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NZCC

Dairy asset beta and specific risk premium

Final

12 August 2021

Purpose of this document

- This document provides supplementary information supporting our advice to the Commission as set out in our letter dated 21st July 2021 on Asset Beta and Specific Risk Premium.
- This document should be read jointly with that letter.
- We previously advised the Commission on an appropriate asset beta for a notional dairy processor in *CEPA and Freshagenda (2018), Dairy Notional Processors' Asset Beta, CEPA and Freshagenda (2018), Dairy Notional Processor's Asset Beta – Response to Submissions* and *CEPA (2019), Consideration of Partington and Satchell Report to Fonterra data 1 August 2019*. References to our previous advice are references to these documents.

Purpose of this review

- NZCC is responsible for undertaking a review of both the milk price manual and the calculation of the base milk price on an annual basis. The aim of this monitoring regime is to provide incentives for Fonterra to act efficiently while providing contestability. NZCC has interpreted these two dimensions as follows:
  - **Efficiency** – Fonterra will have an incentive to operate efficiently when the manual provides for independent benchmarks for revenue and cost inputs in the calculations.
  - **Contestability** – The contestability dimension is satisfied if the assumptions used in setting the base milk price are practically feasible for an efficient processor.
- In addition to this NZCC points to a set of "mandatory assumptions" under 150C of DIRA. This includes new requirements specifically for asset beta (see slide 7). The amendment only comes into force for the review of the base milk price in the 2021/22 season. However, we understand that Fonterra has sought to apply the requirements of the new provision in advance of it coming into force.
- NZCC states their role is not to develop an alternative approach or to suggest alternative components.
- In light of these requirements, we have been commissioned to examine the asset beta and specific risk premium estimates provided by MPG.

Our interpretation

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Asset beta

- For the purposes of this review, we have assumed that if MPG have met the mandatory assumptions for asset beta under the new 150C provisions they have met the requirements. This is regardless of whether the asset beta meets the efficiency and contestability dimensions.
- However, given our previous work on this issue, we have considered whether there is now evidence that a notional processor may have a higher or lower asset beta than previously considered.

Specific risk premium

- On whether an additional specific risk premium is appropriate, our assessment is that this fundamentally comes down to asset stranding risk.
- If asset stranding risk is considered systematic it will be captured by asset beta and by extension covered by the new 150C requirements.
- If it is considered non-systematic and asymmetric then a specific risk premium may be appropriate.

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1. Comparator selection

MPG's interpretation of Section 150 c of DIRA

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The amendment to the DIRA

- *(3) For the purposes of subsection (1)(b), any estimate of the return on capital must be made applying the capital asset pricing model.*
- *(4) For the purposes of subsection (3), the asset beta used in the application of the capital asset pricing model must be consistent with the estimated asset betas of other processors of dairy and other food products that are—*

  (a) traded in significant quantities in globally contested markets; and

  (b) characterised by uniform technical specifications.
- *(5) In subsection (4), asset beta means a measurement of a firm's exposure to systematic risk where systematic risk measures the extent to which the returns on a company fluctuate relative to the equity returns in the stock market as a whole*

Key elements of MPG's interpretation

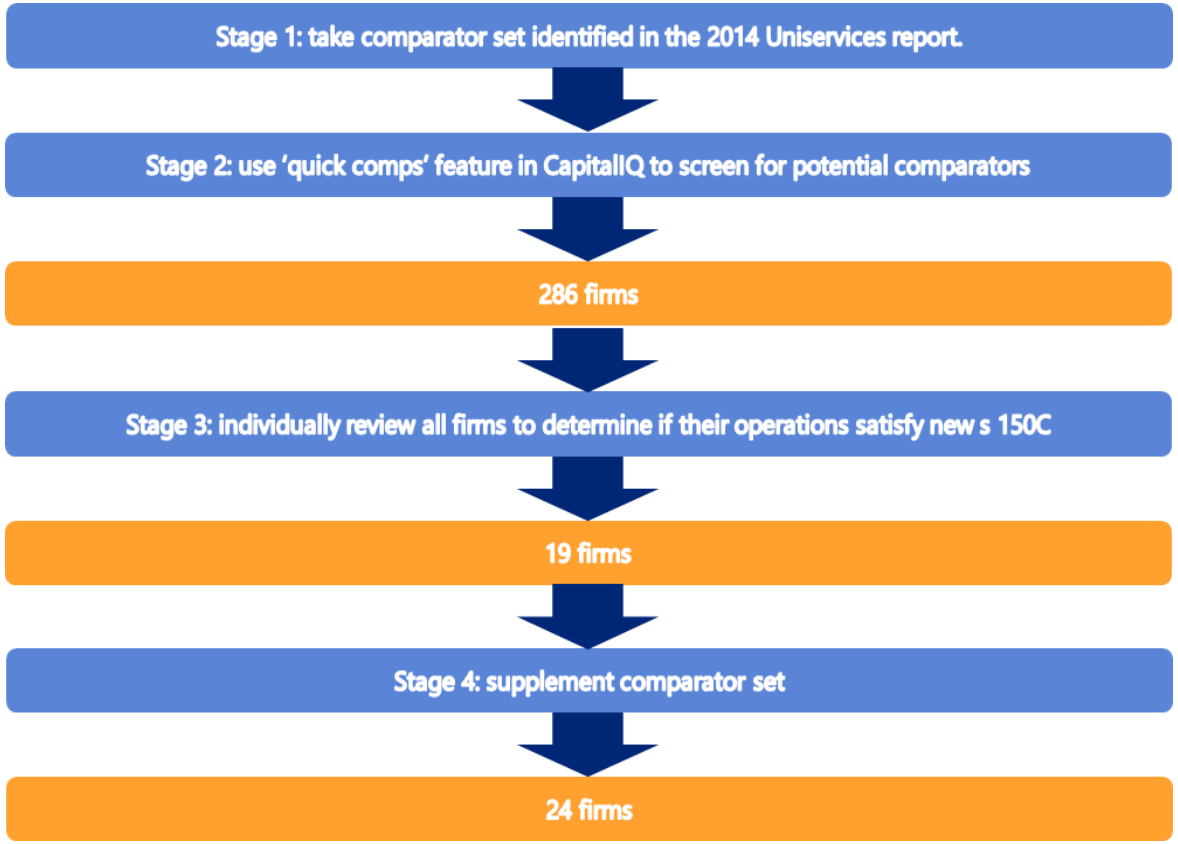
"Uniform technical specifications"

