International Journal of Industrial Organization 29 (2011) 356–359

Contents lists available at ScienceDirect

International Journal of Industrial Organization

journal homepage: www.elsevier.com/locate/ijio

Ex ante or ex post competition policy? A progress report

Marco Ottaviani [a,*], Abraham L. Wickelgren [b]

[a] Kellogg School of Management, Northwestern University, 2001 Sheridan Road, Evanston, IL 60208–2013, USA
[b] University of Texas School of Law, 727 E. Dean Keeton Street, Austin, TX, USA

ARTICLE INFO

Available online 15 February 2011

JEL classification:
L40
L50

Keywords:
Competition policy
Regulation
Merger review
Learning
Signaling

ABSTRACT

When intervening in markets, say to block a merger, competition authorities are constrained by the limited information they have about the social desirability of the available alternatives. Compared to ex ante control, ex post control is based on the more accurate information that becomes available in the intervening period, but entails temporary losses to social welfare and reversal costs incurred to unscramble the eggs. Through a toy model, we identify situations in which the competition authority finds it optimal to commit to forego the option of ex post review in order to avoid chilling ex ante socially beneficial mergers. On the other hand, the case for ex post review is strengthened if post-merger market conducts can signal the merged firm's private information about the consequences of the merger.

The process of formulating competition policy frequently requires public antitrust authorities to make difficult judgments amid uncertainty about the competitive significance of various forms of business conduct. Will a merger of two significant rivals retard or increase competition? Are the restrictions that limit the freedom of participants in a joint venture reasonably necessary to ensure the development of a new product? Are the business justifications offered to support a refusal to deal or an exclusive contract genuine or contrived? (Kovacic, 2001, page 844).

1. Introduction

A key challenge of competition policy is to base intervention on accurate information. For example, when deciding whether to block a merger, a competition authority faces the daunting task of assessing the likely effects of the merger on consumers. In the merger review process the authority should forecast how the market evolution will be affected by the merger: What is the right way to define the market? How will the remaining competitors react to the merger? Will new players enter the market? How will technology develop? How will demand evolve? Alternatively, the authority could take a "wait and see" approach by letting the merger go through so as to have a more accurate picture of the actual effects of the merger. However, unscrambling the eggs can be very costly once the merger is already in place:

> Fashioning a divestiture package after the close of a merger is difficult. Where two companies have combined their business operations and have begun the process of assimilating product lines, combining real estate, shedding duplicative manufacturing capabilities, or aggregating intellectual property, a post-close order of divestiture may be difficult, costly, punitive to the business involved in the merger, and, overall, detrimental to customers (Sher, 2004, pages 81–82).

The question then arises of the choice between (and optimal mix of) ex ante control and ex post control.

This paper highlights some of Ottaviani and Wickelgren's (2010) findings on the optimal timing of approval regulation. Even though the analysis applies to many other regulatory approval processes, for concreteness we focus on competition policy, with a particular emphasis on merger control. In the Unites States the principal federal statute relevant for the merger review process is Section 7 of the 1914 Clayton Act which prohibits mergers and acquisition whose effect "may be substantially to lessen competition, or to tend to create a monopoly."[1] The probabilistic language of the Clayton Act could have given the government substantial latitude in blocking mergers. However, the government found it difficult to prove the merging parties' intent to merge and so obtain preliminary injunction to block transactions before they are enacted. Once firms had already mingled their assets, it became difficult to reinstate the pre-merger market structure.[2] To alleviate this problem, the Hart–Scott–Rodino (HSR) Antitrust Improvement Act of 1976 introduced the current premerger

* Corresponding author.
E-mail addresses: m-ottaviani@northwestern.edu (M. Ottaviani), awickelgren@law.utexas.edu (A.L. Wickelgren).

