

Merging with a Buyer Group Member

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Abstract

We examine a merger between a national retailer and a local retailer who is a member of a buyer group. While the traditional literature on mergers assumes an oligopolistic industry (where the merger takes place) supplied by a perfectly competitive one, here any retailer obtains its input from a supplier who can offer quantity discounts. In this setting, a merger can be profitable for insiders (solving the merger paradox) and can also be more profitable for insiders than for outsiders (solving the free-riding problem). This result holds even if the merged firm ends-up with a very small share of the market where the merger takes place. However, welfare decreases post-merger.

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1 Introduction

‘The merger paradox refers to the difficulty to construct a simple economic model in which there are sizable profitability gains for the firms participating in a horizontal merger *that is not a merger to monopoly.*’ (Pepall et al., 1999, p. 406) This is illustrated through the work of Salant et al. (1983) and Kamien and Zang (1990) who show that a merger is not profitable unless insiders account for more than 80% and 50% of firms, respectively. Such mergers are unlikely to proceed because of antitrust laws.

A merger can nonetheless be profitable for insiders if it creates a first-mover advantage to the newly created firm (Daughety, 1990), or if the outsiders’ output expansion is limited by increasing marginal production costs (Perry and Porter, 1985) or by capacity constraints (Pesendorfer, 2003). Embedded in these papers is the assumption that firms are competing in a downstream market where the input is supplied by a perfectly competitive industry. However, it is easy to imagine a situation where downstream firms need an input supplied by an imperfectly competitive industry. In this case, retailers may form buyer groups to increase their bargaining power when dealing with suppliers.

Independently of the work on mergers, the economic literature has analyzed the emergence of buyer groups. One objective of buyer groups is to pool members’ purchases to obtain lower prices from suppliers.¹ This applies to situations where suppliers offer volume rebates in the form of non-linear pricing (e.g., Bonnet, Dubois and Simioni, 2005) or where trade terms are determined through bargaining (e.g., Horn and Wolinsky, 1988b).

By combining these two strands of literature, we find a solution to the merger paradox and

¹Inderst and Shaffer (2005) provide a survey of the buyer power literature which offers many other reasons to explain the presence of buyer groups.

the free-riding problem.² A real-world example illustrates what we have in mind. Matériaux Coupal Inc. (Coupal), an independent retailer selling building materials for housing industry professionals, operated 9 stores in the province of Québec, Canada. It was also part of the Independent Lumber Dealers Cooperative (ILDC) buyer group. This allowed Coupal and other members of the ILDC to obtain competitive prices from suppliers and to compete on a level playing field with hardware superstores. In April 2006, Rona Inc. (Rona), the largest Canadian distributor and retailer of hardware, home renovation and gardening products, received the approval of the Competition Bureau, Canada's antitrust authority, to acquire a 51% interest in the operating businesses of Coupal. The likely effects of this transaction were at least three fold: a decrease in the number of competitors in local markets where Coupal operated; a decrease in the volume purchased by the ILDC from suppliers; and, an increase in the volume purchased by Rona from suppliers.

This example serves as the premise for our analysis. Imagine a situation where a national retailer, acting as a monopolist in a market, faces competition in a local market from smaller retailers who have formed a buyer group to obtain volume discounts from a supplier. In this setting, a merger between the national retailer and a local retailer is profitable for insiders, and insiders gain more than outsiders. But welfare falls post-merger even if the merged firm's marginal cost decreases in all markets. Thus, there may have existed reasons to block rather than to approve the merger between Coupal and Rona.

The paper is organized as follows. Section 2 describes the model, section 3 presents the results, and section 4 provides concluding remarks.

²The free-riding problem refers to the fact that outsiders gain more than insiders post-merger.

2 The model

Suppose a local market where a national retailer, denoted by n , has a monopoly; this market is referred to as the monopoly market.³ Suppose also a competitive local market where the national retailer competes with a set, $L = \{2, \dots, l\}$,⁴ of local retailers with i being a typical element of L .⁵ Because retailers offer a homogeneous good, the inverse demand functions in the competitive and monopoly markets are respectively

$$p^c = 1 - q_n^c - q_i - q_{-i} \quad (1)$$

$$p^m = 1 - q_n^m. \quad (2)$$

In (1) and (2), q_n^c and q_n^m denote the quantity of the national retailer in the competitive and monopoly markets, respectively; also, q_i and q_{-i} denote the quantity of the local retailer i and of all local retailers but i in the competitive market, respectively.

