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CWH/WSI - Response to Certain Issues Raised at Conference

Bell Gully

NERA
Economic Consulting

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Project Team

James Mellsop

Kevin Counsell

Will Taylor

NERA Economic Consulting
Level 18
151 Queen Street
PO Box 105 591
Auckland 1143
Tel: +64 9 373 7230
Fax: +64 9 373 7239
www.nera.com

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1. Introduction

During the 4 to 6 May 2011 Conference regarding the proposed CWH/WSI merger, Commissioners requested that we provide further analysis on three issues:

- A wool scouring entry model;
- The incentives on the merged entity to raise the costs of Godfrey Hirst; and
- The detriments of any production disruption during the proposed wool scour rationalization.

We set out our further analysis in this report.

2. Entry Model

2.1. Process

During the conference, we presented our initial review of Dr Layton's entry model that we carried out with Mr Jim Drake, Financial Controller of CWH. That review demonstrated that by altering a small number of important modeling inputs,[1] entry would be profitable with a price increase of $[ ] per kg, rather than the $0.125 estimated by Dr Layton per kg.

We refer to the spreadsheets tabled at the Friday session of the Conference, and to the discussion there. There were a variety of changes suggested by Mr Drake, primarily to better reflect the way costs vary with volume in a wool scouring operation. The two most material changes suggested by Mr Drake and ourselves were as follows:

- The "management fee" of $800,000 suggested by Dr Layton resulted in a double-up of management costs, with these costs already being picked up in the "salaries" line;
- Despite the text of his report referring to a pre-tax WACC of 15%, Dr Layton actually used a pre-tax WACC of 20.83% in his model.

In light of this review, Commissioner Gale asked NERA to prepare an entry model.[2]

In our view, the best way to assess the economics of entry is to prepare a multi-period cash flow model, and to calculate the net present value of the cash flows.

We prepared a template for such a model, and provided this to CWH. Drawing on its own internal financial models (but adjusted to take into account scale issues), CWH estimated the relevant revenues, operating expenditure and capital expenditure of entry, and we then incorporated these into our NPV model.

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[1] As well as a variety of more minor ones, some of which increased the costs in Dr Layton's model.

[2] Day 1 transcript, lines 25-26.

2.2. Assumptions

The following are our key assumptions:

- We test entry at assumed price increases of 0%, 5% and 10% from the pre-merger price. Using the pre-merger price ([ ]) of [ ] per kg, this equates to post merger prices of [ ], [ ] and [ ] respectively. We then add lanolin revenue of [ ] per kg[3] to obtain the entrant's revenue per kg.
- Entry would be by a combination of [ ].[4] It is CWH's view that entry at this scale would most efficiently utilise a 2.4m scour rather than a 3m scour, and accordingly our model adopts a 2.4m scour. CWH believes the technology of the 2.4m and 3.0m scours are the same, but the 3.0m has a higher capacity. CWH believes that 2.4m plant could be acquired for $[ ]m. We have also sensitivity tested our results at a plant cost of $[ ]m (simply doubling the $[ ]m) and $[ ]m (the cost of [ ]m scour mentioned at paragraph 4.2(d)(i) of the Bell Gully post conference submission less the land and buildings cost).[5]
- We have assumed land and buildings would cost $[ ] million. This is similar to the value claimed as a benefit by CWH for the Whakatu site.
- In the first year of operation there would be no production for the first four months while the plant is installed and commissioned, followed by 8 months of production at 70% of capacity (i.e. [ ] greasy kgs in year 1). This allows for the "run-in" of the new plant. Because of this we have assumed the firm would only accrue 8 months worth of tax depreciation in the first year.
- By year 2, the scour would be operating at a run rate of [ ]/hr at 90% volume capacity (i.e. [ ] greasy kgs). As our assumed entrant is a combination of [ ], or [ ], virtually all of the volume would be provided by the owners, with some small proportion of commission scouring.
- The model has a time period of [ ] years.[6] This seems a reasonable assumption [ ]. There would likely be some residual value of the business after year [ ], however because the impact of the residual value on the NPV result would be minimal due to discounting, we have not attempted to estimate it.[7]

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3 This is the North Island figure from the counterfactual taken from the "Critical Loss (NERA edit).xls" spreadsheet that has been filed with the Commission.

