Dear Keston

Open Country Dairy Response to the Commerce Commission's Draft Review of Fonterra's 2016/17 Base Milk Price Calculation: The Asset Beta

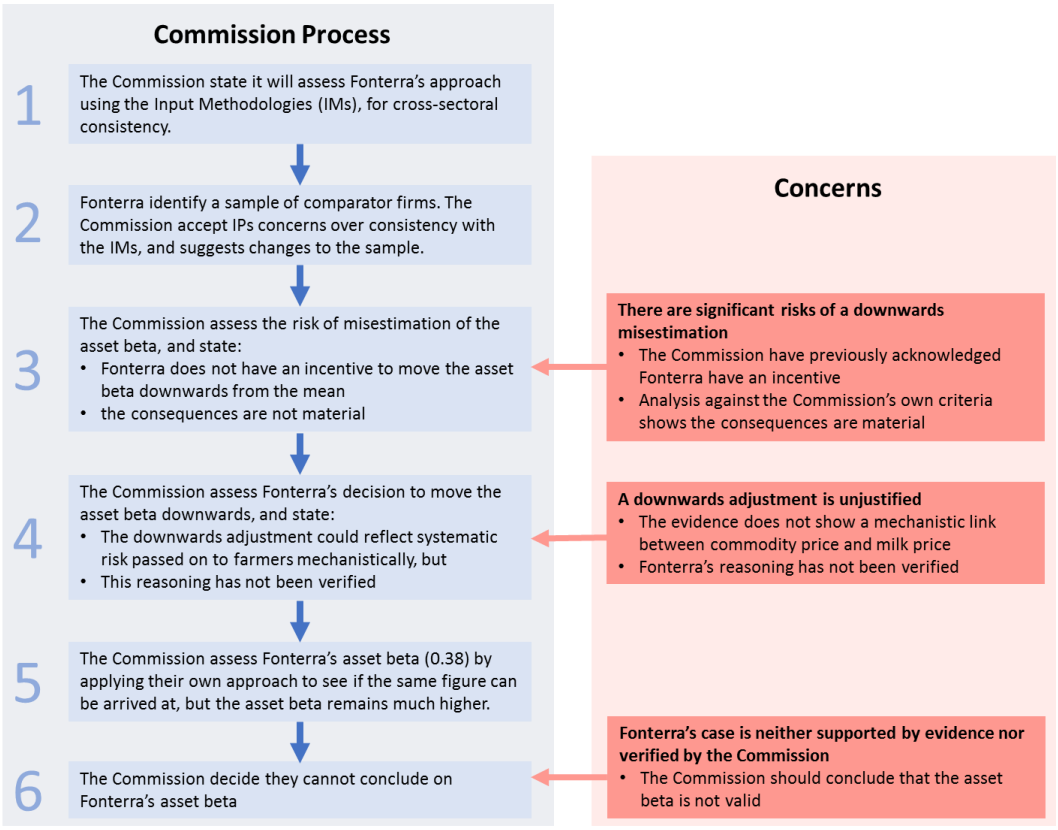
Open Country Dairy's (Open Country) submission responds specifically to the Commerce Commission's (Commission) approach to reviewing Fonterra's asset beta in its Draft Review of Fonterra's 2016/17 Base Milk Price Calculation.

Our position on this issue is straight-forward. There is no plausible basis for adjusting the asset beta estimate downwards from 0.51 (the company comparator mean) to 0.38 (Fonterra's estimate). The Commission must therefore conclude that Fonterra's estimate is not practically feasible. If it does not, the Commission risks perpetuating reduced contestability of the dairy market through a base milk price that is inefficient.

The Commission's draft report systematically reviews the asset beta calculation, explaining its logic at each step. Its review shows many of Fonterra's assertions are neither supported by evidence nor able to be verified by the Commission. Fonterra have had two years to provide evidence. The obligation on the Commission is to now conclude on the matter.

We have identified several material issues with the Commission's approach at each stage of its review. Figure 1 shows the Commission's approach to reviewing the asset beta, and provides an overview of our three major concerns.

Figure 1: Commission Process and Concerns



In this submission we explain each concern in detail, including:

1. The material risks of misestimating the asset beta downwards
2. The lack of evidence supporting a downwards adjustment
3. The Commission's refusal to conclude on the matter.

