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Chapter 64

MERGERS WITHOUT COST ADVANTAGES

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Salant, Switzer, and Reynolds showed that a merger in the standard Cournot framework with linear demand and costs is not profitable unless the merging firms have 80 percent of the market. Nonetheless, we observe mergers where the firms have market shares below this threshold. This survey shows that the paradox may be resolved without resorting to explanations involving merger cost savings. Competition between firms is affected by many strategic considerations, including the internal organization of the firm, the time structure of decision making, information aspects of competition, and the extent to which competition between firms is part of strategic trade competition between governments. A careful consideration of these factors reveals many reasons why firms below the 80 percent threshold may find it profitable to merge, even in a Cournot framework with linear demand and costs.

1. Introduction

The idea that a group of players, by joining forces and coordinating their actions, may improve their position relative to other players is intuitively appealing. Applied to an oligopoly context, this intuition suggests that a merger among a subgroup of competing firms should benefit the members of this subgroup and harm the firms outside this group. However, a seminal paper by Salant, Switzer, and Reynolds (henceforth SSR) showed that this intuition can go wrong. Specifically, a merger is unprofitable in the standard Cournot framework unless the merging firms have at least 80 percent of the market.[1]

To see why this result holds, consider an industry that consists of three identical firms, A, B, and C, that compete in a Cournot oligopoly. Each of the firms receives one-third of the industry profit. Now let two firms, B and C, merge to one firm, B&C. After the merger, each firm receives one-half of the duopoly profit. The duopoly profit is higher than the total profit with three competitors. As a result, it is unambiguous that the profit of Firm A (the nonmerging firm) is higher after the merger. It receives a larger share of a larger industry profit. In contrast, the owners of the two firms B and C see their share of industry profit fall from two-thirds to one-half. Unless total industry profits increase substantially, the owners of B&C will be worse off.

SSR show that unless the merger will bring the industry close to pure monopoly (i.e., a single firm with 80 percent market share), the net effect of the merger is to reduce the total profit of B&C. This result is closely linked to the response of Firm A. When B

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1. *See* Stephen W. Salant, Sheldon Switzer & Robert J. Reynolds, *Losses from Horizontal Mergers: The Effects of an Exogenous Change in Industry Structure on Cournot-Nash Equilibrium*, 98 Q.J. ECON. 185 (1983).

and C merge, they jointly prefer to offer a smaller quantity than the sum of their equilibrium quantities in the three-firm Cournot equilibrium. The reason why a smaller quantity is better for B and C is because they internalize a larger share of the negative externality of increasing output. That is, if one firm increases output and reduces its price, all firms are hurt. However, Firm A anticipates that B&C will offer a smaller quantity, and, with Cournot competition, this makes A increase its output. B&C suffers from this strategic reaction of A, as the increased quantity reduces the equilibrium price for the quantity that B&C sells. The increased output by A mitigates the benefit that B and C obtain from internalizing their own competition.[2]

The SSR framework presents a paradox, however, because it is inconsistent with empirical evidence on mergers. Bilateral mergers are observed in virtually all industries, even in industries where cost reductions are unlikely.[3] In contrast to the SSR framework, the evidence suggests that parties outside the merger are often worse off.[4] Moreover, the stock market typically does not punish a merger and reward those outside the merger.[5] This paradox may be resolved in many ways, and it has motivated a number of researchers to investigate the robustness of the SSR framework. The purpose of this chapter is to survey market characteristics that may make a merger in a Cournot framework profitable, even when the merger does not bring the industry close to pure monopoly.

To understand the limits of the SSR framework better, note that SSR make a number of explicit and implicit assumptions. Specifically:

1. Firms compete in quantities and the n firms in the industry sell a homogeneous product.
2. Firms face a linear (inverse) demand function (i.e., $P(x) = a - bX$ where P is the market price and X is industry output).
3. Both before and after the merger, all firms make simultaneous output decisions.
4. When a merger of $m \leq n$ firms occurs, the postmerger market is assumed to consist of $n - m + 1$ firms. That is, there is a fusion of the m merging firms in the "atomic" sense such that $m - 1$ firms simply disappear from the market.
5. Each firm consists of a single decision-making unit. That is, there is no distinction between ownership and management.
6. Firms have complete information about their own costs and the costs of their competitors.
7. Firms operate in an environment with no other strategic players.
8. The objective of each firm is to maximize profits.

