OPTIMAL PRE-MERGER NOTIFICATION THRESHOLDS: AN ECONOMIC APPROACH

Every year, the number of mergers taking place across countries is extremely high: the Institute of Mergers, Acquisitions and Alliances estimates the total number of announced M&A worldwide to be between 30 and 40 thousands in 2014.[1] Imposing notification to all mergers would be costly and inefficient. Conversely, approving every merger without scrutiny would make anticompetitive effects more likely to arise.

In order to guarantee an effective and efficient merger review regime, international best practices recommend setting pre-merger notification thresholds (ICN, 2008).[2] For such thresholds to be applied, transactions must have a "local nexus" with the jurisdiction concerned and must be based on objective criteria, i.e. assets or turnover.

When thresholds are based on these objective criteria, they can vary according to the type of turnover required, e.g. worldwide turnover of the merging parties, aggregate domestic turnover, turnover of the target firm (the acquired entity).[3] In practice, each country chooses the requisites that make the merger notification mandatory, with conditions that can be either cumulative or alternative. This note will focus on cumulative conditions and in particular on determining the optimal aggregate domestic turnover and the optimal turnover of the target firm, which are the

most used thresholds adopted throughout the European Union.

The question is crucial: how do countries choose these thresholds? A recent survey (ICN, 2008) shed light on the different methods used across countries when setting thresholds: establishing clear reform goals, benchmarking based on historical information, determining an appropriate threshold system and examining the country-specific industry structure, among others.

However, none of these methods seem grounded in economics. In this context, the need for a more sophisticated and tailored method comes to the fore.

Towards a Neo Chicago Approach

The actual level of thresholds is a matter of extreme importance. On the one hand, the higher the thresholds, the higher the risk of having potential anticompetitive mergers that would not be scrutinised by the relative competition authority. This could imply higher prices, lower quality and decreased innovation at the expense of consumers. On the other hand, the lower the thresholds, the higher the number of notified operations: this, in turn, would increase the cost of reviewing and filing a notification, at the expense of both the

competition authority and the merging parties.

Thus, a jurisdiction should consider two costs when setting pre-merger notification thresholds. First, it should account for the costs imposed on the parties and on the competition authority of having to respectively file and review the notification. These costs amount to a wasteful use of scarce resources every time a notified merger does not yield anticompetitive effects. Following the terminology introduced by Easterbrook (1984), we define this cost as the *type I error cost*.[4] Type I error can only occur if the merger is notified, that is if the specific thresholds set by a country are met. As thresholds increase, the number of notified mergers decreases and the probability of type I error to occur declines as well. Second, jurisdictions should account for the consumer welfare loss that results from non-notified mergers that are anticompetitive. This error is defined as *type II error*. Type II error can only occur if the merger is not notified. Other things equal, the higher the thresholds, the higher the probability of type II error to occur.

Basing on economic theory and evidence, jurisdictions should assess both the likelihood and the cost of these two errors. Policymakers must then plan the legal rules in order to minimise the sum of expected error costs. These two-stage analysis has already been conceived for the definition of substantive rules to be applied to unilateral practices, under the name of Neo Chicago Approach.[5] However, the error cost minimisation principle can be applied also to merger control and to procedural rules. In order to do so, in the following we sketch a simplified theoretical model.[6]

The Theoretical Framework

Assuming all notified mergers that are anticompetitive are blocked, we define $n(x)$ as the fraction of mergers that are notified and the total cost function as:[7]

$$(1) \quad C = n(x) \, EC_I + (1 - n(x)) \, EC_{II}$$

where EC_I and EC_{II} are respectively the expected cost of type I and type II errors and x is the policy variable defined by the relevant rule. Solving the minimisation problem with respect to x, we obtain:

$$(2) \quad \frac{\partial n}{\partial x} \, (EC_I - \, EC_{II}) = 0$$

or,

$$(3) \quad EC_I = EC_{II}.$$

This condition indicates that jurisdictions shall set the threshold levels such that, at the margins, the expected cost of type I error is equal to the expected cost of type II error. This error cost minimisation approach is very general and can be applied to different rules, including those setting the notification thresholds, whatever the type of thresholds is. As anticipated in the introduction, this note will further specify the case of a jurisdiction setting two cumulative pre-merger notification thresholds: one for the aggregate domestic turnover and another for the turnover of the target firm.