We ask that the Commission reconsider its views, and conclude that Fonterra's asset beta estimate is not practically feasible. While our submission focuses on the key issues that we consider to be most material, for completeness we walk through the Commission's approach and explain our concerns at each stage in greater detail in Table 1 (in Appendix A).

1 The significant risks of misestimating the asset beta downwards

The Commission accepts two propositions that are critical to their conclusion: first, that Fonterra has no incentive to adjust the asset beta downwards below a practically feasible level, and second, that the consequences of misestimating the asset beta are not material.

Fonterra does have incentives to lower the asset beta

Clarity on Fonterra's incentives to adjust the asset beta is important, because it signals possible bias in Fonterra's calculations. The Commission state that Fonterra do not have an incentive to move the asset beta downwards (para 2.49). To support this, the Commission cites one of its own previous reports.[1]

However, that report does not provide supportive evidence. The report actually concludes that "Fonterra may have an incentive to restrict IPs from accessing farmers." Although the report queries Fonterra's ability to act on its incentive, and concludes that Fonterra is "limited in its ability to do so," it does not challenge the existence of this incentive.

A lower asset beta, and therefore a higher farm gate milk price, directly restricts IPs from accessing raw milk supply through farmers. This is expressly recognised as a risk in the Commission's previous report. The incentives we identified in our previous submission are precisely the same as those that the Commission recognise in its previous report.

Further, the reasons cited by the Commission that limit Fonterra's ability to act on its incentive do not apply to Fonterra's asset beta estimate, because:

- The Commission asserts that the importance to Fonterra of trading among farmers (TAF), and other divergent interests, requires confidence in the milk price. However, confidence in the milk price does not come directly from Fonterra's calculations. Confidence in the milk price is achieved through regulation of the milk price under the Dairy Industry Restructuring Act (DIRA), including the Commission's review of the milk price calculation. As such, confidence in the milk price is achieved when the Commission supports the asset beta (or refuses to make a positive finding of inconsistency), even if the beta is misestimated; and
- There is no obvious connection between Fonterra's incentive to ensure the sustainability of their capital programme and limits on their incentive to reduce the asset beta. The Commission's report notes that the main source of Fonterra's capital is from regular retentions of distributable profits.[2] Any under-investment from a misestimated asset beta is therefore compensated for through profit retention. Most investors are farmers and are more likely to be indifferent to lower dividends because, in return, they benefit from higher milk prices, while non-farmer investors retain confidence in the milk price precisely because the Commission supports Fonterra's asset beta.

[1] Commerce Commission "Review of the state of competition in the New Zealand Dairy Industry: Final Report (1 March 2016)", paras X32-X36.

[2] Ibid. Footnote 255.

More fundamentally, the existence of the DIRA regulatory regime itself presupposes that Fonterra has both the incentive and the ability to meaningfully restrict IPs' ability to access raw milk supply through the base milk price. The Commission could only adopt a different position if there was compelling evidence.

To date, neither the Commission nor Fonterra have offered a sufficiently compelling reason to ignore Fonterra's incentive to reduce the asset beta to artificially low levels. On the available evidence, the Commission must recognise this incentive when assessing Fonterra's calculation.

The consequences of underestimating the asset beta are material

The second important assertion the Commission make is that the estimation error needs to be 'material' in magnitude to justify an uplift (para 2.52). The Commission relies on research it has previously commissioned to define a 'material under-investment problem' as a sustained differential of 0.5–1 percent between the true cost of capital and the allowed WACC. The Commission then asserts, without analysis, that Fonterra's downwards adjustment to the asset beta estimate is not material.

We have calculated the Notional Producer WACC using an asset beta of 0.38 (Fonterra's estimate) and 0.51 (the company comparator mean), and estimate there is a difference of 91 basis points between them (see Appendix B for calculations). This fits inside the Commission's 0.5-1 percent range of 'material under-investment'.

This result should not be surprising. The Commission itself refers to the effect of Fonterra's asset beta on the milk price (a deviation of 5 cents) as 'material' (para 2.61).