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2. The result of the SSR framework resembles Harsanyi's bargaining paradox, in the sense that the cooperation of a subset of players harms the group and outsiders gain. *See* JOHN C. HARSANYI, RATIONAL BEHAVIOR AND BARGAINING EQUILIBRIUM IN GAMES AND SOCIAL SITUATIONS (1977).
3. *See* U.K. Office of Fair Trading, *Merger Appraisal in Oligopolistic Markets* (Economic Research Paper No. 19, Nov. 1999).
4. *See, e.g.*, Ajeyo Banerjee & E. Woodrow Eckard, *Are Mega-Mergers Anticompetitive? Evidence from the First Great Merger Wave*, 29 RAND J. ECON. 803 (1998).
5. *See* C. Edward Fee & Shawn Thomas, *Sources of Gains in Horizontal Mergers: Evidence from Customer, Supplier, and Rival Firms*, 74 J. FIN. ECON. 423 (2004).

9. Firms have constant marginal cost, $c \geq 0$ with $c < a$ both before and after the merger. That is, a merger does not lead to cost reductions or synergies.[6]

This chapter reviews the existing literature and describes the result of relaxing all but the last of the above assumptions. The chapter demonstrates that the discrepancy between the theory articulated by SSR and the empirical evidence on merger can be reconciled without resorting to explanations involving cost savings or other merger synergies. While analyses by Perry and Porter and Farrell and Shapiro suggest that such synergies can resolve the paradox as well,[7] this chapter shows that there are a number of other factors that can lead to profitable mergers even within the SSR framework.

2. Resolving the paradox

2.1. Relaxing the assumption of quantity competition

Deneckere and Davidson show that the results in SSR are sensitive to assumptions about the type of market interaction.[8] They analyze a differentiated products oligopoly in which firms compete in prices and find that all mergers are profitable with this type of competition. To see why this is the case, consider the case of three firms, A, B, and C selling differentiated products. Coordinated activity between B and C will induce them to charge higher prices for their products than otherwise, as they take into consideration that a higher price of product B will induce higher demand for product C, and vice versa. This direct effect of price coordination benefits the merged firm B&C. In turn, Firm A will anticipate these price increases. With Bertrand competition, Firm A will respond by increasing its price, and this will benefit B&C indirectly. The more firms that participate in the merger, the more the merged firm's profits increase.

A comparison of the analysis by SSR and Deneckere and Davidson reveals a general principle about mergers: the coordinated action of B and C increases their profits compared to independent choices if Firm A maintains its original behavior prior to the merger. However, the anticipated change in the behavior of B and C will change the behavior of A. This change in A's behavior may, but need not, harm the merging firms. A's behavior harms the merging firms in the Cournot framework with homogenous goods, but it benefits them in other oligopoly frameworks. For example, mergers are profitable in a spatial competition framework.[9]

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6. Farrell and Shapiro describe the case of no merger synergies as a situation where "the merged firm's production possibilities are no different from those of the insiders (jointly) before the merger." *See* Joseph Farrell & Carl Shapiro, *Horizontal Mergers: An Equilibrium Analysis*, 80 AM. ECON. REV. 107, 112 (1990).
7. *See* Martin K. Perry & Robert H. Porter, *Oligopoly and the Incentive for Horizontal Merger*, 75 AM. ECON. REV. 219 (1985); Farrell & Shapiro, *supra* note 6.
8. *See* Raymond Deneckere & Carl Davidson, *Incentives to Form Coalitions with Bertrand Competition*, 16 RAND J. ECON. 473 (1985).
9. *See* Pedro Posada & Odd R. Straume, *Merger, Partial Collusion and Relocation*, 83 J. ECON. 243 (2004). Other contributions exploring aspects of mergers in the context of spatial competition or spatial price discrimination are James D. Reitzes & David T. Levy, *Price Discrimination and Mergers*, 28 CAN. J. ECON. 427 (1995); George Norman & Lynne Pepall, *Profitable Mergers in a Cournot Model of Spatial Competition*, 66 S. ECON. J. 667 (2000); Robert Rothschild, *Merger under Spatial*

2.2. Relaxing the assumption of linear demand

The assumption of linear demand is also important in the SSR analysis. Keeping all other assumptions of SSR unchanged, Faulí-Oller and, more generally, Cheung show that the profitability of a merger depends on the degree of concavity in the demand function.[10] Specifically, let $P = P(X)$ be the inverse demand curve in the industry with $P'(X) < 0$. Industry revenue is then given by $P(X)X$ and the second-order condition for profit maximization is satisfied if and only if $2P'(X) + P''(X)X < 0$. Let the degree of concavity of demand be defined by $\beta = (P''(X)X)/P'(X)$. Note that if demand is linear, then $\beta = 0$. Demand is concave if $\beta < 0$ and convex if $\beta > 0$. Faulí-Oller then shows that the greater the degree of concavity (i.e., the more negative β is), the lower the profitability of a merger. To see why this is the case, recall that the overall effect of a merger on the profitability of the merging firms depends on the relative magnitude of two opposing effects. That is, there is an increase in industry profit but at the same time a decrease in the share of this profit that goes to the merged firms. In the case of three firms, the increase in industry profit tends to be smaller the more that demand is concave, and consequently the merger is less likely to be profitable.

