notes that five of the 11 companies identified in the sample of companies with "material commodity exposure" participate in the Australian dairy market⁸ (paragraph 4.55 and footnote No 54);⁹ and
- b. Other New Zealand dairy processors update their prices throughout the season and set the final milk price payable to their suppliers at the end of the season. Like Fonterra and the notional producer, this gives them the opportunity to transfer the risks from volatile commodity prices back to their farmer suppliers via the milk price, at least to some extent (paragraph 4.53).

7.10 **Table 3** summarises the sub-sample of asset betas for listed New Zealand and Australian entities. These entities are Fonterra, Synlait, Murray Goulburn Co-operative, Bega and Graincorp.

⁸ Actually Australian and New Zealand markets.

⁹ Warrnambool Cheese and Butter Factory Company is no longer listed. Hence our updated beta estimates contain only four dairy companies with material commodity exposure" in the Australasian dairy market.

Table 3: Asset beta estimates for NZ and Australian comparator sample (including Fonterra)						
Company	Average all periods	31/03/2017	6/01/2017	14/10/2016	22/07/2016	29/04/2016
Fonterra						
Weekly estimate using 2 years data (No tax)	0.10	0.12	0.11	0.13	0.10	0.06
Four-weekly betas using 5 years data (No tax)	0.29	0.28	0.27	0.31	0.30	0.28
Average of weekly and four-weekly	0.20	0.20	0.19	0.22	0.20	0.17
Synlait						
Weekly estimate using 2 years data (No tax)	0.33	0.32	0.34	0.27	0.31	0.42
Four-weekly betas using 5 years data (No tax)	0.52	0.57	0.57	0.54	0.43	0.51
Average of weekly and four-weekly	0.43	0.44	0.45	0.40	0.37	0.46
Murray Goulburn Co-op						
Weekly estimate using 2 years data (No tax)	0.39	0.45	0.41	0.42	0.26	0.41
Four-weekly betas using 5 years data (No tax)	-0.59	-0.79	-0.88	-0.09		
Average of weekly and four-weekly	-0.10	-0.17	-0.23	0.17	0.26	0.41
Graincorp						
Weekly estimate using 2 years data (No tax)	0.26	0.27	0.28	0.27	0.27	0.23
Four-weekly betas using 5 years data (No tax)	0.44	0.42	0.40	0.43	0.48	0.47
Average of weekly and four-weekly	0.35	0.35	0.34	0.35	0.38	0.35
Bega						
Weekly estimate using 2 years data (No tax)	0.87	0.86	0.89	0.83	0.87	0.91
Four-weekly betas using 5 years data (No tax)	0.65	0.70	0.71	0.61	0.63	0.61
Average of weekly and four-weekly	0.76	0.78	0.80	0.72	0.75	0.76
All Listed NZ Companies - Fonterra and Synlait						
Average weekly estimate using 2 years data (No tax)	0.22	0.22	0.23	0.20	0.21	0.24
Four-weekly betas using 5 years data (No tax)	0.41	0.43	0.42	0.42	0.37	0.39
Average of weekly and four-weekly	0.31	0.32	0.32	0.31	0.29	0.31
All Listed Australian Companies						
Average weekly estimate using 2 years data (No tax)	0.51	0.53	0.53	0.51	0.47	0.52
Four-weekly betas using 5 years data (No tax)	0.32	0.11	0.08	0.32	0.56	0.54
Average of weekly and four-weekly	0.42	0.32	0.30	0.41	0.51	0.53
All Listed NZ and Australian companies						
Average weekly estimate using 2 years data (No tax)	0.39	0.40	0.41	0.38	0.36	0.41
Four-weekly betas using 5 years data (No tax)	0.26	0.24	0.21	0.36	0.46	0.47
Average of weekly and four-weekly	0.37	0.32	0.31	0.37	0.41	0.44

Source: EY New Zealand analysis of betas and UniServices analysis

7.11 In our view, considerable caution must be exercised when drawing conclusions on beta from a small sample set. However, the table above highlights that empirical estimates of asset beta:

- a. For Fonterra and Synlait (based on the average of the weekly and four-weekly estimates) are between 0.29 and 0.32 (see heading “All listed NZ Companies” in Table 3 above).
- b. For Murray Goulburn, asset beta estimates using weekly data are between 0.26 and 0.45. However, negative betas are observed using four-weekly data. The extreme variation in the betas observed for Murray Goulburn suggests there is a lot of “noise” in the empirical estimate of the asset beta for this company.
- c. For Bega (based on the average of the weekly and four-weekly estimates) asset betas are between 0.72 and 0.80.

Murray Goulburn

7.12 In respect of Murray Goulburn, we understand (based upon advice from Fonterra):

- a. Murray Goulburn is committed to a mechanistic formula under which in the normal course, between 92.5 – 96.5 percent of actual net earnings prior to paying for milk (but after all other costs, including interest and tax) would be allocated to the milk price, and the balance to equity holders. The lowest percentage would apply when the resulting milk price exceeded AUD 7.00 and the highest when the resulting milk price was less than AUD 5.00.
- b. The mechanism results in the final milk price directly reflecting actual revenues and costs for the year, so in this respect results in differences between forecast and actual revenue (or >90% thereof) flow directly to the milk price.
- c. While the mechanism and original offer price of the Murray Goulburn units was presumably designed to deliver an appropriate expected return to equity holders, the actual return will vary directly with commodity prices, with a one to one correlation between actual returns and commodity returns per kgMS less than around AUD 5.20 and greater than around AUD 7.50, and greater than a one to one correlation otherwise. Implied returns to equity holders are therefore more volatile under this mechanism relative to the Fonterra mechanism.
- d. The events subsequent to Murray Goulburn’s milk price downgrade in April 2016 imply Murray Goulburn faces additional constraints around its milk price, the impact of which may be to further increase volatility of returns to equity holders. In particular, various investigations under way into Murray Goulburn, including by the Australian Competition and Consumer Commission and Australian Securities & Investments Commission suggest Murray Goulburn is likely to adjust its payment mechanism, potentially by adopting an advance payment system akin to those employed by NZ processors, to minimise the likelihood of having to make late in the season negative adjustments to its milk price.¹⁰

