PUBLIC VERSION

Comments on the Commerce Commission's "Draft Determination: Cavalier Wool Holdings Limited and New Zealand Wool Services International Limited"

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Introduction

I have reviewed the Commission's Draft Determination on the proposed merger of Cavalier Wool Holdings Limited and New Zealand Wool Services International Limited. This report summarizes my views of the Commission's analysis of the public benefits and detriments of the merger.

Detriments

I begin by reviewing the Commission's assessment of the level of detriments that will arise if the merger goes ahead.

Loss of allocative efficiency

When the Commission estimates the detriment due to the loss of allocative efficiency, it bases its calculations on potential price increases ranging from 10% to 20%. In para. 255, the Commission uses the entry model developed by NERA on behalf of Cavalier, with inputs adjusted by the Commission, to show that entry would be profitable if the price increased by 20%. In this calculation, the Commission assumed that the entrant requires an after-tax rate of return of 15%. This assumption thus plays an important indirect part in the Commission's calculation of the loss of allocative efficiency.

There is credible theoretical, survey-based and econometric evidence to suggest potential entrants will require a significantly higher after-tax rate of return than 15%. If the required rate of return is higher than the Commission's assumed value then the merged firm will be able to increase prices further without triggering entry. If this happens, the loss of allocative efficiency will be greater than the Commission calculates in the Draft Determination.

In this section, I briefly summarize the evidence that firms require high rates of return before they invest, I then use a plausible required rate of return to re-estimate the cap on price increases that is due to the threat of entry, before re-estimating the detriments due to the loss of allocative efficiency.

Theoretical evidence

Potential entrants will have flexibility regarding when and how they invest. Their flexibility regarding the timing of investment allows them to wait and see how future uncertain economic conditions evolve before committing to large irreversible investments (McDonald and Siegel, 1986; Dixit and Pindyck, 1994; Guthrie, 2009). A consequence of this is that investment is optimal only when the expected rate of return exceeds the project's WACC by some strictly positive premium. This premium is especially large at firms with investment that is costly to reverse (that is, future capital expenditure will be sunk), involves high capital intensity, and has high levels of uncertainty surrounding future demand and capital costs.

The importance of investment timing flexibility is closely tied to the potential for post-entry bad news about a project's profitability. Consider a firm that delays entering an industry. If the firm subsequently receives news that indicates it would have regretted earlier investment (perhaps because demand is insufficient), the decision to delay has allowed the firm to avoid incurring wasteful expenditure. In contrast, if it receives news that indicates it would not have regretted earlier investment, it still has the option to invest. That is, delaying investment does not prevent the firm from undertaking good investments, but it helps it to avoid making bad ones. This observation is the basis of the "bad news principle" of Bernanke (1983): out of all possible future outcomes, only the unfavorable ones have a bearing on the current propensity to invest.

In the case of the NZ wool scouring industry, the potential for such bad news is substantial. The combination of an industry that is not growing with the ability of a single firm to supply all of the market exposes any entrant to "winner-take-all" risk: any investment an entrant makes could be stranded in the future. This potential for very bad news implies that the bad news principle will be an important consideration for any potential entrants to the NZ wool scouring industry. In turn, this implies that the rate of return required for entry to the industry will be considerably higher than the WACC.

Numerous authors have used numerical analysis involving theoretical models of investment timing to predict the rates of return that firms will require before they are willing to invest. For example, McDonald (2000) uses a standard model of investment timing to show that, for a wide range of possible parameter values, a fixed required rate of return equal to 20% "can provide close-to-optimal investment decisions". Similarly, Malchow-Møllera and Thorsen (2005) use a more sophisticated model and find that a required rate of return involving a 12 percentage point markup over the WACC leads to close-to-optimal investment decisions.

Survey evidence

Survey evidence reveals that firms, many of them operating in highly competitive markets, require rates of return substantially in excess of their WACC before

they are willing to invest in a project. The best and most recent survey-based study is Jagannathan et al. (2014). These authors find that firms require rates of return that are on average twice their WACC. Firms responding to their survey used, on average, a required rate of return of 15% although their WACC was 8%. They find that the margin between the required rate of return and the WACC is used by firms to help deal with operational considerations, such as rationing scarce managerial and organizational resources. Jagannathan et al. survey large U.S. firms in the Compustat database, which seem likely to have fewer operational constraints than firms considering entering the NZ wool scouring industry. This would imply that the gap between the required rate of return and the WACC will be even larger for entry into the N.Z. wool scouring industry than it was in Jagannathan et al.'s sample of firms.

Brunzell et al. (2013) study the determinants of required rates of return in the Nordic countries. They find that, on average, firms set required rates of return significantly higher than a CAPM-based WACC estimate. The required rate of return exceeds the WACC by 4% on average; the premium ranges from -4% to +19%. They find that higher required rates of return are used by firms that are less "financially sophisticated". Given the scale of a new NZ wool scouring operation, it is likely to be relatively financially unsophisticated, suggesting that potential entrants would use a relatively high required rate of return.