- MPG has interpreted this to reference products which are:
  - Typically transacted according to a standard market convention (e.g. tonnes)
  - Are considered sufficiently undifferentiated for the processors identity to be relatively immaterial to a potential purchaser's decision to buy.
  - Current prices are readily available.
- Overall MPG has interpreted this to mean commodity type goods.

"Traded in significant quantities in globally contested markets"

- MPG has interpreted this section to mean that the firms products are sold in globally traded markets.

Comparator selection – MPG's method



- **Stage 2:** Firstly, Fonterra used the 'quick comps' feature to locate firms identified by CapitalIQ as potential comparators for all firms in the initial set. Secondly, CapitalIQ was used to screen for all listed companies in North America, Asia Pacific or Europe with an industry classification of 'food distributors' or 'food products (primary)' and with a keyword search for 'dairy', 'commodity', 'grain', 'meat', or 'oil'.
- **Stage 3:** MPG reviewed whether the firm's operations satisfied the criteria set out in section 150 c. MPG required that "at least some" of the products manufactured by the firm were characterised by uniform technical specification and sold on global markets. Many firms only had a small proportion of their operations consistent with criteria set out in section 150 c.
- **Stage 4:** This was supplemented with additional firms which sell products that "can reasonably be viewed as 'commoditised'". This includes products which are typically used as intermediate inputs, and where purchases likely regard products produced by multiple suppliers as being readily substitutable. The list was also supplemented with firms who sell commodities or commoditised food products on markets which although not global, the price in those markets reflects a global price.

Comparator selection – MPG's method

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- MPG's final list excluded a lot of firms included in CEPA's 2018 analysis. This is due to the amendments to the DIRA, where many firms which only produced consumer type products such as Nestle, Mondelez and Kraft were excluded.

- Examples of products that MPG considered commodities are crude vegetable oils, liquid milk, milk powder, raw sugar and frozen whole chicken.

- Examples of products that MPG considered commoditised (i.e. used in the supplement comparator set) are flour, sweeteners, edible nuts, beans and molasses.

- We consider MPG's method of selecting comparators to be reasonable, noting that we haven't completed a full audit of companies which they have excluded in stage 3 of their process.

2. Beta estimation

Beta estimates – MPG methodology

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- MPG estimates 5-yearly betas using the following periodicities and end periods:
  - Daily (31/12/2020, 25/6/2020, 26/12/2019, 27/6/2019, 27/12/2018)
  - Weekly (31/12/2020, 25/6/2020, 26/12/2019, 27/6/2019, 27/12/2018)
  - Four-weekly (31/12/2020, 18/6/2020, 5/12/2019, 20/6/2019, 6/12/2018)

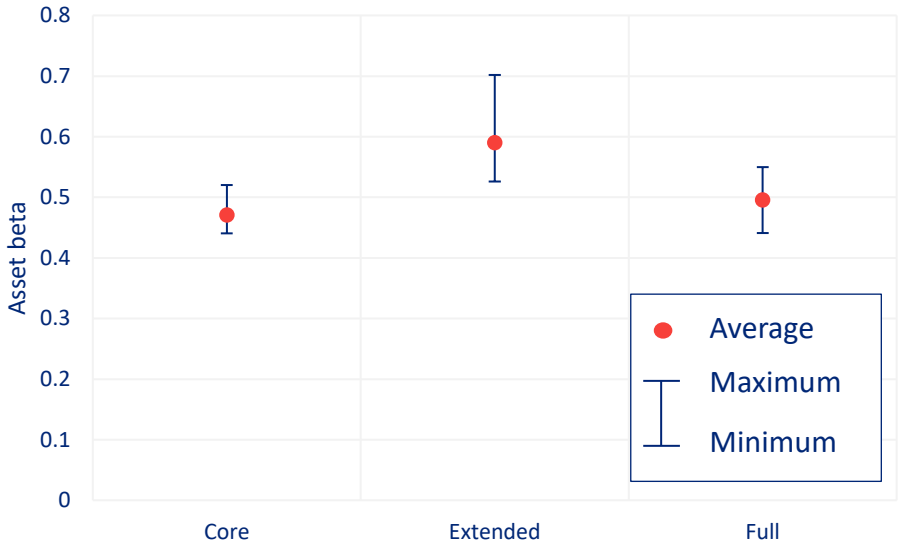
- We consider MPG have generally applied standard well-accepted methods for estimating beta. We are able to closely replicate their results using their comparators.[1]

- There are two areas which may deviate from common regulatory approaches:
  - MPG have applied an adjustment to gearing. This is done to apply a consistent level of net debt over a period when IFRS16 came into effect. We estimated asset betas with and without this adjustment to net debt and find the adjustment has a limited impact (~0.01) on MPG's estimate.
  - The time periods chosen. NZCC has in the past placed emphasis on the last 10 years and in our previous report we estimated beta over two five year periods.

