Pre-merger Notification Mechanisms: Incentives and Efficiency of Mandatory and Voluntary Schemes

Aldo Gonzalez and Daniel Benitez*

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Abstract

We compare the two current merger control mechanisms employed worldwide: The mandatory system contingent on the merger size and the voluntary with ex-post monitoring. On the basis of the existing literature and our own work, we conclude that the voluntary system has two main advantages compared to the mandatory regime: (i) It allows the competition agency to discretionally select the mergers to investigate. (ii) It employs fewer resources in controlling a given set of mergers due to the ex-post monitoring action. The superiority of the voluntary system relies on the ability of the antitrust system to apply penalties for unlawful omission to notify and to promptly react to stop the consummation of likely anticompetitive mergers. These conditions may not be satisfied in economies with weak enforcement of law or with insufficient experience in antitrust supervision.

* University of Chile (agonzalez@fen.uchile.cl) and the World Bank (dbenitez@worldbank.org) respectively.
1. **Introduction: Merger control and antitrust policy**

Since the Sherman Antitrust Act (1890) as a first attempt to limit cartels and monopolies in the US, competition policy has evolved to supervise a large variety of complex problems that affect the functioning of competitive markets. Modern competition laws include the assessment of horizontal and vertical agreements, the enforcement against the abuse of a dominant market position, and the control of mergers between firms.

Mergers and acquisitions are often legitimate responses to changing business conditions, such as local and global competition, technological change, deregulation, and overcapacity. Every day mergers and acquisitions are arranged bringing together separate companies to make larger ones. In antitrust analysis, mergers are named **horizontal** when they occur between firms that compete in the same market, **vertical** if they integrate different segment of the supply chain within a firm and **conglomerate** if the merging firms operate in adjacent markets and they produce good that are either complements or independent from the demand point of view.

Williamson (1968) pointed out that horizontal mergers have an inherent trade-off between efficiency gains and market power. Mergers allow firms to internalize pricing externalities among former rivals, increasing their exercise of market power, and therefore reducing social welfare. On the other hand mergers may reduce production costs and create efficiencies that may end up favoring firms and consumers.

In vertical mergers although the presumption of anticompetitive danger is less clear than in horizontal mergers, there is a risk of foreclosure of competitors by controlling the access of an essential facility or indispensable input. In the case of conglomerate mergers the main concern is the consolidation of a dominant firm that through the use of business practices like bundling or full line forcing may deter the entry of competitors or to force them to leave one of the markets.

Unlike other horizontal agreements, merger control has to be done in a preventive way. Mergers are a highly irreversible process, once they occur it is very costly if not impossible to bring back the market structure to the status quo. During the merger, firms
combine assets, technologies, and redesign their organization and management making unfeasible to undo the process once consolidated.\(^1\) Despite that some anticompetitive effects of a merger can be controlled ex-post, the Competition Agency (CA) may not be able to implement feasible remedies to solve all the competitive problems that a merger may cause.\(^2\) These reasons explain why merger control is prospective, and why CA must decide on the basis of its best prediction about the likely effect on competition that the merger will cause in the involved markets.

In this article we compare the two mechanisms employed worldwide to control mergers: the ex-ante mandatory and the voluntary notification system. The contrast we make between both mechanisms is mainly based on the relative effectiveness to detect anticompetitive cases and on the cost of the merger control process.

There is a growing literature that studies the contribution of competition law, which includes merger control, to the economic performance and the well being of consumers around the different countries.\(^3\) We take here as given the positive effect of merger control to the competitiveness of the economies and focuses instead on the implementation stage of a merger enforcement mechanism, particularly in the procedures and rules of the different notification systems. Although we concentrate mainly on horizontal mergers, our analysis is general enough to be valid for vertical and conglomerate mergers as well.

2. Toward a Competitive Market: The Goals of the Merger Control Policy

In a world of perfect information or where the CA were able to discover at no cost the likely effect of a potential merger, the mechanism employed to evaluate a transaction would be irrelevant. On that fictitious scenario, all anticompetitive mergers would be costlessly prevented without error. However, as we know, the CA is less informed than

\(^1\) The term “unscrambling the eggs” is often used by experts to explain the irreversibility of mergers.

\(^2\) According to Hovenkamp (1999), merger control has become the best remedy against tacit collusion.

\(^3\) The works of Dutz and Hayri (2002) and Kee and Hoeckman (2003) show the positive contribution of antitrust law to economic growth and to lower industry mark-up respectively. For a summary of this literature see Xhang and Dong (2008).
firms about the relevant market variables such as – technology, cost structure, competition strategies, etc- that have incidence in the effect on welfare of a merger. Firms, as informed parties, have not always the incentives to truthfully reveal the information they have because it may lead to unfavorable decisions to them. Hence, CA must spend resources on verifying and acquiring relevant information about the merger in order to make the right assessment. In this sense, different notification mechanisms - mandatory or voluntary – may yield different outcomes in terms of the pursued goals of merger control.

The objectives of a control merger policy should be the following:4

(i) **Induce right decisions.** The mechanism must decide with the lowest possible error. It should tend to reject the anticompetitive mergers and to approve the competitive ones.

(ii) **Minimize the administrative burden in cost and time.** Reviewing a merger is costly for both the interested firms and the CA. These costs involve human and physical resources employed in the economic and legal analysis of the transaction. Interested parties have to prepare reports and submit evidence about the scope and characteristics of the undertaking, which then is reviewed by the specialized staff of the CA. In addition, there is an opportunity cost for firms and eventually to the society, associated to the delay of the materialization of the merger.

(iii) **Transparency and accountability.** Merger control mechanisms are created by laws and placed in practice through institutions like public agencies and courts. The implementation of these procedures should minimize the risk that agencies be abusive or negligent at the moment of enforcing the rules.

It is evident that these three properties cannot be fully satisfied simultaneously. The asymmetry of information between the firms and the CA makes no evident at first sight the negative effects derived from the merger. In order to reduce the informational gap, the CA needs time to learn about the proposed operation and to evaluate its likely effects on

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4 According to Sullivan and Grimes (2000)
competition. Thus, there is a first trade-off between objectives (i) and (ii). If an agency wants to minimize the risk of a wrong decision it will demand more time and resources to evaluate the case. In fact, there are two types of risks. A very long review process delays the start up of potential social desirable mergers or even discourages them to be proposed. On the other hand, investigations accomplished in a very short-term frame are likely to induce misleading decisions, either rejecting positive mergers or accepting those that damage competition.

A second trade-off between objectives (ii) and (iii) emerges. If we want to reduce the scope for discretionary behavior from the CA and introduce transparency in its actions, we must require that the agency explains and justifies its decisions. Then, the CA will need to report why some merges are not investigated in more detail or challenged. However, this requirement is likely to raise administrative costs since the competitive risks associated to a merger are not trivial to identify and explain.


In this section, we describe the two approaches employed worldwide to control mergers: the compulsory and the voluntary system. Most of the countries that have specific legislation on mergers count with mandatory mechanisms to control the transactions. According to the LexMundi survey on Pre-Merger Notification Systems (2007) 41 out of 48 countries have a compulsory notification system, whereas the seven remaining countries have a voluntary system. Among the latter group of countries we have Australia, Chile, New Zealand, United Kingdom and Venezuela.