Econometric evidence

Chirinko and Schaller (2009) use data on investment expenditure and actual project outcomes for 16,140 publicly traded U.S. firms. They find required rates of return well in excess of estimated costs of capital on average. They estimate margins between the required rate of return and the cost of capital that are economically significant. For example:

- The premium for firms with limited resale markets is 5.1%.
- The premium for firms with low depreciation rates is 2.2%.
- The premium for firms with high demand uncertainty is 7.3%.
- The premium for firms with a recent negative industry-wide shock is 5.5%.

However, these premia are not additive. For example:

- The premium for firms with low depreciation rates and high cost uncertainty is 9.2%.
- The premium for firms with limited resale markets and high demand uncertainty is 10.8%.
- The premium for firms with low depreciation rates and a recent negative industry-wide shock is 12.6%.

Table 5a of Chirinko and Schaller (2009) shows even higher premia for firms with combinations of three or more of these characteristics. The premia range

from 13.6% to 33.1%. The nature of the N.Z. wool scouring industry suggests that potential entrants fit the profile of firms that have high required rates of return relative to their WACC.

Implications for the loss of allocative efficiency

When the Commission estimates the ability of the threat of entry to put a cap on price increases, it assumes that potential entrants have a required rate of return equal to 15% (e.g., para. 255). However, the evidence I have just summarized shows two things. First, there is considerable uncertainty over potential entrants' required rates of return. Second, required rates of return in excess of 15% are plausible.

I have therefore repeated the Commission's calculations described in para. 255 using a required rate of return equal to 20%, which I believe is consistent with the evidence summarized above. I have retained all of the Commission's other assumptions, as specified in para. 255, including the assumption that the entrant's volumes fall by 1% per annum. My calculations show that with this required rate of return, it would take a 25.4% price increase before entry occurred. If the entrant's volumes fall by 2% per annum, it would take a 28.6% price increase before entry occurred.

The conclusion I draw from these calculations is that it is quite plausible that the merged firm would be able to increase prices by 25% without triggering entry. I have therefore recalculated Table 4 of the Draft Determination, which shows the estimated allocative efficiency losses. The updated table is shown below:

Price increase	Price elasticity	
	-0.5	-1
10%	$4,584,024	$9,168,049
15%	$7,179,804	$14,359,608
20%	$9,978,095	$19,956,189
25%	$12,978,897	$25,957,793

Loss of productive efficiency

The Commission argues that the detriments caused by the reduction in productive efficiency will be small due in part to the concentrated ownership of the merged firm (para. 286). Lempriere will own 45% and Cavalier, ACC, and Direct Capital will jointly own 55%. The Commission argues that the fact there would be only four shareholders means that the merged firm would have a strong incentive to maximize profit, and hence to minimize costs. However, there is an important aspect of the ownership arrangement that the Commission has not considered.

Lempriere owns an option that gives it the right it buy the shares owned by ACC and Direct Capital at fixed prices. This arrangement alters the way that risk is

allocated within the merged firm. If the firm performs poorly, then Lempriere will be exposed to some of the consequences, but so will the other three shareholders. For example, if Lempriere's option is deeply "out-of-the-money", then for each $100 reduction in the firm's value, Lempriere loses $45 and the other shareholders lose $55. In contrast, if the firm performs well, then Lempriere will receive all of the benefit thanks to its ability to buy out the rest of the shareholders. For example, if Lempriere's option is deeply "in-the-money", then for each $100 increase in the firm's value, Lempriere gains $72.50, ACC and Direct Capital gain nothing (they are selling their shares at a fixed price), and Cavalier gains $27.50.

This gives Lempriere an incentive to push for relatively high-risk business strategies, as it benefits from the greater upside risk but is buffered from the greater downside risk that results. If the risk is high enough, Lempriere could even benefit if the firm adopted a policy that leads to *lower* profits on average.[1] In contrast, this arrangement gives ACC and Direct Capital an incentive to push for relatively low-risk business strategies, as they benefit from the reduced downside risk but are unaffected by the reduced upside risk that results. If the risk is high enough, these shareholders might even suffer if the firm adopts a policy that leads to *higher* profits on average.[2]

Note that the option does not need to be exercised for these incentives to arise. All that is needed is that the option exists. It is the presence of the option—whether or not it is eventually exercised—that generates the unwelcome incentives.

This option-induced conflict is well understood in the academic literature on corporate finance. Similar internal conflicts arise between bondholders and shareholders, due to the limited liability of equity contracts, and between managers and shareholders when the former are granted executive stock options.[3] There is a vast academic literature on these conflicts, which convincingly shows that firms do not maximize market value (or "profits" in the static framework adopted by the Commission) when key stakeholders have different risk exposures. The intuition is exactly the same as in the case described here. The contractual arrangements determine how changes in the firm's value are allocated, which creates a conflict between different types of shareholders. As in the literature on bondholder-shareholder and manager-shareholder conflict, the firm will not be a profit-maximizer (and hence not a cost-minimizer).

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[1] For example, a policy change might result in profit decreasing by $60 with probability ½ and increasing by $40 with probability ½. On average, profit decreases by $10, but a 45%/72.5% shareholder would still be better off if this policy change occurs as its payoff is a $27 loss with probability ½ and a $29 gain with probability ½.

[2] For example, a policy change might result in profit decreasing by $40 with probability ½ and increasing by $60 with probability ½. On average, profit increases by $10, but a 13.75%/0% shareholder would still be worse off if this policy change occurs as its payoff is a $5.50 loss with probability ½ and a $0 gain with probability ½.