Cheung shows that for all demands satisfying $\beta > -2$ (which is consistent with the second-order condition for profit maximization being satisfied), the minimal market share for a merger to be profitable is 50 percent. This is lower than the 80 percent threshold established by SSR for linear demand.[11]

Hennessy explores whether there is a "well-behaved" demand function such that any set of firms can profitably merge.[12] He identifies the negative exponential demand function given by $P(X) = Ae^{-\lambda X}$ ($A > c$ and $\lambda > 0$), and shows that with this demand function any number of firms can profitably merge, provided the marginal costs of the merging firms are sufficiently low.

2.3. Relaxing the assumption of simultaneous decision making

Several authors consider mergers in markets where not all firms make their decisions simultaneously and where the merger may change the timing of a firm's decision

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Competition, 37 URB. STUD. 443 (2000); Robert Rothschild, John S. Heywood & Kristen Monaco, *Spatial Price Discrimination and the Merger Paradox*, 30 REG. SCI. & URB. ECON. 491 (2000); John S. Heywood, Kristen Monaco & Robert Rothschild, *Spatial Price Discrimination and Merger: The N-Firm Case*, 67 S. ECON. J. 672 (2001); Duarte Brito, *Preemptive Mergers under Spatial Competition*, 21 INT'L J. INDUS. ORG. 1601 (2003); and Steffen Huck, Vicki Knoblauch & Wieland Müller, *On the Profitability of Collusion in Location Games*, 54 J. URB. ECON. 499 (2003). Conditions for profitable mergers in the case of promotional competition are explored in Steffen Huck, Kai A. Konrad & Wieland Müller, *Merger and Collusion in Contests*, 158 J. INSTITUTIONAL & THEORETICAL ECON. 563 (2002). Mergers in auction markets are surveyed and explored in Keith Waehrer & Martin K. Perry, *The Effects of Mergers in Open-Auction Markets*, 34 RAND J. ECON. 287 (2003).

10. *See* Ramon Faulí-Oller, *On Merger Profitability in a Cournot Setting*, 54 ECON. LETTERS 75 (1997); Francis K. Cheung, *Two Remarks on the Equilibrium Analysis of Horizontal Merger*, 40 ECON. LETTERS 119 (1992).
11. *See* Cheung, *supra* note 10.
12. *See* David A. Hennessy, *Cournot Oligopoly Conditions under Which Any Horizontal Merger Is Profitable*, 17 REV. INDUS. ORG. 277 (2000).

making. For example, Daughety considers the case where decision making occurs at two points in time. Specifically, there are m Stackelberg leaders and $n - m$ followers.[13] The $m < n$ leaders first independently and simultaneously decide on their individual output. Then, the remaining $n - m$ firms act as Stackelberg followers and decide upon their quantities after learning about the total quantity supplied by the leaders. Daughety shows that for a large set of industry structures, a merger of two followers into a new entity that becomes one of the Stackelberg leaders makes the industry more competitive and increases total industry output and welfare. Such a merger also increase the profits of the merging firms.

Huck, Konrad, and Müller analyze this Stackelberg framework further.[14] In the subgame perfect equilibrium of this game, each leader produces $(n - m + 1)$ times the quantity of a follower, with the result being that each leader earns $(n - m + 1)$ times as much as a follower. They then consider three cases: (1) merger of two leaders, in which case the number of leaders is reduced by one and the number of followers is left unchanged; (2) merger of two followers who become one follower, in which case the number of leaders is left unchanged and the number of followers is reduced by one; and (3) merger of one leader and one follower, with the new firm acting as a leader. Hence, in case (3) the number of leaders is left unchanged and the number of followers is reduced by one, as in case (2).