1. Our estimates for individual comparators deviate slightly from those estimated by MPG but our averages and ranges are close.

Beta estimates – MPG Results

Asset beta – Average, minimum and maximum



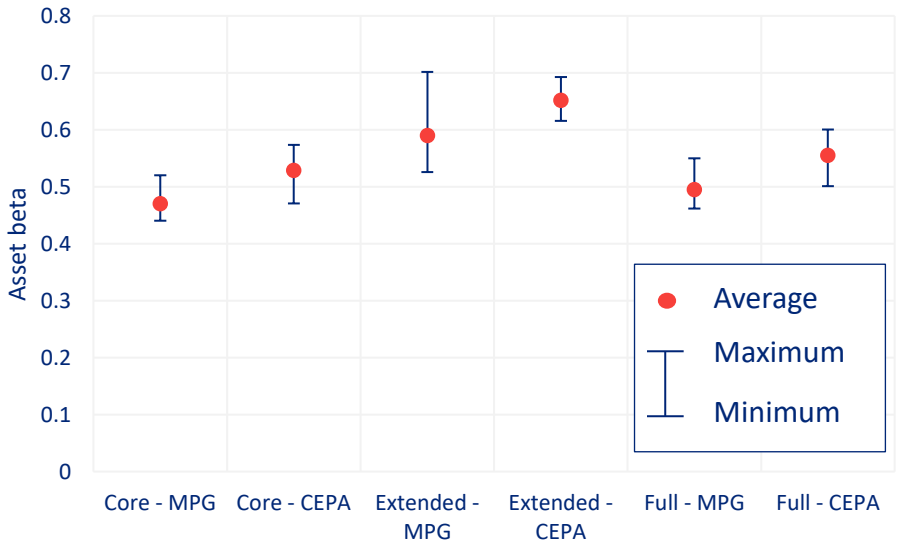
Core	Extended	Full
0.47	0.59	0.50

Averages

- In summarising the evidence MPG calculates the averages by sample for each periodicity and end-date combination.
- MPG then calculates the average across these averages and the minimum and maximum.
  - Core - 0.47 average asset beta
  - Extended – 0.59 average asset beta
  - Full – 0.50 average asset beta
- MPG then make a case for a downward adjustment to the sample average (see slide 16).

Beta estimates – Alternate time period

Asset beta – Average, minimum and maximum



Core - MPG	Core - CEPA	Ext. - MPG	Ext. – CEPA	Full – MPG	Full - CEPA
0.47	0.53	0.59	0.65	0.50	0.55

Averages

- We estimated asset betas with the same comparator set but applying a different time period.
- In the past NZCC has placed emphasis on the last ten years of data. In our last report we examined ten years of data splitting this into two separate five year periods. We do the same here:
  - 5 years to 31/12/2020
  - 5 years to 31/12/2015
- We find that this results in slightly higher averages but with ranges that generally include MPG's average estimate.

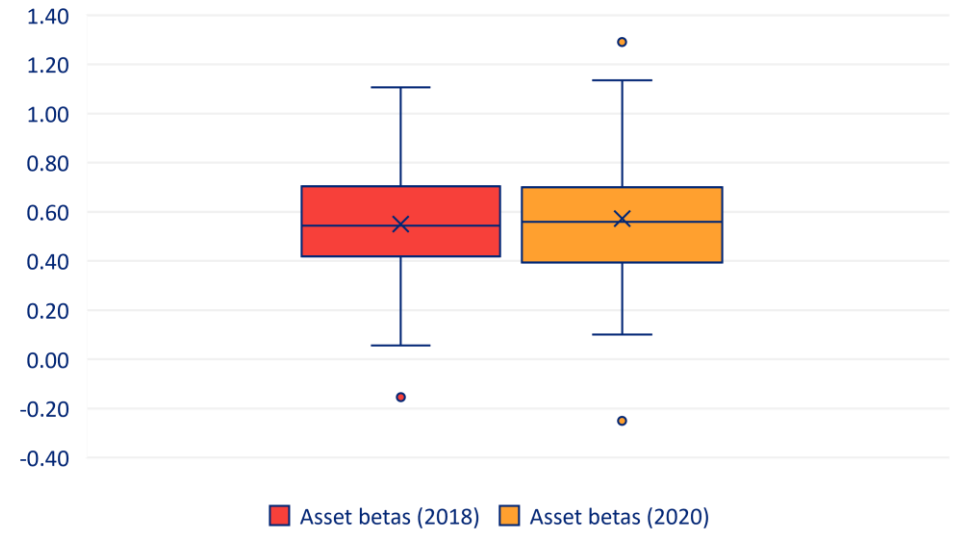
Beta estimates – Inclusion of other comparators