[3] For example, see Jensen and Meckling (1976) on the asset substitution problem and Lambert (1986) on manager-shareholder conflict.

Put another way, the Commission's claim that the merged firm will have a strong incentive to minimize costs relies on "shareholder unanimity": specifically, the result that all shareholders share the same objective function, which is to maximize the firm's market value. In this case, shareholders want to maximize the market value of their individual slice of the pie. Lempriere's option means that the slices are not all the same, hence the conflict. In short, the Commission should not assume that the merged firm will be a profit-maximizer, or even a cost-minimizer.

The Commission also argues that the detriments caused by the reduction in productive efficiency will be small due to the proposed roll-out of incentive-based remuneration schemes from Cavalier's current staff to the "additional staff that CWH would employ" (para. 287). This raises several issues.[4]

- Firstly, although it is generally accepted that workers respond to financial incentives, it is also known that seemingly strong incentive schemes can actually create weak individual incentives. For example, collective bonuses such as those apparently in place at Cavalier suffer from a free-rider problem: individuals incur all the costs of working hard but share the benefits, leading to low effort levels overall. Thus, the incentives generated by the proposed pay schemes may be relatively weak.

- Secondly, performance-based pay schemes can generate unwelcome incentives. For example, when a bonus system is reviewed regularly, as appears to occur at Cavalier, a so-called "ratchet effect" arises. High output levels show managers what levels of output are achievable, leading managers to set tougher bonus rules. Workers anticipate this and restrict output. Similarly, when bonus payments are based on just one performance measure, say output, workers will divert effort from other tasks towards the performance measure that is rewarded (the "multi-tasking effect").

- Thirdly, even if the proposed performance-based pay schemes generate strong (and appropriate) incentives—and the Commission has not given any third-party evidence that this is the case—it is not at all clear that the proposed pay scheme is better than what is already in place at NZWSI. For example, stronger incentives are not necessarily better than weak ones. In addition to the ratchet and multi-tasking effects, performance-based pay increases the risk of workers' wages and, as a result, average wages need to be higher to compensate workers for the extra risk. The benefits of the stronger incentives will not necessarily outweigh the cost of the higher wages.

- Fourthly, performance-based pay schemes like the one in place at Cavalier are already available to NZWSI's management. That is, their effects should be present in both the factual and counterfactual. The Commission's

[4] See Prendergast (1999) for a survey of performance-based pay and the incentives it generates.

approach implies that the merger is required for performance-based pay to be introduced across both firms, but that is not the case.

- Fifthly, even if Cavalier's incentive-based remuneration schemes have been effective, they would explain only why productive efficiency losses are low, *not why they are lower than in Decision 725*. Incentive-based remuneration schemes would have been available to the merged firm's management in Decision 725. For the reasons explained earlier in this section, management's incentives to deploy such remuneration schemes this time are actually weaker than they were in Decision 725 due to the option-based conflicts within the ownership group. The available tools are the same as in Decision 725 and management's incentive to deploy them is weaker, so their effectiveness should be *less* than in Decision 725.

Even without the option-induced conflict among the shareholders, I believe the Commission has underestimated the loss of productive efficiency in its Draft Determination. I believe that competition plays a more important role in disciplining firm behavior that the Commission gives it credit for. The feature of the ownership structure in this particular merger that I have described above simply compounds the loss of productive efficiency. In short, I think the Commission is mistaken in adopting the lowest point of its range for the loss of productive efficiency.

In Decision 725, the Commission chose a range for the loss of productive efficiency from 1% to 5% of pre-merger variable costs, and adopted the midpoint of this range, 3% of pre-merger variable costs. The 1%-5% range was not disputed by the High Court, although it did query the Commission's decision to use a single point in that range. In the Draft Determination, the Commission has adopted the 1% figure as its (single) estimate of the loss of productive efficiency this time.

Due to the uncertainty surrounding the precise level of the loss of productive efficiency, I believe it is inappropriate to consider any single point in the range proposed by the Commission.

Due to the issues discussed above, I believe that the loss of productive efficiency will be greater this time than in Decision 725. The most significant change between the current merger proposal and the previous one is the existence of Lempriere's option to increase its ownership stake. As I have explained above, the conflict introduced to the firm by this aspect of its ownership structure means that the loss of productive efficiency will be greater this time around. The Commission should have increased its estimate of the loss of productive efficiency since Decision 725, not decreased it.

Loss of dynamic efficiency

The comments above regarding the loss of productive efficiency following the proposed merger also apply to the issue of dynamic efficiency losses. For example, in para. 299, the Commission states that it believes "the shareholders of CWH would have a strong profit maximizing incentive to optimize dynamic

efficiencies." As explained above, I believe that the Commission's confidence is misplaced. Indeed, the conflict caused by different exposures to risk would have even greater significance whenever the merged firm has to make decisions regarding the investments needed to maintain dynamic efficiency, because the value of such investments is closely tied to the risk of the investment outcomes.

In Decision 725, the Commission chose a range for the loss of dynamic efficiency from 0% to 1% of total industry revenue, and adopted the midpoint of this range, 0.5% of total industry revenue. In the Draft Determination, the Commission has adopted the 0.5% figure as its (single) estimate of the loss of dynamic efficiency this time.

