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Mergers and Acquisitions: The Industrial Organization Perspective

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Chapter 1

Introduction

The variety of effects that may result from a merger or acquisition is surprising and so is the number of possible contexts in which such concentration operations may occur.[1] Mergers may have unilateral effects or multilateral effects, and may involve firms selling products ranging from close substitutes (such as *Volvo* and *Scania* trucks) to complements (*HP* printers and *Compaq* computers). Mergers may reduce competition or facilitate collusion, thus increasing prices. But they may also create synergies that reduce costs and ultimately depress prices. One can have mergers between similar firms or, alternatively, a large firm that acquires a smaller competitor. Mergers may involve domestic firms (such as *Boeing* and *McDonnell Douglas* in the US) but they might involve foreign competitors as well (the case of the North-American *Procter and Gamble Company* and the German *Wella AG*). Mergers may be highly profitable though more than a few of them have resulted in large losses for the participating firms. After the announcement of a merger, non-participating rivals have been seen to react in a hostile fashion, while others have seen the value of their shares increase dramatically. The same holds for governments: sometimes they fiercely oppose a merger while in other cases they welcome it. What does economic theory have to say about this?

[1] We make no distinction between mergers and acquisitions. For convenience, we will use the term "mergers" to refer to both operations.

The purpose of this book is to bring the reader up to date with the latest developments that theoretical Industrial Organization literature has produced on the issue of mergers and acquisitions. By "latest" we mean the string of literature that dates back to the 80's and uses Game Theory to analyze business behavior. The book is of interest to specialists working in the field of mergers and acquisitions. They may find here a single source for analytical solutions to the cases they are faced with. The book is also of interest to advanced Microeconomics and Industrial Organization students searching for a "specialization" in merger theory and analysis. In this sense it would be appropriate for a graduate course on advanced Industrial Organization focusing on mergers and acquisitions.

This book provides an Industrial Organization approach to mergers in which effects on profits, on consumer surplus and on overall welfare are of the greatest relevance. Issues concerned with the internal organization of firms before and after a merger are left aside, as well as the financial view of mergers as a means of risk diversification and the impact of merger announcement on the stock market value of bidders and targets.[2] The emphasis is primarily on horizontal mergers, that is, mergers involving firms operating in the same product market. Vertical and conglomerate mergers are addressed when the producers of complementary goods are involved. The book is mainly of a theoretical nature, and so little attention is devoted to the empirical work in this area.[3]

In this introductory chapter, we will start with a simple framework to introduce some of the key implications of a merger or acquisition. This will be followed by a brief overview of the merger process, from the notification to the final decision on its fate. The relevance of using economic models to help making this decision is then discussed. Finally, an overview of the remainder of the book is provided.

[2] As modeled, for example, in Jovanovic and Braguinsky (2004).

[3] In this respect see for instance Andrade, Mitchell and Stafford (2001), Jovanovic and Rousseau (2002), and the many papers cited therein.

A useful trade-off

An interesting feature about horizontal mergers is that they tend to alter market structure, firms' conduct and market performance. Mergers affect market *structure* because they reduce the number of active players and may also increase or decrease the asymmetries between competitors. Firms' *conduct* is also affected by a merger: firms have unilateral incentives to change their strategic decisions as their profit function is altered. Also, the degree of coordination between competitors may change after a merger. Any merger between sellers of substitutes is hence likely to reduce competition. For instance, if firms compete on price, two (or more) brands that were initially owned by independent rivals now see their prices being set by the same owner. The incentive to undercut the rival's price, in order to increase demand, is no longer present after a merger. In fact, most owners of the merged firm would find it profitable to increase the price of one product to create demand for the other one and so forth. This increase in price is profitable for the firms while it harms consumers: the net effect is negative as the firms' gain is less than what consumers lose, meaning that market *performance* is affected.

However, merger defendants will claim that there are other implications arising from a merger that may invert this negative result. They may even claim that the merger is in the consumers' interests. The reason behind these claims is the following: by producing jointly, insider firms may benefit from lower costs that may arise from a number of reasons. The merged firm may pool its best assets together and may benefit from adopting the best procedures that its constituents individually used and independently learned through time. A larger firm may also obtain better conditions from its suppliers or may benefit from economies of scale. Some fixed costs need not be duplicated after merger and firms may also own complementary assets that are inefficiently exploited when not combined. All this amounts to a reduction in costs and may indeed be sufficient for welfare to increase after a merger. The anti-competitive effects from mergers should be balanced against these