4 Another plausible alternative would be [ ].

5 Bell Gully post conference submission, 18 May 2011, para 4.2(d)(i).

6 [ ]

7 Our results would be similar if we used a shorter timeframe (e.g., [ ] years), and calculated a residual value for the business. The key point is that once the investment in plant has occurred, a highly utilised scouring business results (at the assumed prices) in [ ].

- Although CWH does not believe it would be necessary given the likely make-up of any entrant, to be conservative a specific cost for a new CEO has been included in addition to a general manager and other managers.
- For the sake of this analysis we have adopted Dr Layton's pre-tax cost of capital of 20.83%, although we do not necessarily accept that this is the appropriate figure given the likelihood that entry would be underwritten by contract or the owner's own wool volumes, and that there would be some debt funding. Our model is post-tax so we have grossed the figure down to 15%.

The material differences from Dr Layton's model are as follows:

- Multi-period;
- Lower volumes;
- Lower "management fees";
- Lower expenditure on wages and salaries;[8]
- Lower plant capex;
- Inclusion of working capital; and
- Lower expenditure on gas/coal and detergent.

The CWH cost model will be sent to the Commission as a separate, confidential spreadsheet. We will also supply a tab comparing line-by-line the costs assumed by Dr Layton to those used in our entry model, with differences in excess of $100,000 highlighted in red.

2.3. Model

The model itself will be sent to the Commission as a separate, confidential spreadsheet, although we now set out the high level results. We have modeled a number of potential scenarios for no price increase, a 5% and 10% price increase.

The results of this modeling are set out in Table 1 below.

[8] We understand that this figure has been calculated using the wages that CWH pays its own employees applied to CWH's estimates of the staff that would be needed by an entrant.

Table 1
NPV of entry

	Plant cost		
	$[ ]m	$[ ]m	$[ ]m
No price rise	[ ]	[ ]	[ ]
5% price rise	[ ]	[ ]	[ ]
10% price rise	[ ]	[ ]	[ ]

Table 1 demonstrates that entry [ ] under the assumptions we have used.

As the critical loss analysis in our 8 February 2011 report demonstrates, a loss of the volumes modelled in this entry analysis would be unprofitable for the merged entity. Accordingly the threat of entry would be a material constraint on the merged entity.

3. Vertical Integration Issues

3.1. Introduction

In its 4 March 2011 and 27 April 2011 reports, Castalia argued that a vertically integrated merged entity/Cavalier Bremworth (CB) would have the incentive and ability to raise the costs of CB's downstream rival, Godfrey Hirst (GH).

We have previously responded to this argument, noting in our 10 March 2011 memo the countervailing effects on profit from raising rivals' costs, and how the ACC and Direct Capital would only share in the losses from such a strategy, so would be unlikely to be interested in it.

After a discussion of this issue at the Conference, Commissioner Gale asked us to provide more analysis of it, including a review of the relevant literature (transcript day 1, p.71).

We start with a generic, algebraic analysis of the economics of input foreclosure (section 3.2). We then briefly describe the supporting economics literature, including the applicability to non-price forms of foreclosure (section 3.3).

In section 3.4 we apply the analysis to the proposed wool scour merger.

Finally in section 3.5 we briefly respond to Mr Sundakov's argument at the Conference that CWH could harm GH without reducing GH's demand for CWH's services.

3.2. Incentives for Input Foreclosure

As we set out in our 10 March 2011 memo, the methods of raising rivals' costs identified by Castalia are forms of behaviour known as input foreclosure, designed to lower the volume of

output sold by downstream rivals and thus soften the competitive constraint on the downstream business of the vertically integrated firm.

The incentive of the vertically integrated firm to engineer input foreclosure against downstream rivals depends on the impact such behaviour has on the vertically integrated firm's profits. Foreclosure leads to two countervailing effects on profits:

- The profits of the downstream business would increase as the lower volume supplied by the foreclosed rival would result in some of its customers switching their business to the downstream business.[9] The profits of the upstream business would also increase due to the additional volume of products supplied to its downstream business; and
- On the other hand, there would also be a decrease in profits of the upstream business, as the volume of products sold to the foreclosed rival would decrease.