Due to the uncertainty surrounding the precise level of the loss of dynamic efficiency, I believe it is inappropriate to consider any single point in the range proposed by the Commission.

Due to the issues discussed above, I believe that the loss of dynamic efficiency will be greater this time than in Decision 725. As explained in the previous section, the most significant change between the current merger proposal and the previous one is the existence of Lempriere's option to increase its ownership stake. For this reason, the loss of dynamic efficiency will be greater this time than last time. However, the Commission is using 0.5% of total industry revenue, the same as in Decision 725.

Benefits

I continue by reviewing the Commission's assessment of the level of public benefits that will arise if the merger goes ahead.

Non-capital cost savings—economies of scale benefits

The Commission identifies several sources of cost savings and estimates the present value of the associated benefits to be $[ ]m. By using a single number to estimate the present value of the cost savings, rather than a range as for the loss of allocative efficiency and the benefits from the sale of surplus land, the Commission is implicitly assuming that it has no uncertainty regarding non-capital cost savings. However, there is surely substantial uncertainty surrounding some of the components of the total cost savings.

For example, the Commission has accepted Cavalier's estimate that electricity costs will fall by [ ]. However, use of this point estimate makes no allowance for uncertainty about either the amount of electricity saved or the price of electricity over the five years after a merger approval. If electricity prices are lower than forecast, then the value of the benefits from reduced electricity usage will be lower as well.

The Commission's calculations appear to assume that the proposed restructuring will occur as soon as the merger occurs. For example, the full amount of

"reduction in administration expenses" applies in the first year. These reduced expenses include cost savings from fire protection, insurance, repairs and maintenance of buildings and grounds, and security (para. 319). However, the land and buildings will not be sold immediately after the merger is approved. Indeed, as I argue below, the sale process might not be completed for several years. The buildings will still need to be insured, maintained, and protected during this time. Allowing for such delays reduces the present value of the cost savings. Furthermore, as the length of the delay is unknown, this introduces uncertainty into the present value of the cost savings.[5]

Sale of surplus land

The merger would result in the sale of land at three separate locations, making the land available for other uses. The value to society of this change equals the present value of the net benefits that the land generates in its best alternative use. The Commission uses third-party estimates of the land's market value, which have been provided by Cavalier, to estimate the present value of these net benefits.

The flow of benefits that is relevant to the Commission's calculation begins at the time the land starts to be used for its new, non-scouring, purpose, not at the time the merger is approved. The land will produce only minimal benefits from being used for other activities between the time that the merger is approved and the time that the land's conversion to some other use is completed.

If the change in land use is associated with the sale of the land, then the correct way to estimate the present value of the net benefits from freeing up the land uses the expected market value of the land at the time the sale process is complete, discounted back to the date when the merger is approved. In principle, the expected future market value of the land can be found by applying an expected growth rate to an estimate of the current market value. However, as the following formula demonstrates, the same result can be achieved using capitalization rates. Specifically, the present value equals

$$\text{PV} = \text{E}_0[P_t]/(1+r)^t = P_0(1+g)^t/(1+r)^t = P_0/(1+y)^t,$$

where t is the number of years between the merger being approved and the sale process being completed, P_t is the market value of the land when the sale is completed, g is the growth rate in the market value of the land, r is the discount rate, and y is the capitalisation rate. This formula gives the value today of taking ownership of the land t years from today.

In the Draft Determination, the Commission uses an estimate of the current market value of the land instead of PV in the formula above. That is, it effectively

[5] A similar argument applies to the claimed maintenance cost savings on plant that will be offered for sale if the merger proceeds. Some maintenance will surely be required between the time the merger is approved and the time any sale process is completed. Allowing for this will reduce the savings in maintenance costs claimed by Cavalier.

sets *t*=0. However, the Commission should set *t* equal to the length of time expected to pass between the merger being approved and the sale process being completed. That delay is needed to prepare the land for sale, find a potential buyer willing to pay the highest price, and complete the sale process.

The following table reports the reduced market values for the three affected sites for various lengths of this delay period, using market value and capitalisation rate estimates from the third-party valuations provided by Cavalier and accepted by the Commission.

Property	Net rent ($m p.a.)	Mkt value ($m)	Tax-adj cap rate (% p.a.)	Years between the merger being approved and the sale process being completed					
				0	1	2	3	4	5
Clive	[ ]	[ ]	10.5	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Kaputone	[ ]	[ ]	7.9	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Whakatu	[ ]	[ ]	11.0	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total		[ ]		[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

The Commission's calculations in other parts of the Draft Determination assume a one-year "rationalisation period" (for example, para. 344). From the table above, if the land is sold at the earliest opportunity after that rationalisation period ends, the present value of the benefits from freeing up the land is $[ ]m. If, instead, the land is not available to its new user for an additional year, the present value is just $[ ]m. Longer delays lead to even lower present values.

Delays between the merger being approved and the sale process being completed have a second effect. Even in the Commission's current approach, which uses third-party estimates of the land's market value, it has only an *estimate* of the sale price. There will be considerable uncertainty in that estimate even in ideal situations. Here the uncertainty is even greater as any usable valuation must estimate the sale price of the land assuming it is to be used for some unknown (non-wool-scouring) purpose. To make matters even more difficult, what is actually needed is an estimate of the sale price if the land is to be used for some unknown purpose *and the sale is to occur at an unknown future date* (which could be several years in the future). Any estimate constructed by a valuer in these circumstances will have substantial uncertainty.