Retailers obtain their input from a monopolist supplier. There is a one-to-one relationship between the input bought by a retailer and its output. The supplier's marginal production cost is normalized to zero. When selling to retailers, the supplier uses a non-linear price $\rho - \mu Q$ with $\rho \geq 0$, $\mu \geq 0$, and Q representing the total quantity purchased by any buyer;⁶ accordingly, the supplier offers volume discounts. Remark that the price structure is flexible enough for the supplier to use a linear tariff (by setting $\mu = 0$) if it is profit maximizing.

Because volume discounts are available, we assume that local retailers have formed a buyer group to pool their purchases. The total cost of retailer i is therefore $c_i = [\rho - \mu(q_i +$

³Results would hold if this market was oligopolistic, or if there was more than one monopoly market.

⁴ l is treated as a continuous variable to simplify the analysis.

⁵We assume the presence of sunk costs of entry which limit the number of firms operating in any local market. Horizontal mergers with free entry have been analyzed in Spector (2003), for example.

⁶Sliding scale royalties, similar to the price structure used here, are commonly observed in licensing (Rostoker, 1983) and in franchising (Blair and Lafontaine, 2005).

$q_{-i})q_i$, while the total cost of the national retailer is $c_n = [\rho - \mu(q_n^c + q_n^m)](q_n^c + q_n^m)$.

Interactions between the supplier, the national retailer, and local retailers are described by a three stage game. At the first stage, the national retailer decides whether or not to merger with a local retailer.⁷ A merger takes place only if it is profitable (i.e., if there is no merger paradox) and if insiders gain more than outsiders (i.e., if there is no free-riding problem). At the second stage, the supplier sets the price for its input. At the third stage, retailers set their quantities simultaneously. Because we are looking for a subgame perfect equilibrium (SPE), we solve the game using backward induction.

3 Equilibria in the Marketplace

3.1 Downstream Competition

At the third stage, retailers simultaneously set their quantities knowing the market structure downstream and the supplier's price structure. Two cases need to be considered: the case of no merger and the case where the national retailer merges with a local retailer.

When there is no merger, the Cournot equilibrium quantities of the national retailer in the competitive and monopoly markets, and of a local retailer are respectively

$$q_n^c(l, \rho, \mu) = \frac{1 - \rho}{1 + (l + 1)(1 - 4\mu)} \quad (3)$$

$$q_n^m(l, \rho, \mu) = \left[1 + \frac{l}{2}\Delta \right] q_n^c(l, \rho, \mu) \quad (4)$$

$$q_i(l, \rho, \mu) = \Delta q_n^c(l, \rho, \mu) \quad (5)$$

where $\Delta = (1 - 4\mu)(1 - \mu)$. Accordingly, the profit of a local retailer and of the national

⁷A merger is seen as a long-term decision, and price or quantity decisions are seen as short-term ones.

retailer are respectively

$$\pi_i(l, \rho, \mu) = [1 - q_n^c(l, \cdot) - lq_i(l, \cdot)]q_i(l, \cdot) - [\rho - \mu lq_i(l, \cdot)]q_i(l, \cdot) \quad (6)$$

$$\begin{aligned} \pi_n(l, \rho, \mu) &= [1 - q_n^c(l, \cdot) - lq_i(l, \cdot)]q_n^c(l, \cdot) + [1 - q_n^m(l, \cdot)]q_n^m(l, \cdot) - \\ &\quad \{\rho - \mu[q_n^c(l, \cdot) + q_n^m(l, \cdot)]\}[q_n^c(l, \cdot) + q_n^m(l, \cdot)]. \end{aligned} \quad (7)$$

When there is a merger, the Cournot equilibrium quantities of the national retailer in the competitive and monopoly markets, and of a local retailer are denoted respectively by $q_n^c(k, \rho, \mu)$, $q_n^m(k, \rho, \mu)$, and $q_i(k, \rho, \mu)$ where $k = l - 1$ has been substituted for l in (3), (4), and (5). The profit of a local retailer and of the national retailer are obtained by replacing l by $k = l - 1$ in (6) and (7), respectively.⁸

3.2 Supplier's Pricing Decision

At the second stage, the supplier sets its tariff given the decision of the national retailer to merge or not with a local retailer. When there is no merger, the supplier's profit is

$$\begin{aligned} \pi_s^*(l) &= \max[\rho - \mu lq_i(l, \cdot)][lq_i(l, \cdot)] + \\ &\quad \{\rho - \mu[q_n^c(l, \cdot) + q_n^m(l, \cdot)]\}[q_n^c(l, \cdot) + q_n^m(l, \cdot)] \end{aligned} \quad (8)$$

with $(\rho^*(l), \mu^*(l))$ as the solution to (8), and we let $\pi_i^*(l) = \pi_i(l, \rho^*(l), \mu^*(l))$ and $\pi_n^*(l) = \pi_n(l, \rho^*(l), \mu^*(l))$.