0167-7187/$ – see front matter © 2011 Elsevier B.V. All rights reserved.
doi:10.1016/j.ijindorg.2011.02.004

[1] The existence of some loopholes made it very difficult to apply Section 7 of the Clayton Act until the passing of the Celler–Kefauver amendments in 1950. Lewis (1972) reports that the number of Section 7 suits brought by the U.S. government increased from 21 in the period 1914–1955 to 167 in the period 1956–1971.

[2] For the period before the institution of the premerger notification program, Elzinga (1969), Pfunder et al. (1972), and Rogowsky (1986) provide evidence on the ineffectiveness of divestiture orders in reinstating pre-merger conditions.

notification program that requires parties involved in sufficiently large mergers to notify their intention to merge before closing the deal.[3] Following notification, mergers are cleared or challenged.

Nevertheless, the government can still challenge consummated mergers.[4] As stated by former Federal Trade Commission (FTC) Chairman Timothy J. Muris (2001): "We are quite prepared to go after consummated mergers or mergers that are too small to require an HSR filing." Even though this option is rarely used, in recent years mergers have attracted increased ex post scrutiny. Note that ex post interventions after HSR approval are not precluded under the current system, although they are rare.[5] Since 2009 the FTC has challenged seven consummated mergers, compared to an average of one per year in the past. There has been a similar spike in civil investigative demands issued by the Department of Justice, with seven in 2009, two in 2008, and one in 2007.

We proceed to analyze the tradeoff between ex ante and ex post regulatory control through a streamlined model. The model is a binary-state version of the continuous-state model of Ottaviani and Wickelgren (2010), to which we refer for a more detailed discussion of the literature. Besanko and Spulber (1993) formulate an early model of the merger review process, but in their setting the authority does not choose the timing of the decision, as in our model. Our model can be seen as a simple collective experimentation problem (see Strulovici, 2010), given that information about the effect of the merger is generated only if both the firm makes the acquisition and the antitrust authority allows it.

Even though our presentation focuses on merger control, the tradeoff between ex ante and ex post regulation is relevant for many other competition policy decisions, such as those regarding agreement among competitors and vertical restraints. Through the adoption of Council Regulation (EC) 1/2003 (so called Modernisation Regulation), the EU has recently implemented a move toward ex post control in the regulation of agreements among competitors, thereby phasing out an ex ante control system (originally established by Regulation 17/62) based on mandatory notification.[6] In the area of consumer financial protection and financial stability, instead, the recent financial crisis has spurred a move toward increased ex ante regulation.

Section 2 introduces our toy model. Section 3 analyzes the baseline model with symmetric learning about the consequences of the merger. Section 4 extends the model to allow the firm to observe privately the effect of the merger and to signal it to the antitrust authority though its market conduct. Section 5 concludes with a summary of the findings and an overview of our broader research on the timing of approval regulation.

2. Toy model

In period 0, a firm is contemplating an acquisition. The change in profits from the acquisition will depend on the market power generated as well as on the efficiency gained. Assume for the moment that the efficiency gains are common knowledge to both the firm and the antitrust regulator and that these increase profits and consumer surplus, while the amount of market power generated is uncertain.[7] With probability q the post-acquisition level of competition in the market is high, in which case the net payoff from the deal for the firm is π_H and the social payoff is $\theta_H>0$, and with probability $1-q$ the deal generates a lot of market power so there is little competition in the market, in which case the payoff to the firm from the acquisition is π_L while the social payoff is $\theta_L<0$. Notice that L and H represent low and high social payoffs, not private payoffs. These are per period payoffs that occur in each of $n+1$ periods starting in period 1.

3. Symmetric learning

If the antitrust authority decides whether or not to approve the deal in period 0, it will do so if and only if

$$q\theta_H + (1-q)\theta_L > 0.$$

Then, expected social welfare is $\max\{(n+1)[q\theta_H+(1-q)\theta_L],0\}$. We proceed under the assumption that the merger generates positive expected profits for the firm, $q\pi_H+(1-q)\pi_L>0$.