Lastly, the Commission states the consequences of unintentionally misestimating the milk price are not as serious as in sectors regulated under Part 4 of the Commerce Act. There is no obvious basis for this conclusion. The dairy industry is worth over $18 billion to the New Zealand economy and employs over 40,000 people.[3] The consequences of reduced market resilience through reduced contestability in the dairy industry are therefore material and potentially significant.

2 The lack of evidence supporting a downwards adjustment

Our previous submission explained that the risks of misestimating the asset beta are asymmetric: the consequences of an erroneous downwards adjustment are more likely to be more damaging than an upwards adjustment. This is largely because underestimating the asset beta would reduce market contestability (and therefore market resilience), whereas overestimating the asset beta would encourage competitive entry by IPs. This risk asymmetry heightens the need for compelling evidence to support any adjustment downwards from the sample mean.

The only justification for Fonterra's downwards adjustment is the assertion that processors can transfer systematic risk to farmers (para 2.62). The Commission expressly states in its draft report that it is unable to verify this view (para 2.63).

The statutory framework does not create a necessary implication that the Notional Producer should be assumed to transfer commodity price risk to farmers. Section 150C(1)(b) expressly signals that the issue is to be "taken into account" as a relevant consideration, indicating that the matter falls for consideration rather than being treated as an assumption to be adopted. The costs of both "collecting milk" and "processing milk" naturally operate as considerations rather than assumptions on an orthodox interpretation, and it would be an odd construction of section 150C(1)(b) if the costs of "selling commodities" were treated differently. In any case, the extent of any adjustment to the WACC because of risk transfer pricing certainly remains to be determined regardless of how far the Commission is willing to push ordinary statutory interpretation principles.

Positive evidence of practically feasibility is therefore required to justify Fonterra's view on systematic risk transfer. However, available evidence directly contradicts Fonterra's argument. If there was a

[3] DairyNZ. *Quick Stats About Dairying*. See: https://www.dairynz.co.nz/media/1357994/quickstats-new-zealand.pdf

simple, mechanistic transfer of systematic risk from commodity prices to the milk price, we would expect to see milk prices move in mechanistic synchronisation with commodity prices, which is not observed in the real world. More importantly, a true mechanistic transfer of commodity prices to the milk price would result in processors that were genuinely indifferent to commodity prices – because all risk would be transferred. This is patently not the case. Analysing the reasons why processors may or may not care about commodity prices becomes a second order issue: real-world, practically feasible observation tells us, conclusively, that all processors act to mitigate commodity price reduction, and are therefore clearly not indifferent to changes in commodity prices.

If Fonterra's assertion that commodity risk is transferred to farmers is neither supported by evidence nor verified by the Commission, the Commission should conclude that the downwards adjustment would result in an asset beta estimate (and an overall WACC) that is not practically feasible. This is particularly important when considering the asymmetry of risk, and the greater damage that a downwards misestimation can cause.

3 The Commission's refusal to conclude on the matter

Fonterra are unable to justify their asset beta estimate despite multiple instances where the Commission have granted the benefit of the doubt. Fonterra have now had two years to provide evidence. The Commission itself tried to manipulate the company comparator set to match Fonterra's figure (0.38), but could not. Despite these remarkable concessions to the regulated business, Fonterra remain unable to provide a plausible case.

Sections 150A and 150C of DIRA set out mandatory requirements for the calculation of a base milk price by Fonterra. The Commission's statutory function under s 150P is to review the inputs and processes used by Fonterra in calculating the base milk price and to report on the extent to which the calculation is consistent with the mandatory requirements imposed on Fonterra. This statutory function makes it necessary for the Commission to conclude the matter in the absence of the requisite evidence to justify Fonterra's approach. DIRA requires the Commission, as an expert economic regulator, to review the extent to which Fonterra's asset beta estimate is consistent with the requirements of efficiency and contestability. Refusing to exercise its judgement on this point, based on the presented evidence, effectively strips the DIRA regime of its intended regulatory force. The Commission is deferring to Fonterra and this is an abdication of the Commission's function. Indeed, as we explained in our previous submission, an uncertain or ambiguous conclusion only serves to increase the regulatory risk faced by independent processors, which undermines the objective of promoting contestability. The Commission's role as dairy sector regulator requires precisely the same level and type of regulatory scrutiny and robust decision-making as is expected in other sectors, regardless of whether its ultimate function is to "review" or "determine". There can be no meaningful review without the Commission forming an independent judgement.