When the national retailer merges with a local retailer, the supplier's profit writes as

$$\begin{aligned} \pi_s^*(k) &= \max[\rho - \mu kq_i(k, \cdot)][kq_i(k, \cdot)] + \\ &\quad \{\rho - \mu[q_n^c(k, \cdot) + q_n^m(k, \cdot)]\}[q_n^c(k, \cdot) + q_n^m(k, \cdot)] \end{aligned} \quad (9)$$

⁸A retailer's second order condition for a maximum is respected as long as $\mu < 1$.

with $(\rho^*(k), \mu^*(k))$ being the solution to (9), and we have $\pi_i^*(k) = \pi_i(k, \rho^*(k), \mu^*(k))$ and $\pi_n^*(k) = \pi_n(k, \rho^*(k), \mu^*(k))$.

We can solve for $(\rho^*(l), \mu^*(l))$ analytically, but we do not report these expressions here as they are too large.⁹ Figure 1 depicts $\rho^*(l)$ (the upper curve) and $\mu^*(l)$ (the lower curve).¹⁰ Both functions are convex in l : if the number of local retailers is small (large), they both increase (decrease) post-merger as the supplier reacts to the change in the market structure.

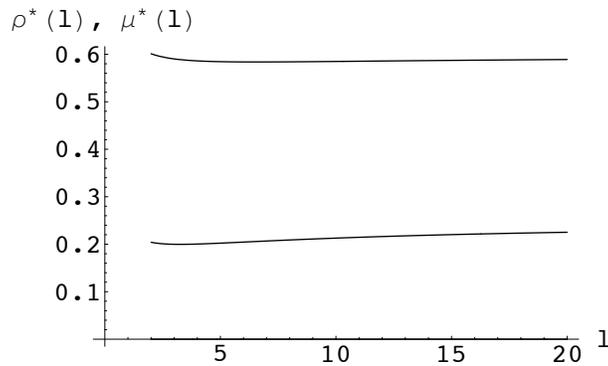


Figure 1: Supplier's Tariff

Figure 2 shows the equilibrium profit of a local retailer (the lower curve) and of the national retailer (the upper curve). The profit of a local retailer is concave in l : as l decreases, it increases, reaches a maximum, and then decreases. Three effects explain this. First, when the number of local retailers diminishes, the marginal cost of a local retailer is raised since the buyer group's total output drops. This should reduce the profit of a local retailer. Second, the contraction in the buyer group's purchases is partially offset as each local retailer increases its output because of the reduction in competition in the local market. This should lead to a higher profit for a local retailer. But the expansion in output is limited. Indeed,

⁹These expressions are available upon request from the authors in a *Mathematica* file.

¹⁰Note that all figures illustrate situations where $l \in [2, 20]$ but results hold for, at least, $l \in [2, 1000]$.

rather than to decrease its output, the merged firm increases its quantity in the local market because of its lower marginal cost post-merger. The competition from a stronger rival should translate into a lower profit for a local retailer; this is the third effect. While the second effect dominates the other two when l is large, the result is reversed when l becomes small.

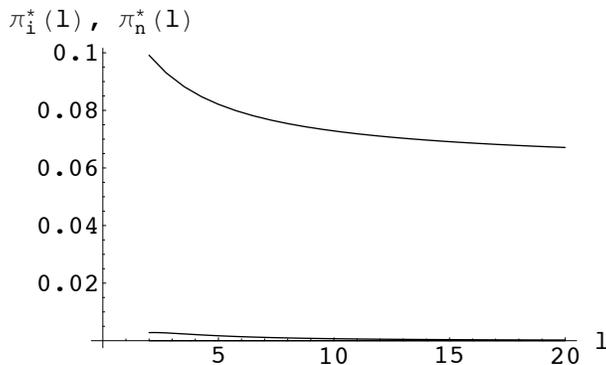


Figure 2: Retailer's Equilibrium Profits

As for the national retailer's profit, it increases with a reduction in the number of local retailers. Post-merger, the output of the national retailer increases reducing its marginal cost. As a result, the national retailer's profit in the monopoly market increases. It also becomes relatively more efficient than the remaining competition in the competitive market. Those two factors explain why a reduction in l is beneficial to the national retailer. Remark that the decrease in the national retailer's marginal cost is not a cost synergy but is a scale-economy efficiency (Farrell and Shapiro, 1990).

3.3 Merger Decision

At the first stage, the national retailer decides whether or not to merge with a local retailer. Two conditions must be met for a merger to take place. First, insiders must profit from a

merger. This implies that the national retailer's post-merger profit must be greater than or equal to the sum of its pre-merger profit and of a local retailer's pre-merger profit, or

$$\pi_n^*(k) \geq \pi_n^*(l) + \pi_i^*(l). \quad (10)$$

Figure 3 illustrates the difference between the left-hand side (LHS) and the right-hand side (RHS) of (10).