In cases (1) and (2), the two leaders (followers) have an incentive to merge only if there are two leaders (followers) in the original market. These results show that, as in standard Cournot markets with linear costs, firms of equal power rarely have an incentive to merge. The picture changes when two firms of different ability to assume the role of a Stackelberg leader merge. Merger between a leader and a follower, as in (3), is always profitable. A follower's value when integrated into a leader firm exceeds its value as a stand-alone firm. In other words, to use the title metaphor of Huck, Konrad, and Müller, if a big fish eats a small fish, the resulting fish is more valuable than the combined value of the two fish as separate entities. Interestingly, this is true even if the big fish does not grow. In fact, in this model the newly merged firm produces the same quantity as the leader prior to merger. However, price is also higher, and the increase in profits due to the price increase exceeds the loss in profit from the decrease in the joint quantity sold. This is not true for mergers between equally strong firms, except in the cases identified above. In terms of consumer welfare, cases (1) through (3) all have the same effect on competition: total output and welfare are reduced. This outcome differs from Daughety's analysis of the leadership generating merger, which enhances welfare.[15]

Given that mergers between equally strong firms reduce joint profits in Cournot markets and, with some exceptions, also in Stackelberg markets, mergers should be expected instead between leaders and followers, as these mergers are always profitable. If the linear cost assumption holds, however, welfare is reduced. Consequently, this

13. *See* Andrew F. Daughety, *Beneficial Concentration*, 80 AM. ECON. REV. 1231 (1990).
14. *See* Steffen Huck, Kai A. Konrad & Wieland Müller, *Big Fish Eat Small Fish: On Merger in Stackelberg Markets*, 73 ECON. LETTERS 213 (2001).
15. *See* Daughety, *supra* note 13.

framework suggests that antitrust authorities should focus on mergers between firms that have different strategic roles in the industry. In the Stackelberg game with quantity competition, the strategic roles are indicated by the relative market shares. Therefore, such a policy could be implemented by focusing on mergers between firms with very different market shares.

2.4. Relaxing the assumption of a fusion in the "atomic" sense

SSR do not consider the possibility of a firm with a complex internal organization. Instead, they assume that (1) the firm is run by a central decision unit, and (2) the merged firm (B&C) maintains the same decision-making structure as B or C. The following two subsections discuss the results of research that relaxes these two assumptions.

Multisubsidiary organizational form or "staggered" competition. Huck, Konrad, and Müller and, similarly, Creane and Davidson argue that a merger is not necessarily a process that transforms two firms into one firm of the same type, as assumed by SSR.[16] A merger often leads to a different organization, in which merged firms B and C are kept as intact decision-making units within a more complex entity. Consequently, suppose that the new entity, B&C, consists of a joint headquarters (HQ) that governs its affiliates, B and C. In particular, suppose HQ can enforce the *sequence* in which B and C choose their outputs. For example, HQ may force affiliate B to decide on output before C. If information flows freely between the two affiliates—which will be assumed here—C will be informed of the quantity chosen by its sibling prior to making its own decision. The market will no longer be a simple Cournot competition. Rather, it will have the flavor of Stackelberg competition as the affiliate that decides first becomes a "partial Stackelberg leader," and the affiliate moving second becomes a "partial Stackelberg follower." Leadership is only partial as outsiders will not be able to observe what the second-moving affiliate can observe. A merger that results in a situation in which HQ can enforce the timing of decisions of its two affiliates is referred to as a merger with commitment by governance.

The following conclusions are reached in this type of market. Bilateral mergers are (1) profitable if there are originally at least four firms in the market, (2) always welfare-improving even if all firms have the same linear cost functions, and (3) always reduce the profits of firms not involved in the merger.[17]

This model shows that clever governance can induce a commitment advantage for the merged firm even if no other firms can observe what its affiliates are doing. HQ may provide this governance, but Huck, Konrad, and Müller show that HQ is not

16. *See* Steffen Huck, Kai A. Konrad & Wieland Müller, *Profitable Horizontal Mergers without Cost Advantages: The Role of Internal Organization, Information, and Market Structure*, 71 ECONOMICA 575 (2004); Anthony Creane & Carl Davidson, *Multidivisional Firms, Internal Competition, and the Merger Paradox*, 37 CAN. J. ECON. 951 (2004).

17. Conclusion (2) is similar to the result of the leadership generating merger studied by Daughety. *See* Daughety, *supra* note 13. In this case, however, the change in leadership structure has a microeconomic underpinning, and the outcome of the merger is not a Stackelberg leader but a more complex organizational structure.

necessary.[18] The timing of decisions inside B&C can emerge *endogenously*. With this type of self-governance, the same beneficial Stackelberg commitment can emerge without any direction from HQ. Thus, even if the merged firm does not benefit from commitment by governance, it will increase its joint profit as it benefits from endogenous commitment.

The policy implications of this governance framework are twofold. First, from a welfare standpoint, mergers may be more beneficial than traditional models suggest. This, however, depends on the organizational form that the merged companies choose. Hence, in judging the competitive effects of mergers, governing bodies should be mindful of how the merged firms plan to operate. Second, on a more general level, the analysis suggests that one can only fully understand the consequences of merger when carefully considering its consequences for market structure. If one does, the standard view that mergers must induce cost advantages in order to be profitable and/or welfare-improving is not warranted.