Alternatively, say the antitrust authority can allow the deal in period 0 and then review it in period 1. We assume at this point that after seeing what happens for one period, the amount of market power the deal generates becomes known to all. In case the antitrust authority decides to undo the merger after one period, however, the firm must bear a private cost of k to "unscramble the eggs." While private, this cost also detracts from social welfare. Then, in period 1, the antitrust authority will undo the merger in state L if and only if $n\theta_L<-k$, while it will never undo the merger in state H because $\theta_H>0$.[8] If $n\theta_L<-k$, then expected social welfare from ex post review is:

$$q(n+1)\theta_H + (1-q)(\theta_L-k). \tag{1}$$

If instead $n\theta_L\geq -k$, there is never any ex post scrutiny of the deal.

Clearly, if $n\theta_L<-k$, ex post review is optimal if $q\theta_H+(1-q)\theta_L>0$. The interesting issue is whether to prohibit the deal ex ante or wait for ex post review if $q\theta_H+(1-q)\theta_L<0$. Prohibiting the deal leads to expected social welfare of zero. We can rewrite the social welfare from ex post review Eq. (1) as:

$$(n+1)[q\theta_H + (1-q)\theta_L] + (1-q)\Delta, \tag{2}$$

where $\Delta=-n\theta_L-k>0$ is the social welfare gain from prohibiting a merger that generates a lot of market power. The first addend in Eq. (2) is negative since we are considering an acquisition that generates negative expected social welfare. The second addend in Eq. (2) is positive and represents the option value from waiting to learn more about the actual effects of the merger.

As one should expect, this option value is increasing in the savings that can be achieved from undoing a socially harmful merger, represented by $\Delta=-n\theta_L-k$. It is also larger the smaller is q, that is, the smaller is the probability of the good state. Of course, larger q also means the first term is not so negative. That said, if we hold constant the expected social loss from the merger, ex post review is more likely to be superior as Δ increases, because the bad state is either more likely (as q is reduced) or more socially harmful (as the social loss θ_L is larger in absolute value or the second period's length n increases). That is, for any given (negative) mean effect of the deal, ex post review is more desirable if the merger is very likely to be bad and very harmful when it is, but when it is good, the social welfare gain is quite large compared to a situation where there is less variance in the effect of the deal.

One potential concern about ex post review, however, might occur in situations in which the deal would be approved ex ante, that is when $q\theta_H+(1-q)\theta_L>0$. The possibility of ex post review might discourage such mergers that are in expectation socially desirable. Under ex post review the antitrust authority will effectively allow the merger only in the state in which the firm wishes it had not merged. If the firm's

[3] We refer to Johnson and Parkman (1991) for more details on the institution of the premerger notification program.

[4] See Compton and Sher (2003), Sher (2004), and Leibeskind (2004).

[5] See Evanston Northwestern–Highland Park Hospital and Chicago Bridge & Iron for two recent highly publicized cases of post hoc reviews of mergers where were notified and initially cleared.

[6] See Barros (2003) and Loss et al. (2008) for details and analyses.

[7] Later in this illustration when we discuss signaling, we will consider a case in which the market power effect of the merger is known but the level of efficiencies are unknown in period 0.

[8] Here we are assuming that the firm stays merged in state H, which would be the case if $n\pi_H\geq -k$.

expected profits under ex post review are negative, $q(n+1)\pi_H+(1-q)(\pi_L-k)<0$, the firm would never undertake the acquisition in the first place, resulting in expected social welfare of 0. If instead the regulator were to commit *not* to review the merger ex post, the firm would merge provided that $q\pi_H+(1-q)\pi_L>0$, resulting in expected social welfare of $(n+1)[q\theta_H+(1-q)\theta_L]>0$. In this case, the social welfare gain in the high state is large enough to compensate for the social losses in the low state when the merger does reduce competition.