The Commission ought to accept the mid-point range of the sample set as the benchmark for practical feasibility, and in doing so reject Fonterra's unsubstantiated reasons for a downwards adjustment. Equivocating on this point allows Fonterra to continue for a further year with an unjustified asset beta miscalculation, which will impact market contestability. Given that the assertions made by Fonterra are neither supported by evidence nor verified by the Commission despite multiple opportunities to demonstrate otherwise, it is now incumbent on the Commission to conclude that Fonterra's asset beta estimate is not practically feasible.

Best regards,

Steve Koekemoer

Chief Executive Officer

Open Country Dairy Ltd

Appendix A: Table 1: Overview of the Commission's view, and Open Country Dairy's view, on the asset beta review process

In the table below, we describe the Commission's position, and Open Country's position, on each step of the asset beta analytical review process. In the last column, we explain what the Commission's position means for the asset beta: importantly, it shows that even if the Commission does not change its view on any of the issues below, there remains no justification to move the asset beta from the midpoint.

Commission's view	Open Country Dairy view	Does the Commission's view justify a move from the asset beta midpoint?
The Commission's approach to assessing Fonterra's initial sample of comparator firms		
The Commission accept that Fonterra's initial company comparator set was inconsistent with the Input Methodology (para 2.45). The Commission have refined Fonterra's initial dataset to ensure consistency, including addressing inconsistencies pointed out by OCD (such as the erroneous inclusion of parent and subsidiary companies).	Open Country agree with the Commission's recognition that the dataset was not consistent with the Input Methodologies.	No
The risk of misestimating the asset beta: The Commission's approach to the incentives facing Fonterra		
The Commission state that Fonterra do not have an incentive to move the asset beta downwards (para 2.49). The Commission cite a report to justify this,[4] and summarises Fonterra's need to ensure their capital programme remains sustainable and to balance the interests of other parties (like external investors).	The cited report does not support the Commission's conclusions. The report concluded that "Fonterra may have an incentive to restrict IPs from accessing farmers", but Fonterra is "limited in its *ability* to do so." The report queries Fonterra's ability to act on its incentive: it does not query the existence of the incentive. The reasons cited by the Commission which limit Fonterra's ability to act on its incentive are unrelated to the asset beta calculation:	No

[4] Commerce Commission "Review of the state of competition in the New Zealand Dairy Industry: Final Report (1 March 2016)", paras X32-X36.

	• The importance of TAF to Fonterra, and the need for Fonterra to protect divergent interests, require confidence in the milk price. This confidence is largely a product of the credible application of the DIRA regulatory regime, and so Fonterra's incentives must be assessed as part of that regime. • There is no obvious connection between Fonterra's incentive to ensure the sustainability of their capital programmes and limits on their incentive to reduce the asset beta. Any under-investment from a misestimated asset beta is compensated for through profit retention. Most investors are farmers and are more likely to be indifferent to lower dividends because, in return, they benefit from higher milk prices, while non-farmer investors retain confidence in the milk price precisely because the Commission supports Fonterra's asset beta. • The existence of the DIRA regulatory regime itself presupposes that Fonterra has both the incentive and the ability to meaningfully restrict IPs' ability to access raw milk supply through the base milk price. The Commission should only adopt a different position if there was compelling evidence.	
The risk of misestimating the asset beta: The Commission's approach to the consequences of miscalculating the asset beta		
The asymmetric consequences of unintentionally misestimating the milk price are not comparable to sectors regulated under Part 4 of the Commerce Act, because Part 4 sectors are subject to a 5-year annual 'reset' (unlike Fonterra, which is subject to an annual 'reset') which can lead to longer-term underinvestment consequences.	The dairy industry is worth over $18 billion to the New Zealand economy and employs over 40,000 people: it is unclear how the Commission have concluded that reduced market resilience through reduced contestability has substantially lower consequences than underinvestment in energy networks. This year is the second year the Commission are not prepared to conclude on the asset beta, which has the *de facto* effect of allowing Fonterra to roll over the same asset beta of 0.38. This undermines the view that there is an annual 'reset', or that any longer-term risks are being effectively mitigated.	No