7.13 In a recent ASX announcement on 2 May 2017, Murray Goulburn has now stated that it would forgive the Milk Supply Support Package (MSSP) and that all future payments of the MSSP, which were to commence from July 2017, would cease. The cost of this announcement would be reflected in a write-down to the pre-tax value of \$148 million.¹¹ Murray Goulburn also announced that it would be paying a higher milk price for the current financial year than the price that would have resulted from application of its formal milk price mechanism.

¹⁰ See for example <https://www.accc.gov.au/media-release/accc-takes-action-against-murray-goulburn>

¹¹ See <http://www.mgc.com.au/media/46199/asx.pdf>

Bega

- 7.14 In respect of Auckland UniServices Report No 2, we noted that Bega, an Australian listed company on the ASX with business interests in dairy products, is still exposed to competition for milk and must pay a market-determined price.¹² Hence, we would expect to observe a higher asset beta for Bega compared to Fonterra, where a significant portion of its business is not exposed to commodity price risk.
- 7.15 Fonterra further advise that Bega has two milk pools, each of approximately 300 million litres, with separate pricing arrangements. These are:
- a. The Tatura pool located in northern Victoria, where Bega faces competition for milk from Fonterra and Murray Goulburn, and where Bega has traditionally benchmarked off the Murray Goulburn and Fonterra price. To the extent general commodity price movements are reflected in the Murray Goulburn and Fonterra price, they will also be reflected in the Bega milk price, but Bega does not have the direct ability to transfer reductions in Bega-specific revenue through into its milk price; and
 - b. The Bega Cheese pool is located in New South Wales, where Bega does not face material competition. Fonterra does not have a significant amount of information on the detail of Bega's pricing arrangements for this pool, but considers it is likely that Bega has at least a theoretical ability to pass late in the season movements in actual vs forecast milk prices onto its suppliers. Bega notes, however, that returns to its Bega Cheese division are relatively stable due to its exposure to retail and food service markets, and that the milk price for this pool is less reflective of global commodity markets.¹³ Fonterra is not aware of any evidence, anecdotal or otherwise, of Bega passing late in the season movements in actual vs forecast returns through into its milk price in recent seasons.

Synlait

- 7.16 The Commission (2016, paragraph 4.53 and footnote No 53) notes that Synlait's gross margins are unaffected by changes in milk price (see Synlait "Investor update", December 2015, page 3). Thus, the Commission considers that the systematic risk affecting revenue has been effectively transferred to farmers.

¹² In Bega's 2015 Annual Report the Chief Executive Officer states (page 12):

“Notwithstanding the fact that the vast majority of milk supply was committed for three years, Bega Cheese Group had to meet the competition in relation to the milk price it paid in FY2015. Bega Cheese Group is pleased that its milk suppliers received a highly competitive farm gate milk price in addition to the support they received under the Milk Sustainability and Growth Program positioning both the farmer suppliers and the Company well for the future.”

Source: <http://www.begacheese.com.au/wp-content/uploads/2012/10/04-2015-ANNUAL-REPORT.pdf>

¹³ See Bega Cheese Investor Presentation, FY2016 Full Year Results: 24 August 2016, <http://www.begacheese.com.au/investors/announcements/>

7.17 The Synlait “Investor update” of December 2015 states that:

“A common misconception is that there is a link between international dairy prices and our profitability as a business.

Our value proposition is driven by margin achieved over international dairy pricing and through growth in our higher margin nutritional products.”

7.18 The Synlait “Investor update” of December 2015 also provides a graph for illustrative purposes that shows that:

“When the milk prices are high, our revenue is higher however our gross margin is unaffected. When the milk price is low, revenue is also lower however our gross margin is still unaffected”.