One example of this might be a merger which enables two firms to improve the quality of their product. If other firms in the market can also improve their quality, then this merger will not generate market power and may even reduce profits if it reduces product differentiation or increases production costs. If the other firms cannot improve their products very much, this added market power will increase profits but might reduce social welfare more than the gain from a better product. This merger could easily be socially beneficial on average, but ex post review might deter the firms from undertaking it.

4. Private learning and signaling

Consider now the effect of relaxing the assumption that after period 1 both the antitrust authority and the firm learn the true state of the world. Instead, suppose that only the firm learns whether it is in state H or L, but the antitrust authority must infer this from the pricing of the firm. We maintain the assumption, however, that in period 0, both the firm and the antitrust authority have symmetric expectations about the state. In this signaling game, there could be either a pooling equilibrium in which the firm charges the same prices in either state, so the antitrust authority learns no information. Or, there could be a separating equilibrium in which in state H the firm charges a low enough price that the firm in state L would not want to mimic this even if that were necessary for ex post approval. In the pooling case, ex post review has no information advantages. In the separating case, however, the antitrust authority learns the same information as it does if it could observe the state directly. That said, this situation makes ex post review more desirable because the pricing in period 1 is lower than it would otherwise be as the firm in state H must make sure that the state L firm would not want to mimic its price. If there is still some market power in state H, this lower price increases social welfare.

To formalize this argument, we introduce a price choice, p, so that the firm's profit is given by $\pi_j(p)$ in state j. We assume that $\pi_L(p)>\pi_H(p)$ for all p (for any given price, a firm earns more profit if competition is less) and that $\pi_j'(p)>0$ for $p<p^j$ while $\pi_j'(p)<0$ for $p>p^j$. Furthermore, $p^L>p^H$ and $\pi_j'(p)>\pi_H'(p)$ (the lower the level of competition the higher the optimal price and the greater the marginal benefit from increasing price). Lastly, $\pi_j''(p)<0$ for $p<p^j$. These assumptions are all consistent with standard models of differentiated Bertrand competition.

4.1. Conditions for a signaling equilibrium

For the firm in state H to be able to signal the state by charging a price of p_H, the following conditions must hold:

$$\pi_H(p_H)+n\pi_H\left(p^H\right)\geq\pi_H\left(p^H\right)-k, \tag{3}$$

$$\pi_L(p_H)+n\pi_L\left(p^L\right)\leq\pi_L\left(p^L\right)-k. \tag{4}$$

The first condition guarantees that the type H firm prefers to charge a price of p_H and have its merger approved ex post (garnering profits of $\pi_H(p_H)$ for period 1 and $n\pi_H(p^H)$ thereafter) than to charge its profit-maximizing price of p^H but to have the merger rejected (garnering profits of $\pi_H(p^H)$ in period 1 but losing k thereafter due to having to undo the merger). The second condition ensures that the type L firm does not want to mimic the type H firm. If these two conditions are satisfied, then the antitrust authority will approve a merger if it observes a price of p_H (or smaller) and reject it otherwise.

Given our current interpretation of the two states, the two conditions in Eqs. (3) and (4) cannot be simultaneously satisfied unless $n<1$. While $n<1$ is not unreasonable (it reflects a situation where the length of time between the ex ante and the ex post review is long relative to the life of the firm after ex post review), it is certainly the exception rather than the rule. That said, if we reinterpret the two states as representing different levels of efficiency gains from the merger, a signaling equilibrium becomes much easier to achieve. Since state H now represents a high level of efficiencies from the merger (rather than a high level of competition), we would now have $\pi_H(p)>\pi_L(p)$ (the merged firm's profit is greater for any given price if the merger generates a high level of efficiencies rather than a low level). We would still have $p^L>p^H$ and $\pi_L'(p)>\pi_H'(p)$ however since the less efficient firm would have a higher profit-maximizing price and would have a greater increase in profit from raising price.