	The Commission's position on these issues has concerning consequences for the success of the DIRA regime. The Commission believes that an erroneous asset beta is unlikely to outlive several annual reviews (para 2.51). However, the Commission has not clarified what indicators of weak contestability it might be looking for, and how the Commission will know if contestability is threatened. Given the Commission's apparent rejection of the independent processors' evidence to date, the most likely indicator of the remaining options is the very damaging market exit of competition, by which point mitigation action is too late.	
The Commission state the estimation error needs to be 'material' in magnitude and duration to justify an uplift. To define this, the Commission cite a paper stating a 'material under-investment problem' would exist when there is a sustained differential of 0.5–1% between the true cost of capital and the allowed WACC (para 2.52).	Open Country strongly disagrees with the Commission's conclusion and query the robustness of the Commission decision-making process, because under the Commission's own definition, the potential misestimation error *is* material. Open Country has calculated the Notional Producer WACC using an asset beta of 0.38 and 0.51, and estimate there is a difference of 91 basis points between them (see Appendix B for calculations), which fits inside the Commission's 0.5-1% range of 'material under-investment'. The Commission also refers to the effect of Fonterra's asset beta on the milk price (a deviation of 5 cents) as 'material' (para 2.61).	No
The Commission's approach to Fonterra's downwards adjustment of the asset beta		
The Commission consider Fonterra's departure from the sample mean as 'material' (para 2.61). Despite this, the Commission believe Fonterra have provided a valid reason for a downwards adjustment (on the view that processors can transfer systematic risk to farmers, para 2.62), while recognising that Fonterra have not verified this reason (para 2.63).	There is no case for a downwards adjustment. The assertion made by Fonterra is neither supported by evidence nor verified by the Commission, and the Commission should conclude that the argument is not valid. The issue of risk transference is discussed below.	No – there are no verified reasons for a downwards adjustment.

The Commission's assumption that risk is transferred from processors to farmers as a reason to adjust the asset beta downwards		
It is a necessary principle of section 150C of the Milk Price Manual that the Notional Producer should be assumed to transfer the commodity price risk to farmers	The Commission's approach leads to a logical circularity that comes from assuming the Milk Price Manual determines the risk profile of the notional producer, simply because of the calculations it applies to determine the milk price. The Milk Price Manual is a tool for estimating a market price of milk, which is otherwise unobservable, and not itself a guide to how we conceive the nature of the business in which the notional processor is involved. The nature of the business must be decided independently of, and then fed into, the Milk Price Manual. This requires determining risk allocation that is practically feasible. This is discussed in the row below. There is no necessary implication arising from the statutory framework that the Notional Producer should be assumed to transfer commodity price risk to farmers. Section 150C(1)(b) expressly signals that the issue is to be "taken into account" as a relevant consideration, indicating that the matter falls for consideration rather than being treated as an assumption to be adopted. The costs of both "collecting milk" and "processing milk" naturally operate as considerations rather than assumptions on an orthodox interpretation, and it would be an odd construction of section 150C(1)(b) if the costs of "selling commodities" were treated differently.	No – there are no verified reasons for a downwards adjustment.
Aside from section 150C, risk allocation should be determined by whether it is practically feasible for an efficient processor to pass on commodity risk, which the Commission believe is the case. The Commission cite real-world co-operative processors that pay farmers ex-post as an example.	Open Country agrees that risk transfer should be determined with reference to practical feasibility, but does not think the Commission has done this. Observable evidence directly contradicts Fonterra's reasoning that there is a simple, mechanistic transfer of systematic risk from commodity prices to the milk price. If this were the case, we would expect to see milk prices move in mechanistic synchronisation with commodity prices, which is not the observed, real-world case. More importantly, a true mechanistic transfer of commodity prices to the milk price would result in processors that were genuinely indifferent to commodity prices – because all risk would be transferred. This is patently not the case, and analysing the reasons why	No – there are no verified reasons for a downwards adjustment.