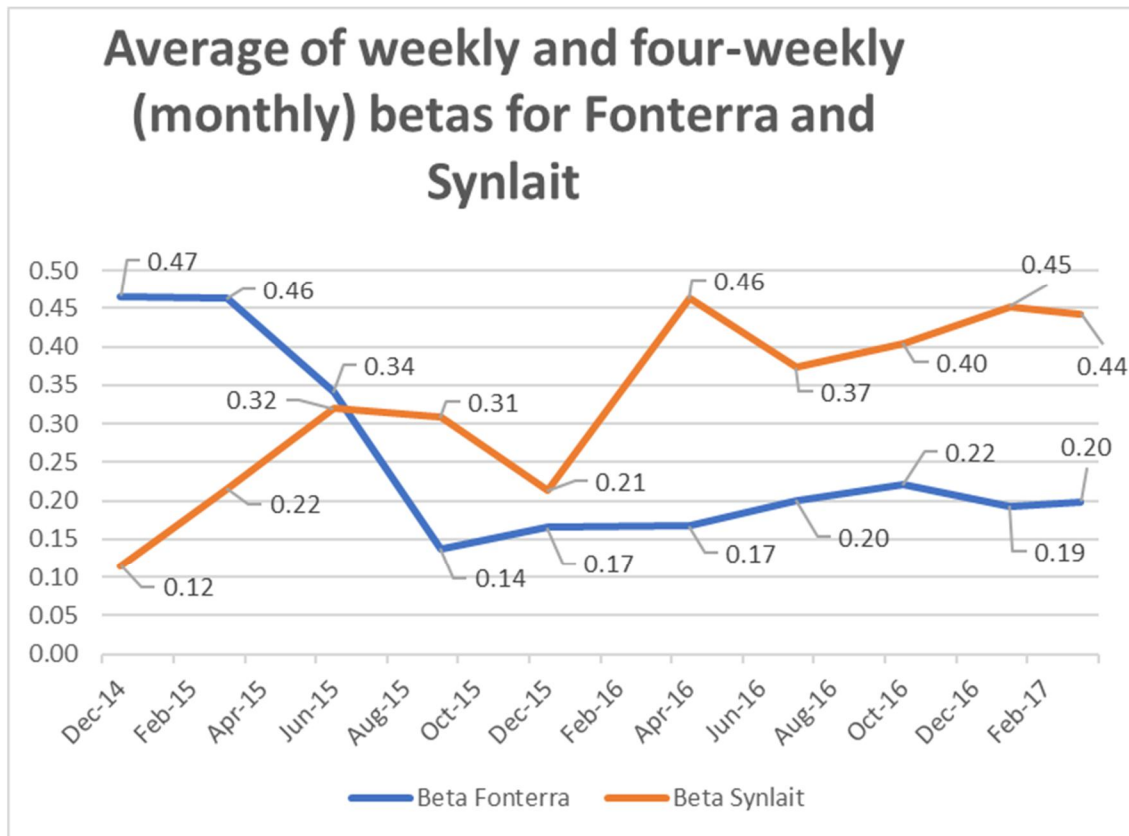
7.19 To the extent that Synlait’s gross margins are unaffected by international dairy prices or commodity price risk, in Auckland UniServices’ view this will exert a downward adjustment to Synlait’s asset beta. This is consistent with the analysis in Table 3, which shows based upon the average of weekly and four-weekly data that Synlait’s asset beta is less than the average asset beta for the comparative company set of circa 0.51.

Other ‘comparable’ companies

7.20 In our discussions with Fonterra, we are not aware of any other companies in our comparative set of listed entities or companies that have any material ability to make retrospective adjustments to their overall cost of goods.

Rolling betas for Fonterra and Synlait

7.21 **Figure 1** plots the average of the weekly and four-weekly / monthly asset beta estimates for Fonterra and Synlait over the period ending 31 December 2014 to 31 March 2017. For the period 31 December 2014 to 30 September 2015, we take the beta estimates as set out in Auckland UniServices Report No 2. For the period 29 April 2016 to 31 March 2017, we take the beta estimates as set out in Table 3 and Appendix 1 of this report (also see **Appendix 2** for more details).



7.22 The figure shows that the average of the weekly and four-weekly / monthly empirical estimates of asset beta over these periods between ending 31 December 2014 and 31 March 2017 are:

- a. Between 0.14 and 0.47 for Fonterra; and
- b. Between 0.12 and 0.46 for Synlait.

Components of beta

7.23 The beta of an entity is the weighted average by value of the components or entities of the business.

7.24 In our analysis below we seek to decompose the asset beta of Fonterra between:

- a. The Notional Business¹⁴ of Fonterra; and
- b. The remainder of Fonterra’s business, which we term Fonterra’s “**Value Add Business**”.

7.25 The overall beta of Fonterra can be expressed as follows:

¹⁴ More strictly this is the Actual Business of Fonterra as described in Auckland UniServices Report No 2. In this report, we considered the asset beta for Fonterra’s Notional and Actual Business to be the same.

$$\beta_{Fonterra} = \frac{\beta_{NB} \times V_{NB}}{V_F} + \frac{\beta_{VA} \times V_{VA}}{V_F} \quad (1)$$

Where:

$\beta_{Fonterra}$ = Beta for Fonterra (i.e., Notional /Actual Business and Value Add Business combined);

β_{NB} = asset beta for Fonterra's Notional / Actual Business;

V_{NB} = value of Fonterra's Notional /Actual Business;

β_{VA} = asset beta for Fonterra's Value Add Business;

V_{VA} = value of Fonterra's Value Add Business;

V_F = value of Fonterra's combined Notional / Actual and Value Add Businesses.

Parameter Inputs into Equation (1)

7.26 We apply equation (1) to evaluate the overall asset beta estimate of the combined Fonterra's Notional / Actual and Value Add Businesses with the following input assumptions:

- a. The estimate of the asset beta for Fonterra's Notional Business is 0.38 (as per Auckland UniServices Report No 2);
- b. The estimate of the asset beta for Fonterra's Value Add Business is 0.51. This is consistent with the asset beta for our compactor sample of companies with both "commodity & brand exposure" and "brand exposure";
- c. The value (see **Table 4** below for details) as at 31 July 2016 of:
 - i. V_{NB} = \$8.200 billion.
 - ii. V_{VA} = \$6.638 million.
 - iii. V_F = \$14.838 billion.