Under these conditions on the profit functions, to see that Eqs. (3) and (4) can always be satisfied for $n\geq1$, rewrite the signaling conditions as follows:

$$\pi_H(p_H)+(n-1)\pi_H\left(p^H\right)\geq-k,$$
$$\pi_L(p_H)+(n-1)\pi_L\left(p^L\right)\leq-k.$$

If p_H is small enough, then the second condition can be met. Let the p_H for which this holds at equality be $\hat{p}_H$. Then we have that $\pi_H(\hat{p}_H)+(n-1)\pi_H(p^H)>\pi_L(\hat{p}_H)+(n-1)\pi_H(p^H)\geq\pi_L(\hat{p}_H)+(n-1)\pi_L(p^L)=-k$. Thus, there always exists a period one price $\hat{p}_H$ for which the type H firm will choose if doing so is necessary and sufficient to ensure the merger is not undone but the type L firm prefers to choose p^L even if that means the merger will be undone. Given this pricing behavior, and the assumption that $-n\theta_L>k$, the antitrust authority will undo the merger if and only if the firm prices at or below $\hat{p}_H$ in period 1.

4.2. Conditions for a pooling equilibrium

Of course, even though a separating equilibrium exists, there may also be a pooling equilibrium that satisfies the intuitive criterion (Cho and Kreps, 1987). This will occur if $\pi_L(p^H)+(n-1)\pi_L(p^L)\geq-k$. This condition says that a type L firm prefers to charge a type H firm's one-period profit-maximizing price rather than charge its own one-period profit-maximizing price if doing so is necessary to make sure that the merger is not undone. In this case, there can be a pooling equilibrium that satisfies the intuitive criterion in which the firm charges p^H in period one regardless of the state.

4.3. Impact of private learning

If $\pi_L(p^H)+(n-1)\pi_L(p^L)<-k$, then there is no pooling equilibrium which satisfies the intuitive criterion. The unique separating equilibrium that satisfies the intuitive criterion has both firms charging their one-period profit-maximizing price — which is the full information price as well. Thus, in this case, the outcome resulting in the private learning scenario with ex post asymmetric information is the same as in our baseline scenario with symmetric learning.

Analyzing the effect of asymmetric information if $\pi_L(p^H)+(n-1)\pi_L(p^L)\geq-k$ is more complicated. In the pooling equilibrium, the antitrust authority gets no additional information from ex post review. That said, under ex post review prices are lower in state L with the merger than they would be under full information. Thus, if the merger would be approved under ex ante review only ($q\theta_H+(1-q)\theta_L>0$), it will be optimal to threaten ex post review as long as social welfare is greater in state L with prices of p^H than with prices of p^L. This will be the case if the market power in state L is large relative to the efficiency

difference between state H and state L so that inducing the firm to charge p^H is greater than (or even not much smaller than) its marginal costs. In this case, the value of ex post review is not that it generates more information but rather than it (for at least one period) mitigates the anti-competitive effect of the merger in the bad state.

If $\pi_L(p^H)+(n-1)\pi_L(p^L)\geq -k$ and we have a separating equilibrium, then ex post asymmetric information does not reduce the informational advantages of ex post review. The antitrust authority can perfectly infer the state even though it cannot observe it. In this case, ex post asymmetric information may actually make ex post review relatively more attractive. This will occur if social welfare in state H is greater at a price of $\hat{p}_H$ than at a price of p^H. If the firm still has some market power in state H and $\hat{p}_H$ is sufficiently close to p^H, then under ex post review period one prices in state H generate more social welfare if there is ex post asymmetric information than if there is ex post complete information. Intuitively, the need to signal its type prevents the type H firm from fully exercising its market power.

5. Conclusion

Our analysis reveals that ex post control has an undesirable chilling effect on ex ante incentives to undertake some socially desirable mergers. Such mergers would not be undertaken unless the government is able to commit not to undo them when they turn out to be socially detrimental. This effect clarifies a concern often voiced in the policy debate, see for example Bromley (1958, pages 646 and 651) and the related discussion in Sher (2004, pages 63–64).