Owners hiring managers versus the effect of strategic delegation. Research by Ziss, as well as by González-Maestre and López-Cuñat, modify the SSR framework by considering the incentive to merge if owners of firms hire managers to make output decisions.[19] Both papers compare merger profitability when the objectives of managers and owners coincide (the "nondelegation regime") with the situation when owners delegate output decisions to managers but also pay managers according to a strategically chosen compensation scheme (the "delegation regime").

In the delegation regime, it is assumed that each of the n firms in the industry consist of an owner and a manager, and that firms play a two-stage game. First, all owners simultaneously determine the incentive scheme given to their managers. An incentive scheme consists of a fixed payment plus a convex combination of firm profits and revenues. Specifically, owners select the parameter representing the weight attached to firm profits. Note that managers will be more aggressive the greater is the weight attached to the firm's revenue. Then, upon observing the contracts of all other managers in the industry, all managers simultaneously make output decisions for their firms. Under both regimes (delegation and nondelegation), it is assumed that after the exogenous merger of m of the n firms, $m - 1$ firms "disappear" from the market such that the postmerger industry consists of $n - m + 1$ firms. The main result of the two papers is that the minimum number of firms (or, equivalently, the market share) necessary for a merger to be profitable cannot be greater under a delegation regime than under a nondelegation regime. This result is illustrated in Table 1, which is adapted from the study by González-Maestre and López-Cuñat.[20]

For example, consider the case in which the premerger industry consists of four firms ($n = 4$). Whereas under the nondelegation setup of SSR all four firms have to be part of the merger in order to make it profitable, only two firms (or 50 percent) are necessary under the delegation regime. Furthermore, recall SSR's 80 percent minimum share

18. *See* Huck et al., *supra* note 16.

19. *See* Steffen Ziss, *Horizontal Mergers and Delegation*, 19 INT'L J. INDUS. ORG. 471 (2001); Miguel González-Maestre & Javier López-Cuñat, *Delegation and Mergers in Oligopoly*, 19 INT'L J. INDUS. ORG. 1263 (2001).

20. *See* González-Maestre & López-Cuñat, *supra* note 19.

Table 1.

Profitability of exogenous mergers in the delegation model versus the nondelegation model

n	3	4	5	6	7	8	9	10	15	30	100	140	1000
m_d	2	2	3	3	4	5	5	6	9	21	78	112	900
m_d%	66	50	60	50	57	62	55	60	60	70	78	80	90
m_{nd}	3	4	4	5	6	7	8	9	13	26	92	130	970
m_{nd}%	100	100	80	83	86	88	89	90	87	87	92	93	97

Note: n is the number of firms; m_d (m_{nd}) is the minimum number of merger participants necessary for a merger to be profitable in the delegation model (nondelegation model); and m_d% (m_{nd}%) is the ratio of m_d (m_{nd}) to n.

requirement for a merger to be profitable. Under delegation, this requirement only applies when there are more than 140 initial firms and demand is linear. For more general demand curves, Ziss shows that the minimum market share required for mergers to be profitable under the delegation regime is nondecreasing in the degree of concavity of demand (β).[21] Finally, when firms merge in markets in which delegation is used both before and after the merger, total output and welfare are reduced.

Why are fewer firms necessary to make a merger profitable under delegation than under nondelegation? González-Maestre and López-Cuñat point out that with delegation each firm can compete along two dimensions, managerial compensation and quantity.[22] Consequently, with delegation, a merger lessens competition not only with respect to quantities (as in the nondelegation regime) but also with respect to managers' compensation. As a result, delegation always amplifies the effects of pure consolidation on competition.

2.5. Relaxing the assumption of complete information

SSR assume that both before and after the merger all firms have complete information about rivals' costs. This assumption is relaxed in Amir, Diamantoudie, and Xue.[23] Specifically, they start with a premerger industry as in SSR where all firms have the same publicly known constant marginal cost equal to c. After a bilateral merger, however, outsiders are uncertain of the merged entity's new cost. More precisely, outsiders believe with probability p that the merged firm has marginal cost $c_l < c$.[24] With the complementary probability $1 - p$, outsiders believe that the merged firm's cost remains constant at c. Therefore, while the merged entity knows the exact value of its

21. *See* Ziss, *supra* note 19. For the definition, see Section 2.2. This result shows that the finding in Faulí-Oller is also true in models with delegation. *See* Faulí-Oller, *supra* note 10.
22. *See* González-Maestre & López-Cuñat, *supra* note 19.
23. *See* Rabah Amir, Effrosyni Diamantoudie & Licun Xue, Merger Performance under Uncertain Efficiency Gains (McGill University, Working Paper, 2004).
24. This setup contains the case of no cost savings at all so that (as becomes clear below) we are not strictly departing from our basic assumption that a merger does not lead to a cost reduction for the merged firm.

marginal cost, outsiders only know the probabilities with which the two possible levels of the merged firm's marginal cost will occur.