Table 4: Fonterra's Total Enterprise Value and Split between Notional Business and Value Add Business

Assumptions	Parameter input	Comment
No. of Shares in Fonterra	1,599,094,000	As advised by Fonterra
Price of Fonterra Share	5.69	Price as at 31 July 2016
Market Capitalisation	9,099	Millions of dollars
Add Net debt		
<i>Current assets</i>		
Cash and cash equivalents	-369	Annual Report Y/E 31 July 2016
Derivative financial instruments	-451	Annual Report Y/E 31 July 2016
<i>Non-current assets</i>		
Derivative financial instruments	-417	Annual Report Y/E 31 July 2016
<i>Current liabilities</i>		
Bank overdraft	12	Annual Report Y/E 31 July 2016
Borrowings	955	Annual Report Y/E 31 July 2016
Derivative financial instruments	43	Annual Report Y/E 31 July 2016
<i>Non-current liabilities</i>		
Borrowings	5,397	Annual Report Y/E 31 July 2016
Derivative financial instruments	569	Annual Report Y/E 31 July 2016
Total Net Debt	5,739	Millions of dollars
Total Enterprise Value Fonterra	14,838	Sum Market Cap and Total Net Debt
Net Book Value of Notional Business	7,200	As advised by Fonterra
Average net working capital	1,000	As advised by Fonterra
Enterprise Value of the Notional Business	8,200	55%
Implied Enterprise Value of Fonterra "Value Add Business"	6,638	45%
Total Enterprise Value Fonterra	14,838	

7.27 The table above shows that Fonterra as at 31 July 2016 can be split between approximately:

- a. 55% value weight for its Actual Business (or proxy for Notional Business); and
- b. 45% value weight for its Value Add Business.

7.28 In **Appendix 3**, we replicate the calculation above for the split between Fonterra's Notional / Actual Business and the Value Add Business as at 31 July 2014. As at this date the value weight of Fonterra's Notional / Actual Business is 48%.

7.29 We therefore take the ratio of $V_{NB} / V_F = (0.55 + 0.48) / 2 = 0.52$

7.30 Applying equation (1) we derive an overall asset beta of 0.44 for Fonterra, as follows:

$$\beta_{Fonterra} = \frac{\beta_{NB} \times V_{NB}}{V_F} + \frac{\beta_{VA} \times V_{VA}}{V_F}$$

$$0.44 = \frac{0.38 \times 0.52}{1} + \frac{0.51 \times 0.48}{1}$$

- 7.31 The implied asset beta for Fonterra’s total business of 0.44 is:
- a. Towards the upper bound of the average of the empirical estimates of asset beta for Fonterra of 0.14 to 0.47 (averaged across weekly and four-weekly / monthly estimates for all periods 31 December 2014 to 31 March 2017 – see Figure 1). It is also above the empirical estimate of Fonterra’s asset beta for the more recent periods ending 29 April 2016 to 31 March 2017 (see Table 3), albeit caution must be applied referencing beta estimates to a single company observation only;
 - b. Above the 25th percentile estimate for all the comparator sample of companies in Table 1 of 0.37 measured over all periods ending 29 April 2016 to 31 March 2017; and
 - c. Just below the 40th percentile estimate for all the comparator sample of companies in Table 1 of 0.45 measured over all periods ending 29 April 2016 to 31 March 2017.
- 7.32 Overall, in Auckland UniServices’ view, the comparator company empirical evidence is consistent with:
- a. The asset beta for Fonterra’s combined business being below the comparator sample of companies with both “commodity & brand exposure” and “brand exposure”. This is where Fonterra’s Notional / Actual Business is largely insulated from commodity price risk under the Milk Price Manual and Fonterra’s Notional / Actual Business is a significant portion of Fonterra’s total business; and
 - b. The point estimate asset beta of 0.38 in Auckland UniServices Report No 2 for Fonterra’s Notional Business.

Size of the downward adjustment

- 7.33 Lastly, we note that the Commission has requested more support for the size of the downward beta adjustment of 0.13 from the mid-point estimate of beta from the comparator set (i.e., from the 0.51 mid-point estimate to the 0.38 estimate adopted by Fonterra) (Commerce Commission, 2016a, paragraph 4.56).
- 7.34 In Auckland UniServices view, the “size” of the adjustment should be referenced relative to the difference in asset beta between the Notional Business and that business that reflects a combination of a Notional Business and a Value-Add business. To illustrate if the overall asset beta for Fonterra for a business comprising both the Notional Business and Value Add Business is 0.44, the downward size of the adjustment to beta for Fonterra’s Notional Business is 0.06.¹⁵

¹⁵ We note that the Commerce Commission (2016b) in the case for NZ Airports reduced the asset beta by 0.05 for Airport’s aeronautical activities relative to the average empirical asset beta of 0.65 observed for airport companies that comprised a mixture of aeronautical and non-aeronautical activities.

8 Further comments on submissions relevant to asset beta by the Commission, Open Country, Synlait and Miraka

Further comments raised by the Commerce Commission (2016)

8.1 To attract and retain suppliers from Fonterra, the Commission observes that the independent processor seeks to match or better Fonterra's price. It is not clear to the Commission, however, how these differences would affect the residual exposure to systematic risk that the different processors are exposed to (paragraph 4.54).

UniServices' Comment

8.2 In Auckland UniServices Report No 2 (paragraph 7.19) we noted that Auckland UniServices Report No 1 stated”

“In our view, Synlait is correct in its assertion that other processors will face some incremental risk relative to Fonterra, due to other processors’ inability to perfectly match factors such as Fonterra’s sales phasing and foreign exchange rate conversion profiles in the absence of perfect information.” (paragraph 11.4); and

“We note, however, that at least some of this risk may be diversifiable and have both “under” and “overs” depending on the other processors actual sales phasing and foreign exchange conversion rates”. (paragraph 11.5).