3.1 Mandatory pre-notification scheme

One of the characteristics of the mechanism denominated obligatory is that no all the transactions need to be reported. Generally, there are well-defined thresholds, in terms of the transaction and parties’ size, above which firms are obliged to report the merger and wait until the CA makes a pronouncement that merger is approved. In contrast, all the transactions below the threshold can be consummated without a formal approval of the
CA. The requirement of notification is usually dictated by law and firms are sanctioned if they do not proceed in accordance with the competition guidelines. The enforcement of this rule does not seem to be an issue because mergers are usually public events, so the agency can identify them at low cost.

Agencies usually employ the transaction size or some variables related to the magnitude of the merger as a first filter to identify cases that need to be reviewed. In principle, large mergers are not necessarily more anticompetitive in expected terms, than those of small size. However, in case of being harmful for competition, large transactions amplify the cost for the society. On the contrary, small mergers will not produce a large social loss, in absolute terms that worth to devote resources in investigating it. Since the evaluation of a merger is costly, it is natural that agencies tend to focus more in large operations than in smaller ones.\(^5\)

Why we do not use notifications thresholds based on variables more directly related to the anticompetitive risk of the merger instead of using an imperfect signal such as the transaction size? As stated by the theory, the probability of having an anticompetitive merger depends on some characteristics of the market and the firms themselves, such as market concentration, market shares of merging companies, entry barriers, likelihood of collusion and the expected efficiency gains. However, all these factors are difficult to objectively measure ex-ante in order to use them as a condition to report a merger.

For instance, the market shares of the involved firms are not always easily observed because they depend on the definition of the relevant market, which in turn is an intermediate outcome of the review process. Similarly, entry barriers are not trivial to identify and measure in each industry. In consequence, it is not possible to find parameters that in one hand show unequivocally the anticompetitive risk of a merger and in the other be easily observed and measured. In practice, the law opts for an indirect indicator, which still conveys information, and at the same time it can be clearly defined and enforced as is the case of the transaction value of the merger or other variables related to that.

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\(^5\) According to OFT a merger revision process in UK may cost to the involved agencies between 300,000 and 750,000 British pounds.
There is evidence that supports the positive relationship between the above indicated factors and the evaluation of anticompetitive risk by the enforcement agencies. In the U.S., Coate, Higgins y Mc Chesney (1990) analyzes the factors that influence FTC decisions on more problematic mergers, on a universe of seventy mergers that went to the second request phase, under the revision of the FTC. The authors estimated the impact of four industry variables – level of HHI\(^6\), change in HHI, entry barriers and likelihood of collusion\(^7\) - in the chance that the merger were rejected or approved with remedies by the FTC. The results show effectively that these four variables are positively correlated with the possibility that the commission either block the merger or ask for remedies. Similar analysis was done later by Coate and Ulrick (2006) for a set of second request cases analyzed by the FTC between 1996 and 2003. The results confirm the above findings on effects of the industry and merger parameters in the likelihood of enforcement action. Also, some industry specific effect mattered since mergers in oil, chemical or groceries sectors were more likely to demand action by the FTC. On Canada, Khemani and Shapiro (1992) report that concentration and market shares of merging firms are the most important variables at the moment of predict whether a merger will be challenged by the Canadian CA. In addition, their results suggest that entry barriers and the existence of import competition also play a relevant role on the decision of the agency.

Bergman, Jakobson and Razo (2005) found results in the same line for a sample of mergers submitted before the European Commission between 1990 and 2002. They obtain that ex-post merger market shares, significance of entry barriers and easiness of collusion make more likely that a merger either goes to a second phase revision or to be blocked by the commission. In New Zealand, Strong, Bollard y Pickford (2000) studied the determinants of market dominance, according to the assessment done by the competition agency on mergers cases. They obtained that merging firm joint market share and the height of entry barriers had a positive effect in the probability that dominance were found. In particular, when entry barriers were high, having a 75% of market share

\(^6\) HHI stands for Herfindahl-Hirschman Index, which is defined as the sum of square of market shares of the firms belonging to a same market. This index aggregates two dimensions: the number of participants in the market and the asymmetry on market shares.

\(^7\) These two last variables were measured in a binary way.
derives in a 50% of probability of finding dominance.\textsuperscript{8} That probability is increased to 95% when the market share rose to 87%.

Usually, the firms’ turnover and their asset value are employed as proxy variables of the magnitude of the merger. In the US, if the transaction is above $252 Millions, the merger must be notified.\textsuperscript{9} For lower transactions, the obligation to notify will depend on the size of both parties. In the EU the volume of sales of the involved firms are used to determine the notification threshold. In Canada, there is obligation to report the merger if the parties have annual sales above C$ 400 Millions.

There is a trade-off in the choice of the threshold between the number of mergers that the agency shall review and the costs involved in the process. The higher the threshold, the lower the number of mergers presented for approval but the higher the likelihood that in the margin, some anti competitive mergers will take place.\textsuperscript{10} The thresholds are reviewed along the time in order to include the effect of price inflation as well as to reflect the changing views of competition authorities about the importance of merger control. Thresholds vary across countries and sometimes they include some exemptions like transactions on financial assets or real states. Also some industries with specific regulation are excluded from the general notification system.\textsuperscript{11}

Once a transaction is notified, it begins a review process that includes several steps. The different stages, the timing, the informational requirements for the merging parties and other details related to the procedure are in general established in antitrust laws or in specific rules governing mergers. Usually, there is a first phase where the CA makes a preliminary review, separating the mergers that may have some anticompetitive risks from those that are harmless. The first set continues to a next review phase whereas mergers belonging to the second set are approved and can be implemented without conditions.

\textsuperscript{8} Under the New Zealand Commerce Act, a merger leading to dominance is a necessary but not sufficient condition to block a merger. Entry barriers were classified qualitatively in three categories: Low, Moderate and High.
\textsuperscript{9} This threshold has been recently increased from $200 Million in February 2008.
\textsuperscript{10} As an idea of the magnitude of the problem, some estimations show that 25 percent of the 1297 mergers observed in Canada were reported in 2000.
\textsuperscript{11} In Europe, some credit institutions are exempted.
In Europe, the first stage is denominated Phase I, which cannot last more than 25 days. The second stage or phase II analyzes the most critical cases and has a fixed term of 90 days, which can be extended—within some limits—if demanded by any of the involved parties. In Japan, the terms are 30 days for the first phase and 90 days for the second. In the US, the Hart Scott Rodino Act contemplates an initial period of 30 days after that, the CA can approve a merger or start a second phased named “second request.” Unlike the European and Japanese regulations, there is no time limit for the Federal Trade Commission (FTC) or the Department of Justice (DOJ) to issue a statement about the merger during the second request period. Note that in complex cases, it is on the common interest of the parties to extend the examination period to achieve a satisfactory deal to both, the CA and the merging firms.

Canada has a particular system of waiting periods, where the maximum examination length is defined after an initial review of the merger. According to the classification made by the CA on the merger in - non complex, complex o very complex- the periods are fourteen days, ten weeks or five months. After these deadlines, the agency is obliged to submit a decision about the transaction.

Once exhausted the review stage, the CA issues a statement detailing whether a merger should be blocked or approved. However, decisions are not always binary, that is, either approve or block a merger. The agency can agree with the firms on some modifications to the initial proposal – usually called remedies – in a way that the transaction becomes satisfactory for the CA as well as for the firms. In Europe, the Commission investigates and decides in a first round. In the US, the courts are the institution that formally has the final decision about allowing or not a merger. If the enforcement agency opts for blocking the merger, and the companies want to continue with the transaction, the CA open a case, where the courts decide following the different levels of appeals. If the CA reaches an agreement with the firms, the merger can take place since it is very unlikely that the court will challenge the decision, under a scenario of no objection from the part of the CA.
3.2 Voluntary pre-notification scheme

Under a voluntary scheme, the firms are not obliged to submit the merger for a review, unless the transaction is likely to pose anticompetitive risk. In that case, the merger must be notified to the CA, entity that after reviewing the case should approve –with or without conditions- or block the transaction.

