Review of the milk pricing methodology of Fonterra

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Executive Summary

I was assigned the task of assessing the milk pricing methodology of Fonterra and outline any concerns that the approach taken may raise. On the basis of the material provided to me, and thus on a limited knowledge of the specifics of the New Zealand dairy markets, I identified several potential concerns.

First, the restructuring prompted by the *Dairy Industry Restructuring Act* and the set-up of Fonterra is akin to the organisation of a cartel among the cooperative members. This can allow farmers to get a bigger share of the difference between the international prices for processed milk and the production cost of raw milk at the expense of non-domestic processors and intermediaries, but also affects domestic independent processors, who then face higher prices for raw milk, as well as domestic consumers, who face higher prices for dairy products.

Second, the restructuring led to the establishment of a vertically integrated entity, Fonterra, which as such can have the incentives to foreclose downstream markets, by degrading their access to raw milk or by raising farm-gate prices. While an appropriate ECPR rule would allow maintain the same gains for the farmers without preventing more efficient rivals to enjoy the benefit of their comparative advantages, the integrated firm can have an incentive to bypass such a rule in order to appropriate part of these efficiency benefits, at the expense of deterring entry if these efficiency gains are not large enough.

Third, having removed the competitive pressures that cooperatives were exerting on each other before the creation of Fonterra raises the issue of its incentive to behave in an efficient manner, all the more so in the light of the atomized ownership of the cooperative, which limits shareholders' incentives to invest in monitoring and supervision activities; protecting the agency rents that the cooperative may enjoy in this way may give it additional incentives to engage in vertical foreclosure in downstream markets. While raising the farm gate milk price to squeeze independent processors' margins may benefit farmers in the short-term, in a longer term the lack of effective competitive pressure from these rivals may backfire and eventually lead to higher processing costs than would otherwise arise.

Fourth, the extent to which Fonterra's milk price methodology may affect independent processors depends critically on the respective roles of the milk price, the share price and the dividend policy, as well as on farmers and Fonterra's access to credit.

Fifth, the Milk Price Manual appears to rely on some *average* plant of Fonterra (dedicated to the product mix that rival processors seem to be targeting); however, in a competitive process, prices are instead determined by the cost of the *marginal* plants, that is, of the *least* efficient plant among those active in equilibrium. Using infra-marginal rather than marginal costs would bias the milk price upwards, which would prevent rival competitors from progressively replacing the less efficient plants and would also fail to incentivize Fonterra to upgrade or replace them.

Finally, the methodology adopted appears to leave some flexibility in the way it is implemented, which calls for some form of checks and balance, e.g., by allowing rivals to provide counter-expertise and by relying on arbitration in case of persistent disagreement.

1. Introduction

I was assigned the task of assessing the milk pricing methodology of Fonterra, as outlined in its Milk Pricing Manual, and outline any concerns that the approach taken may raise; for any such concern, I was asked to state:
- what those concerns are;
- why they are relevant; and
- in broad terms, what an alternative would look like.

To focus the scope of potential concerns, I will rely on the objective stated in the relevant sections of the *Dairy Industry Restructuring Act*:

- First, Part 1 ("Preliminary provisions"), section 4 ("Purpose"), states the following purpose:

"(f) promote the efficient operation of dairy markets in New Zealand by regulating the activities of new co-op to ensure New Zealand markets for dairy goods and services are contestable;"

- Similarly, Part 2 ("Restructuring and regulation of dairy Industry", Subpart 5 ("Regulation of dairy markets and obligations of new co-op"), states:

"70 Purpose
The purpose of this subpart is to promote the efficient operation of dairy markets in New Zealand."

It then goes on listing several principles, the first one being:

"71 Statement of principles
The intention of this subpart is to promote the following principles:
(a) independent processors must be able to obtain raw milk, and other dairy goods and services, necessary for them to compete in dairy markets"

I will therefore focus on the impact of the milk pricing methodology on *efficiency* and on *competition* in *domestic dairy markets*, namely (i) the domestic production of raw milk, (ii) the domestic processing stage (from raw milk to powder and other intermediate products), and (iii) the domestic production of dairy goods (final products).