8.3 Our analysis in Auckland UniServices Report No 2 (paragraphs 7.20 to 7.23) concluded that there was no strong evidence that “phasing risk” is systematic in nature.

8.4 In paragraphs 7.15 to 7.19 of this report we also note that Synlait’s “Investor update” of December 2015 suggests Synlait’s gross margins are unaffected by international dairy prices or commodity price risk, which in Auckland UniServices’ view will exert a downward influence on Synlait’s asset beta.

Submissions on asset beta by Open Country, Castalia and Miraka

8.5 The submission by Open Country (2016, page 1) to the Commerce Commission states that:

- a. Auckland UniServices misconceive *“the notional processor as having attributes of Fonterra that would not be expected to exist for an efficient and practically feasible notional processor;*
- b. *Electricity lines businesses (ELBs) are an inappropriate starting point for estimating the notional processor’s asset beta because of the significant differences between the industries and the firms;*
- c. *Market comparators are the most appropriate starting point for estimating the asset beta for the notional processor. “*

8.6 Castalia (2016), who were engaged by Open Country, also state that:

- a. *“Of particular importance is the ex-post calculation of the milk price by Fonterra that contributes to Fonterra passing on substantial risks to farmers and leaves Fonterra’s equity holders bearing limited risk. This risk allocation is central to Dr Marsden and Dr Lally’s conclusions that the notional processor is close to riskless and therefore the asset betas they derive.*

However, we would be surprised if this interpretation of the notional processor satisfied DIRA and the requirement for the milk price to be practically feasible. Open Country has received legal advice that such an interpretation would not satisfy practical feasibility. On this basis, and since, to the best of our knowledge, almost all large milk processors globally share in commodity price risk, this allocation of risk should be incorporated in the understanding of what the notional processor is – and therefore its asset beta” (Castalia, 2016, page 5); and

- b. ***“There are greater growth options for dairy than for ELBs.*** *The conversion of land to dairy farming in New Zealand over the past decade demonstrates the growth options available to dairy. In contrast, the limited growth options available to ELBs have already been discussed extensively in the Commission’s consultation process on the asset beta for gas pipeline businesses. Dr. Lally (among others) has previously noted the presence of growth options as a factor indicating a higher asset beta. ¹⁶ These growth options sit alongside the potential for significant asset stranding. This is not inconsistent—rather, it highlights the volatility of the dairy processing business and its greater exposure to macroeconomic fluctuations”.* (Castalia, 2016, page 11).

8.7 Miraka (2016, paragraph 2.4) further states in relation to asset beta that:

“...to be practically feasible, the asset beta must assume a business which is “exposed to competition for milk and must pay a market determined price””.

UniServices’ Comment

8.8 In our view, much of the focus of Open Country (2016), Castalia (2016), Miraka (2016) and Synlait’s (2016) submissions relate to “framing issues” and how commodity price risks should be allocated between the farmer and processor. Thus, in my view, these submissions are arguing that the Commission should put to one side the actual allocation of risks between the farmer and the notional processor implied by the Milk Price Manual, and instead assume a different notional risk allocation, which may be more consistent with those observed in countries other than New Zealand.

¹⁶ Lally, M. (2008). ‘The Weighted Average Cost of Capital for Gas Pipeline Businesses’ 28 October 2008 at 5.1.

- 8.9 Auckland UniServices Report No 1 and No 2 and this report have sought to estimate the asset beta of Fonterra’s Notional Business in accordance with the risk allocation under the Milk Price Manual.
- 8.10 In respect of submissions by Open Country, Castalia and Miraka that ELBs are not appropriate comparators and market comparators are the appropriate starting points, we have addressed these comments earlier in this report.
- 8.11 In respect of Castalia’s (2016) comments on a higher asset beta on account of greater growth options for the notional processor compared to ELBs, in Auckland UniServices Report No 2 (paragraph 3.34) we concluded:
- “.....In Auckland UniServices view, any uplift in asset beta on account of expansion options for Fonterra’s Notional and Actual Businesses will be small, where we understand (based on discussions with Fonterra) that at the margin any increase in milk supply is likely to be sold on-GDT.”*
- 8.12 Lally (2016b, page 8) also notes that the growth option to convert land to dairy farming is owned by the owner of the land and not Fonterra.

Submissions on asset beta by Synlait

- 8.13 Synlait (2016) also makes similar submissions in relation to ELBs not being an appropriate starting point to estimate the beta for Fonterra’s Notional Business and state:
- “Synlait’s view is that the notional producer should be assumed to allocate risks in a way that is practically feasible for an efficient producer. Since existing markets include a range of world-class producers, the way they share risk is the most appropriate benchmark for the notional producer. This is especially the case when international producers consistently share in the risks the notional producer is currently assumed to pass on to farmers” (paragraph 24).*

UniServices’ Comment

- 8.14 We have already noted that:
- a. The question of risk allocation is a framing issue; and
 - b. The Synlait “Investor update” of December 2015.
- 8.15 The Synlait “Investor update” of December 2015 suggests that like Fonterra, Synlait also have some ability to hold off finalising their milk prices till year-end.