If firms opt to submit the merger for reviewing, the CA evaluates its competitiveness following a similar procedure as in the case of a mandatory notification. If parties proceed with the transaction without notification, the CA may review it or not. If the CA decides to launch an investigation, without a prior notification from the interested parties, and finds that the merger carries out serious anticompetitive effects it may apply measures to avoid the materialization of the merger or to order some remedies in case that the merger was already consummated. In Australia and New Zealand the CA has the right to apply fines in addition to the above mentioned measures. If the investigation concludes that there is no anticompetitive risk, it does intervene in the merger.

This mechanism lets the interested parties to undertake the decision to notify or not the operation. The firms should have a good understanding of the criteria followed by the CA to decide if the merger creates risks for competition when they decided to notify (or not) the transaction. For such a reason, the regulation usually sets the criteria employed by the CA to determine the degree of anticompetitive risk of a merger. Both, the Merger Guidelines in Australia and New Zealand establish a threshold on concentration on the relevant market, denominated “safe harbors” under which is unlikely that the merger will weaken competition and thus, making unnecessary the notification.

However, as mentioned in the legislation, such thresholds are only rouge estimation and they do no replace a case-by-case analysis. Thus, there will always be some degree of uncertainty about whether a merger should be notified or not. This fact does not occur when the conditions to notify depends on the magnitude of the transaction, as it is the case of a mandatory notification scheme.

To have firms notifying when needed, they not only should have the knowledge of the criteria adopted by the CA but also they should have clear incentives to submit the operation for a review. Naturally, there is a risk that firms behave unlawfully, executing
the merger even knowing that they will be penalized afterwards. This risk is exacerbated by the costly or even impossible reversion to the market structure existing in the pre merger scenario. It is crucial that the CA had the ability to react and commit to act vigorously in order to avoid that mergers with a high competitive risk be consummated without previous notification. The regulatory framework must provide the necessary instrument –fines and remedies- to act against unlawful avoidance of revision by the CA.

In general, the instruments used by the antitrust system oriented to induce voluntary notifications in cases that mergers are likely to lessen competition are: (i) pecuniary fines, (ii) costly remedies on transactions already implemented, and (iii) approval of the merger with conditionalities. The first two instruments act as sticks since they impose a cost to the firms that knowing that a notification was required, they opted to avoid it. The last instrument looks like a carrot since it offers the firms with the possibility to accommodate the merger to the requirements of the CA instead of being totally refused by the agency – if the operation can be improved to eliminate the damage to competition. In Australia, the firm that does not notify a merger can only opt for an approval or a refusal – dichotomy decision – and it does not dispose of an intermediate solution that allows for a merger with conditionalities.

4. Comparison between the Systems

This section provides a qualitative comparison of both mechanisms, describing their advantages and drawbacks according to the objectives stated in Section 2. We assume that both schemes are equally accurate to perform an investigation on a case, independently of whether the merger was notified by the firms or the CA decided to investigate it. Mergers submitted to investigation are thus evaluated and without error, the CA determines if they anticompetitive or not. In our analysis, the difference between both schemes resides on the universe of mergers that are investigated and in the efficiency of the resources allocated to the task of monitoring and reviewing.
4.1 Incentives to avoid control

In the mandatory system, all mergers that are above the threshold for submission are reviewed and therefore, following our previous assumption, they should be approved or rejected according to their competitive impact without error. On the other hand, a well-structured voluntary system should induce the self notification of likely anticompetitive mergers, avoiding thus its materialization without previous approval. The fact that merger are highly irreversible confers great incentives to the firms to continue despite its effects on competition.

If the fines administrated by the voluntary system are not high enough to discourage the integration and the antitrust system does not respond timely, the firms may prefer to merge anyway and pay the fine instead of losing the opportunity of executing the transaction. Maximum fines that are not sufficiently high make a screening that goes against the objective of the CA. Larger mergers are the ones that are more likely to have incentives to avoid notification due to its bigger private benefits, and also are the more likely to be harmful if the are anticompetitive. Thus, the voluntary system compared to a mandatory notification will not be able to avoid large anticompetitive mergers if the fines are not set accordingly.

In theory, the risk that firms take the way of faits accomplis also exists in a mandatory system. Merging firms may decide not to notify despite that the transaction size is above the threshold defined by the law, and go on with the process. However, this risk is lower compared with the one generated by a voluntary scheme. It is easier to show before a court that firms acted illegally when the requirement to notify is determined by well-defined and easily-verifiable parameters, as the one used in a mandatory scheme, than when the conditions are more difficult to prove like the anticompetitive potential of a merger. This difference in the clarity of the rule plays a crucial role, making easier to prove the illegal action in a compulsory system. There will be less degree of freedom to undertake mergers out of the law than in the voluntary system in which the proof of competitive harm of a merger will demand more time and resources.

The transition from an ex-post control to a mandatory scheme in the US, through the Hart Scott Rodino Act in 1976, is mainly explained by the inability of the former system to
properly examine potentially harmful mergers before they were executed. Given the already mentioned irreversibility, the companies had strong incentives to speed up the operation, joining their assets as soon as possible without collaborating with the authorities in providing with the relevant information about the operation. In such a way, they hindered the job of the CA on the elaboration of the case to ask for a “preliminary injunction” to the court in an attempt to at least block the merger temporally.

Some studies at that time showed that just few mergers could be effectively investigated ex-ante and only in a small share of them, the CA obtained a preliminary injunction. Some estimations show that around 70 percent of the more problematic mergers could not be temporally stopped via a judicial process in order to be properly investigated before its materialization.\textsuperscript{12}

The option the competition agencies had was to act ex post, prosecuting through a judicially process all those mergers considered as anticompetitive. Although in most of the cases - around 90 percent - the CA obtained favorable decisions from the courts, some facts played against the chance of blocking a merger in such a way. First, the long period needed by the court to solve the litigation – on average between five to six years. Second, the remedies that the CA could apply to fix the competitive problems of the already materialized mergers were usually ineffective. Elzinga (1969) found that in the 90 percent of the 39 cases analyzed between 1950 and 1960, the remedies were either unsuccessful or insufficient. The author mentioned that after large and costly litigation process, that finally supported the claim of the CA, meant a pyrrhic triumph for the agency as they did not solve the real problem: avoid the configuration of less competitive market structure.

\textbf{4.2 Agency Discretion}

In a voluntary system the CA has the flexibility to select the mergers to investigate. Besides the transactions voluntarily submitted by the parties, the agency by its own initiative, may scrutinize non notified mergers, where there are valid presumptions about

\textsuperscript{12} Lewis (1972).
the anticompetitive risk without being restrained by pre-established thresholds. In contrast, under the mandatory system, the agency must follow the notification thresholds, which not always convey sufficient information about the dangers of a merger.

Hence, irrelevant mergers from the competitive point of view will not be notified nor submitted to an investigation by the CA under the voluntary regime. On the contrary, in the mandatory system, there is a set of mergers that classify to be notified and investigated by the CA - due to their magnitude above the threshold- despite of having a low competitive risk.