The first of these effects, the profit increase effect, corresponds to an increase in profit to the vertically integrated firm equal to:

$$\delta \times \Delta Q_R \times (m_U^V + m_D^V)$$

where:

- δ is the diversion ratio, which represents the percentage of sales that are diverted from the foreclosed rival to the downstream business of the vertically integrated firm;
- ΔQ_R is the reduction in the foreclosed rival's volume of sales (in units) caused by the foreclosure strategy and thus $\delta \times \Delta Q_R$ is the total volume of sales diverted from the foreclosed rival to the downstream business of the vertically integrated firm;
- m_D^V is the downstream gross margin (in dollar terms) earned by the vertically integrated firm on each unit of the product sold to final consumers; and
- m_U^V is the upstream gross margin (in dollar terms) earned by the vertically integrated firm on each unit of the product sold to its downstream business, so that for every unit diverted to the downstream business of the vertically integrated firm, the total margin earned by the entire vertically integrated firm is equal to $(m_U^V + m_D^V)$.

The profit decrease effect is equal to:

$$m_U^R \times \Delta Q_R$$

where m_U^R is the upstream gross margin (in dollar terms) earned by the vertically integrated firm on each unit of its product sold to the downstream rival; and ΔQ_R is the reduction in the downstream rival's volume of sales as above.

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[9] Other customers would switch to other downstream rivals, or leave the market altogether.

The profit of the vertically integrated firm, and thus the incentive to engineer input foreclosure, depends on balancing the above effects. It can be seen from the above analysis that the incentive itself depends on the margins of the upstream merged entity (on both sales to the downstream rival and its own downstream business), the volume of output foreclosed, and the amount of this volume that is diverted from the downstream rival to the downstream business of the vertically integrated firm.

Another factor to take into account is whether the volume foreclosed is sufficiently large such that the downstream division can increase prices to final consumers. If that is the case, then there is potentially another profit increase effect for the downstream business of the vertically integrated firm, due to the higher prices it can receive on its post-foreclosure sales.

3.3. Summary of the Economics Literature

The above assessment of the incentives for input foreclosure is often referred to as "vertical arithmetic". Analysis of this sort has been used by competition authorities and regulators in other parts of the world in assessing the effects of vertical integration, including by the European Commission,[10] Ofcom in the UK,[11] and the FCC in the US.[12]

This analysis has also been used in the economics literature. Weisman (1995)[13] and Sibley and Weisman (1998)[14] apply it in the context of the incentives of vertically integrated telecommunications companies in the US to foreclose downstream rivals. Their analysis assumes the vertically integrated firm faces a regulated input price, so cannot use price methods to foreclose rivals, but can use other non-price methods of discrimination. This literature is neatly summarized by Mandy and Sappington (2007)[15] as follows:

> *The existing literature offers two important insights regarding the incentives of a vertically integrated supplier to sabotage its downstream rivals. First, cost-increasing sabotage generally confers an advantage upon the affiliated downstream producer, and thereby increases its profit. Second, by reducing downstream output, sabotage can reduce demand for the upstream product, thereby reducing upstream profit. Consequently, the downstream benefits of cost-increasing sabotage must be weighed against the corresponding upstream costs to determine whether sabotage will be profitable.*

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10 See the EC's non-horizontal merger guidelines, and the references therein to the EC cases in which this technique has been applied: "Commission Notice: Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings", Council Regulation (EC) No 139/2004, 20 January 2004.

11 See Ofcom's second pay TV consultation: "Competition issues related to Core Premium content: Annex 8 to pay TV market investigation second consultation", 30 September 2008.

12 As noted in Michael Riordian (2008), "Competitive Effects of Vertical Integration", Columbia University Department of Economics, Discussion Paper 0506-11.

13 Dennis Weisman (1995), "Regulation and the Vertically Integrated Firm: The Case of RBOC Entry into Interlata Long Distance", *Journal of Regulatory Economics*, 8, 249-266.

14 David Sibley and Dennis Weisman (1998), "The Competitive Incentives of Vertically Integrated Local Exchange Carriers: An Economic and Policy Analysis", *Journal of Policy Analysis and Management*, 17(1), 74-93.

15 Mandy, D. and Sappington, D. (2007), "Incentives for sabotage in vertically related industries", *Journal of Regulatory Economics*, 31, 235-260.