The following table present several companies which MPG have excluded but may potentially meet the requirements of s150C

Company Name	Description	MPG comment
Freedom Foods	Freedom Foods sells “industrial nutrition” such as bulk whey protein.	MPG noted that this could be included in the primary comparator set and that it has an average beta of 0.46 and therefore wouldn’t alter the conclusions.
WH Group limited	Sells fresh pork (and other meat products) in China and internationally. 40% of their fresh pork is sold in international markets.	MPG commented that their main product is packaged meat and that it appears that they sell mostly in domestic markets.
Murray Goulburn	Was sold to Saputo in May 2018. Supplies whey, milk powder, concentrate.	
Beston Global Foods Companies	Sells commodities such as bulk protein powder and bulk butter.	MPG commented that it could be added to primary comparator set given some minor commodity sales in international markets.
Inner Mongolia Yili	China based consumer goods producer. Owns Westland (New Zealand dairy producer which produces commodity dairy products).	

Beta estimates – Previous sample

Comparison of asset betas – All periodicities



Highest value
Median
Lowest value
Outlier
X Mean

- In our 2018 advice on this issue we provided an estimate of beta using a comparator sample of 39 firms split into 5 sub-samples.
- We considered that on this basis an asset beta of 0.45 could be justified for a notional processor.
- We have updated our estimates for the five samples we considered previously.
- We found that our estimates of asset beta have increased slightly:
  - The average for the full sample and all periodicities to 2018 was 0.55.
  - The average for the full sample and all periodicities to 2020 was 0.56.

Note: To ensure a like-for-like comparison with our previous estimates we have not undertaken an adjustment for gearing for the asset beta estimates shown on this slide.

Downward adjustment

- MPG states that the Commission's most comprehensive views on downward adjustments in beta come from various 2010 IMs reasons papers. The Commission accepts the principle that there may be grounds to adjust the beta across three circumstances:[1]

  - Making adjustments to multi-divisional asset betas estimates;
  - Adjusting asset beta estimates sources from overseas for differences in systematic risk due to regulatory differences; and
  - Adjusting asset beta estimates due to differences in systematic risk between services.

- MPG argue in all three circumstances that the asset beta for Fonterra should be adjusted downward.

- MPG also argue that the lower beta in their core comparator set compared to their extended comparator set indicates that operations which fully conform to the new s150C have lower systematic risk than firms which don't. MPG acknowledge that the sample size is small and therefore doesn't place much weight on this difference.

1. Commerce Commission (2010), Input Methodologies (Electricity Distribution and Gas Pipeline Services) – Reasons paper, pg. 526,

Evidence for downward adjustment in beta

- MPG's estimation of multi divisional betas.
  - The 2010 IMs (Airport services) reasons paper explains that a company's overall beta can be viewed as a weighted average of the betas of its component businesses.
  - MPG estimated divisional betas (for commodity and non-commodity operations) for Synlait.
  - MPG assumed that a2's asset beta would be a suitable proxy for Synlaits non-commodity operations. This is because from 2015 to 2016 a large percentage of Synlait's non-commodity business was generated through manufacturing infant formula for a2.
  - found an implied commodity beta for Synlait of around 0.3-0.4 in 2015, compared to Synlait's asset beta of 0.39-0.48.
- Our view is that this method may not provide robust evidence::
  - MPG used Fonterra's share price performance as a proxy for overall performance of the dairy industry. Fonterra's shares trade in a restricted market for cooperative members only, with arrangements for liquidity using related securities from non-members of the cooperative (which have been suspended in 2021). We don't consider movements in the share price to reflect dairy industry conditions (a fuller explanation of this is given in our 2018 commentary on submissions).
  - The assumption that a2's asset beta would be a suitable proxy for Synlait's non-commodity business. a2 sells a wide range of consumer goods, the systematic risk of their entire business does not necessarily represent the systematic risk of one of their products (infant nutrition).

Evidence for downward adjustment in beta

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- Difference in systematic risk due to regulatory differences between Fonterra and the comparator set.
  - MPG note that while Fonterra's milk price is not subject to formal regulatory control Fonterra has in numerous times committed to calculating its Milk Price under the Milk Price Manual which comes under Commission oversight. This gives two implications for investors:
    - Provides added certainty over expected returns to Fonterra's reference commodity product (RCP) business; and
    - Returns on Growth options (e.g. options to expand) should be valued at zero as Milk Price investors will only recover costs (including WACC). Other food production businesses it can be assumed that these growth options are NPV positive and positively correlated to market conditions.
  - Our view is that the empirical evidence suggests that investors value growth opportunities positivity and that this is true for a notional processor. Regulation has not been demonstrated to impact beta; it is the nature of the business which determines it. Therefore, we use comparator companies in the same industry to estimate beta.
- Differences in systematic risk of RCP businesses and the comparator firms.
  - MPG state that CEPA (2018) showed Fonterra's NP business had less risk than other comparators. It is important to note that the comparator sample has now changed and therefore this conclusion might not still hold.
  - The Commission has a precedent of adjusting beta's by 0.05 in Electricity networks and airports.
- Our view is that comparator sample is different now due to changes in the DIRA and therefore CEPA's analysis in 2018 may not hold for the new comparator set.