To proceed, it is interesting to start with Fonterra's constitution, which states (see ANNEXURE 1: MILK PRICE PRINCIPLES at page 48):

"The Milk Price for a Season should reflect the benefits that arise from the collective selling power of Shareholders as suppliers to the Company, and from the scale and other economies the Company enjoys in production and sales.
In this context, the Milk Price should be the maximum amount that the Company, reflecting its status as a properly managed and efficiently run sustainable co-operative, could pay for the Milk

supplied to it in a Season if:

    • Shareholders and other suppliers of Milk to the Company collectively contracted to supply all their Milk to the Company;

    • The Company, on their behalf, processed that Milk into commodity products which were sold on freely contested global markets;

    • The Company was appropriately encouraged to make investment, production and sales decisions that maximised the Milk Price, both now and in the future; and

    • The Company was able to earn a risk-adjusted return on the assets required to collect, process and sell that Milk sufficient to warrant long-term investment in the new and replacement assets necessary to collect, process and sell the Milk reasonably expected to be supplied to the Company in future Seasons.

    • Risks should be allocated between Milk suppliers and the Company in a manner which appropriately reflects the relative abilities of each party to manage those risks."

    The reference to the "collective power of Shareholders" is akin to the organisation of a cartel among the farmers that join the cooperative, seeking to maximize farmers' joint payoff. The restructuring may have been successful in that dimension, as the evolution of the milk overall pay-out is consistent with the overall milk payout inducing production growth and increased use of land for milk production (see Compass Lexecon report at p. 56, chart entitled "New Zealand Milk Production) as well as an expansion of the land devoted to milk production (see Compass Lexecon report at p. 57, chart entitled "Total Land for Dairy Production in New Zealand").

Since most of New Zealand production is exported, setting-up such a cartel-like organization may well enhance New Zealand domestic welfare; this can be the case for instance if the new organization mainly allows farmers to get a bigger share of the difference between the international prices of milk commodities such as WMP or SMP, on the one hand, and the cost of raw milk production, on the other hand, at the expense of non-domestic processors and intermediaries. The new structure however also affects domestic independent processors as well as domestic consumers. Domestic independent processors may suffer from an increase in raw milk price; while this may respond to the deterioration of their margins by increasing their own prices, this is unlikely to off-set entirely the direct impact of the increase in raw milk price, and will also affect domestic consumers, who will face higher prices for dairy goods. Since the impact on domestic consumers is relatively clear, in what follows, I will focus more specifically on the impact on farmers and on independent processors. I will organize my comments around five points:

1. The incentive of the cooperative with respect to the setting of raw milk prices.
2. The role of milk price in the competition between the cooperative and rival processors.
3. The principles and methodology adopted for the farm gate price.
4. The relation between the farm gate price and the regulated factory gate price

    I discuss below each point in turn. I should stress that, at this point, the discussion is only based on a review of the material provided to me, and thus on a limited knowledge of the specifics of the New Zealand dairy markets; the discussion reflects preliminary thinking prompted by this review, and should be interpreted more as possible avenues for further exploration than as a final assessment.

2. The incentive of the cooperative with respect to raw milk prices

In order to discuss the principles underlying Fonterra's milk pricing methodology of Fonterra, as well as the possible implications of whatever leeway the cooperative may enjoy in the application of these principles, it is useful to first assess what are the incentives of the cooperative with respect to raw milk prices. I will discuss here two issues: (a) the implication of vertical integration for foreclosure concerns, and (b) the internal agency problems related to the emergence of a dominant player in the processing sector.

a. Vertical foreclosure

For the sake of exposition, I will first assume here that (i) the farmers jointly control a "bottleneck", namely, the production of raw milk, and (ii) this bottleneck is integrated downstream in the processing sector; this will allow me to consider the implications of such vertical integration for Fonterra's milk pricing policy. I will discuss afterwards the additional implications of the fact that, in practice, farmers do not jointly control such a bottleneck.