9 Summary and Conclusion

Conclusion on asset beta

- 9.1 Auckland UniServices interprets the term “*practically feasible*” in the context of the scope of our work to mean an asset beta for Fonterra’s Notional Business which reflects the allocation of systematic risks borne by the processor (i.e., Fonterra’s Notional Business) and suppliers (farmers) in accordance with the “rules” to set the milk price under the Milk Price Manual.
- 9.2 In our view:
- a. ELBs provide suitable comparators where ELBs and Fonterra’s Notional Business have similar systematic risk profiles, albeit they are different industries. This is where the Milk Price Manual enables Fonterra to make ex-post adjustments to pass through variances between forecast and actual performance to the milk price.
 - b. There are no truly comparative companies that set prices for their raw commodity under a price setting arrangement and “rules based” Milk Price Manual similar to Fonterra’s commodity based Notional Business, whereby companies have the ability to make ex-post adjustments to pass through all variances between forecast and actual performance to the milk price.
- 9.3 Notwithstanding the above, in Auckland UniServices’ view, the comparator company empirical evidence is consistent with:
- a. The asset beta for Fonterra’s combined business, comprising both “processing operations” and “Value Add components”, being below the mean of the comparator sample of companies with both “commodity & brand exposure” and “brand exposure”. In Auckland UniServices’ view we would expect to observe a lower asset beta for Fonterra’s combined business compared to this comparator sample of companies where:
 - i) The value weight split to Fonterra’s Notional / Actual Businesses is circa 52% to total value weight; and
 - ii) A substantial portion of Fonterra’s combined business is largely insulated from commodity price risk under the Milk Price Manual.
 - b. The point estimate asset beta of 0.38 in Auckland UniServices Report No 2 for Fonterra’s Notional and Actual Businesses.
- 9.4 Overall, we still conclude the point estimate asset beta for Fonterra’s Notional and Actual Businesses is **0.38**.

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Appendix 1: Comparable Company Asset Betas

Weekly asset betas using 2 years of data, averaged across each trading day.

Appendix: Detail of Beta Estimates			Weekly estimate using 2 years data (No tax)					
Company	Type of Exposure	Ticker Code	Average all periods	Period ended				
				31/03/2017	6/01/2017	14/10/2016	22/07/2016	29/04/2016
Archer-Daniels-Midland Company	Material Commodity Exposure	nyse:adm	1.01	0.89	0.91	1.13	1.11	1.03
Bega	Material Commodity Exposure	ASX:BGA	0.87	0.86	0.89	0.83	0.87	0.91
Bunge	Material Commodity Exposure	nyse:bg	0.56	0.61	0.53	0.60	0.54	0.49
Fonterra	Material Commodity Exposure	NZSE:FCG	0.10	0.12	0.11	0.13	0.10	0.06
Glanbia	Material Commodity Exposure	ISE:GL9	0.55	0.51	0.56	0.56	0.54	0.56
Graincorp	Material Commodity Exposure	ASX:GNC	0.26	0.27	0.28	0.27	0.27	0.23
Murray Goulburn Co-op	Material Commodity Exposure	ASX:MGC	0.39	0.45	0.41	0.42	0.26	0.41
Synlait	Material Commodity Exposure	NZSE:SML	0.33	0.32	0.34	0.27	0.31	0.42
Tate & Lyle	Material Commodity Exposure	lse:tate	0.51	0.51	0.47	0.50	0.53	0.54
Wilmar	Material Commodity Exposure	sgxf34	0.51	0.50	0.51	0.49	0.52	0.53
Associated British Foods	Both Commodity & Brand Exposure	LSE:ABF	0.79	0.78	0.74	0.80	0.78	0.85
BRF S.A.	Both Commodity & Brand Exposure	BOVESP:BRFS3	0.38	0.37	0.36	0.40	0.38	0.40
Bright Dairy & Food Co., Ltd	Both Commodity & Brand Exposure	SHSE:600597	0.76	0.82	0.77	0.72	0.72	0.74
ConAgra Foods	Both Commodity & Brand Exposure	NYSE:CAG	0.37	0.30	0.29	0.43	0.43	0.41
Dairy Crest	Both Commodity & Brand Exposure	LSE:DCG	0.47	0.47	0.45	0.46	0.47	0.48
Dean Foods	Both Commodity & Brand Exposure	NYSE:DF	0.37	0.36	0.37	0.35	0.37	0.39
Ingredion Incorporated	Both Commodity & Brand Exposure	NYSE:INGR	0.67	0.54	0.59	0.72	0.72	0.78
Inner Mongolia Yili	Both Commodity & Brand Exposure	SHSE:600887	0.82	0.84	0.84	0.79	0.80	0.82
Kerry Group	Both Commodity & Brand Exposure	ISE:KRZ	0.53	0.46	0.48	0.54	0.55	0.63
NH Foods	Both Commodity & Brand Exposure	TSE:2282	0.49	0.53	0.51	0.48	0.49	0.42
Olam International	Both Commodity & Brand Exposure	SGX:O32	0.24	0.21	0.22	0.24	0.27	0.25
Savencia	Both Commodity & Brand Exposure	ENXTPA:SAVE	0.08	0.05	0.04	0.10	0.11	0.12
China Mengniu	Brand Exposure	SEHK:2319	0.29	0.36	0.32	0.26	0.26	0.24
Chr. Hansen	Brand Exposure	CPSE:CHR	0.70	0.65	0.65	0.72	0.75	0.70
Danone	Brand Exposure	ENXTPA:BN	0.62	0.62	0.65	0.63	0.62	0.60
Emmi AG	Brand Exposure	SWX:EMMN	0.48	0.33	0.50	0.51	0.53	0.52
General Mills	Brand Exposure	NYSE:GIS	0.43	0.40	0.41	0.43	0.42	0.47
Grupo Lala	Brand Exposure	BMV:LALA B	0.77	0.87	0.79	0.74	0.72	0.71
Hershey	Brand Exposure	NYSE:HSY	0.52	0.45	0.48	0.57	0.54	0.55
JBS S.A.	Brand Exposure	BOVESP:JBSS3	0.21	0.14	0.15	0.19	0.25	0.29
Kellog	Brand Exposure	NYSE:K	0.36	0.33	0.34	0.38	0.38	0.40
Kraft Heinz	Brand Exposure	NASDAQGS:KHC	0.58	0.55	0.57	0.56	0.59	0.64
Mead Johnson	Brand Exposure	NYSE:MJN	0.88	0.83	0.84	0.90	0.88	0.96
Mondelez	Brand Exposure	NasdaqGS:MDLZ	0.62	0.59	0.61	0.63	0.64	0.61
Nestle S.A.	Brand Exposure	SWX:NESN	0.74	0.71	0.74	0.75	0.75	0.76
Parmalat SpA	Brand Exposure	BIT:PLT	0.20	0.20	0.20	0.20	0.19	0.21
Saputo	Brand Exposure	TSX:SAP	0.44	0.40	0.40	0.48	0.45	0.45
Unilever plc	Brand Exposure	LSE:ULVR	0.73	0.74	0.74	0.72	0.74	0.73
Want Want China Holdings	Brand Exposure	SEHK:151	0.25	0.29	0.25	0.24	0.24	0.23
Yakult	Brand Exposure	TSE:2267	0.88	0.83	0.89	0.88	0.89	0.93
Average			0.52	0.50	0.50	0.53	0.52	0.54
Median			0.51	0.49	0.49	0.51	0.53	0.52
25th percentile			0.37	0.33	0.34	0.37	0.35	0.40
40th percentile			0.45	0.43	0.44	0.47	0.46	0.46
60th percentile			0.55	0.53	0.54	0.57	0.55	0.58
75th percentile			0.71	0.67	0.67	0.72	0.72	0.72