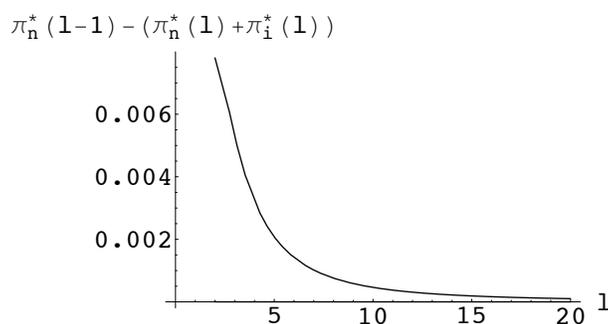


Figure 3: Merger Paradox

Proposition 1. *The merger is profitable even if the merged firm has an extremely low market share post-merger in the market where the transaction takes place.*

Second, the acquired firm must obtain more as an insider than as an outsider. Hence, the difference between the national retailer's post-merger profit and the sum of its pre-merger profit and of a local retailer's pre-merger profit must be greater than or equal to the difference between a local retailer's profit post and pre-merge, or

$$\pi_n^*(k) \geq \pi_n^*(l) + \pi_i^*(k). \quad (11)$$

Figure 4 depicts the difference between the LHS and the RHS of (11).

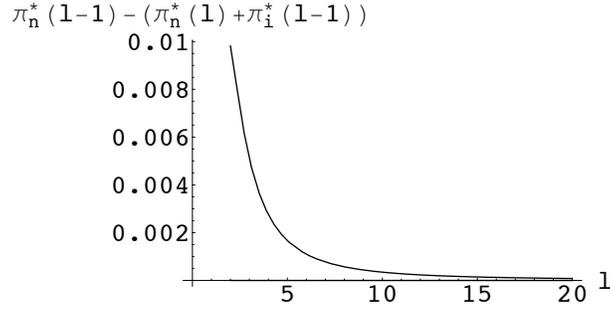


Figure 4: Free-Riding Problem

Proposition 2. *The acquired firm obtains more by participating in the merger than by remaining as an outsider.*

Corollary 1. *A merger takes place at a SPE of the game.*

3.4 Welfare Effects

Traditionally, it has been found that a merger failing to create synergies decreases welfare. The reason is that total production is lower post-merger. In our framework, the national retailer’s marginal cost decreases after a merger. Hence, it produces more in markets where it operates. But this does not offset the overall output contraction in the competitive market. Figure 5 shows the following result ($W(l)$, the upper curve, refers to total welfare and $W_c(l)$, the lower curve, refers to welfare in the competitive market).

Proposition 3. *Welfare in the competitive market (as measured by total surplus) and total welfare (computed as the sum of the total surplus in the competitive and monopoly markets) decrease for any merger; the drop in welfare in the competitive market exceeds the gain in welfare in the monopoly market.*

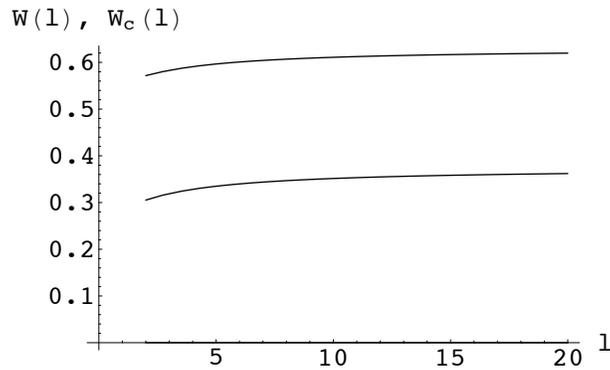


Figure 5: Welfare

4 Conclusion

Inspired by a real-world merger, we propose an answer to the merger paradox and the free riding problem associated with mergers. While other papers on horizontal mergers implicitly consider a perfectly competitive market upstream, we look at an upstream market where a monopolist supplier uses a non-linear price. Because quantity discounts are available, buyer groups may form. In this framework, we investigate the consequences of a merger between a national retailer operating in a monopoly market and a local retailer who is a member of a buyer group in a competitive market where the national retailer is also active.

We find that a merger between the national retailer and a local retailer is profitable for insiders even if their market share is very small post-merger. Furthermore, insiders gain more than outsiders. But because total welfare is lower post-merger, antitrust authorities should be careful in analyzing mergers involving a buyer group member, especially as cost savings are not cost synergies but rather scale-economy efficiencies that may not be merger specific.

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