It is well-known that downstream competition may prevent even a pure bottleneck from fully exerting its market power. The reason is that, when dealing with one downstream firm, the bottleneck owner may have an incentive to free-ride on the others: that is, once it has contracted with these other downstream firms, it has an incentive to provide additional access (or input) to the other firm as well, even though this firm will compete with the first ones and reduce their profits. But then, anticipating this risk of opportunism, the others will not be willing to pay the "full" price (i.e., the monopoly price).[1] This insight, first formally captured by Hart and Tirole (1990)[2], appears in line with the situation that was prevailing before the restructuring of the industry, as downstream competition among rival cooperatives as well as with non-cooperative processors led to lower prices, not only for the processed milk, but also for the raw milk.

The literature on this topic has pointed out that vertical integration restores the exercise of market power and leads the integrated firm to *squeeze* the margins of downstream rivals. The reason is that, when dealing with downstream competitor, the integrated firm no longer has an incentive to free-ride on its own subsidiary. It will instead fully exert its market power by (i) raising the access price it charges to downstream rivals, so as to prevent them from exerting any effective competitive pressure on its own subsidiary in the downstream market, and (ii) charging monopoly prices to final consumers (through its own subsidiary).[3] It can be noted that the ECPR

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1 A similar problem has long been identified for patent licensing and franchising. Consider for example a patent that covers the unique technology that can be used in a given productive process. While the patentholder thus controls a bottleneck, it is unlikely to make much money if it cannot commit not to flood the market with licenses; for, if everyone holds a license, intense downstream competition destroys the profit created by the use of the patent. Therefore, a patentholder would like to promise to limit the number of licenses. There is however a commitment problem: Once the patentholder has granted *n* licenses, it is then tempted to sell further licenses. Such expropriation is ex post profitable for the licensor, but depreciates the value of the first *n* licenses and, if anticipated, reduces the patentholder's ex ante profit. A similar issue arises for franchising: franchisees are unlikely to pay much to franchisors if they do not have the guarantee that competitors will not set up shop at their doorsteps.

2 See also O'Brien and Shaffer (1992) and McAfee and Schwartz (1994). Rey and Tirole (2007a) provide an overview of this foreclosure literature.

3 Note that this margin squeeze differs from a standard predatory pricing scenario, where the predator first

rule, by itself, does not preclude an integrated bottleneck from fully exerting its market power: while the rule allows a more efficient downstream rival from earning a margin reflecting its comparative advantage, it prevents downstream competition from eroding upstream and downstream prices. That is, the integrated firm can still obtain a monopoly profit by maintaining the downstream price at the monopoly level (based on its cost structure), and charging an input price equal to that downstream price, minus its downstream cost.

Note that the integrated firm however has an incentive to bypass the ECPR rule if it can, in order to appropriate all or part of the downstream rivals' efficiency gain. Suppose for instance that the monopoly price is $p^M = 100$, and that the downstream costs are $c = 30$ for the integrated firm and $c' = 20$ for a downstream rival. Applying ECPR would require the integrated firm to charge a wholesale price equal to $w = 100 - 30 = 70$, which would allow the downstream rival to obtain the full benefit of its comparative advantage: it could attract customers with a price slightly below $p^M - w - c' = 100 - 70 - 20 = 10 = c - c'$. However, by bypassing ECPR and charging in input price equal to $w' = 80$ (or slightly below that level), the integrated firm could squeeze the downstream rival's margin, *de facto* forcing the rival to give away almost all of its comparative advantage. While the integrated firm would still allow the rival to enter the market in this stylized example, in a more realistic setting where the distribution of downstream rivals' costs is heterogeneous, the optimal level of the input price trades off the amount of efficiency gain that can be appropriated against the likelihood of entry. If for example the cost of the downstream rival was uniformly distributed between 10 and 30, then it would be optimal for the integrated firm to charge an input price equal to 80, in which case half of the rivals would enter (those with a cost lower than 20).[4]

Transposed in the present context, this insight would suggest that Fonterra has an incentive to squeeze independent processors' margins, by raising the farm gate milk price as well as the factory gate price (i.e., the price at which Fonterra may sell to the independent processors). Moreover, while the strict application of an ECPR rule would allow more efficient rivals to earn a margin reflecting their comparative advantage, the integrated entity would in fact have an incentive to increase further the "access prices" (i.e., the farm gate and factory gate prices) in order to force rivals to "give away" this comparative advantage by conceding themselves better terms (directly to farmers in the case of the farm gate price, or indirectly through dividends in the case of the factory gate price).