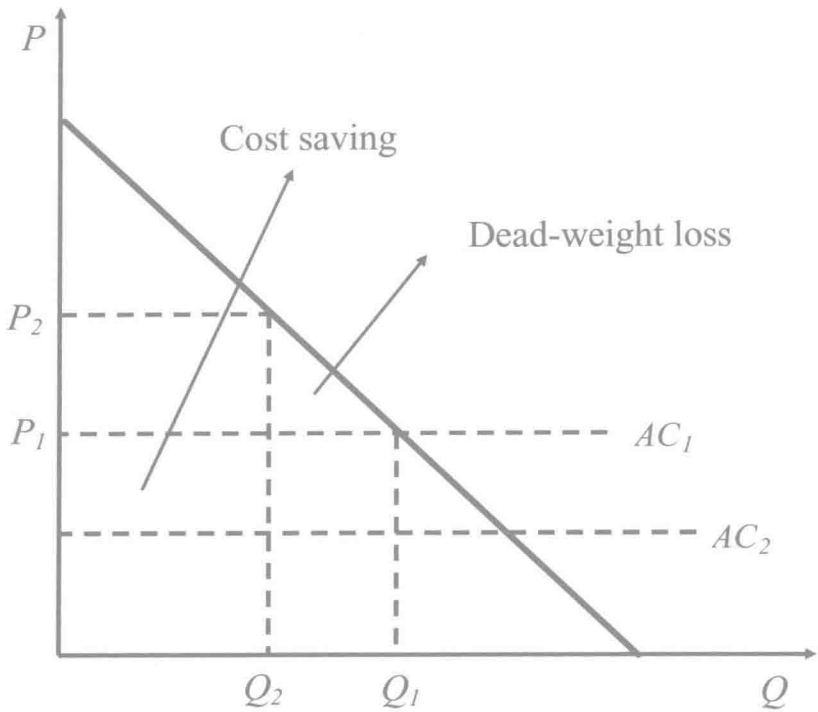

Figure 1-1 Welfare effects of a merger-induced increase in price and decrease in average costs.

eventual benefits. Williamson (1968) showed that, under some assumptions, a small cost reduction would be sufficient to outweigh any negative effects due to an increase in price. Figure 1-1 depicts his argument. Initially, prices (P_1) and industry-wide average costs (AC_1) are assumed to be equal. After the merger prices are assumed to increase to P_2 while average costs decrease to AC_2. The indicated areas represent the loss due to an increase in price as well as the gain resulting from lower production costs. The net effect from a merger is positive if

$$(AC_1 - AC_2)Q_2 - \frac{(P_2 - P_1)(Q_1 - Q_2)}{2} > 0 \Leftrightarrow \frac{\Delta AC}{AC_1} > \frac{1}{2}\frac{-\frac{\Delta P}{P_1}\Delta Q}{\frac{Q_2 AC_1}{P_1}}$$

Defining demand elasticity as $\varepsilon = -\frac{\Delta Q}{\Delta P}\frac{P_1}{Q_1}$ we obtain

$$\frac{\Delta AC}{AC_1} > \frac{\varepsilon}{2}\left(\frac{\Delta P}{P_1}\right)^2 \frac{Q_1}{Q_2}$$

Hence, provided that cost reductions are sufficiently large, the merger will increase total welfare. It is possible to compute, for each percentage increase in price, how much average costs would have to fall (as a percentage) for welfare to remain unchanged. It is easy to see that, for a given increase in price, the cost reduction must be higher when demand is very elastic (at the initial equilibrium), which implies that output will fall substantially.

But how likely is this to happen? Despite being extremely useful as a way of presenting the main forces at work, this analysis leaves several questions unanswered. The missing link here is that the change in prices is not independent of the decrease in costs or of market elasticity. The extent to which lower costs result in lower prices depends on the type of interaction in the market and on its own characteristics. In particular, depending on factors such as the type of competition, the degree of rivalry, the shape of the demand curve and the number of competitors, the same cost efficiencies may yield very different outcomes. This implies the need to carefully analyze each case in hand, a task that is generally carried out by the antitrust authorities.

The merger process in practice

Evaluating the consequences of a merger typically follows several stages. The first stage assesses whether the merger in question falls under the jurisdiction of the authorities. The second stage involves defining the relevant market. Finally, the third stage consists of an investigation of the effects of the merger. In what follows we will briefly overview each of these stages and compare how different authorities deal with them.