Source: Drawn from data and analysis provided by EY New Zealand

Appendix 1 Cont: Comparable Company Asset Betas

Four-weekly asset betas using 5 years of data, averaged across each trading day.

Appendix: Detail of Beta Estimates			Four-weekly betas using 5 years data (No tax)					
Company	Type of Exposure	Ticker Code	Average all periods	Period ended				
				31/03/2017	6/01/2017	14/10/2016	22/07/2016	29/04/2016
Archer-Daniels-Midland Company	Material Commodity Exposure	nyse:adm	0.89	0.89	0.88	0.93	0.87	0.87
Bega	Material Commodity Exposure	ASX:BGA	0.65	0.70	0.71	0.61	0.63	0.61
Bunge	Material Commodity Exposure	nyse:bg	0.63	0.66	0.62	0.61	0.63	0.64
Fonterra	Material Commodity Exposure	NZSE:FCG	0.29	0.28	0.27	0.31	0.30	0.28
Glanbia	Material Commodity Exposure	ISE:GL9	0.49	0.48	0.48	0.45	0.52	0.53
Graincorp	Material Commodity Exposure	ASX:GNC	0.44	0.42	0.40	0.43	0.48	0.47
Murray Goulburn Co-op	Material Commodity Exposure	ASX:MGC	-0.59	-0.79	-0.88	-0.09		
Synlait	Material Commodity Exposure	NZSE:SML	0.52	0.57	0.57	0.54	0.43	0.51
Tate & Lyle	Material Commodity Exposure	lse:tate	0.56	0.63	0.61	0.55	0.53	0.49
Wilmar	Material Commodity Exposure	sgx:f34	0.56	0.55	0.56	0.56	0.57	0.57
Associated British Foods	Both Commodity & Brand Exposure	LSE:ABF	0.76	0.79	0.78	0.74	0.71	0.76
BRF S.A.	Both Commodity & Brand Exposure	BOVSPA:BRF	0.40	0.41	0.41	0.42	0.38	0.38
Bright Dairy & Food Co., Ltd	Both Commodity & Brand Exposure	SHSE:600597	0.65	0.66	0.65	0.65	0.64	0.67
ConAgra Foods	Both Commodity & Brand Exposure	NYSE:CAG	0.35	0.26	0.27	0.37	0.42	0.43
Dairy Crest	Both Commodity & Brand Exposure	LSE:DCG	0.50	0.57	0.53	0.48	0.46	0.48
Dean Foods	Both Commodity & Brand Exposure	NYSE:DF	0.36	0.31	0.35	0.31	0.44	0.41
Ingredion Incorporated	Both Commodity & Brand Exposure	NYSE:INGR	0.68	0.50	0.53	0.71	0.81	0.82
Inner Mongolia Yili	Both Commodity & Brand Exposure	SHSE:600887	0.66	0.65	0.67	0.67	0.66	0.66
Kerry Group	Both Commodity & Brand Exposure	ISE:KRZ	0.52	0.50	0.50	0.51	0.54	0.56
NH Foods	Both Commodity & Brand Exposure	TSE:2282	0.45	0.46	0.45	0.42	0.45	0.46
Olam International	Both Commodity & Brand Exposure	SGX:O32	0.38	0.32	0.37	0.40	0.40	0.42
Savencia	Both Commodity & Brand Exposure	ENXTPA:SAVI	0.18	0.15	0.15	0.17	0.22	0.23
China Mengniu	Brand Exposure	SEHK:2319	0.41	0.40	0.41	0.41	0.41	0.40
Chr. Hansen	Brand Exposure	CPSE:CHR	0.54	0.55	0.56	0.58	0.52	0.51
Danone	Brand Exposure	ENXTPA:BN	0.52	0.55	0.52	0.52	0.50	0.49
Emmi AG	Brand Exposure	SWX:EMMN	0.42	0.45	0.47	0.39	0.41	0.41
General Mills	Brand Exposure	NYSE:GIS	0.35	0.42	0.39	0.34	0.29	0.30
Grupo Lala	Brand Exposure	BMV:LALA B	0.62	0.71	0.69	0.57	0.58	0.57
Hershey	Brand Exposure	NYSE:HSY	0.29	0.34	0.33	0.29	0.25	0.26
JBS S.A.	Brand Exposure	BOVSPA:JBS	0.37	0.29	0.31	0.38	0.40	0.45
Kellog	Brand Exposure	NYSE:K	0.32	0.33	0.32	0.32	0.30	0.31
Kraft Heinz	Brand Exposure	NASDAQGS:K	0.19	0.29	0.26	0.02		
Mead Johnson	Brand Exposure	NYSE:MJN	0.78	0.94	0.87	0.80	0.65	0.65
Mondelez	Brand Exposure	NasdaqGS:MDL	0.59	0.63	0.62	0.59	0.56	0.56
Nestle S.A.	Brand Exposure	SWX:NESN	0.66	0.71	0.70	0.66	0.61	0.61
Parmalat SpA	Brand Exposure	BIT:PLT	0.54	0.44	0.48	0.46	0.66	0.66
Saputo	Brand Exposure	TSX:SAP	0.58	0.59	0.58	0.52	0.60	0.59
Unilever plc	Brand Exposure	LSE:ULVR	0.72	0.88	0.79	0.74	0.63	0.58
Want Want China Holdings	Brand Exposure	SEHK:151	0.19	0.21	0.20	0.19	0.19	0.17
Yakult	Brand Exposure	TSE:2267	0.74	0.76	0.75	0.72	0.73	0.74
Average			0.48	0.49	0.48	0.48	0.51	0.51
Median			0.52	0.50	0.51	0.49	0.52	0.51
25th percentile			0.37	0.34	0.37	0.38	0.41	0.41
40th percentile			0.45	0.44	0.46	0.42	0.46	0.47
60th percentile			0.55	0.56	0.56	0.54	0.56	0.57
75th percentile			0.64	0.65	0.62	0.61	0.63	0.61