As mentioned above, the farmers do not in practice "jointly control" the raw milk "bottleneck". Rather, each farmer remains free to choose its supplier and to negotiate the terms of a supply contract with any independent processor. In the absence of vertical integration, this can reinforce the pressure that downstream competition may exert on upstream prices (that is, by forcing downstream firms to lower the prices at which they sell their products, downstream competition may give them additional incentives to extract better terms from the suppliers); this may in turn create an additional incentive for farmers to "join forces" and exert "collective selling power", as mentioned in Fonterra's constitution, as well as to integrate vertically milk production

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sacrifices profit (by engaging in a price war, say), and then "recoups its investment" by enjoying greater market power later on (once rivals have been eliminated, say, or once their expansion has been discouraged); here, instead, the integrated firm maximizes its profit even in the short-term: there is no sacrifice whatsoever.

4 The argument applies equally to situations where there is a single downstream rival with uncertain cost, or a distribution of small rivals with fixed capacities and heterogeneous costs.

and processing.

However, another implication of the lack of "joint control" over raw milk production is that, despite being largely dominant in the processing sector, the cooperative is not exactly vertically integrated upstream in raw milk production; instead, it must convince farmers to stick with the cooperative rather than to turn to alternative processors. *Prima facie*, whether this suffices to prevent the cooperative from squeezing independent processors is unclear. However, to the extent that raising the farm gate milk price would effectively increase farmers' loyalty to the cooperative (an issue I discuss further below), this may potentially give the cooperative an additional incentive to raise farm gate price.

With regards to the factory gate price, two conflicting forces may be at work: while Fonterra may have additional incentives to foreclose rivals, so as to alleviate the pressure on farmers' loyalty, raising the factory price may however make rivals eager to secure milk supply directly from farmers. I suspect that the overall implication for Fonterra's incentive with respect to the factory gate (beyond the basic foreclosure incentives highlighted above), depend among other things on the magnitude of scale economies: if these are important, access to Fonterra's factory gate may facilitate the development of new entrants, in which case Fonterra may wish to limit further access to its factory gate.

b. Internal agency problems

My understanding is that Fonterra is not the pure result of a competitive process, but rather the outcome of a merger between the largest cooperatives that emerged out of such a competitive process. Therefore, it did not secure its position by competing "on the merit", but by removing the competitive pressures that these cooperatives were exerting on each other. Furthermore, to the extent that economies of scale play an important role in the processing sector, the merger also limited the scope for relevant benchmarking, the remaining independent processors being much smaller in size.

A natural concern in this context relates to Fonterra's incentive to behave in an efficient manner. As already noted, this concern is exacerbated by the atomized ownership of the cooperative, which limits shareholders' incentives to invest in monitoring and supervision activities. To the extent that Fonterra can take advantage of this situation (but this would require an analysis of Fonterra's governance) and benefit from the resulting agency rents (in terms of lower managerial skills and efforts, inertia with respect to investment and new technology, and so on), it would have an incentive to limit the competitive pressure from the independent processors. This, in turn, may again lead Fonterra to try and squeeze independent processors' margins, by raising the farm gate milk price as well as the factory gate price – even beyond the levels that would allow more efficient rivals to earn a margin reflecting their comparative advantage.

This concern is reinforced when taking a long-term perspective. While artificially high milk prices may seem to benefit farmers in the short-term, by preventing rivals from reaching the minimal scale required for being an effective source of competition, these current high prices may lead to less favourable conditions being offered to farmers in the longer term. That is, in a longer term this may prevent rivals' competitive pressure from exerting a disciplining effect on the behaviour of the cooperative; this may in turn backfire and eventually lead to higher processing

costs than would otherwise arise (e.g., through reduced investment in new technology, reduced attractiveness for managerial talent, and so forth), at the expense of the farmers as well as domestic consumers.

3. The role of milk price in the competition between the cooperative and rival processors

There seems to be a debate about the role of the farm gate milk price in the competition between the cooperative and the independent processors. The Compass Lexecon report first argues at page 13 that what matters is not the farm gate price offered by Fonterra, but the total pay-out to the farmer, including the dividend associated with the farmer's shares in the cooperative (the number of which is roughly proportional to the volume of milk supplied by the farmer), and any increase in the milk price will reduce accordingly the dividend. It however acknowledges that a fuller analysis should account for the impact that the price/dividend distribution of the farmer's pay-out may have on the price of Fonterra's share.