The Commission has adopted the third-party valuations provided by Cavalier "with an adjustment of plus and minus 10% to account for variability in actual sale values" (para. 334). Given that the valuers do not know what the land would be used for or even when the land would be sold, I believe a much wider margin would be appropriate.

Sale of surplus plant

A similar argument applies to the sale of surplus plant that it is claimed would follow the merger being approved. The value to society of this change equals the present value of the net benefits that the surplus plant generates in its best

alternative use. As for land sales, the flow of benefits that is relevant to the calculation begins at the time the sale process is completed, because the surplus plant will not produce any benefits until the sale process is completed. The present value of that flow at the time the merger is approved is the market value at that date, discounted back to the date when the merger is approved. The Commission uses its estimate of the resale value of the surplus plant, $1.0m, as its estimate of this present value. However, this approach implicitly assumes that the sale occurs immediately. Assuming a 10% discount rate and zero capital gain, even if the surplus plant was sold immediately after the end of the rationalisation period, the present value falls from $1.0m to $0.9m.

Wealth transfers to and from New Zealanders

In its Draft Determination, the Commission has accepted the argument that it needs to account for overseas ownership of the merged scouring firm and other industry players. It has attempted to quantify the effects of overseas ownership, but it has done so only for the calculation of the detriments due to the loss of allocative efficiency (Table 6). The Commission does not make any allowance for overseas ownership when it calculates productive efficiency losses or dynamic efficiency losses (para. 386), or when it calculates the benefits of the proposed merger. It should have allowed for the effects of overseas ownership in all of its calculations of the benefits and detriments of the proposed merger.

In this section I concentrate on the implications of overseas ownership for the public benefits of the proposed merger. If the merger goes ahead, the five plants currently operating will be reduced to two, reducing both the operating and overhead costs associated with operating the scours. From para. 312, "The cost savings accepted by the Commission were supported in the High Court as public benefits as they are reduced inputs to achieve the same outputs, regardless of whether CWH passes on the cost savings in the factual." In effect, the merger would allow some of the resources currently used for wool scouring to be made available for other productive uses. The Commission's argument is that as these resources will be used in NZ, this rationalisation benefits the NZ economy. However, overseas ownership of (part of) the merged firm complicates the situation because it means that some of the benefits of freeing up those resources flow overseas, where they provide no benefit for NZ, as I now explain.

Reduction in production and administration costs

The loss of benefits overseas can be understood by considering one illustrative source of cost savings and working through the flow of benefits step by step. In this section I demonstrate what would happen if Cavalier was able to reduce its spending on gas by $100.[6] The gas supplier loses $100 in revenue, but gets to keep gas worth $100 to sell to another customer, now or in the future. The supplier therefore (approximately) breaks even, so there is no surplus generated there. Some of Cavalier's $100 reduction in operating costs will be passed onto

[6] The effect of reduced spending on coal and gas is considered in para. 326-327 of the Draft Determination.

customers and the rest will appear as increased pre-tax profit. If all customers and shareholders were New Zealanders, then all $100 would benefit NZ one way or another, regardless of how much of the cost savings was passed through to customers. However, if the merged firm has some overseas customers, then some of the benefits passed onto customers in the form of lower scouring prices will flow overseas. If the merged firm has some overseas shareholders, then some of the benefits passed onto the firm in the form of increased pre-tax profit will also flow overseas.

At one extreme, suppose that none of the $100 is passed onto merchants in the form of reduced scouring prices, so that the merged firm's pre-tax profit increases by $100. Of this $100, $28 will be paid to the NZ government in the form of increased tax, leaving $72 to be shared by shareholders. If 45% of the merged firm is owned overseas, then 45% of the post-tax cost savings will flow overseas. That is, 45%*$72 = $32.4 of the $100 cost saving is lost overseas. The NZ public receives no benefit from the $32.4 that flows overseas.

At the other extreme, suppose that the entire $100 is passed onto merchants in the form of reduced scouring prices. In the Commission's discussion of the economic incidence of price increases, it assumes that 90% of price increases will pass through to growers.[7] The remainder (presumably) benefits merchants. Of the $100 cost savings, $28 will be paid to the NZ government in the form of increased tax, leaving $72 to be shared by growers and merchants. The Commission reports that overseas ownership of growers is approximately 2% and of merchants is approximately 80%.[8] Therefore in this case 90*0.02 + 10 *0.80 = 9.8% of the post-tax cost savings will flow overseas. That is, 9.8% * $72 = $7.1 of the $100 cost saving is lost overseas. The NZ public receives no benefit from the $7.1 that flows overseas.

Depending on how much of the cost savings are passed onto merchants in the form of reduced scouring prices, somewhere between 7.1% and 32.4% of the cost savings are lost to NZ. Note that in the discussion of cost savings in para. 310, the Commission notes that "Cavalier's estimates are based on the level of production remaining largely unchanged as between the factual and the counterfactual." The proposed merger will not affect the location of the demand curve, so if the level of production is unchanged, as Cavalier assumes, then the price will be unchanged as well. Thus, Cavalier's assumption implies that no cost savings will be passed onto merchants, implying that 32.4% of the cost savings will be lost to NZ.