Next, consider the case in which the new information about the effect of the merger is observed only privately by the merged firm. As we show, the firm might then have incentives to distort its post-merger actions to influence the government's ex post regulatory decision. Our analysis uncovers instances in which this signaling distortion resulting with ex post enforcement actually increases efficiency without loss of information. According to this discipline effect, the threat of ex post review has the advantage of disciplining a firm's post-merger market conduct. Jurisprudence and legal scholarship, instead, stress that courts should use market structure but not market conduct (which is clearly endogenous) to conclude whether a merger raises competition concerns (see Sher, 2004, pages 67–80). However, we contend, market conduct can contain valuable information.

As Ottaviani and Wickelgren (2010) argue, the tradeoff between ex ante and ex post policy intervention is relevant for a wide array of regulatory approval processes set in place by governments to protect consumers from potential damage from private economic activities. Beyond competition policy, applications include food and drug safety regulation, occupational health and safety regulation, urban planning and zoning, and professional licensing. In all these situations there is a substantial amount of uncertainty about the sign and magnitude of the externality generated by the private activity. In addition, more precise information about the extent of the externality typically becomes available once the activity is undertaken, but at that stage some of the damage is already done and the activity becomes costly to reverse.

References

Barros, P.P., 2003. Looking behind the curtain — effects from modernization of European Union competition policy. European Economic Review 47 (4), 613–624.

Besanko, D., Spulber, D., 1993. Contested mergers and equilibrium antitrust policy. Journal of Law, Economics and Organization 9 (1), 1–29.

Bromley, B., 1958. Business view of the Du Pont General Motors decision. Georgetown Law Review 46, 646–654.

Cho, I.-K., Kreps, D.M., 1987. Signaling games and stable equilibria. Quarterly Journal of Economics 102 (2), 179–221.

Compton, C.T., Sher, S.A., 2003. If at first you succeed … counseling for the close of a merger between competitors. Mergers and Acquisition Newsletter 4 (1), 3–8.

Elzinga, K.G., 1969. The antimerger law: pyrrhic victories? Journal of Law and Economics 12 (1), 43–78.

Johnson, R.N., Parkman, A.M., 1991. Premerger notification and the incentive to merge and litigate. Journal of Law, Economics and Organization 7 (1), 145–162.

Kovacic, W.E., 2001. Evaluating antitrust experiments: using ex post assessments of government enforcement decisions to inform competition policy. George Mason Law Review 9, 843–861.

Leibeskind, Richard, 2004. Challenges to consummated mergers: making the game worth the candle. Mergers and Acquisition Newsletter 4 (2), 25–32.

Lewis, G.S., 1972. Preliminary injunctions in government section 7 litigation. Antitrust Bulletin 17 (1), 1–18.

Loss, F., Malavolti-Grimal, E., Vergé, T., Bergès-Sennou, F., 2008. European competition policy modernization: from notifications to legal exception. European Economic Review 52 (1), 77–98.

Muris, T.J., 2001. Antitrust Enforcement at the Federal Trade Commission: In a Word — Continuity. Prepared Remarks before American Bar Association Antitrust Section Annual Meeting, Chicago, IL.

Ottaviani, M., Wickelgren, A., 2010. Approval Regulation and Learning, with Application to Timing of Merger Control, Northwestern University mimeo.

Pfunder, M.R., Plaine, D.J., Whittemore, A.M.G., 1972. Compliance with divestiture orders under section 7 of the Clayton Act: an analysis of the relief obtained. Antitrust Bulletin 17 (1), 19–180.

Rogowsky, R.A., 1986. Economic effectiveness of section 7 relief. Antitrust Bulletin 31, 187–234.

Sher, S.A., 2004. Closed but not forgotten: government review of consummated mergers under section 7 of the Clayton Act. Santa Clara Law Review 45, 41–98.

Strulovici, B., 2010. Learning while voting: determinants of collective experimentation. Econometrica 78 (3), 933–971.