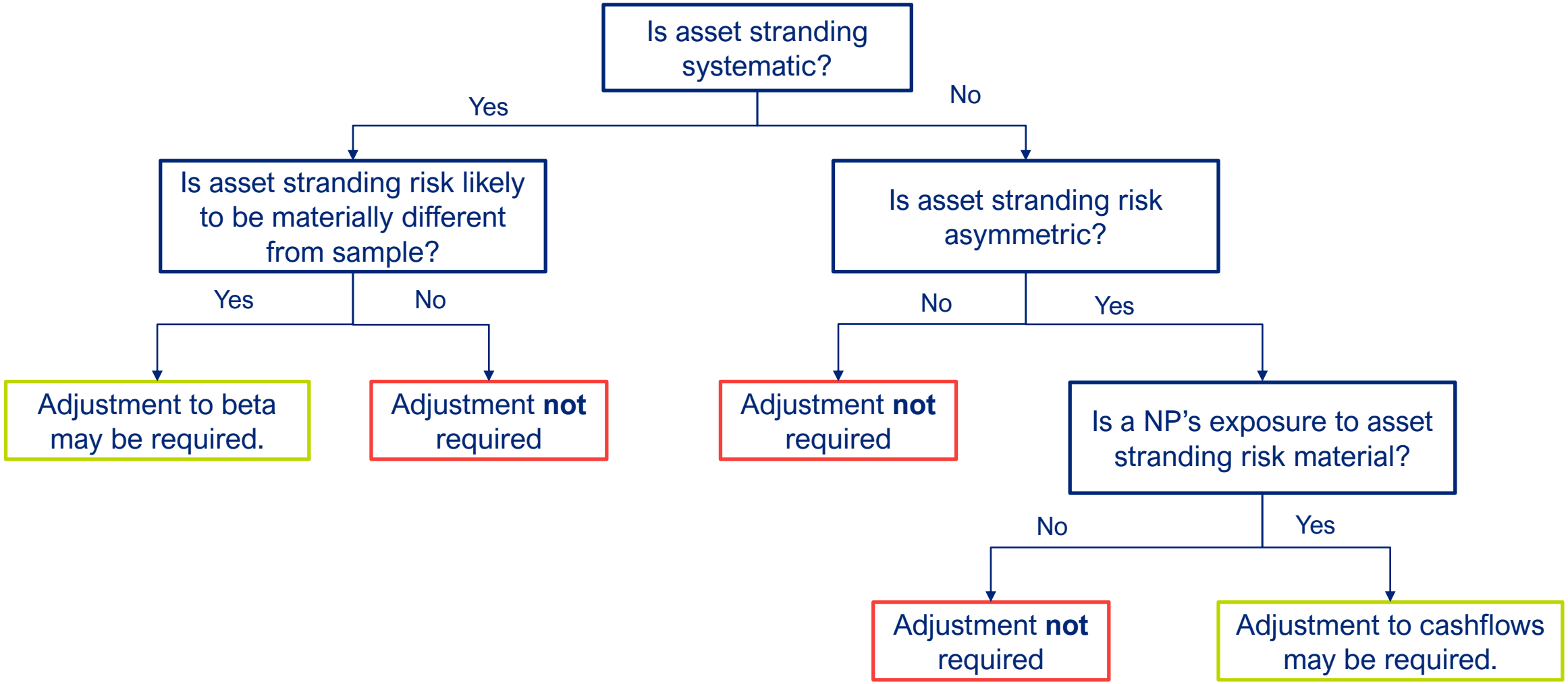
3. Specific risk premium

Key questions

In assessing whether a Specific Risk Premium should be applied, the following sequential questions need to be answered:

Question	Comment
Is asset stranding risk systematic?	• If the asset stranding risk is systematic than it should be considered through the asset beta. • Asset stranding risk may have more than one driver and may be made up of systematic and non-systematic components. • An adjustment to asset beta is only justified in this case if it is considered that the systematic component is materially different from the comparator sample.
Is asset stranding risk asymmetric?	• In general, CAPM requires that non-systematic risks, that is risks specific to the business, not be compensated for. This is because an investor can diversify these risks away. • This is not the case if the risks are asymmetric and the CAPM model will not provide sufficient compensation.
Is a NP's exposure to asset stranding risk material?	• There may be reasons why even if asset stranding risk is identified it may not be material. • For example, if the firm can adjust prices or the depreciation profile of assets it may be able to adjust for asset stranding risk. • A justification is required for why the framework applying to the firm does not provide a mechanism for compensation before an ex-ante allowance is provided.

Key questions



Framework - Fibre IMs

- The Commission examined the issue of asset stranding risk at length during the setting of the Fibre Input Methodologies (IMs).
- The Commission concluded that an ex-ante allowance through a discount rate of 0.1% of RAB was appropriate for asset stranding.
- While we don't necessarily endorse the conclusion that an ex-ante allowance is appropriate the reasons paper sets out a useful framework for considering this issue.
- We have set out a simplification of the key issues considered by the Commission in the IMs and the answers required to justify an ex-ante allowance for asset stranding on slide 25.
- The focus here is on those risks described as "Type II asymmetric risks" by the Commission. Type I risks are described as those unrelated to day-to-day operations of the firm and rise from infrequent events that produce large losses (e.g. natural disasters). These risks can and often are insured for in competitive markets.
- In the Commission's discussion of Type II asymmetric risks, the focus is on negative demand shocks. We consider that the framework allows us to consider negative supply shocks as well.
- An ex-ante allowance is only one option under a regulatory framework for appropriately compensating for asset stranding.