In the postmerger Bayesian equilibrium, outsiders continue to choose a unique quantity, whereas the merged entity chooses a quantity depending on whether its own costs are the same or lower than before the merger. In order to assess the effects of this incomplete information regarding possible cost savings, two approaches are possible. The first is to compute expected outputs and profits at the Bayesian equilibrium. Amir, Diamantoudie, and Xue, however, focus on a "worst case scenario" that assumes that the merged firm fails to achieve any postmerger cost reductions.[25] If outsiders believe with sufficiently high probability that the merged firm will experience sufficiently high cost reductions, then the merger is profitable, even if no cost savings materialize ex post. This result is established by deriving two threshold values. One threshold relates to the probability of achieving lower costs (p), while the other relates to the lower level of cost that may be achieved (c_l). Using these two threshold values, it is possible to show that the scope for a profitable bilateral merger is quite broad. This result is shown in Figure 1, which is adapted from Amir, Diamantoudie, and Xue.[26] This figure shows for various numbers of initial firms (n) the combinations of p and c_l for which a bilateral merger is profitable. In this illustration, demand is given by $P(X) = 10 - X$ and the premerger marginal is constant at $c = 3$. Moving towards the southeast in Figure 1 represents an increase in both the probability and the size of potential cost reductions. For any given set of initial firms, the merger is unprofitable above the corresponding curve but profitable below it, and thus a wide range of values clearly exist where mergers are profitable.

Amir, Diamantoudie, and Xue offer some intuition for how a bilateral merger can be profitable with incomplete information. Recall that in the original SSR framework the merged firm reduces its output (it internalizes the business-stealing externality experienced by its merging partner) while outsiders respond to this reduction by expanding output. Amir, Diamantoudie, and Xue note: "By contrast, in the present Bayesian setting, the merged firm exploits its informational market power that lies in the inability of the outsiders to adapt their outputs to its true unit costs. Depending on the belief held by outsiders, this new market power may well lead to the merged firm producing more than before the merger, despite the fact that the aforementioned externality effect is still present here. While a tendency for the outsiders' output to move in the opposite direction is still there, there is a range of values p for which all firms decrease their output after the merger, even in the worst case scenario."[27]

The result by Amir, Diamantoudie, and Xue implies that firms have an incentive to misrepresent the cost savings achieved by a merger both to antitrust authorities (in order to get the merger cleared) and to competitors (in order to influence their beliefs). This is consistent with Fisher's view that "[t]he burden of proof as to cost savings or other offsetting efficiencies, however, should rest squarely on the proponents of a merger, and

25. *See* Amir et al., *supra* note 23.
26. *Id.*
27. *Id.* at 12.

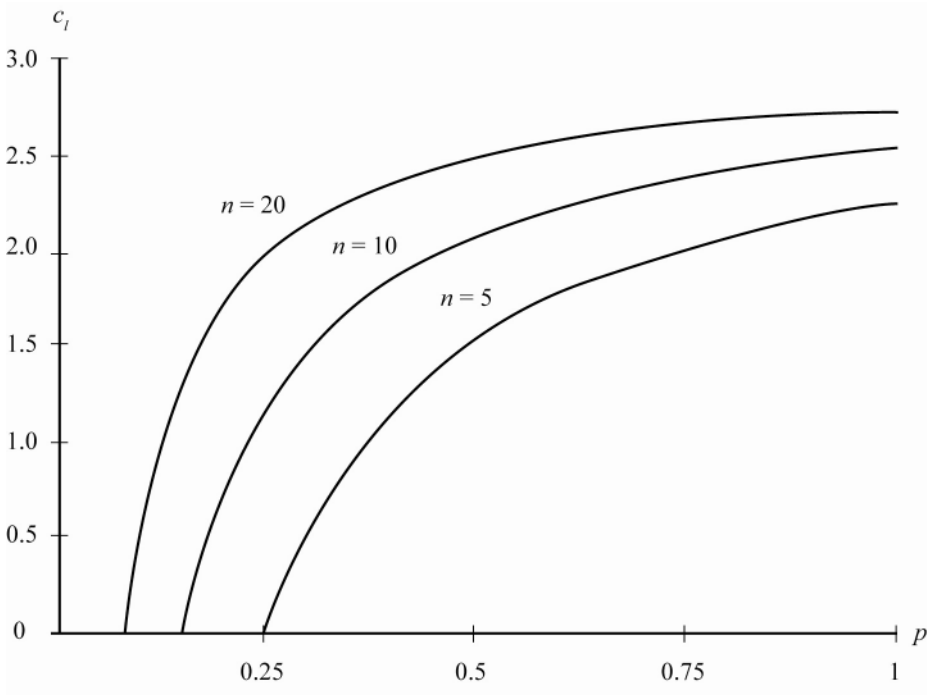

Figure 1.