	processors may or may not care about commodity prices becomes a second order issue: real-world, practically feasible observation tells us, conclusively, that all processors act to mitigate commodity price reduction, and are therefore clearly not indifferent to changes in commodity prices. The Commission's cooperative example is not compelling. Ex-post payment to farmers is not evidence that commodity price risk transfers mechanistically to farmers: at best, it shows that *some* commodity price risk transfers.	
The Commission's approach to testing Fonterra's specific asset beta of 0.38		
The Commission refine Fonterra's sample set to try to capture companies that might be able to transfer systematic risk to farmers, to see if the asset beta is closer to Fonterra's (0.38).	Open Country is concerned that the Commission is applying its own approach to try to back-calculate to Fonterra's pre-determined answer, which does not justify Fonterra's inputs and processes.[5] We would expect the Commission to develop an alternative approach only as a means of testing Fonterra's approach – not to replace it, and not to justify a pre-conceived answer. Further, refining the sample this way leads to new 'false positive' errors. By cherry-picking only the perceived systematic risks presented by Fonterra – and trying to refine the comparator set to try to reflect these risks – the Commission is not accounting for the impact of unknown systematic risks present in other jurisdictions, and is failing to refine the sample for unknown New Zealand systematic risks (the Commission already notes they "have not assessed whether any relevant comparators were excluded, or any relevant ones included" (footnote 33)). Finally, refining the sample to capture companies that change prices throughout the season is a very poor indicator that milk price risk is mechanistically transferred to farmers: at best, it shows that *some*	No – there are no verified reasons for a downwards adjustment, and the Commission cannot justify Fonterra's asset beta by refining the sample set.

[5] As OCD noted in its previous submission (Open Country "Submission on emerging views – 31 July 2017", Section 3.2, page 4), the process that Fonterra used to calculate 0.38 was specious, so if the Commission could match Fonterra's figure, it would not justify Fonterra's calculation process.

	commodity price risk transfers, but processors can still absorb significant commodity risk prior to an ex-post payment.	
The Commission's decision not to conclude on the matter, and to seek further information		
The Commission have asked for better information on the extent to which comparators pass on systematic risk to farmers, and for IP input into Fonterra's statement that no other jurisdiction is governed by a milk price mechanism like the Milk Price Manual.	Open Country recognises the Commission's request for information on systematic risk transfer to farmers. We remain willing to assist the Commission where needed, however the Commission's information request is for an erroneous calculation and therefore we do not see the value in supporting it. For completeness, we explain why the calculation would be erroneous below. First, asymmetric risks and Fonterra's incentives tell us that there must be very compelling evidence to move from the beta midpoint, particularly downwards (which is most risky). Second, there are no compelling reasons to consider a downwards adjustment. Fonterra's reasoning is unverified, and as we explain in this submission, evidence tells us the opposite is the case: there is not a mechanistic link between commodity prices and milk prices in the real world. Third, manipulating the data is very likely to lead to a 'false positive' error, whereby other systematic risks that are unique to other jurisdictions are captured in the modified dataset, making it impossible to draw meaningful conclusions.	No – there are no verified reasons for a downwards adjustment, and the Commission has not been presented with any compelling evidence.
The Commission cannot conclude on Fonterra's asset beta of 0.38, because the Commission do not have confidence in their alternative approach to the calculation.	This table illustrates that, under any approach, the asset beta arrived at is significantly higher than 0.38. Firstly, the Commission ought to accept the mid-point range of the sample set. If an adjustment were to be made, there are compelling reasons to adjust the asset beta upwards to account for the incentives facing Fonterra and asymmetric risks. There are no verified reasons for a downwards adjustment.	No – under any approach taken, the Commission ought to conclude that 0.38 is not practically feasible.

Despite this, even when exploring all avenues for a downwards adjustment, the asset beta remains significantly higher than 0.38.

Fonterra have had two years to provide compelling evidence, and in the absence of that, the Commission are departing from best-practice by refusing to conclude the matter and allowing Fonterra to continue for a further year with an unjustified asset beta miscalculation.

Appendix B: Calculation of the Notional Producer WACC using two Different Asset Betas

The calculations below have been provided by Castalia Strategic consultants.

We describe how we calculate the notional producer WACC using Fonterra's asset beta (0.38) and the company comparator midpoint asset beta (0.51). The difference between the two calculations is **91 basis points**.