Assessing whether a merger falls under the jurisdiction of the authority should be relatively straightforward. A merger justifies the authority's attention if the dimension of the firms involved exceeds a certain threshold. For instance, the EC Merger Regulation considers that a merger has a Community dimension if (i) the aggregate worldwide turnover of all the parties involved exceeds ECU 5000 million, (ii) the aggregate EC-wide turnover of at least two of the participants exceeds (individually) ECU 250 million and (iii) at least one of the participants does not produce 2/3 of its EC-wide turnover within one member state. In some countries the threshold for the *absolute size* of the undertakings may be combined with one pertaining to the *relative size*. In Portugal, for instance, firms are subject to mandatory notification if the aggregate market share of the insiders exceeds 30%, or if the aggregate turnover of the participants is in excess of ECU 150 million, provided that at least two of the firms involved have a turnover in excess of ECU 2 million. Interestingly, for firms with an aggregate turnover below ECU 150 million, the obligation to notify the authorities depends on market shares which, naturally, depend on the market definition adopted. This, however, can be subject to strong debate.

Defining the relevant market

In an attempt to make clear what the relevant market is, the US Guidelines have, since 1982, based their analysis on the hypothetical monopolist or *SSNIP* test. The relevant market is defined as the smallest group of products and geographic area for which a hypothetical monopolist, selling those products in that area, would profit from a small, significant, non-transitory increase in price (*SSNIP* - in practice a 5 to 10% increase in price). Thus, the relevant market is the narrowest one in which a given degree of market power could be exercised. It is implicit that if such price increase is profitable then demand must not decrease substantially, meaning that there are no substitutes close enough to this group of products.[4]

[4] Another widely used tool in the definition of the relevant market is the "critical loss analysis", introduced by Harris and Simons (1989).

The way to obtain the products (and geographic area) that belong to this market is as follows. First an estimate is made of the effect of the *SSNIP* on one of the products sold by one of the undertakings. If such increase is profitable, then the market is properly defined. Otherwise, demand has fallen substantially for the firm. If this is the case, it is necessary to identify the product to which most of the consumers switched. This product is then included in the relevant market and the test is repeated, this time increasing the prices of both products. The same steps should be followed until the hypothetical increase in price is shown to be profitable. This procedure is also applied to define the relevant geographic market. The *SSNIP* test has recently been introduced in Europe and can also be found in Canada.

Note that the group of products that result from such a process are related only to the extent that consumers consider them as substitutes. This means that the relevant market may include products that are technologically unrelated but serve the same purposes and may not include highly similar products that, for some reason, consumers do not regard as substitutes.

Supply-side substitution is not considered at this stage but is relevant in the investigation stage. The risks of not taking supply-side substitution into account are clear. Consider the case (cited by Neven, Nutall and Seabright) of the *Pepsi Co/Kas* merger. The EC observed that there is a low demand substitution between flavors of carbonated soft drinks. Nevertheless, despite the large market share that the merged company would have in the lemon market, it would hardly be possible to exercise any market power due to the ease with which its competitors could switch from the production of one flavor to another (high degree of supply substitution). A price increase would most certainly induce other companies to switch production to this market, reducing profitability. Thus, when market definition is based only on demand substitution, supply substitution must necessarily be considered in the following stage.

Merger investigation

At the final investigation stage, the effects of the merger on welfare should be evaluated, balancing possible gains with the likely negative aspects. The US Merger guidelines explicitly consider this, whereas the EC mainly assesses the presence of dominance, defined as the ability of a firm (or, in the case of collective dominance, a group of firms) to behave to some extent independently of competitors and consumers.[5] Among the dominance-enhancing or hindering factors considered by the EC at this stage, one can find ease of entry (analysis of potential competition and barriers to entry), competition by other firms, efficiencies (in some cases) and buyer power. Until recently, the EC used market share as a proxy for market power and complemented its analysis with qualitative considerations regarding the factors mentioned above.

In the US, the Herfindahl-Hirschman Index (*HHI* - sum of the squares of all the firms' market shares) is used to measure concentration and to help determine whether a price increase is likely after a concentration operation. If the post-merger *HHI* is inferior to 1000, the merger is challenged only in exceptional conditions because the market is considered unconcentrated. For *HHI*s between 1000 and 1800 the market is considered moderately concentrated and the merger is likely to be challenged if it increases the *HHI* by more than 100 points. Finally, for *HHI*s above 1800, the merger might be challenged when it raises the index in excess of 50 points and will be challenged when this increase exceeds 100 points.

By permitting mergers that hardly increase the *HHI* the authorities are relying on an inverse relation between welfare and the index. This relationship is known to exist, for instance, when firms are symmetric Cournot competitors. Unfortunately, this is not always the case, as the following simple examples illustrate. Consider the merger between two duopolist firms with different marginal costs. The merger will unambiguously increase market concentra-

[5] Note that the conception of dominance as the ability to behave independently of competitors and consumers is a legal formula that makes little sense from an economic point of view: no profit-maximizing firm would act independently of consumers in its market, as pointed out by Cour and Møllgaard (2000).