Agencies, in the obligatory system, cannot refuse to review competitively harmless mergers that fall within the notification thresholds. The agencies have a mandate to inspect these mergers and to provide a recommendation according to the guidelines. Eventually, the time dedicated to those cases can be minimized by the CA by speeding up brief reports in short periods. In any case, some resources are employed in addition to the costs faced by the parties, who need to notify and wait the formal approval before initiating the merger.

In the jurisdictions that introduced the mandatory system, a large number of cases are approved during the first stage – moreover, many of them are dispatched before the due date specified in the guidelines. In the US, there is a mechanism known as “early termination” that allows firms, which expect that their merger will not carry anti competitive risk and the CA shares the same vision, to request an early decision about their case. The European Union, since the 2000, has a mechanism denominated “simplified procedure” that can be adopted for mergers that, despite the fact that they have to be notified, it is unlikely to produce damage to competition. Even for some cases, classified as unproblematic, there is a short form decision that does not require a written statement from the agency.¹³

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Graph 1. Merger Review Statistics in the United States.

The statistics show that in the US, during the period 1997-2006, of the total of mergers notified (27,492 cases), a 67 percent of them received an approval through the early termination and only a 2.7 percent of the total cases passed to the second stage of investigation. In the European Union, of the 2,471 cases notified during the period 2000-2007, a 46.3% has been resolved through the simplified procedure and only a 4.1% passed to the second stage.

4.3 Merger revision costs

Another advantage of the voluntary system is that it discourages anticompetitive mergers to take place at a lower cost with respect to the mandatory scheme. The reason is that in the former system the CA acts after the firms have decided either to notify or to merge without notice. This ex-post investigation confers the CA with a second move advantage that is characteristic of the monitoring games. As is shown by Choe and Shekhar (2006), in order to induce the notification of anticompetitive mergers, the CA must commit to a certain intensity of ex-post investigation – not necessarily equal to one. For instance, if the CA decides to open an investigation in the 60 percent of the non-notified cases and fines for improper notification are sufficiently high, then all the anticompetitive cases will be notified and investigated by the CA. If the mechanism is well structured, the 100 percent of the anti-competitive mergers and the 60 percent of the competitive ones will be reviewed. On the contrary, the mandatory system, by definition, must review the 100 percent of the cases presented, both the competitive and anticompetitive ones. Therefore,

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14 Actually, the commitment can result from the capacity that the CA has to handle simultaneous cases and the resources that the authorities committed to the activity.
a voluntary system would allow for a better allocation of resources of the CA towards the examination of the more difficult cases.

Shekhar and Williams (2004) present evidence supporting the hypothesis that the voluntary Australian system makes the right screening about the population of mergers to control. The larger revision time spent on self submitted cases, compared to those investigated by the initiative of the CA, would suggest that mergers which are more complex to analyze are being voluntarily submitted by the firms, which is precisely the screening purpose of the self-selecting mechanism.

4.4 Arbitrary decisions by Competition Agencies

Although the discretion in the selection of cases to be investigated by the CA is a positive attribute in any scheme of control, it can involve issues of arbitrariness in the behavior of the CA. According to Baer (1996), the mandatory system is a guarantee of transparency during the decision process because all cases are subject to the same rules. Thus, the decision of which cases should be investigated does not depend on randomness but on factors objectively defined ex-ante and known by the interested parties.

There are two types of perils related to the discretion of the CA in the process of controlling mergers. The first is the possibility that the CA rejects or unnecessarily delays innocuous mergers. The second is that the CA does not review the mergers that seem to be necessary.

The former risk is controlled by the supervision of the interested parties and by the existence of pronouncements by tribunals during the different stages of the process. For instance, in the voluntary systems existing in Australia and New Zealand, if the CA acts on a case that was not notified, the agency requires that the court of justice issues a “preliminary injunction” to halt the merger during the investigation. Also, the court is the institution that finally decides if it approves or not a merger whose recommendation by the CA was the rejection. In the mandatory system, there is no need of a “preliminary injunction” during the first stage because all the mergers that are above the thresholds will be reviewed and thus, by default, they are halted. However, during the second stage,
if there is no agreement between the CA and the firms, the final decision is defined by the court.\textsuperscript{15}

About the second type of risk mentioned, clearly, there are fewer guarantees than in the second because the CA faces no direct supervision in case that it decides not to investigate a risky merger. The mandatory system has a better control of this risk than the voluntary scheme because once the agency receives the notification, it is obliged to deliver a decision. It is likely that some records will be created, such as documents or reports, explaining why the merger does not create competitive harm. On the other hand, in the voluntary scheme, the CA is not obliged to provide an explicit reasoning about why it decided not to open an investigation in a non notified merger.

There are some mechanisms that help to minimize the risk of omission:

(i) The existence of third parties affected by the merger that want to open a case (competitors, suppliers, buyers, etc.)

(ii) A system of ex post “disclosure”, where the agencies after a period of time, make public the information of the results of the analysis during the first stage – in case of the mandatory system.

(iii) Ex post audits, where another agency, independent of the CA, randomly investigates why some mergers were not examined.

Reducing the omission risk carries some costs because agencies must spend resources and time to justify why some cases were not investigated further or challenged. Since the competitive risks of a merger are not always easy to identify and explain, this task can derive in high cost. Notice that this burden might not be neglected due to the large set of mergers that do not pose any competitive risk. Sullivan and Grimes (2000) mention that the usage of an immediate disclosure can reveal important private information of the firms related to the merger, damaging the operation if it finally does not pose any risk. For that reason, the disclosure should be implemented ex-post like in the US.

\textsuperscript{15} In Europe, the decision during the first instance is done by the Commission (CA), which also investigates the case. However, there are two appeal instances, the Court of First Instance and the European Court of Justice.
5. A Simple Model to Analyze the Incentives and the Efficiency of Pre-Notification Schemes

In this section we present a model that allows us to compare both merger control mechanisms on the basis of the objectives (i) and (ii), as they were defined section 2.

Consider a population of mergers that are characterized by two parameters: the magnitude of the transaction, denoted by $S$, and the anticompetitive risk of a merger represented by the parameter $\rho$. We assume that both, $S$ and $\rho$, are random and independent variables distributed in the interval $[0, S_{\text{max}}]$ with density $f(s)$ and $[0,1]$ with density $g(\rho)$ respectively.

The magnitude $S$ represents the monetary value of the transaction, i.e. the price paid by the acquiring firm to the owners of the acquired company. It may also represent the asset value of the newly created firm in case of integration of two companies. The parameter $\rho$ is defined as the probability that the merger will decrease welfare. It contains all the relevant information about the risk that a transaction becomes anticompetitive. For instance, variables such as market concentration, change in concentration, entry barriers, likelihood of collusion, efficiencies as well as industry specific characteristics are included in the probability $\rho$.

In this model, $S$ can be observed at not cost whereas $\rho$ is observable but not verifiable by a third party like a court of justice.\(^{16}\) The different nature of these two parameters will have real implications when designing and comparing different notification mechanisms. As discussed below, notification rules need to be based on verifiable parameters.

About the competitiveness of a proposed merger, we assume two states of nature: The operation is either competitive or anticompetitive. In the first case, the merger adds a social value normalized to 1. On the contrary, when it is anti-competitive, it generates a social cost equals to -1. Formally, we represent the competitive effect by a parameter $\theta$ such that $\theta$ belongs to the set $\{-1,1\}$. The competitiveness $\theta$ is private information of the

\(^{16}\) Even if it is verifiable, the cost of studying the problem by a non-specialist unit makes it enough costly to implement it
merging firms and unknown by the competition agency. The agency only perceives the risk behind this transaction as is captured by $\rho$.