Calculating the WACC

The general formula for calculating the WACC is:

$$WACC = K_E \times \frac{E}{D+E} + K_d \times \frac{D}{D+E} \times (1 - T_{Firm})$$

Where:

$WACC$ is the weighted average cost of capital,

K_E is the cost of equity,

$\frac{E}{D+E}$ is the ratio of equity to total capital in the firm,

K_d is the cost of debt,

$\frac{D}{D+E}$ is the ratio of debt to total capital in the firm,

$(1 - T_{Firm})$ is the tax shield of the firm,

T_{Firm} is the marginal tax rate faced by the firm.

Calculating the ratio of equity ($\frac{E}{D+E}$)

We assume 40 percent equity, as per the inputs into the Farmgate Milk Price Calculation.[6]

Calculating the ratio of debt ($\frac{D}{D+E}$)

We assume 60 percent debt, by subtracting the total equity from total assets.

Calculating the cost of equity (K_E)

We calculate cost of equity as:

$$K_E = R_f + (B_E * MRP)$$

Where,

K_E is the cost of equity,

R_f is the risk free rate,

B_E is the equity beta,

MRP is the market risk premium.

The risk-free rate (R_f)

We calculate the risk-free rate using the average secondary market yield on five-year government stock as reported by the Reserve Bank of New Zealand for the last 60 months. This is 3.10 percent.

[6] See Fonterra "Reasons' paper in support of Fonterra's base milk price for the 2015/16 Season." 1 July 2016. Page 39.

The equity beta ***(B_E)***

Equity beta is calculated as:

$$B_E = B_A \times \frac{D+E}{E}$$

Where,

B_A is the asset beta,

$\frac{D+E}{E}$ is the ratio of capital in the firm to total equity.

The asset beta ***(B_A)***

We calculate the WACC using two asset betas: Fonterra's asset beta (0.38) and the company comparator midpoint (0.51).

The market risk premium ***(MRP)***

We use 7 percent for the market risk premium, as recommended by the Commerce Commission.[7]

Calculating the cost of debt *(K_d)*

We calculate the cost of debt using the inputs for the Farmgate Milk Price Calculation.[8] This assumes four components:

- The risk-free rate, calculated as five-year rolling average of monthly average five-year government stock rates, as reported by RBNZ. We calculate this as 3.10 percent.[9]
- The average US company debt premium, calculated as five-year average of average spread of five-year A-rated debt issued by US industrials over US treasuries. We calculated the average five-year US Treasury bond yield as 1.42 percent,[10] and the average five-year US industrial bond yield as 4 percent.[11] This gives a spread of 2.55 percent.
- Allowance for annualised debt issuance & other debt-related costs of 35 basis points.
- Specific risk premium of 15 basis points.

Summing these leads to a cost of debt of 6.15 percent.

Calculating the marginal tax rate *(T_{Firm})*

We use the corporation tax rate in New Zealand, which is 28 percent.

Calculating the WACC (using an asset beta of 0.38)

We apply this formula:

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[7] See the Commission's cost of capital determinations 2016: http://www.comcom.govt.nz/regulated-industries/input-methodologies-2/cost-of-capital-2/cost-of-capital/

[8] See Fonterra "Reasons' paper in support of Fonterra's base milk price for the 2015/16 Season." 1 July 2016. Page 39.

[9] Data source: RBNZ https://www.rbnz.govt.nz/statistics/b2

[10] Data source: https://www.investing.com/rates-bonds/u.s.-5-year-bond-yield-historical-data

[11] Data source: S&P Dow Jones Indices. See: https://us.spindices.com/indices/fixed-income/sp-500-industrials-corporate-bond-index

$$WACC = K_E \times \frac{E}{D+E} + K_d \times \frac{D}{D+E} \times (1 - T_{Firm})$$

Using these figures:

$$WACC = 0.098 \times 0.4 + 0.062 \times 0.6 \times (1 - 0.28)$$

$$WACC = 6.56\%$$

Calculating the WACC (using an asset beta of 0.51)

We apply this formula:

$$WACC = K_E \times \frac{E}{D+E} + K_d \times \frac{D}{D+E} \times (1 - T_{Firm})$$

Using these figures:

$$WACC = 0.12 \times 0.4 + 0.062 \times 0.6 \times (1 - 0.28)$$

$$WACC = 7.47\%$$