Combinations of p and c_l for which a bilateral merger is profitable.

here I would require a very high standard. Such claims are easily made and, I think, often too easily believed."[28]

This cautious view regarding cost savings is reinforced by the model in Amir, Diamantoudie, and Xue when one looks at the welfare effects of a bilateral merger. While the model identifies conditions under which the merger increases producer surplus both in expected terms and in the worst case scenario, the effects of the merger on consumer welfare are ambiguous in expected terms and always negative in the worst case scenario. On balance, the merger always lowers total welfare in the worst case scenario. In expected terms, the merger increases total welfare provided the merger is expected to be profitable.

2.6. Relaxing the assumption of no other strategic players

In SSR the homogenous decision makers at the firms face customers who behave nonstrategically as price takers. In reality, however, firms often compete in an environment with other strategic players, including governments, unions, or other upstream firms that supply inputs.

One important example of a potentially strategic environment is a labor market that is unionized. If firms interact with unions, a merger may change the bargaining power of the union(s) and the firm(s), depending on how the labor market is organized. If

28. *See* Franklin M. Fisher, *Horizontal Mergers: Triage and Treatment*, 1 J. ECON. PERSP. 23, 36 (1987).

employers' associations and national unions negotiate wages that apply to all employment contracts within the country (central wage bargaining), an international merger can shift bargaining power from the unions to the firm because the firm may be able to threaten to shift production from one country to another. This enhanced bargaining power may make mergers more profitable. Lommerud, Straume, and Sørgard consider this and related questions in the context of an international oligopoly. They conclude that a cross-border merger is a likely outcome if the links between input prices and the decision to merge are considered.[29]

A further example of strategic considerations emerges in the context of trade policy. Consider the case in which firms in an industry are located in different countries but compete in the same market. The government of the country where a particular firm is located may choose export duties or subsidies to change the market outcome in a way that is favorable from the country's perspective. Brander and Spencer note that if a government subsidizes the exports of a firm that is located in its country, this is equivalent from the firm's perspective to a reduction in the firm's per unit cost of production on the units exported.[30] Such a firm will choose higher output than in the absence of subsidies. This behavior will then be anticipated by competitor firms. As a result, in a Cournot framework trade subsidies in one country will induce competing firms to choose smaller quantities in equilibrium. The subsidized firm gains from the reduction in its competitors' output. If more than one firm is located in a country, however, a subsidization policy is less effective in promoting that industry. A subsidy paid to, say, Firm B in a country will also reduce exports of competitors in the same country. Hence, a government that considers subsidizing a given export industry faces a more complex situation the more firms there are in the industry. If there is only one firm in the export industry, subsidizing this firm benefits this firm and harms the competing firms in other countries. Subsidizing an entire group of firms belonging to a given export industry, however, is less beneficial from the point of view of the government. Each firm benefits from the subsidies it receives, but also suffers from the subsidies that the other firms in this group receive. For this reason, a government will choose more moderate trade subsidies if the group of exporters in the country is large.[31]

Trade policy and industrial concentration are closely interdependent in such a strategic framework, and this interaction has been addressed in a number of studies.[32]

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29. *See* Kjell E. Lommerud, Odd R. Straume & Lars Sørgard, *Downstream Merger with Upstream Market Power*, 49 EUR. ECON. REV. 717 (2005).

30. *See* James A. Brander & Barbara J. Spencer, *Export Subsidies and International Market Share Rivalry*, 18 J. INT'L ECON. 83 (1985).

31. *See* Avinash Dixit, *International Trade Policy for Oligopolistic Industries*, 94 ECON. J. 1 (1984).