Costs of type I include all costs that both the parties and the competition authority bear because of a merger notification. For the merging parties, these costs include the cost of the personnel notifying the merger as well as the fee of legal advisors. For the competition authority, they amount to the cost of the personnel reviewing the notified merger. Hence,

$$(4) \quad EC_I = p_I \, C_I$$

where C_I is the marginal cost of a type I error given by the sum of the overall costs borne by the parties and by the competition authority to notify and revise a merger and p_I is the probability of a type I error cost to occur.[8]

Moving on to EC_{II}, it represents the expected marginal cost on final consumers, measured in terms of welfare loss, caused by a non-notified merger being anticompetitive. Let T be the aggregate turnover threshold of the merging parties, and t the turnover threshold of the target firm.[9] We can write:

$$(5)\ EC_{II} = p_{II}\ (\alpha\ T - C_I)$$

where p_{II} is the probability of a type II error to occur;[10] $(\alpha\ T)$ represents the consumer welfare loss, and specifically: $\alpha = \frac{P_{t+1} - P_t}{P_t}$ is the percentage increase in price post-merger and T is the pre-merger parties' aggregate turnover, or $T = t + \tilde{t}$, where $\tilde{t}$ is the combined turnover of the acquiring group.[11] The marginal cost of a type II error is given by the consumer welfare loss minus the marginal cost of notification. Indeed, the net cost of a type II error should consider the cost avoided by not-notifying the merger.

Estimating p_{II} is extremely difficult. A possible approach is to estimate p_{II} as the probability that a merger is forbidden, withdrawn or cleared with remedies, given that it has been notified. Hence p_{II} will depend both on the aggregate turnover threshold T and on the turnover threshold of the target firm t. Indeed, as T and t change, the overall number of notified mergers will change, and thus will the conditional probability p_{II}. In other words, p_{II} has to be set as a function of T and t. This probability function should have the following desirable properties: (i) the probability of a merger producing anticompetitive effects must tend toward 0 as the turnover of the acquired undertaking approaches 0; (ii) the same probability should increase, at a decreasing rate, as long as the turnover of the target firm increases; (iii) the probability of anticompetitive effects should reach a maximum when the acquiring party and the acquired party have the same size and, therefore, are more likely to be close competitors.

Intuitively, the optimal notification thresholds t^* and T^* should positively depend on C_I and negatively on EC_{II}. Indeed: (i) when type I error costs are high, the cost of notifying and reviewing a merger is high, hence the threshold should increase so that less mergers are notified; (ii) when type II error costs are high, the cost on consumers in terms of lost welfare is high, hence the threshold should be revised downwards so that more mergers are notified.

The theoretical model outlined in this section suggests that, when the notification rule is cumulative, the optimal values T^* and t^* are interdependent. In particular, there should be an inverse relation between T^* and t^*, whose sign can be described with an example. Suppose for instance that T^* increases, while t^* is kept constant. This would increase the probability of type II error to occur. Therefore, to balance this effect, t^* should decrease, hence the inverse relation between the two thresholds.[12]

To conclude, when deciding on the optimal turnover thresholds for the target firm, the relative competition authority should take into account both thresholds.
However, solutions to this model are infinite: for every value of T^*, the rule would return one and only one value of t^*. Some method to select the optimal T^* needs to be found. How can we deal with this issue?

Fixing the aggregate domestic threshold

As highlighted by the International Cooperation Network survey (ICN, 2008), there can be several qualitative approaches to determine pre-merger notification thresholds. In particular, benchmarking against similar countries can be used to obtain the optimal T^* as well the optimal t^*. What do we mean for "similar" countries? Belonging to the same political reality, sharing a common judicial framework, having the same economic and structural conditions, e.g. level of GDP, openness to trade, average firm size. If, for instance, we were to consider an EU Member State, a reasonable cluster of "similar" countries could be the remaining 27 MSs, because of the shared Communitarian thresholds on top of National ones.

However, finding the optimal level for the aggregate domestic threshold is certainly challenging and an accurate result would require some empirical analysis. From this point of view, benchmarking can complement

our theoretical framework and be used to obtain the optimal T^*.