The logic set out here is exactly that set out with respect to vertical arithmetic. It is important to note that the vertical arithmetic approach applies equally to both price and non-price methods. Doane and Sibley (2002) apply this approach to a vertical merger in the US retail book industry, and note that the input foreclosure on which their analysis is based could apply through either price discrimination or "[m]ore subtly" through non-price discrimination.[16] The EC in its non-horizontal merger guidelines states the following:

> *Input foreclosure may occur in a variety of forms. The merged entity may decide not to deal with its actual or potential competitors in the vertically related market. Alternatively, the merged firm may decide to restrict supplies and/or raise the price it charges when supplying competitors and/or to otherwise make the conditions of supply less favourable than they would have been absent the merger. Further, the merged entity may opt for a specific choice of technology within the new firm which is not compatible with the technologies chosen by rival firms. Foreclosure may also take more subtle forms, such as the degradation of the quality of input supplied.*

3.4. Application to Wool Scour Merger

Applying this analysis to the present merger, the key point to take from the above discussion is that foreclosure by CWH/CB would lead to a trade-off between higher profit for the (downstream) CB and (potentially) lower profit for the (upstream) CWH.

Regarding the downstream profits, if the downstream market is workably competitive (which is implicit from the Commission's *Decision No. 628*),[17] then the diversion ratio from GH to CB is likely to be significantly lower than 1, given the availability of substitutes. That is, if foreclosure reduces GH sales, only some of those sales will flow to CB, while others will flow to other competitors. Therefore the increased profit to CB from foreclosure would be lower than if the carpet market was not competitive (in which case both the diversion ratio and CB's margins would be higher, making foreclosure more profitable for CB).[18]

Regarding upstream profits, CWH would trade-off higher profit from increased sales to CB, given by $\delta \times \Delta Q_R \times m_U^V$, against lower profit from decreased sales to GH, given by $m_U^R \times \Delta Q_R$.

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16 David Sibley and Michael Doane (2002), "Raising the Costs of Unintegrated Rivals: An Analysis of Barnes & Noble's Proposed Acquisition of Ingram Book Company", in D.J. Slottje, *Measuring Market Power*, Elsevier Science.

17 Commissioner Gale also pointed out at the Conference that both firms operate in a global carpet market (transcript, day 1, p.71).

18 And because the market is competitive, CB would not be able to raise price.

Based on the above analysis, we conclude that the upstream merged entity would likely suffer a reduction in profits from implementing a foreclosure strategy.

This is important because CWH is half-owned by the ACC and Direct Capital. If the ACC and Direct Capital do not have a financial interest in CB, then under a foreclosure strategy the ACC and Direct Capital would share in the lost profits of the strategy, while not sharing in the full benefits of the strategy (which would accrue only to CB). This would mean that the ACC and Direct Capital would have no incentive to engage in input foreclosure.

The EC, in its non-horizontal merger guidelines, notes this exact same incentive:[19]

> *... in cases where two companies have joint control over a firm active in the upstream market, and only one of them is active downstream, the company without downstream activities may have little interest in foregoing input sales. In such cases, the incentive to foreclose is smaller than when the upstream company is fully controlled by a company with downstream activities.*

We now understand that the ACC does have a relatively small financial interest in CB, via a 3.11% shareholding in Cavalier Corporation. This means that the ACC has a financial claim on 3.11% of any profits accruing to CB from a foreclosure strategy, while incurring 25% of the costs through its stake in CWH. Accordingly it is unlikely that this shareholding would affect our conclusion that the ACC and Direct Capital do not have the incentive to foreclose GH.

3.5. Foreclosure without Affecting Profit

As a final issue, Mr Sundakov argued at the Conference that CWH could harm GH without reducing GH's demand for CWH's services (transcript day 1, p.69). Even if this was correct as a factual matter, the implicit degree of "sabotage" would be so small as to be irrelevant – if the sabotage is not affecting GH's demand for CWH's scouring services, then it could not be having a material effect on GH's business. Similarly, this also means there would not be a material diversion of sales from GH to CB.

4. Production Disruption

4.1. Introduction

In his 27 April 2011 report, Dr Layton argues that the rationalization under the factual would disrupt wool scouring, with resulting economic costs. He quantified these detriments by assuming a three-month delay affecting 10-30m kg of wool, and applying an interest rate of 7% to a wool price of $5/kg, which we assume is a proxy for the world price of wool.

CWH gave evidence at the Conference that it had considered the potential for production disruption in planning the relocation of the scours and had planned so there would not be any disruption.[20] Mr Hales commented that CWH would not have any incentive to incur

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[19] See footnote 41 of the EC non-horizontal merger guidelines, 20 January 2004.