The other sources of cost savings are affected the same way. For example, consider reduced labour costs. At para. 317, the Commission quotes the High Court: "Those employees no longer required will be available to produce other goods and services for New Zealand consumers. … In the absence of any evidence or submission otherwise, the Commission was not wrong to value that available resource at the price an employer is willing to pay for it (here, as evidenced by

[7] Para. 361-375.
[8] Para. 358-359.

Cavalier's saved salaries and wages)". This is a reasonable approach to measure the *total* benefits generated by the cost savings, but it measures the total benefits generated, not the benefits that stay in NZ.

To see the difference, we can use the same approach as for reduced energy costs. The laid off workers receive no net benefit or loss because they are assumed to be employed at another firm.[9] That employer is paying a fair wage so also receives no net benefit, which is the High Court's position described above. The benefits are reflected in lower costs for the merged firm, and some of these leak to overseas customers and shareholders. That is, the *total* benefit of more efficient labour utilization is measured by the reduced wage bill, as the Commission argues, but between 7.1% and 32.4% of these benefits are lost overseas.

Sale of land and plant

A similar argument applies to the benefits derived from the sale of land and plant. The merged firm will require less land to carry out wool scouring than is needed under the counterfactual. The Commission states that "[f]reeing up surplus land and buildings is a public benefit, as these resources can be redeployed to other productive uses. This was accepted in the Commission's consideration of the application resulting in Decision 725 and agreed by the High Court."[10] However, some of the benefit from redeploying those resources to other productive uses will be captured by the merged firm's overseas shareholders.

I explain what is happening in two steps. First, in order to focus on the role played by the land in its new use, I suppose that the merged firm does not sell the land, but instead operates the land itself in its new use. Second, I explain why the change in ownership resulting from selling the land has no effect on the final conclusion.

Suppose that land no longer needed for wool scouring can be used for some other productive purpose. Further suppose that the merged firm decides to retain ownership of the land and use it for this productive purpose itself. (I will consider the effects of a pre-transformation land sale shortly.) The land generates a flow of benefits in its new use. Some of these benefits flow to consumers in the form of consumer surplus, some flow to the NZ government in the form of tax, and the rest flow to the merged firm's shareholders in the form of post-tax profits. Of the latter component, 45% flows to the merged firm's overseas shareholders and so will not benefit NZ. The present value of the excluded benefits equals 45% of the present value of the post-tax profits generated by the land in its alternative use.[11]

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[9] The Commission uses redundancy costs to estimate the social costs of short-term disruptions in employment.

[10] Para. 332.

[11] Note that if the land were sold in an arms-length transaction, the sales price would be approximately equal to the present value of the post-tax profits generated by the land in its alternative use. Thus, the present value of the benefits flowing overseas equals 45% of the sale price.

Now consider what happens if the land is sold in an arms-length transaction to a new owner who will use the land for the same productive purpose as above. The sale price will be approximately equal to the present value of the post-tax profits generated by the land in its alternative use. The purchaser of the land breaks even, paying for the land an amount approximately equal to the present value of the post-tax profits that it will generate. It is the seller of the land who captures the benefits generated by the land in its new use, via the sale price. These are unlikely to be passed onto wool merchants or other industry players.[12] As 45% of the sales price is flowing overseas, this means that 45% of the flow of producer surplus generated by the land in its new use is effectively flowing overseas as well.

To summarize, 45% of the post-sale flow of producer surplus that will be generated by the land in its new use is received by overseas shareholders. The future flow of producer surplus is effectively bundled up and passed out of NZ when the land is sold.

Making these adjustments does not disincentivize investment

It might be suggested that the Commission should count benefits lost offshore as benefits to the NZ public as these represent returns to capital that incentivize investment that benefits NZ. However, that suggestion is incorrect.

Incentives are generated by the benefits that firms actually receive, not by the benefits that a competition authority includes in its merger analysis. In the example above involving a $100 reduction in energy usage, if the energy bill is reduced then overseas shareholders will receive the $32.4 in benefits *whether or not the Commission includes them in its analysis*.[13] The fact that they actually receive $32.4 in benefits is what gives them the incentive to undertake the actions required to reduce energy costs. For this reason, including benefits to overseas shareholders does not create any additional incentives to invest; excluding benefits to overseas shareholders does not reduce their incentive to invest.

If the Commission were to adopt a policy of adding benefits received by overseas shareholders to those received by NZ shareholders, one of the following three outcomes would occur for any merger considered by the Commission

- The policy might make a good merger seem even better. That is, the correctly-measured net benefits to NZ are positive, so adding benefits that flow overseas makes the total net benefit even more positive. If this outcome occurs then the decision to include benefits to overseas

[12] Merchants are unlikely to face lower scouring prices just because the merged firm has sold some land. Therefore, it is safe to assume that the benefits flow to the merged firm's shareholders.

[13] The situation is different in a regulatory setting, where the Commission's decisions about what to include in its analysis affect prices that can be charged, and thus directly affect firms' incentives to invest. However, that is not the situation here.

shareholders has no effect, because the Commission would allow the merger to proceed whether or not the benefits to overseas shareholders were excluded.