Indeed, if capital markets were perfect, (i) the value of the share would be equal to sum of the discounted dividend flows, and (ii) if it wished so, the owner of a share could get its money back immediately by borrowing an amount equal to the value in question, and against a flow of reimbursements equivalent to the flow of dividends. Therefore, at first glance it would appear that neither the requirement to acquire shares in the cooperative nor the dividend policy would have an impact on the choice of buyer; the only factor determining the farmer's choice of buyer would be the milk price offered by these buyers.

Consider for example the following stylized situation (obviously, a more detailed analysis might be warranted here):

- in each period $t = 0,1,\ldots$ (where $t = 0$ represents the current period), Fonterra obtains a profit flow R_t and pays a dividend d_t;
- future profits and dividends are discounted with the same uniform discount factor $\delta = 1/(1+r)$, where r denotes an appropriate risk-adjusted discount rate.

Assuming that the number of shares is equal to the current volume of milk Q being supplied by the farmers, the share price would be $s = (\Sigma_t \delta^t R_t)/Q$ and would coincide with the discounted sum of dividends: $s = \Sigma_t \delta^t d_t$. Suppose now that a farmer has a volume of milk q, and can choose between Fonterra, offering a milk price p and a flow of dividends d_t (but requiring the farmer to buy q shares at a share price s), and an independent processor simply offering a milk price p':

- opting for Fonterra yields a net gain equal to $p\,q - s\,q + (\Sigma_t \delta^t d_t)\,q$, where the three terms represent respectively the price obtained for the milk, the cost of acquiring q shares, and the stream of future dividends;
- opting instead for the competing processor yields a gain $w\,q$.

In the first option (buying from Fonterra), by construction the share price s reflects the stream of future dividends, this gain boils down to $p\,q$. That is, while a higher milk price p may translate into lower dividends (including for the first season), any change in dividends is offset by an

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equivalent change in the share price. It follows that, in order to outbid Fonterra, the competitor needs to offer more than the milk price p; that is, only the milk price matters for the competition between the cooperative and its rivals.

The same applies if the farmer is initially a member of the cooperative, and thus already holds q shares:

- opting for Fonterra then yields a net gain equal to $p\,q + (\Sigma_t\,\delta^t\,d_{t.})\,q$, whereas opting for the competing processor yields a gain $w\,q + s\,q$;
- it follows that, as long as the share price equals the flow of dividends (i.e., $s = \Sigma_t\,\delta^t\,d_{t.}$), the competitor needs again to offer a price higher than $w + d$.

In practice, however, capital markets are imperfect and farmers are likely to be constrained in their ability to finance the acquisition of the shares. To illustrate the impact of farmers' credit constraints on the above analysis, suppose for instance that it costs a farmer $(1 + k)\,s$ to acquire a share, where k can be interpreted as reflecting the shadow cost of the credit constraints. Opting for Fonterra now yields a net gain equal to:

$$p\,q - (1 + k)\,s\,q + (\Sigma_t\,\delta^t\,d_{t.})\,q = (p - k\,\Sigma_t\,\delta^t\,d_t)\,q,$$

where the equality makes again use of the "fair value" of the share price, $s = \Sigma_t\,\delta^t\,d_t$ (this assumption however becomes questionable, too, when capital markets are imperfect; further analysis would be warranted there).

It follows that the dividend policy now has an impact on the price that competitors must offer in order to win the farmer. Increasing the milk price p can thus make Fonterra's offer more attractive, not only directly as before, but also indirectly by depressing the flow of dividends, and thus the share price.

The competition between cooperatives and investor-owned processors is also asymmetric in other dimensions. For example, the non-discriminatory open access (and exit) policy of Fonterra exposes it to "runs", whereas its competitors can in theory engage in "cream-skimming" (no pun intended) and attract "better" or "more conveniently" located farmers by offering them preferential terms. Also, as pointed out by Rey and Tirole (2007b), traditional cooperatives may find it difficult to secure member loyalty when capital-intensive investments are required, and profits must be distributed within the same year (no retained earnings). A more detailed analysis of Fonterra's charter would be needed to assess the potential relevance of this issue.