Reflecting stranding risk

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Demand risk

- Reconfiguring plant in response to changing demand is a cost borne by suppliers under Rule 32.
- Current global forecasts (e.g. OECD) project global milk production to grow by 1.6% CAGR to 2029. China remains a key demand source.
- Variations in global demand for products likely to be correlated with global economic growth (although evidence suggests that pricing is not).
- Environmental issues (see supply) may also have a progressive negative impact on global demand, including switches to plant based milks, but impact uncertain.
- **Demand variation likely to be systematic**.

Supply risk

- Environmental regulations a key driver of perceived stranding risk:
  - While dairy cattle numbers fall 8% in the Climate Change Committee's June 2021 reference case from 2019 to 2030, milk solids production falls only 4%. With asset retirements, this would not strand assets.
  - Increasing costs may lead to voluntary exits from the industry.
- Sharper declines likely to be associated with tougher regulation in a range of industries, so be at least in part systematic.
- From a global perspective, shrinking NZ's dairy industry may not be optimal because of its favourable emissions compared to other countries. The risk of an environmentally driven supply shock may therefore be asymmetric.
- **Supply variation likely to at most only partially non-systematic**.

Ināia tonu nei: a low emissions future for Aotearoa. Climate change committee, June 2021.

Reflecting stranding risks - options

Option	Comment
Allow asset to remain in RAB even if stranded.	• Does not appear to be an option in this case. • The Milk Price Manual (rule 33) requires that surplus capacity be removed from the Farmgate Milk price calculation.
Accelerate depreciation	• For regulated networks (fibre/energy) if asset stranding risk can be foreseen then depreciation can be accelerated. This in effect means that revenues are brought forward.[1] • Given the regulatory framework applying in this case we consider an NP has sufficient flexibility to change the price it pays for inputs and the prices it charges to account for this.
Ex-ante allowance	• In the case of fibre the Commission concluded that an ex-ante allowance was justified. • The Commission concluded that the other mechanisms in the regulatory framework do not allow sufficient adjustment for stranding risk. • The Commission then turned to estimating this allowance and applied a model from Dixit and Pindyck to translate an assumed proportion of RAB that is stranded with an assumed probability. This is shown on the next slide.

1. Accelerated depreciation profiles have been considered by other regulators. For example, Ofgem as part of RIIO-GD2 (gas distribution) allowed modified depreciation profiles and stated, "*We considered the stranding risk as part of our asset life review, and we consider that we have mitigated any risk by introducing a front end loaded deprecation profile.*"

Reflecting stranding risk – Ex-ante allowance

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Supply risk

- NZCC have derived relationship between assumptions and asset stranding risk for recent fibre determination.
- We can consider a high-end scenario to guide likely stranding risk under this approach:
  - Assume that milk production declines in line with CCC cattle decline (13%).
  - This would reduce industry processing asset value by around 8% (older assets removed).
  - Assume half of this is systematic.
  - Assume 10-20% probability of this happening.
- This would lead to annual addition to cost of capital (specific risk premium) of 5-10 bps.
- BUT: would independent processors price this in?

NZCC numerical approach

Increment to cost of capital for assumptions around asset stranding probability and % of RAB affected

% RAB which may be stranded	Probability of Stranding									
	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
100%	51	105	163	223	288	357	431	511	598	693
90%	46	95	146	201	259	321	388	460	538	624
80%	41	84	130	179	230	285	345	409	478	555
70%	36	74	114	156	201	250	302	358	418	485
60%	31	63	98	134	173	214	258	306	359	416
50%	26	53	81	112	144	178	215	255	299	347
40%	21	42	65	89	115	143	172	204	239	277
30%	15	32	49	67	86	107	129	153	179	208
20%	10	21	33	45	58	71	86	102	120	139
10%	5	11	16	22	29	36	43	51	60	69

Fibre input methodologies major final decisions reasons paper, page 588

Differences between sectors

- The Commission considered that there were differences between fibre and energy networks which meant an allowance may be justified in one sector and not another.
- We have re-created the summary table used by the Commission below and added our preliminary thoughts on dairy.

Factor	Commission's view on fibre networks	Commission's view on energy networks	Commission's comment on difference between fibre and energy	Our preliminary views on dairy
Risk of economic network stranding	Higher	Lower	The Commission considered these factors independent of the regulatory framework such as technological change or consumer preferences.	Lower than fibre.[1]
Ability to remove assets in RAB	Higher	Lower (Commission does not remove assets from the RAB)	May increase risk exposure for fibre.	Higher than fibre.
Ability to shorten asset lives/flex depreciation	Higher	Lower	Greater ability for fibre to mitigate risk, but unlikely to fully mitigate.	Higher than fibre.
Stranding allowance	Yes	No	Designed to compensate for unmitigated risk exposure	No.

1. We have not undertaken a comprehensive assessment of this issue and our judgement may change if presented with new evidence. However, fibre/telecommunication networks are presented as a sector with particularly high technological change. The Commission is not the only regulator to have come to this conclusion. For example, Ofcom's 'fair bet' principle is an explicit recognition of this.