32. Cowan studies competition policy and trade policy with one importing and one exporting country. *See* Simon Cowan, *Trade and Competition Policies for Oligopolies*, 125 WELTWIRTSCHAFTLICHES ARCHIV 464 (1989). The interdependence of competition policy and strategic trade policy has also been analyzed by Richardson. *See* Martin Richardson, *Trade and Competition Policies: Concordia Discors?*, 51 OXFORD ECON. PAPERS 649 (1999). Policy affecting industry concentration inside the country may be chosen prior to or after a country's choice of trade policy. The role of this sequencing is emphasized by Keith Head & John Ries, *International Mergers and Welfare under Decentralized Competition Policy*, 30 CAN. J. ECON. 1104 (1997); and Henrik Horn & James Levinsohn, *Merger Policies and Trade Liberalization*, 111 ECON. J. 244 (2001). Rysman also considers a framework in

Huck and Konrad analyze the effects of different types of mergers on the profitability of firms.[33] National and international mergers differ considerably in their implications for profitability. If two firms inside one country merge, the government of this country may increase strategic trade subsidies, and other countries may reduce the subsidies they offer to firms located in their countries. A national merger is therefore more profitable for the merging firms than in the SSR framework. Firms outside the merger located in the same country may also benefit, but firms outside the merger in other countries may lose.[34]

2.7. Relaxing the assumption of profit maximization

Simon's innovative theory that firms may aim for a certain level of profits they are accustomed to ("aspiration levels") rather than maximize profits provides yet another way to potentially resolve the SSR paradox.[35] Some experimental evidence on this point has been developed by Huck, Konrad, Müller, and Normann.[36] Specifically, they examined markets where there were three or four firms initially. Demand in these markets was linear, and all firms had the same constant unit costs. Firm performance in these markets was observed for 25 periods, and then bilateral mergers took place such that the four-firm markets became three-firm markets and three-firm markets became duopolies. Postmerger markets were then observed for another 25 periods. While profit maximization theory predicted the total output well, it largely failed to predict individual outputs. In particular, merged firms were significantly more aggressive than their competitors, and as a result mergers were (weakly) profitable in cases where there were initially four firms. In addition, the merged firms did not maximize profits but rather remained at quantities that were higher than optimal. Firms outside the merger appeared to accept this and responded like Cournot firms to the residual demand. Consequently, the merged firm earned more than predicted, somewhat ironically because it did not follow a best reply strategy (i.e., the merged firm behaved similar to a Stackelberg leader).

Given the institutional details of their experimental design, Huck, Konrad, Müller, and Normann offer three explanations for what was observed: (1) the mere fact that a

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which countries first choose the number of firms (via competition policy) and then use strategic trade policy. *See* Marc Rysman, Competition Policy as Strategic Trade (Boston University, Working Paper, 2001).

33. *See* Steffen Huck & Kai A. Konrad, *Merger Profitability and Trade Policy*, 106 SCAND. J. ECON. 1 (2004).

34. *Id.* Huck and Konrad use their results to explain why Airbus Industries may have opposed the merger between its strongest competitors in the United States, Boeing and McDonnell-Douglas. Strategic trade policy tends to play an important role in this market, and the merger of Boeing and McDonnell-Douglas was expected to induce the U.S. (EU) government to increase (decrease) its subsidies. In turn, the merger may be profitable for Boeing and McDonnell-Douglas but unprofitable for Airbus Industries.

35. *See* Herbert A. Simon, *A Behavioral Model of Rational Choice*, 69 Q. J. ECON. 99 (1955); Herbert A. Simon, *Theories of Decision Making in Economics and Behavioral Science*, 49 AM. ECON. REV. 253 (1959).

36. *See* Steffen Huck, Kai A. Konrad, Wieland Müller & Hans-Theo Normann, *The Merger Paradox and Why Aspiration Levels Let It Fail in the Laboratory*, 117 ECON. J. 522 (2007).

firm has resulted from a merger renders the firm "strong" and the whole market asymmetric; (2) as the merged firms are jointly owned (and profits are to be shared), fairness considerations may induce subjects to shift output from unmerged to merged firms; and (3) merged firms are committed to maintaining their original profits because of aspiration levels created in the premerger markets. With the help of two control treatments, explanations (1) and (2) could be excluded. Thus, it appeared that the success of mergers in the markets with four firms was driven by aspiration levels.

3. Concluding remarks

The analysis developed by SSR showed an important benchmark result. Specifically, in a linear Cournot framework, a merger tends to reduce the share of industry profit captured by the merging firms. Consequently, even though industry profit increases, the merger is typically not profitable for the merging firms. Because we actually observe mergers, however, and mergers are expected to take place only if they are profitable, this basic result has been the catalyst for research that has studied the conditions under which a merger may be profitable. Synergies or cost savings from a merger are one reason, but such synergies are difficult to observe and measure. Moreover, there are several other reasons why firms may find it profitable to merge that have been surveyed in this chapter. In particular, strategic interactions that go beyond simple quantity setting in a Cournot game are relevant to profitability. These interactions may take place within the internal organization of the firm, or with other players such as government or input suppliers. Accounting for these factors may result in a profitable merger even in the absence of synergies or improvements in production efficiency. Moreover, unlike cost savings or synergies, these profitability increasing factors are more challenging to evaluate from the perspective of competition policy.