Finally, I note that there seems to be a debate about whether Fonterra could sustain an artificially high milk price, as this may trigger a "tsunami of uneconomic milk". The plausibility of this argument relies again on the exact roles of the milk price and of Fonterra's dividends and share price on farmers' decisions to switch suppliers (and on their decisions to favour milk production over other activities). Also, the argument appears to rely partly on Fonterra's supposed inability to finance the capacity needed to process large additional volumes of milk; however, this concern may overlook the role of Fonterra's share price in providing capital. Conversely, potential difficulties farmers' access to credit may also limit the probability of such a tsunami.

4. The principles and methodology adopted for the farm gate price

The above elements suggest that Fonterra may lack proper incentives to set prices at a level compatible with effective competition in New Zealand dairy markets. It follows that it may be tempted (i) to adopt pricing principles that impede competition in these markets, and (ii) to exploit any leeway left in the implementation of these principles so as to impede this competition. I discuss two points related to these issues.

a. The efficiency benchmark (most efficient *vs.* average *vs.* least efficient processing plant)

I understand that Fonterra's methodology, as described in the Milk Price Manual, essentially consists in:
- determining the revenue that the cooperative would earn if it converted all the milk collected into commodity products such as skim or whole milk powder (which represent about 70% of Fonterra's production);
- deducting operating costs (including the cost of transporting raw milk to factories, and the cost of efficiently manufacturing the commodity products in question, and transporting them to the point of export from New Zealand, along with selling and administration expenses; the costs also of asset depreciation as well as an appropriate return on investment.

The balance is then divided by the volume of milk collected. Each of the first two operations mentioned above has been subject to debate.

On the revenue side, I was not too concerned by the focus placed on the commodity products, as Fonterra's competitors appear to focus on these export markets, and this provides a rather non-manipulable, clearly identifiable benchmark, easily measurable and verifiable (as always, the devil is in the detail, and these assertions may need to be refined, in the light such factors as the practical relevance of the twice-monthly GlobalDairyTrade (GDT) trading events, the way the conversion from US dollars to New Zealand dollars is implemented, and so forth).

It is true that commodity export prices may be affected if Fonterra were to place the remaining 30% of its production on these markets, but such impact would remain to be assessed, given the small proportion of imports and exports in world production, and the impact of the competitors' exports, or a marginal increase in such exports, may already be relevant when assessing competitors' ability to enter or develop their activities. The focus on commodity products appears instead more problematic on the cost side, as it requires the construction of a hypothetical Fonterra, which opens the way to speculation.

Another source of concern relates to the evaluation of the cost that an "efficient manufacturer" would face. This question is all the more difficult since Fonterra operates plants of multiple sizes and generations (and many of them produce goods other than commodity products). With respect to size (and the associated economies), the Milk Price Manual adopts the *average* size of Fonterra's plant (as long as it exceeds the plant size of the competitors; it would otherwise be adjusted accordingly). However, in a standard competitive process, the equilibrium

price of providing a service (such as transforming raw milk into one of the commodity products) would be determined by the cost of the *marginal* plant, that is, of the *least* efficient plant among those active in equilibrium. As noted by Dr. Pickford in his memorandum entitled "A Review of the Compass Lexecon Report on Fonterra's Pricing of Regulated Milk in the Dairy Processing Industry", this would advocate in favour of a different benchmark than the one adopted in the Milk Price Manual, in which the less efficient one (depending on size and generation) would be taken as benchmark.[5] This would allow rival competitors to progressively replace these less efficient plants – and would also incentivize Fonterra to upgrade or replace them. Note that the consequence of using average rather than (higher) marginal costs is to bias the milk price upwards. In addition, I have been told that the "standard" of 1.9m litres adopted by Fonterra,[6] is about twice the size of a standard dryer (15 tonne/hour versus 8 tonne/hour) and close to the size of the unit that Fonterra is currently building at Darfield. Obviously, adopting a standard closer to the largest plant scale would further inflate the milk price.

b. Implementation

As noted by Dr. Pickford in his memorandum entitled "Review of Fonterra's "Milk Price Manual, 2011"", the methodology adopted by Fonterra is somewhat complex and leaves some room for interpretation and adaptation. As a result, Fonterra appears potentially in a position to influence the outcome of the actual implementation of the principles described in the Manual.