Stranding risk in the asset beta

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- MPG argues that:

  "Drawing on CEPA's analysis, we consider the key question relating to the SRP is whether the **average comparator's** (and not necessarily the NMPB's) exposure to asset stranding risk is (primarily) systematic or non-systematic. To the extent it is systematic, it will be captured in the average asset beta for the comparator set. An assessment of the NMPB's exposure to stranding risk (whether systematic or non-systematic) relative to the average comparator would then form part of the process of determining whether an adjustment is required to the average asset beta of the comparator set."
  Milk Price Group Paper, *Asset Beta and Specific Risk Premium*, 26 February 2021, p. 37 (emphasis in original)

- We make a similar but subtly different point:
  - CEPA (2018) did not recommend using the average asset beta. We developed a range of estimates from the sample, which were then used to test whether Fonterra's estimated asset beta of 0.38 was reasonable.
  - This is because setting the asset beta for a NP is necessarily an exercise in regulatory judgement.
  - Therefore, instead of MPG's characterisation above, we recommend that the question be framed as **"is a NP's asset stranding risk likely to be materially different to the sample?"**

- Answering the above question can then help inform the CC's judgement on the asset beta.

Reflecting stranding risk

CEPA (2018) concluded that a NP faces similar asset stranding risk to the companies in its sample:

"Comparators will face asset stranding risks if volumes are significantly different from expectations (and systematic), however most will not have the same obligation to process all raw milk."
CEPA, Dairy Notional Processors' Asset Beta, 28 March 2018, p. 40

Comparators operating in competitive markets

- Would only write down the value of an existing asset if there was no realistic prospect of the asset returning its remaining value (in NPV terms) either in productive capacity or through a sale of the asset. i.e. no/low expected long-term demand for the product that the asset produces.
- This is the same as the basis for writing down assets in the calculation of a NP's price under Rule 32 of the Milk Price Manual.
- So there is no *a priori* reason to expect a NP to have a materially different asset stranding risk to those companies.

Comparators with a regulated milk price

- Asset stranding risk will depend on the regulatory approach that applies to each company – the extent to which the regulated price reflects a (notionally) efficient asset mix, rather than the company's actual assets.
- Detailed assessment of those other regulatory approaches can be part of future work.

Responding to MPG's other points

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The preceding conclusions only relate to the value of the Specific Risk Premium when the asset beta is derived from the sample used in CEPA (2018).

- If the asset beta is derived from other comparators – especially those with lower risk profiles such as ELBs – the value of the Specific Risk Premium would be different.
- CEPA (2018) notes that a NP is likely to have greater exposure to stranded assets risk than ELBs since, for ELBs, the RAB is effectively guaranteed through regulation. This is a stronger protection against stranded assets than applies to a NP under Rule 32 of the Milk Price Guide.
- MPG's view that

  "Keeping stranded assets in the RAB (regulated asset base), which is the approach applied under Rule 32 to assets which become stranded due to a change in the reference basket."
  Milk Price Group Paper, *Asset Beta and Specific Risk Premium*, 30 June 2021, p. 37

  is not consistent with how the CC has previously interpreted Rule 32 of the Milk Price Guide. The Commission previously stated that:

  "We continue to disagree with Fonterra on this point and, by way of simple example…to rule 32 of Fonterra's milk price Manual. This rule provides that the Farmgate Milk Price fixed asset base must be adjusted where the peak milk supply in a region has decreased by an amount that results in one or more Standard Plants being surplus to requirements. In short, the NP is required to bear the costs associated with permanently stranded assets due to a permanent supply shock."
  NZCC, Review of Fonterra's 2017/18 base milk calculation: Dairy Industry Restructuring Act 2001, p.24

Conclusion – Specific Risk Premium

- Asset stranding caused by demand risk is predominantly systematic and will be captured in asset beta. We do not see strong justification that this is materially different from the comparator sample.
- Asset stranding caused by supply risk is partially systematic but there may also be a non-systematic element.
- Asset stranding can be considered to be an asymmetric risk which truncates cashflows on the downside with no upside adjustment. This means CAPM may not appropriately remunerate the investor.
- Given this, we undertook a preliminary assessment with fibre networks as our benchmark:
  1. We consider the risk of asset stranding to be lower than fibre. The current justification that environmental measures will strand assets seems weak. Furthermore, it is unlikely that these measures will be phased in rapidly.
  2. The regulatory framework for Fonterra does not allow assets to remain in the RAB when stranded. This suggests the risks are higher than for fibre networks.
  3. We consider that the pricing framework applying to Fonterra has substantial flexibility when compared to fibre networks. Fonterra can change depreciation profile and then recover that depreciation through a lower base milk price.
- An accelerated depreciation profile is an alternative to mitigating stranding risk. This has the advantage of a requiring an explicit identification of those assets at risk of stranding.
- Our conclusion is given the appropriate choice of asset beta the specific risk premium should be nil.

Annex 1 – Beta estimates

Beta estimation methodology

- We predominantly applied the same beta estimation methodology as described by MPG on pages 20 and 21 of their attachment 6. This includes:
  - Applying the same return periodicity and averaging approach as described including daily, weekly and four weekly calculations.
  - Applying the same de-levering formula as described ('no tax' Hamada).
  - Applying the same adjustment to gearing for IFRS16 as described. We also provide our estimates without this adjustment.
  - Apply a different set of end dates - Estimating betas to 31st December 2020 which is the same as MPG but in addition estimating betas to 31st December 2015.
- Our estimates of asset beta are slightly higher than MPG for the same comparators, same estimation methodology and same end date. These differences could be caused by:
  - Differences in the input data - We estimated beta using data from Bloomberg while MPG use data from CapitalIQ.
  - Differences in the stage at which rounding is applied.
  - Differences in the way average gearing was calculated. We calculated average gearing for each separate regression as the average gearing over the same data points feeding into the regression.