- The policy might make a bad merger seem less bad. That is, the correctly-measured net benefits to NZ are negative and adding benefits that flow overseas makes the total net benefit less negative, but still negative. This also has no effect on the outcome, because the Commission would not allow the merger to proceed whether or not the benefits to overseas shareholders were excluded.

- The only other possibility is that the policy would make a bad merger seem good. That is, the correctly-measured net benefits to NZ are negative, but adding benefits that flow overseas makes the total net benefit positive. This is the only case where the policy would affect the Commission's decision, and it would result in the Commission allowing a merger that it would otherwise have stopped.

To summarize, including benefits to overseas shareholders in the Commission's benefits-detriments analysis

- would have no effect on overseas shareholders' incentive to invest in projects that benefit NZ; and

- would either have no effect on the Commission's decision or lead the Commission to approve a merger that is harmful to NZ.

The correct approach is to exclude benefits (and detriments) to overseas shareholders.

Updating Tables 6 and 7 of the Draft Determination

I have recalculated the estimated public benefits and detriments of the proposed merger, updating Tables 6 and 7 of the Draft Determination to reflect my comments above. I follow the Commission's overall approach, but make the following changes to the underlying assumptions:[14]

- Allocative efficiency: I consider price increases from 10-25%. The largest price increase is motivated by the empirical evidence that entrants may have required rates of return as large as 20%.

- Productive efficiency: I consider losses amounting to 1-5% of pre-merger variable costs. This is the same range as in Decision 725, and I believe likely underestimates the detriments from losses of productive efficiency. As discussed above, the internal conflict created by Lempriere's option will probably lead to greater losses of productive efficiency compared to

[14] I have ignored the NZ government's increased tax take due to the depreciation associated with the avoided capital expenditure. The sum is trivial (less than $0.08m in present value terms) and as I cannot replicate the Commission's capital expenditure calculation, I cannot calculate the exact tax implications.

Decision 725. The increase in losses will not be mitigated by the *continued* availability of incentive-based remuneration schemes.

- Dynamic efficiency: I consider losses amounting to 0.5-1.0% of total industry revenue. This range has the same upper limit as in Decision 725, and I believe likely underestimates the detriments from losses of productive efficiency. As discussed above, the internal conflict created by Lempriere's option will probably lead to greater losses of dynamic efficiency losses compared to Decision 725.

- Reduction in production and administration costs: To account for uncertainty in the level of cost savings that can be achieved, as well as delays in reaching the maximum achievable cost savings, I consider a range of cost savings from 90% to 100% of the Commission's point estimate.

- Sale of surplus land:

    - I have adopted the third-party valuations provided by Cavalier as my estimate of the market value of the surplus land at the time the merger would be approved. This is likely to overestimate the market value (and therefore overestimate the benefits of the merger), as these valuations do not allow for a number of factors likely to reduce the land's value (including the imposition of covenants preventing the land from being used for wool-scouring in the future, concerns around seismic integrity and contamination, and so on).

    - I assume that the surplus land will not be available for an alternative use until a year after the end of Cavalier's "rationalisation period". That is, I assume that the present value of the proceeds from the sale of surplus land equals $[ ]m.

    - In consideration of the valuations being 8-13 months old, uncertainty surrounding future land use, and uncertainty surrounding the delay until the land can be sold, I widen the Commission's range from +/-10% to +/- 20%.

- Sales of surplus plant: I assume that the surplus plant will not be available for an alternative use until immediately after the end of Cavalier's "rationalisation period". That is, I assume that the present value of the proceeds from the sale of surplus plant equals $0.9m.

- Consistent with Cavalier's assumption in para. 310, I assume that no cost savings are passed onto merchants (and then onto growers).

I consider seven scenarios that differ according to the timing and level of overseas ownership of the merged firm. In the first scenario, Lempriere maintains its ownership stake at 45%, the level proposed immediately after the merger is completed. In the next five scenarios, Lempriere exercises its option to increase its ownership stake to 72.5%. The five scenarios differ according to when this option is exercised. The results for Scenario B and C are illustrative

only. Scenarios D, E, and F are more likely due to the expiry date on the Lempriere option. The final scenario considers the effects of Lempriere's option and its drag-along rights resulting in 100% foreign ownership of the merged firm.[15]

- Scenario A: Lempriere owns 45% of the merged firm in all 5 years.
- Scenario B: Lempriere owns 45% of the merged firm in years 1-4 and 72.5% in year 5.
- Scenario C: Lempriere owns 45% of the merged firm in years 1-3 and 72.5% in years 4-5.
- Scenario D: Lempriere owns 45% of the merged firm in years 1-2 and 72.5% in years 3-5.
- Scenario E: Lempriere owns 45% of the merged firm in year 1 and 72.5% in years 2-5.
- Scenario F: Lempriere owns 72.5% of the merged firm in all 5 years.
- Scenario G: An overseas third party owns 100% of the merged firm in all 5 years. This scenario represents the possibility that Lempriere uses the drag-along rights to force Cavalier to sell its shareholding to a third party.[16]

The following tables show the effects of allowing for overseas ownership on the Commission's reported 5-year NPV amounts for the public detriments of the merger. I begin by reporting results when the merged firm can raise prices by at most 20%.