To alleviate this concern, one possibility would be to introduce monitoring by an independent "supervisor" (e.g., the Commerce Commission). However, this requires very detailed knowledge and expertise of the sector as well as of the evolution of the technologies, and is the kind of tasks usually devoted to dedicated, industry-specific regulators. Another, possibly more practical option would be to allow competitors to conduct their own implementation (for confidentiality matters, probably through a third party), too, so as to produce eventually a possibly more balanced estimate;[7] any residual disagreement between the two assessments could be solved through some form of dispute resolution such as arbitration or mediation.

5. The relation between the farm gate price and the regulated factory gate price

The raw milk regulations require Fonterra to offer up to 50 million litres to any independent processor (up to 250 million litres for Goodman Fielder, and within a total cap of 600 million litres), at a regulated price essentially based on the farm gate price. This raises questions for both volumes and prices.

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5 See also the COVEC memorandum by John Small, "Farm Gate Milk Price: Policy Objectives & Problem Definition", dated 22 August 2011, at paragraphs 15 b(i) and 17b(i).

6 See the report by Castalia to the Ministry of Agriculture and Forestry, "The 'Hypothetical Efficient Competitor' and Fonterra's Farm-gate Milk Price", dated July 2011, at page 21.

7 Note that, to counter-balance Fonterra's incentive to favour its own interest, even an independent supervisor should adopt a bias in favour of the rivals; this is similar to the argument advocating antitrust agencies to adopt a consumer surplus standard, rather than a total welfare standard for merger control, in order to counteract firms' selection bias in the proposed mergers – see e.g. Armstrong and Vickers (2010). Another possible motivation for such counter-balancing bias is to protect the agency against lobbying efforts; see e.g., Neven and Röller (2005).

Re. volumes, they appear somewhat limited by comparison with both the total volume of milk collected by Fonterra (about 4%, based on total raw milk supply of approximately 14 billion litres) and the amount needed to operate a plant (Fonterra's average plant processes about 300 million litres, according to the report of Compass Lexecon – see page 27). An alternative rule might be to allow for larger amounts in the first years of operation of a new plant, with a "phasing out" within a few years, so as to allow the independent processor to credibly attract milk supply from farmers.

Regarding prices, the regulated factory gate price is based on the farm gate price, plus a 10 cent premium reflecting the advantage derived from the so-called "square" supply curve. While it seems reasonable to expect some relationship between these two prices, it is more surprising to see the regulated price *de facto* set by the regulated firm, through the determination of the farm gate milk price. I would have expected an alternative approach, where the factory gate price would be set by an independent regulator, or in application of a principle determined by a regulatory authority, and which would not be entirely in the hands of the cooperative.

Finally, while the principle underlying the "square curve" premium sounds reasonable, its magnitude remains the object of debate; I understand that the Ministry of Agriculture and Forestry is currently proposing to allow for a seasonal curve, which would eliminate the issue.

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Patrick Rey is widely recognized as a world leader in competition economics. He has published more than 20 articles in international top-tier economic journals such as *Econometrica, the American Economic Review, the Review of Economic Studies* and the *RAND Journal of Economics*. He has contributed to about 10 books and most recently to *The Economics of Tacit Collusion in Merger Analysis - The Political Economy of Antitrust*, in 2007. He has also developed an innovative pedagogical tool using a "market game".

Patrick has also testified in numerous antitrust cases in Europe, and conducted numerous competition workshops and seminars at the French Court of Cassation (final court of appeal) as well as with various competition authorities. He is a member of the Economic Advisory Group for Competition Policy (the EAGC's main purpose is to support the European Commission Directorate General for Competition in improving the economic reasoning in competition policy analysis).

Patrick Rey's academic excellence has been recognized by numerous awards: he is a fellow of the Econometric Society, a senior member of the Institut Universitaire de France (a distinction shared by less than 0,07% of university professors) and has been granted the prestigious NATO grant and the Fullbright grant (to encourage research abroad).

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