We assume that the size of the transaction amplifies the welfare effect of the merger. The size of the merger -parameter $S$- is relevant for merger control purposes since it amplifies the welfare effect of the transaction. Thus, the change in welfare induced by a merger of size $S$ would be equal to $\theta S$. It means that an anticompetitive merger reduces welfare in $S$, whereas a competitive one increases it in $S$. A merger that is likely to increase prices by 3%, for instance, is going to be more harmful is absolute terms when it affects a market of bigger size.17

The competition agency can spend resources in discovering whether a merger will increase or decrease welfare. The CA at cost $C$ can learn whether the transaction is competitive or not with total certainty. For simplicity, we assume that the cost $C$ of investigating the effect of a merger is independent both on the transaction size $S$ and the ex ante risk $\rho$. It is also assumed that by reviewing the merger, the agency is able to generate hard information that can be presented before a court to support a case either against or supporting the operation. It is not possible to prevent a merger only based on the a priori beliefs represented by $\rho$.

The function of the CA is to allow that competitive mergers take place while preventing the anticompetitive ones being materialized. Naturally, the cost of reviewing mergers restricts the actions that the CA can undertake. Thus, the CA maximizes an objective function that contains two components. One is achievement of the CA main goal which is deciding without error, and the second is the cost of the investigation process. We define three different merger control mechanisms:

1. Mandatory Discretional Mechanism
2. Mandatory Mechanism based on Transaction Size Threshold
3. Voluntary Mechanism

This division is a useful device to compare mechanisms (ii) and (iii) which is the main objective of the paper.

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17 If the market demand is linear, the welfare loss associated the higher ex-post price is proportional to the size of the market.
5.1 Mandatory Discretional Mechanism

This is a fictitious mechanism where all mergers must be announced to the CA no matter the transaction size or competitive risk. This merging announcement imposes no cost to the involved firms and the merger cannot be materialized until the CA explicitly approves it.

Once the merger is reported, the agency observes the parameters $S$ and $\rho$ and then decides whether to review the merger or not according to the CA’s objective function. If the CA resolves not to open an investigation, the merger can be materialized. Otherwise, the CA proceeds as mentioned above, studying the effect of the merger. If the investigation detects that the merger does not damage competition, the CA will approve it. On the contrary, if the outcome of the revision is that the merger is anticompetitive, the CA will block the operation. The hard evidence generated by the investigation is enough to satisfy the standard of proof required by a court of justice for blocking a merger and consequently the court will reject with probability one an appeal from the affected firms.

The CA decides about opening an investigation in base to the expected value of both alternatives. If the merger is approved without reviewing, it produces an expected change in social welfare equals to $W_0$:

$$W_0 = S\theta_1(1-\rho) + S\theta_{-1}\rho = S(1-2\rho)$$

Where $\theta_1=1$ and $\theta_{-1}=-1$. Thus, with probability $1-\rho$, it will enhance social welfare in a magnitude $S$ and with probability $\rho$ the merger is anticompetitive and reduces welfare in $S$ if not blocked. When the merger goes through the revision process, the CA incurs in a cost $C$ and the merger is approved if it is competitive, otherwise it is rejected. The social benefit of reviewing a merger net of costs is equal to:

$$W_r = -C + S(1-\rho)$$
Thus, the revision shall take place if and only if

\[ W_r > W_0 \quad \text{or if } S\rho > C. \quad (1) \]

Equation (1) shows that it is convenient to review the merger when the risk of passing an anticompetitive merger, times the transaction size, is larger than the cost of studying the operation. This result supports the fact that competition agencies tend to review larger transactions that justify the cost of getting crucial information. Small transactions or those that are perceived as riskless should not be reviewed.

5.2 Mandatory Mechanism Based on a Transaction Size Threshold

In this mechanism, the competition agency examines all mergers whose transaction size is above a pre-established threshold \( S^* \). As mentioned, it is not optimal to submit all mergers to a review since some of them are likely to be competitive or have a null impact on welfare. Unfortunately, a formal rule cannot be based in the result of equation (1) since the parameter \( \rho \) is not verifiable. However, it is feasible and partially optimal to define the threshold in function of \( S \). In practice, most of the known mandatory mechanisms like those of U.S, Europe, Canada and Japan for instance are based on variables related to \( S \) and not with \( \rho \) in order to avoid ambiguities when interpreting the law. We also name this mandatory mechanism as “traditional” since is the one applied in most of the countries that control mergers.

It is assumed that the cost of reviewing a merger is upward bounded and belongs to the transaction size interval already defined. Otherwise, the CA should not review any merger. The value of \( S^* \) can be deduced from the following maximization problem:

\[
\text{Max } S^* \left[ \int W_0(s, \rho)f(s)ds + \int W_r(s, \rho, C)f(s)ds \right] g(\rho)d\rho
\]
Therefore, $S^*$ is the value that maximizes the effectiveness of this mandatory scheme including the cost of reviewing mergers. A necessary condition for optimal is thus:

$$\int [ (s^*(1-2\rho) - (-C + s^*(1-\rho))f(s^*)]g(\rho)d\rho = 0$$

$$s^* \int \rho g(\rho)d\rho - C = 0$$

From this last equation we can deduce that mergers should be reviewed if:

$$S^*E[\rho] \geq C \quad (2)$$

or

$$S^* = \frac{C}{E[\rho]}$$

The solution expressed by (2) differs from the result obtained in equation (1) since the traditional mandatory scheme fixes the notification threshold based only in the transaction size. When choosing the optimal threshold $S^*$, the lawmaker takes in account the average competitive risk of the population of mergers which is represented by $E[\rho]$. On the contrary, under the discrentional mechanism, the CA decides the action to undertake using the information provided by two parameters: $S$ and $\rho$.

Clearly, two types of errors are incurred when using a traditional mandatory mechanism with respect to the discrentional scheme defined in (1). First, some mergers that do not possess a large competitive risk are reviewed despite their magnitude, that is when $\rho < E[\rho]$. Second, some other mergers that should be reviewed are not when $\rho > E[\rho]$.

In Figure 1 we graph both mandatory mechanisms, the discrentional and the traditional. The curve $qq$ represents equation (1) and divides in two the space of risk $\rho$ and transaction size $S$. At the left hand side of the $qq$ frontier we have the set of merger that it is not efficient to review, whereas at the right hand side are the mergers that must be investigated. The traditional mandatory mechanism is illustrated by the vertical dotted line that starts at $S^*$. Then, only the mergers above $S^*$ go to revision regardless its competitive risk $\rho$.

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18 As the cost $C$ increases, the curve $qq$ is displaced from the origin meaning that fewer mergers are reviewed.
The two types of relative errors of the traditional mechanism can be observed on Figure 1. Region II contains the mergers that are free from notification since their transaction size is below the threshold but are risky in their respective market. On the contrary, region III include those mergers with low competitive risk but that would be reviewed anyway since their size is above the threshold $S^*$. 