[20] Transcript, day 2, p.2-3, 7.

production disruptions if they could be avoided, which makes economic sense, given the importance of volume to the business. CWH also said it will have sufficient capacity to meet expected demand during the period while it is rationalizing the scouring sites.[21] However, even if there was some disruption, our view is that Dr Layton has overestimated the costs that would arise, because he has:

- Used an inappropriate base value to calculate the loss to the economy; and
- Effectively assumed that no wool would be scoured while the scours are rationalized.

4.2. Base Value

Each time a kilogram of wool is scoured, there is an economic surplus created, being the difference between the willingness to pay for that unit of scouring, and the avoidable cost of that unit of scouring. If there is disruption to scouring under the factual, then the creation of that scouring surplus will be delayed until the scouring occurs. The delay in creating the surplus is the detriment.

The economic surplus created by scouring is divided between the producer surplus (being the excess of price over avoidable costs) and the consumer surplus (being the excess of willingness to pay over price). The relevant data to estimate the producer surplus per kilogram of wool scoured is available to the Commission. As per footnote 18 of our 8 February 2011 report:

- The average price per greasy kg is $[ ] in the North Island and $[ ] in the South Island, [ ];[22] and
- The estimated (post-merger) average variable cost per greasy kg is $[ ] in the North Island and $[ ] in the South Island, [ ].

The producer surplus is therefore approximately $[ ] in the North Island and $[ ] in the South Island.

We do not have data regarding the average willingness to pay for a unit of scouring, and we therefore cannot precisely estimate the consumer surplus. However, we do know that consumer surplus for a unit of scouring will be a function of the margins that merchants earn selling wool, and the Commission has stated that these are on average $0.15-0.20 per kg of greasy wool (¶141 of the Draft Determination). That is, we know that if a merchant earns $0.20 profit per kg from selling greasy wool, its consumer surplus from scouring wool will be no more than $0.20/kg and may well be less.

Accordingly, at most the average economic surplus per kilogram scoured will be approximately $[ ] per kg greasy. Therefore if there was any disruption, it is this figure

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21 Transcript, day 2, p 3, 5,

22 If these volumes were also disrupted, then their price should also be reflected in the calculation. The same comment applies to the variable costs.

that should be multiplied by the relevant interest rate and number of affected units, not the $5 that Dr Layton uses.[23]

4.3. Affected Volumes

As noted by Mr Taylor at the conference (see pages 33-34 of the day 3 transcript), the top end of the volume range adopted by Dr Layton (30m kg) would imply that there would be no scouring at all during the rationalization period.

As discussed above, CWH gave evidence that there would be no production disruption. However, even if there was some, as discussed CWH has provided evidence showing that (at least) its current capacity would remain unaffected. Accordingly, it seems improbable that no wool would be scoured during any disruption period. Dr Layton acknowledged this possibility.[24]

However, solely for the purposes of illustrating the problems with Dr Layton's approach we will use the bottom end of Dr Layton's range, being 10m kg, although we offer no opinion on whether that is a likely figure.

4.4. Results

Even assuming production would be disrupted for three months, correcting Dr Layton's analysis by using the correct base value and assuming 10m kg would be "disrupted", the detriments would be $[ ], rather than the $[ ]m estimated by Dr Layton.

4.5. Vertically Related Markets

We presume that the $5 figure used by Dr Layton is a proxy for price in the wool market, as opposed to the scouring market. We think it is important to point out that surplus changes should only be estimated in one of the set of relevant vertically related markets.[25] Just et al (1982) find that in a vertically-related set of markets, the sum of changes in producer and consumer surplus in the affected market (here, the scouring market) equals the total change in surplus in all markets where all relevant prices are allowed to vary.[26] In other words, by analyzing welfare losses in the scouring market alone, we also capture the net welfare effects in all upstream and downstream markets.

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23 Regarding the $5 used by Dr Layton, as well as not having the correct conceptual basis, it ignores the fact that the production disruption would delay the incurring of costs as well as the receipt of revenues. For example, the variable costs of scouring would not be incurred while scouring production is disrupted. During the conference, Dr Layton disagreed with this analysis, but we remain of the view that it is correct. Reviewing the transcript (see lines 16 to 18 on page 33 of day 3), [ ] – however, if wool has already been scoured, then scouring disruption would not result in any detriments in respect of that wool.

24 Transcript, day 3, p. 34.

25 This also addresses the argument made by Alex Sundakov at page 12 of the conference transcript, day 2.

26 Just, R, D Hueth and A Schmitz (1982) *Applied Welfare Economics and Public Policy*, Prentice-Hall, 187.