Source: Drawn from data and analysis provided by EY New Zealand

Appendix 2 Asset Betas for Fonterra and Synlait

Table: Betas estimates for Fonterra and Synlait										
Period	31/03/2017	6/01/2017	14/10/2016	22/07/2016	29/04/2016	31/12/2015	30/09/2015	30/06/2015	31/03/2015	31/12/2014
Source	Current Auckland UniServices Report					Auckland UniServices Report No 2				
Fonterra										
Weekly estimate using 2 years data (No tax)	0.12	0.11	0.13	0.10	0.06	0.03	0.01	-0.02	0.19	0.19
Four-weekly / monthly betas using 5 years data (No tax)	0.28	0.27	0.31	0.30	0.28	0.30	0.26	0.70	0.74	0.74
Average of weekly and four-weekly	0.20	0.19	0.22	0.20	0.17	0.17	0.14	0.34	0.46	0.47
Synlait										
Weekly estimate using 2 years data (No tax)	0.32	0.34	0.27	0.31	0.42	0.16	0.32	0.27	0.26	0.28
Four-weekly / monthly betas using 5 years data (No tax)	0.57	0.57	0.54	0.43	0.51	0.27	0.30	0.37	0.17	-0.05
Average of weekly and four-weekly	0.44	0.45	0.40	0.37	0.46	0.21	0.31	0.32	0.22	0.12

Source: Drawn from data and analysis provided by EY New Zealand

Appendix 3 Calculation of split between Fonterra's Notional / Actual Business and Value Add Business as at 31 July 2014

Fonterra's Total Enterprise Value and Split between Notional Business and Value Add Business as at 31 July 2014		
Assumptions	Parameter input	Comment
No. of Shares in Fonterra	1,597,833,461	
Price of Fonterra Share	6.20	Price as at 31 July 2014
Market Capitalisation	9,907	Millions of dollars
Add Net debt		
<i>Current assets</i>		
Cash and cash equivalents	-340	Annual Report Y/E 31 July 2014
Derivative financial instruments	-303	Annual Report Y/E 31 July 2014
<i>Non-current assets</i>		
Derivative financial instruments	-154	Annual Report Y/E 31 July 2014
<i>Current liabilities</i>		
Bank overdraft	21	Annual Report Y/E 31 July 2014
Borrowings	1,534	Annual Report Y/E 31 July 2014
Derivative financial instruments	30	Annual Report Y/E 31 July 2014
<i>Non-current liabilities</i>		
Borrowings	3,364	Annual Report Y/E 31 July 2014
Derivative financial instruments	415	Annual Report Y/E 31 July 2014
Total Net Debt	4,567	Millions of dollars
Total Enterprise Value Fonterra	14,474	Sum Market Cap and Total Net Debt
Net Book Value of Notional Business	6,437	As advised by Fonterra
Average net working capital	445	As advised by Fonterra
Enterprise Value of the Notional Business	6,882	48%
Implied Enterprise Value of Fonterra "Value Add Business"	7,592	52%
Total Enterprise Value Fonterra	14,474	