Summary of CEPA beta estimates (MPG's sample)

Sample	Gearing	Daily – 31/12/2020	Daily – 31/12/2015	Weekly - 31/12/2020	Weekly – 31/12/2015	Four weekly – 31/12/2020	Four weekly – 31/12/2015
MPG's primary comparator set	Unadjusted	0.47	0.54	0.49	0.55	0.53	0.57
MPG's primary comparator set	Adjusted	0.47	0.54	0.49	0.55	0.54	0.57
MPG's extended comparator set	Unadjusted	0.60	0.62	0.64	0.64	0.68	0.70
MPG's extended comparator set	Adjusted	0.62	0.62	0.65	0.64	0.70	0.70
MPG's full comparator set	Unadjusted	0.49	0.55	0.52	0.57	0.56	0.60
MPG's full comparator set	Adjusted	0.50	0.55	0.53	0.57	0.57	0.60

Note: Fonterra and Synlait removed from 2015 due to insufficient data points.

Summary of CEPA beta estimates (Previous sample)

Sample	Gearing	Daily – 31/12/2020	Daily – 31/12/2015	Weekly - 31/12/2020	Weekly – 31/12/2015	Four weekly – 31/12/2020	Four weekly – 31/12/2015
Full sample	Unadjusted	0.57	0.55	0.55	0.56	0.57	0.57
Dairy	Unadjusted	0.60	0.55	0.60	0.58	0.63	0.59
Commodity exposed	Unadjusted	0.47	0.54	0.46	0.55	0.56	0.60
Cost-pass through	Unadjusted	0.66	0.51	0.63	0.57	0.64	0.58
Regulated milk price	Unadjusted	0.41	0.55	0.42	0.54	0.44	0.55

Sample	Asset beta range
Full sample	0.55-0.57
Dairy	0.55-0.63
Commodity exposed	0.46-0.60
Cost-pass through	0.51-0.66
Regulated milk price	0.41-0.55

Annex 2 – CEPA 2018 comparators

CEPA 2018 comparator list

Company Name	Included in primary MPG sample	Comment
Archer-Daniels-Midland Company	Yes	
Associated British Foods	Extended set	
Bega	Yes	
BRF S.A.	Yes	
Bright Dairy & Food Co. Ltd	No	Sells milk powders and other dairy commodities through its part ownership of Synlait. Therefore, dairy commodity exposure captured by inclusion of Synlait.
Bunge	Yes	
China Mengniu	No	Dairy products branded and consumer focused. Primarily focused on China and Asian markets. Unlikely to meet new DIRA.
Chr. Hansen	No	Sells probiotics, dietary supplements, food cultures, enzymes etc. Unlikely to meet new DIRA.
ConAgra Foods	No	Sells consumer products, unlikely to meet new DIRA.
Danone	No	Sells consumer products, manufactures commodity products but uses to make consumer products. Unlikely to meet new DIRA.
Dean Foods	No	Sells consumer products is now owned by Dairy Farmers of America. Unlikely to meet new DIRA.
Emmi AG	No	Sells consumer products, unlikely to meet new DIRA.

CEPA 2018 comparator list

Company Name	Included in primary MPG sample	Comment
General Mills	No	Sells consumer products, unlikely to meet new DIRA.
Glanbia	Yes	
Graincorp	Yes	
Grupo Lala	No	Sells consumer products. Processes dairy commodities but uses to make consumer goods. unlikely to meet new DIRA.
Hershey	No	Sells consumer products, unlikely to meet new DIRA.
Ingredion Incorporated	Extended Set	
Inner Mongolia Yili	No	Produces milk powder. Owns Westland (new Zealand dairy producer which produces commodity dairy products). Potentially meet new DIRA.
JBS S.A.	Extended Set	
Kellogg	No	Sells consumer products, unlikely to meet new DIRA.
Kerry Group	Yes	
Kraft Heinz	No	Sells consumer products, unlikely to meet new DIRA.

CEPA 2018 comparator list

Company Name	Included in primary MPG sample	Comment
Mead Johnson	No	Sells consumer products, unlikely to meet new DIRA.
Mondelez	No	Sells consumer products, unlikely to meet new DIRA.
Murray Goulburn	No	Sold to Saputo in 2018 and delisted in 2020. Produces dairy commodities. Potentially meet new DIRA.
Nestle S.A.	No	Sells consumer products, unlikely to meet new DIRA.
NH Foods	No	Fresh meat producer, products focused on consumers. Unlikely to meet new DIRA.
Olam International	Yes	
Parmalat SpA	No	>95% privately held ownership since 2019. Produces consumer products. Unlikely to meet new DIRA.
Saputo	Yes	
Savencia S.A.	Yes	
Synlait	Yes	
Tate & Lyle	Extended Set	

CEPA 2018 comparator list

Company Name	Included in primary MPG sample	Comment
Unilever	No	Sells consumer products, unlikely to meet new DIRA.
Want Want China Holdings	No	Sells consumer products, unlikely to meet new DIRA.
Wilmar	Yes	
Yakult	No	Sells consumer products, unlikely to meet new DIRA.

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