By construction, only those countries for which the aggregate domestic turnover threshold is specified should be included in the analysis. Subsequently, using the estimated coefficients, the country specific T^* that reflects local conditions can be easily computed. The regression analysis could include several explanatory variables from the one we listed before, among which GDP values, average firm size, and a dummy variable to consider the existence of a worldwide turnover threshold notification rule.[13]

Once obtained the relative optimal aggregate turnover threshold (T^*), it should be easy to get the optimal turnover threshold of the target firm (t^*), following the model described in the theoretical framework. Results can be sensitive to different values, among which the price overcharge and the probability of a merger being anticompetitive. In this light, a sensitivity analysis to check for the robustness of the outcome is recommended.

Conclusions

This note presents an economic approach to set optimal pre-merger notification thresholds, a more and more interesting issue for jurisdictions.

First, we elaborated a very simple theoretical framework aimed at identifying an "optimal rule", i.e. the thresholds that minimise the sum of the expected costs of type I and type II errors. This minimisation requires that, at the margins, the expected cost of a notified merger not imposing anticompetitive restrains (type I error costs) is equal to the expected cost of a non-notified merger imposing anticompetitive restraints (type II error costs). In particular, when the notification rule is cumulative, this note argues that the optimal values of the pre-merger aggregate turnover threshold and of the pre-merger turnover threshold for the target undertaking are interdependent. Second, once defined the

rule, the analysis should be complemented – we suggest a benchmarking exercise – in order to get the relative country specific optimal thresholds.

If efficiency is the main or exclusive goal of antitrust rules, the error cost minimisation mechanism can and should also be applied to merger control and to procedural rules. Further, to our knowledge, there is still scant literature on which mergers have to be notified and what criteria should be considered thereof. Our aim was to provide some initial thoughts to fill this gap.

If you would like further information about optimal pre-merger notification thresholds, please contact us.

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Notes

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[1] IMAA statistics website, retrieved on 3 September 2014 and available at
http://www.imaa-institute.org/statistics-mergersacquisitions.html#MergersAcquisitions_Worldwide.

[2] ICN, 2008. Setting Notification Thresholds for Merger Review.

[3] The aggregate turnover of the merging parties is defined as the turnover of all merging firms, that is the combined turnover of the acquiring group plus the turnover of the acquired firm.

[4] Easterbrook, Frank H., 1984. *Limits of Antitrust*, Texas Law Review, vol. 63.

[5] Padilla, J. and Evans, D. S., 2004. Designing Antitrust Rules for Assessing Unilateral Practices: A Neo-Chicago Approach. *University of Chicago Law Review*, 72(1), pp. 73-98.

[6] For a more detailed description of this simple model see Buccirossi, Cervone, Riviera, 2014, "Optimal Pre-Merger Notification Thresholds: A Contribution to the Italian Debate", *Italian Antitrust Review*, Vol 1 No 3.

[7] The fraction of the notified mergers $n(x)$ depends both on the turnover threshold of the target firm as well as on the aggregate turnover threshold of the merging parties.

[8] In this case p_I will cancel out when solving the model and we can write equation (3) as $C_I = EC_{II}$.

[9] We assume that the target firm is the one with the lowest turnover. This assumption does not imply any loss of generality as we can define the firm with the lowest turnover as the "target" firm independently of its actual role in the merger.

[10] Type II error costs occur when a non-notified merger leads to anticompetitive effects; therefore, p_{II} can be thought as the conditional probability that the merger is anticompetitive given that it has not been notified.

[11] Equation (5) contains a number of simplifying assumptions. First and foremost it assumes that the merging parties' turnover concern a single relevant market or that all relevant markets from which firms obtain their turnover will be equally affected by the merger. Second it assumes that, after the merger, only the merging parties will raise the price of their product or service. In reality, other firms in the industry might decide to raise prices following the merger, further increasing the consumer welfare loss. Therefore, the CWL as defined in (5) might be an underestimation of reality. At the same time, (5) assumes (third assumption) the elasticity of demand is zero (i.e. $\varepsilon = 0$), otherwise the consumer welfare loss would be $CWL = T\alpha \left(1 - \frac{\alpha \varepsilon}{2}\right)$, where ε is the demand price elasticity; with respect to this, the consumer welfare loss as defined in (5) might be an overestimation of reality. The CWL as defined in equation (5) is thus a rough approximation of the actual consumer welfare loss.

[12] The same logic applies in the opposite case, i.e. if T^* decreases and, as a consequence, type I error cost increases.

[13] GDP is expected to be positively correlated with the domestic turnover: as the size of the economy increases, markets are likely to be larger in monetary value, hence for an undertaking to hold a significant market share it needs to generate higher revenues.