Scenario	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Allocative efficiency (25% price increase excl.)	4.58-19.96	4.58-19.96	4.58-19.96	4.58-19.96	4.58-19.96	4.58-19.96	4.58-19.96
Productive efficiency, adj. for overseas ownership	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Dynamic efficiency, adj. for overseas ownership	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Net wealth transfers (25% price increase excl.)	3.70-7.39	4.17-8.34	4.69-9.38	5.26-10.52	5.89-11.78	6.58-13.16	9.47-18.94
Total of quantified detriments (25% price increase excl.)	**9.91-31.93**	**10.34-32.51**	**10.81-33.15**	**11.33-33.86**	**11.91-34.63**	**12.54-35.48**	**15.17-39.03**

[15] Note that Scenarios B-G possibly underestimate to some extent the benefits that would remain in NZ if Lempriere exercised its various options. For example, if Lempriere used its option to increase its stake to 72.5%, some of the value of future profits may be captured in the option's exercise price, and could therefore remain a benefit to NZ. However, as the exercise price has been set far in advance of such a transaction occurring, the usual argument that says future benefits will be capitalized in the transaction price does not apply. In my opinion, the actual present value of the public benefits in any one of scenarios B-G lies somewhere between the figure given for that scenario in the table below and the figure given for Scenario A.

[16] The Shareholders Agreement provides that when a party has a [ ]% shareholding it is able to sell its shareholding to a bona fide third party, and force the other shareholders to sell their shares also.

Comparing this table to Table 6 of the Draft Determination shows significantly larger detriments. Reverting to the losses for productive and dynamic efficiency in Decision 725 adds $4m to the total in Scenario A, although the increment is smaller when Lempriere has a larger ownership stake. Allowance for Lempriere's option to increase its ownership stake also substantially raises the net wealth transfers overseas.

The next table repeats these results for the case when the merged firm can raise prices by up to 25%. The worst-case level of the loss of allocative efficiency is significantly higher, and this feeds through to substantially greater net wealth transfers overseas.

Scenario	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Allocative efficiency (25% price increase incl.)	4.58-25.96	4.58-25.96	4.58-25.96	4.58-25.96	4.58-25.96	4.58-25.96	4.58-25.96
Productive efficiency, adj. for overseas ownership	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Dynamic efficiency, adj. for overseas ownership	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Net wealth transfers (25% price increase incl.)	3.70-8.98	4.17-10.13	4.69-11.40	5.26-12.79	5.89-14.32	6.58-16.00	9.47-23.02
Total of quantified detriments (25% price increase incl.)	**9.91-39.06**	**10.34-39.79**	**10.81-40.59**	**11.33-41.46**	**11.91-42.43**	**12.54-43.49**	**15.17-47.92**

The next table repeats this exercise for the merger benefits. It shows the effects of allowing for overseas ownership on the Commission's reported 5-year NPV amounts reported in Table 7 of the Draft Determination.

Scenario	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Reduction in production and administration costs	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Sale of land and plant	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cap. expenditure on buildings	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cap. expenditure on plant	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
One-off rationalization costs	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Cartage to North Island	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Total of quantified benefits	**16.91-20.74**	**16.18-19.92**	**15.37-19.02**	**14.48-18.04**	**13.50-16.95**	**11.39-13.66**	**5.87-6.59**

Comparing this table to Table 7 of the Draft Determination shows that the effect on the quantified benefits of allowing for overseas ownership is very substantial. By ignoring the effects of overseas ownership, the Commission estimated the total quantified benefits of the merger to be in the range from $31.5m to $33.8m. This total falls by more than a third when the initial overseas ownership is incorporated into the calculations. When the effects of Lempriere's option to increase its ownership stake are incorporated, the total falls by a half.

Even under Scenario A, which is the one most favorable to the proposed merger, the public detriments range from $9.9m to $39.1m and the public benefits range from $16.9m to $20.7m. Based on these estimates, even in this most favorable scenario, there appears to be a very substantial risk that the public detriments of the merger will exceed its public benefits.

The following table summarizes the net public benefits of the proposed merger. The results in the top panel apply to the case where the merged firm can raise prices by at most 20%. In the bottom panel, price increases of up to 25% are possible. The table reports similar information to the first row of Table 8 in the Draft Determination. For each ownership scenario, it reports two measures of the (five-year) present value of the merger's net benefits. The entries in the first row of each panel are the amount by which the upper limit on the range of public benefits exceeds the lower limit on the range of public detriments. In this best-case situation, the benefits are typically greater than the detriments, by up to $10.8m. The entries in the second row are the amount by which the lower limit on the range of public benefits exceeds the upper limit on the range of public detriments. In this worst-case situation, the benefits are typically less than the detriments, with the shortfall being more than $15m when prices cannot increase more than 20% and more than $22m when they cannot increase more than 25%.

Scenario	**A**	**B**	**C**	**D**	**E**	**F**	**G**
25% price increase excluded							
Best case	10.83	9.58	8.21	6.71	5.05	1.13	-8.58
Worst case	-15.02	-16.34	-17.78	-19.38	-21.13	-24.09	-33.16
25% price increase included							
Best case	10.83	9.58	8.21	6.71	5.05	1.13	-8.58
Worst case	-22.15	-23.61	-25.22	-26.98	-28.93	-32.10	-42.06

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