The performance of the traditional mandatory system can be improved, for instance, if the CA applies a short inspection to the mergers falling in region III, without allocating the same resources as the case when the competitive risk is higher.\textsuperscript{19} Undoubtedly, this action would be time and resource saving. Also, it helps to define the optimal threshold $S^*$ (by moving it to the left) in a way that some mergers located in region II will go to revision. However, the cost of analyzing mergers in region III will not be totally eliminated. First, the CA has the mandate to review them and some resources will be spent at least to explain why there is not need of further examination and second, because the firms have the obligation to notify the merger and wait for the pronouncement of the CA before finalizing the operation. Notice that there is no equivalent action that allows us to reduce the error of region II, since mergers lying in region II are excluded by law from antitrust control.

\textsuperscript{19} The compulsory mechanisms of the U.S. and Europe have a preliminary review or first phase stage where the CA applies a first screening to the submitted mergers.
5.3 **Voluntary or Self-Identification Mechanism**

We follow the same set up employed by Choe and Shekhar (2006). Under this scheme, merging firms make the first move by deciding whether to report or not the merger to the antitrust agency. After that decision, the CA must resolve the course of action to undertake about the merger. The sequences of actions of the voluntary mechanism are the following:

T=1 The lawmaker sets the rules about merger notification, defining which merger should be notified to the CA. In our model, firms should notify when the merger is anti-competitive, i.e. when $\theta=-1$.

T=2 Firms learn $\theta$ and decide whether to inform the action to the CA. If they decide to notify, they have to wait until the CA pronounces a positive decision about the merger. If firms do not notify the operation to the agency, the merger continues knowing that the CA can react adversely.

T=3 The CA, by observing $S$ and $\rho$, decides to open a case according to the action followed by the firms. If the firms notify, the CA reviews the case under the same procedure described for the mandatory schemes. On the contrary, if the firms opt for not reporting the merger, the CA decides whether to open an investigation or not. Note that when firms do not submit the case for approval, they continue with the merger.

T=4 In case that the CA opens an investigation without notification and it discovers that the merger is welfare decreasing, the CA is entitled to contest the merger and fine the firms with $F>0$. On the other hand, if the investigation concludes that the action is pro-competitive the CA closes the case. It is assumed that the merger is irreversible and thus it cannot be reversed once implemented, independently of the outcome resulted from the investigation.20

The rationale behind this mechanism is to provide incentive for self-selection in such a way that those mergers without competitive concerns should not be reported. On the

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20 The irreversibility of the process is a convenience assumption that simplifies the problem. We later release this assumption.
other hand, mergers which are likely to be anticompetitive should opt for notification. Thus, the challenge is to provide the interested parties clear incentives to notify when it is necessary. When a merger is anti competitive, firms need to obtain a higher benefit reporting the action than not reporting it.

The change in the private benefit of merging parties with respect to the status quo is captured by a function $U(S, \theta)$. It is assumed that $U() \geq 0$, where $U()$ is increasing in the transaction size $S$ and decreasing with respect to the second argument $\theta$. That is, mergers are more profitable when the transaction size is higher and when they are less competitive.\(^{21}\)

The antitrust system -competition law and institutions- has two instruments to induce firms to notify when is due. The first is the probability to investigate given the fact that firms did not report the activity and the second is the possibility to fine the firms if the merger investigation shows an adverse result. We denote the probability of investigating a merger by $X$, which is a discreptional decision of the CA. The fine is fixed exogenously either by a law that specifies the magnitude of fines for this type of behavior or by an independent third party like a court of justice.

The incentive compatible condition that induces firms to report an anticompetitive merger is obtained by the following equations:

$$U_m = (1 - X)U(S, \theta_{-1}) + X(U(S, \theta_{-1}) - F)$$
$$U_n = 0$$

Where $U_m$ denotes the utility when firms merge without notification and $U_n$ the utility if they notify. Thus, notification and wait dominates merge and fine if and only if $U_n > U_m$, which implies:

$$X(S) \geq \frac{U(S, \theta_{-1})}{F} \equiv X^*(S) \quad \text{(3)}$$

This inequality deserves some comments. First, as the probability is bounded in the interval $[0,1]$, the change in the utility when firms merge without notification cannot be

\(^{21}\) For instance, mergers that rise prices, create entry barriers or make more feasible collusion, are likely to be more privately profitable but less socially desirable.
higher than the cost they perceive in case they are punished. If fines are capped, some mergers will not be notified since they still get a positive benefit even if they are fined afterwards. Second, since the utility is increasing in the transaction size, the probability of investigating a merger also must be increasing in S.

The equilibrium of this sequential game of voluntary notification and ex –post inspection is characterized as follows:  

- The CA sets a monitoring policy such that for a not notified merger of size S, it opens an investigation with a probability slightly above the minimum value \( X^*(S) \), which induces all the anticompetitive mergers to be reported.
- If the merger is anticompetitive, the operation it is notified to the CA and consequently reviewed by the agency at cost C.
- If the merger is competitive the firms do not notify the operation. The CA consequently reviews the case according to the probability \( X^*(S) \).

Notice that although in equilibrium only the competitive mergers are not notified, the CA must commit to apply its monitoring policy defined by \( X(s) \). Otherwise, the mechanism unravels and the anticompetitive mergers will take advantage of the lack of monitoring of the CA, and will not notify their operations. Also, the plain act of notification does not relieve the CA from performing the revision of the merger for rejecting it. Even if CA knows with total certainty that a notified merger is anticompetitive, the agency must generate the information for supporting the blocking of the operation before a court of justice.

Like in the discretional mandatory system, it is not optimal to apply the reviewing policy defined in (3) to the full set of non notified transactions. For each merger, characterized by the observable parameters \((S, \rho)\), the CA compares the benefits of not reviewing and let the firms merge versus opening an investigation. If the CA decides not to investigate,

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22 This corresponds to the Bayesian Nash equilibrium of the sequential game of asymmetric information.
23 Otherwise the firms may appeal to a court of justice that the merger is refused without any justification. Courts of Justice are not Bayesian, therefore they cannot resolve based on the updating of information due to the screening property of the merger control mechanism. They decide on the base of the hard information generated by the examination process.
both types of mergers will take place, the competitive and the anticompetitive ones. The value of the no review option in terms of social welfare is equal to:

$$W_0 = S(1 - 2\rho)$$

The value of applying the monitoring policy to a non notified merger will be:

$$W_m = -\rho C + (1 - \rho)[S - X^*(S)C]$$

With probability $\rho$ the merger is anticompetitive and by the incentive compatibility condition it is notified and reviewed at cost $C$ and then rejected by the agency. On the other hand, with probability $(1-\rho)$ the merger is competitive and it is not reported by firms. Then, the CA investigates the case with probability $X^*(s)$ as defined by equation 3. Therefore, it would be optimal to apply the monitoring policy if and only if $W_m \geq W_0$, or if:

$$\rho S \geq C[(1 - \rho)X^*(S) + \rho]$$

The result provided by equation (4) can be compared with the similar condition obtained in (1). In the latter, the policy is deterministic in the sense that all mergers that satisfy this condition will be reviewed with total certainty, while in the former the candidates for revision will be investigated with some probability between zero and one. The difference between condition (1) and (4) is that in the right hand side of the latter equation, the cost of reviewing a merger is multiplied by a coefficient that is lower that one.\(^{24}\) The voluntary mechanism, thus, reduces the expected cost of enforcement because it is not socially optimal to review all non reported mergers as the incentive compatible condition (3) shows.

We can graph the optimal monitoring policy in the $(\rho, S)$ space. The frontier pp in figure 2 corresponds to the equation (4) in state of equality. All mergers at the down left hand side of the frontier are not notified neither investigated. The mergers lying at the up right side of the frontier are notified and controlled if they are anticompetitive, whereas the competitive transaction are not notified and the CA investigates them with probability $X^*(S)$. In technical terms we have a pooling equilibrium for low values of $\rho$ and $S$ where

\(^{24}\) The coefficient that multiplies $C$ in the right hand side of equation 4 corresponds to a weighted average between the probability of monitoring $X^*(s)$ and 1.
the CA is not interested in controlling mergers. Conversely, for high values of $\rho$ and $S$ there is separation of types where the notification of anticompetitive mergers is induced by the monitoring policy $X^*(S)$.

A first comparison on the effective cost of controlling mergers between the discretional mandatory and voluntary mechanism can be stated. Since the voluntary mechanism creates a sort of self-selection of firms, it induces the same number of cases than in the mandatory scheme being submitted but at a lower effective cost. In terms of objectives pursued by the competition law, the performance of both schemes – the identification error – would be equal, that is, both mechanisms avoid that the same number of anticompetitive mergers to take place, but the implementation cost is lower under a voluntary mechanism.

Since the inspection cost is reduced in real terms using a voluntary mechanism, it is optimal to investigate more mergers, improving further the effectiveness of this mechanism with respect to the mandatory one. This effect is represented in Figure 2 where the frontier $pp$ of the voluntary mechanism corresponds to an inward shift of the inspection frontier $qq$. One important implication of this result is that under a voluntary mechanism, more anticompetitive mergers are blocked compared to a mandatory mechanism. Such increment in the set of merger to be potentially reviewed is optimal since the benefit from marginally inspecting more mergers outweighs the cost generated by it. Although in aggregate terms the mandatory mechanism performs more revisions, the voluntary system allocates better the resources in the more dangerous cases, which reinforce the deterrence effect of the latter system.

Figure 2
The advantage of a voluntary system relies on the fact that the CA acts after the firms have taken a decision about reporting or not, which provides some information to the CA about the competitive risk of the merger. As the CA moves in a second place, the agency does not have to perform controls in the hundred percent of cases that are needed. The credible treat of an ex –post review, and the risk of being fined, discourages anti competitive mergers to take place without notification. On the other hand, competitive mergers are not reported despite that some of them–ex post– may be investigated. Although in equilibrium only competitive mergers are not notified, the CA cannot evade the monitoring. Otherwise the anticompetitive cases will not be reported as well leading to a clear suboptimal policy. It is crucial the commitment of the CA to the optimally defined monitoring policy.

To sum up, we have shown in a very simple framework that the voluntary pre-notification scheme has advantages with respect to the discretional mandatory mechanism. Given the advantages that the latter has with respect to the traditional mandatory system, by transitivity, we conclude that the voluntary scheme is a superior solution compared with the mandatory system based on transaction size threshold. This superiority is due to two fundamental aspects:

(i) The voluntary scheme does not require inspecting all the universe of potential anti competitive mergers. It induces the firms to self-select themselves and to opt for notifying the operation when it is socially desirable to do so.

(ii) The voluntary scheme gives discretionally to the CA about the set of mergers to be investigated. The CA reviews mergers following a case-by-case approach, observing two parameters $S$ and $\rho$ and does not follow a pre-established ex-ante rule based only in the transaction size $S$.

5.4 Constrained Fines

If fines for unlawful no notification are exogenously capped, some of the mergers will not be reported even if firms are punished for that omission. This undesired behavior will
occur for the mergers that entail a larger transaction size, which in turn are the ones to create the largest social cost in case of being anticompetitive.

To illustrate this phenomenon, we define as $S^{**}$ the merger size such that $U(S^{**},\theta_{-1}) = F_m$, where $F_m$ is the maximum penalty. Then, for all mergers such that $S > S^{**}$ the transaction will not be notified despite that the merger is anticompetitive and the firms will be fined for that omission. Those firms will prefer to consummate the merger, even knowing that with probability one the CA will investigate the operation and will punish them for not notification.

In this case of limited fines, the advantage of a voluntary mechanism disappears since it is not possible to block large anticompetitive mergers. In this scenario, the comparison of mechanisms –voluntary versus mandatory- renders an ambiguous result that will depend on the level of maximum fines and the probability of having large mergers among the population ($S > S^{**}$).

Figure 3

A superior solution consists in a mixed mechanism where notification is voluntary for mergers with $S \leq S^{**}$ and compulsory for the set of mergers where $S > S^{**}$. In figure 3 we represent this optimal mechanism, subject to the constraint on the maximum fine. At the size $S^{**}$ the discretionary obligatory mechanism becomes equivalent to the voluntary system, because by definition, a merger of size $S^{**}$ is monitored with probability equal to
one. Hence, equations (3) and (4) that represent the optimal policies on both mechanism are equivalent at \( S = S^{**} \) since \( X^{*}(S^{**}) = 1 \). Graphically \( S^{**} \) is the value at which frontier pp intersects qq.

Summarizing, when the maximum fine is not large enough to induce the whole population of mergers to pre-notify, the optimal policy is the following:

(i) If \( S^{*} < S^{**} \), all mergers above \( S^{**} \) must pre-notify the operation no matter if they are pro or anti-competitive. For mergers below \( S^{**} \) the monitoring policy of the voluntary system applies.
(ii) If \( S^{*} > S^{**} \) the optimal policy is to make mandatory the notification for \( S > S^{*} \) and voluntary for \( S < S^{*} \).

If we are in case (i), for values of \( S > S^{**} \) the obligation to notify dominates voluntary notification since in the latter, no merger will be notified and by consequence the error associated to the materialization of anticompetitive mergers will be maximum. In contrast, under forced notification, that error is zero. However, there are some competitive mergers that the CA is obliged to inform despite their low competitive risk (those located below frontier \( qq \) and to the left of \( S^{**} \)). This error of over-notification is lower than the error of no-notification of the voluntary system as long as \( S^{*} < S^{**} \). Recall that \( S^{*} \) is defined as the merger size threshold that minimize the aggregate error of the mandatory notification system. At the size \( S^{*} \), in the margin both errors are equal, therefore for values of \( S \) greater than \( S^{*} \), the error no notification must be larger than the error of over notification.

In case (ii) -when \( S^{*} > S^{**} \) - it is not optimal to make mandatory the notification above \( S^{**} \) because the error of over notification is greater than the error of omission. Thus, the threshold for compulsory notification is set at \( S^{*} \). As in the mandatory mechanism, mergers with \( S > S^{*} \) are obliged to notify and by consequence anticompetitive mergers in that range are prevented. If \( S^{**} < S < S^{*} \), no merger is notified which means that all operations are materialized without revision. Only if \( S < S^{**} \) we have separation of types and the voluntary mechanism induces the proper separations of types. In the limit case of
zero fine, the voluntary system converge to a traditional mandatory system, where all mergers above $S^*$ must compulsorily notify.

### 5.5 Remedies

In merger control, usually the decision of the CA is not always constrained to a binary policy of either approving or rejecting the concentration. In most of the complex cases, mergers are allowed subject to conditions that are called remedies.

These remedies render acceptable mergers that are anticompetitive if permitted in its original proposal, but at the same time reduce the private benefit that firms obtain from the operation. For the sake of simplicity we assume that all anticompetitive mergers can be modified, in a way that they become competitively harmless through remedies. Thus, the change in welfare will be zero if approved and the private benefit will be reduced to $(1-\alpha)U(S)$, where $\alpha$ represent the intensity of the remedy necessary to avoid any anticompetitive harm from the merger, such that $0 \leq \alpha \leq 1$. It is further assumed that $\alpha$ is constant across the population of mergers.

First, we see how the voluntary mechanism is modified when the possibility to apply remedies exists. The incentive compatibility condition that induces anticompetitive mergers to notify becomes:

$$(1-\alpha)U(s) \geq X(U(s) - F) + (1-X) U(s)$$

Which yields to:

$$X_d(s) \geq \frac{\alpha U(s)}{F} \equiv X^*_d(s) \quad (5)$$

Compared with the condition of equation (3), we see that the parameter $\alpha$ reduces the minimum intensity of monitoring to induce notification. Thus for given values of $F$ and $S$ and $\alpha$ we have that $X^*(s) \geq X^*_d(s)$.

Since firms have now a strictly positive benefit for notifying, they are now more willing to report the operation with respect to the situation where the notification led to rejection.
The lower the level of intervention (lower $\alpha$) needed to fix the competitive problems of the merger, the higher the incentives of the firms to notify the merger and the lower is the monitoring required to induce the report to CA. In this sense, the remedies that both parties may accord act as a “carrot” to the firms whereas the fine plays the role of a “stick”. As we see in equation 5, both instruments are useful to induce notification when is needed.

The application of remedies to mergers that are initially anticompetitive modifies the working of the voluntary mechanism. The reduction in the minimum probability to open an investigation decreases the cost of the monitoring policy compared with the binary policy of full rejection or approval. With remedies, the condition for being optimal to review a merger becomes:

$$\rho S \geq C[\rho + (1 - \rho)X_d^*(S)] \quad (6)$$

Compared to equation 4, the term in the right hand side is reduced due to the decrease in the minimum probability of monitoring towards $X_d^*(s)$. This lower “effective” cost of monitoring will induce the CA to open more cases to revision, shifting inwards the frontier pp of Figure 2. Additionally, the use of remedies alleviates the constraint imposed by maximum fines when they are not big enough to induce the notification of anticompetitive mergers. With remedies, the threshold above which mergers unlawfully do not notify moves up as we see in the equation below.

$$U(s_d**) = \frac{F_{\text{max}}}{\alpha} \geq F_{\text{max}}$$

The introduction of remedies does not affect the performance of the mandatory notification system. In case of an anticompetitive merger, the operation is either rejected under the binary system or approved with remedies when they are feasible, but in both cases yields zero welfare increases. This results hinges in two facts (i) The private benefits are not part of the objective function of the CA and (ii) The agency does not go beyond what is required to render competitive a merger. Therefore, the possibility of fixing otherwise anticompetitive mergers through remedies improves the performance of a voluntary system compared with the mandatory scheme.
5.6 Irreversibility

In this section we modify the above analysis, by relaxing the assumption of full irreversibility of the merger. Thus, in the voluntary system if a not notified merger is investigated and discovered as anticompetitive, then the CA may ask for structural relief, undoing partially the integration of firms. We denote as \( \beta \) the degree of irreversibility, such that \( 0 \leq \beta \leq 1 \), where \( \beta = 0 \) means that the merger can be totally undone.

If an originally anticompetitive merger is notified, then the firm, as above gets utility equals to \( \alpha U \). If the merger is not notified, then in expected value, the utility is equal to:

\[
X (\beta U(s) - F) + (1-X) U(s).
\]

Thus the IC condition becomes:

\[
(1-\alpha) U \geq X (\beta U(s) - F) + (1-X) U(s)
\]

Which yields to:

\[
X(s) \geq \frac{\alpha U(s)}{U(1-\beta) + F} \tag{6}
\]

As it is evident from equation 6, the lower is the level of irreversibility, the lower is the level of minimum monitoring required to induce notification. This degree of irreversibility of the mergers makes more cost-effective the voluntary mechanism in comparison with the mandatory systems.

Also, notice that the mechanism works even when no fines are available to punish the transgressors of the merger law, if the following condition is satisfied: \( \alpha \leq 1-\beta \).

The interpretation of the above condition is that the level of necessary intervention to fix an anticompetitive merger has to be lower than the degree of reversion of the operation. If the merger is highly irreversible or the remedies are too strict, then it is unlikely that the CA could induce firms to report the operation without having fines.

As we explained above, mergers are a highly irreversible process, implying that it is very costly to go back to the initial market structure once the operation is consummated. The experience shows that the cases of successful ex-post divestiture are very rare and costly in time and litigation effort when undertaken. In consequence, the scope for structural
relief is limited once the transaction is already materialized. A more realistic interpretation of $\beta$ would be the time taken by the CA to react against the not notified merger and obtain an order to stop the operation from the courts, for instance.

6. Conclusions and Further Extensions

In terms of the objectives of minimum decision error and lower enforcement cost, the voluntary system performs better than the mandatory system that is based on a transaction size threshold. The advantage of the former mechanism is based in two effects: The flexibility of the agency to select the mergers to investigate and the self-selection induced by the ex-post monitoring mechanism. Both features of the voluntary system allow the enforcement agency to concentrate its human resources on analyzing most critical mergers.

The superiority of the voluntary mechanism relies on the assumption that institutions are strong enough to promptly punish firms that omit to notify mergers when is due. Agencies must be able to detect likely anticompetitive mergers and to act speedily to request the court an order to stop them and to apply the corresponding penalties. Both the reputation of agencies to promptly react and the credibility of the system to implement the sanctions against unlawful behavior are crucial to induce merging firms to notify when is due.

The discretion of institutions in charge of enforcing the rules may be undesirable in scenarios where capture or corruption is an issue. If the CA deviates of its welfare maximizing objective, then it may omit to investigate some mergers that are clearly risky form the competition point of view.

The impact of remedies in the working of mechanisms is also of interest. Our model considers that remedies may be applied only to mergers that are originally
anticompetitive. However, competitive mergers could also be improved further, respect to its original proposal, increasing the social welfare but reducing the incentives to be voluntarily notified by the parties. This over activism of the CA may reduce the effectiveness of the remedies to act as a “carrot” to induce notification.

Another avenue for improving the model is to see how different degrees of information of the CA, affects the relative performance of both mechanisms. We may think that an agency with more experience and knowledge of the markets and its competitive risks will be more capable to detect ex-ante which mergers are more dangerous. On one side, a better degree of information should mitigate the comparative advantage of the voluntary mechanism, since the screening effect becomes less significant. But, in the other side the benefit of the discretion is more relevant since the error of reviewing harmless mergers becomes more evident ex-ante for the CA.

At the moment of choosing a notification mechanism or deciding to reform it, there are two variables to be looked at: The strength of the country's institutional system and the level of experience of antitrust agencies in dealing with cases of mergers.

As we pointed above, a voluntary mechanism is likely to work better in economies with a solid enforcement of law, where antitrust institutions (agencies and courts) may act effectively against breach of the rules about notification of mergers. The expertise accumulated by the agencies in analyzing mergers also affects the relative effectiveness of the mechanisms. Agencies with more experience and knowledge should be able to detect timely and with better degree of accuracy what mergers deserve further investigation. Instead, less experienced agencies will need more time to evaluate the merger in order to take or recommend a decision. For this reason, it is important to provide some legal safeguards, like mandatory requirements to notify the mergers, to the agencies which are at early stage of the learning process.
References:


– Lexmundi Pre-Merger Notification Survey


