



## UvA-DARE (Digital Academic Repository)

### Europeanization of EU member-state competition policy: the commission's leadership role

Barros, P.P.; Clougherty, J.A.; Seldeslachts, J.W.

**DOI**

[10.1016/j.irl.2012.11.001](https://doi.org/10.1016/j.irl.2012.11.001)

**Publication date**

2013

**Document Version**

Final published version

**Published in**

International Review of Law and Economics

[Link to publication](#)

**Citation for published version (APA):**

Barros, P. P., Clougherty, J. A., & Seldeslachts, J. W. (2013). Europeanization of EU member-state competition policy: the commission's leadership role. *International Review of Law and Economics*, 34, 41-51. <https://doi.org/10.1016/j.irl.2012.11.001>

**General rights**

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

**Disclaimer/Complaints regulations**

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

*UvA-DARE is a service provided by the library of the University of Amsterdam (<https://dare.uva.nl>)*



# Europeanization of EU member-state competition policy: The commission's leadership role

Pedro P. Barros, Joseph A. Clougherty and Jo Seldeslachts

DEPARTMENT OF MANAGERIAL ECONOMICS, STRATEGY AND INNOVATION (MSI)

# Europeanization of EU Member-State Competition Policy: The Commission's Leadership Role

Pedro P. Barros

Nova School of Business and Economics, and CEPR-London

Campus de Campolide

1099-032, Lisboa, Portugal

E-Mail: [ppbarros@novasbe.pt](mailto:ppbarros@novasbe.pt)

Tel: +351 213 801 600

Joseph A. Clougherty

University of Illinois at Urbana-Champaign, and CEPR-London

350 Wohlers Hall, 1206 S. 6<sup>th</sup> St., MC-706, Champaign, IL 61820, USA

E-Mail: [jaclough@illinois.edu](mailto:jaclough@illinois.edu)

Tel: +1 217 333 6129

Jo Seldeslachts \*

University of Amsterdam and KU Leuven

Roetersstraat 11, 1018 WB, Amsterdam, The Netherlands

E-Mail: [J.W.Seldeslachts@uva.nl](mailto:J.W.Seldeslachts@uva.nl)

Tel: +31 20 525 7158

July 18, 2012

**Abstract:** The European Commission (EC) has long intended to play a leadership role in setting a pan-European competition policy; yet, both centralized and decentralized tendencies have been manifest in the European context for competition policy. It is not clear then whether these leadership intentions translate into actual leadership by the EC. We shed light on this issue by considering and estimating whether the EC's leadership is both evident and robust. We present a framework that highlights the costs to Member States of diverging from EC merger policy norms. Employing cross-national panel data (covering 1994-2005) on European merger control, we find that changes in the EC's proclivity to remedy mergers are reflected in Member States in subsequent years. Thus, the European Commission appears to play a leadership role in setting the tenor of merger policy throughout Europe.

**JEL:** L40, K21

**Keywords:** Antitrust, Competition, Merger Policy, Leader-Follower, Institutions

**Short Title:** EC Leadership in European Competition Policy

\* Corresponding author.

## **1. Introduction**

The Treaty of Rome authors gave competition policy – with its embedding in the Community’s constitution – a privileged position in the founding of the European Community. Since the European Union (EU) was first conceived as an economic area, competition policy represented a fundamental policy pillar ensuring a well-functioning common market that would be undistorted by the domestic arrangements of Member States (Wilks, 2005). Nevertheless, the ‘subsidiarity’ principle – authority is granted to EU institutions only after it has been established that Member States cannot satisfactorily exercise such powers – has consistently characterized the balance between Brussels and the Member States (Van Den Bergh, 1996). For instance, van Waarden and Drahos (2002) note that merger control – our area of empirical interest – involves clear thresholds demarcating jurisdictional boundaries between national competition authorities (NCAs) and the European Commission (EC). Furthermore, the 2004 reform of competition policy within the EU (where many elements were de-centralized to the NCAs and national courts) highlights these same separations as it is stated that all European competition authorities “are independent from one another. Cooperation between the NCAs and with the Commission takes place on the basis of equality, respect and solidarity” (European Commission, 2003, p. 1).

While the above suggests the decentralization of EU competition policy and the equivalence between the EC and the NCAs, a number of scholars argue that EU competition policy is better characterized as centralized with the Commission having precedence over the various NCAs. Both Neumann (1990) and Van Den Bergh (1996) argue that the Commission is in charge of pan-European competition policy. In this vein, Dutz and Vagliasindi (2000) found East European NCAs to have fully adopted EU competition law and practice; and Amato (1996) – the then Chairman of the Italian competition authority and former Prime Minister – stated that Italy’s competition policy was fully derived from EC norms and

regulations: a characterization which applies to other EU Member States. Furthermore, while the 2004 reform of EU competition policy highlighted the supposed equality between the EC and NCAs, it was also stated that the “Commission, as the guardian of the treaty, has the ultimate ... responsibility for developing policy ... therefore, the instruments of the Commission on the one hand and of the NCAs on the other are not identical” (European Commission, 2003, p. 2). Vives (2009) sums up well the idea of EC precedence when he states that “competition policy has become central in the European Union, with the authority of the European Commission firmly established and with an ... international leadership role” (p. 19).

Accordingly, the question we ask here is whether Member States actually take their cue from the European Commission when setting the tenor of national competition policy; i.e., does the European Commission provide leadership in the realm of merger policy? Specifically, we will consider the use of remedies in merger control, and test whether an upswing in the use of remedies by the EC results in Member State NCAs employing more remedies in subsequent years. As Lyons (2004) notes, our understanding of competition institutions and processes “is not a completed research program” (p. 252). Thus, by providing empirical evidence on whether it is ‘EC leadership’ or ‘subsidiarity’ that best characterises merger control within the European Union, we hope to shed more light on the workings of pan-European competition policy.

Taking such a leadership role implies that European Commission actions not only have the immediate goal of ameliorating anti-competitive merger proposals, but also involve the additional goal of setting a benchmark to achieve desired levels of EU-wide merger control. This inducing of European NCA actions is done indirectly by increasing the potential dissent between the observed EC-level and NCA-level of scrutiny. NCAs face a cost from such dissent, and adjust their policies in order to mitigate these costs. Consider, for instance,

that NCAs tend to value more the creation of national champions through domestic mergers despite these mergers potentially harming domestic consumers. From a European-wide perspective, a price-increasing merger of two firms based in one Member State – though operating in other EU Member States – is more likely to be blocked by a supra-national authority than by a national authority (Barros and Cabral, 1994). Thus, the supranational authority would prefer that national authorities have stricter merger control.<sup>1</sup> Furthermore, in order to induce higher levels of NCA scrutiny, the supranational agency can overstate its position against mergers so that it increases observed dissent with national competition authorities. In turn, the NCAs will be stricter with regard to mergers in their jurisdictions to reduce dissent. This mechanism, associated with the interaction between national authorities and the supranational authority – the European Commission in our case – involves the latter acting as a Stackelberg leader.

The paper is organized as follows in order to support our analysis of EC leadership in European merger control. The second section presents a framework that shows how one can derive our principal testable hypothesis regarding EC leadership. The third section provides background on the data employed in our empirical analysis. The fourth section establishes the main empirical specification. The fifth section discusses the empirical results. The sixth section presents some robustness checks. The last section concludes.

## **2. A framework**

We can model the leadership argument introduced above as follows. Consider a set of NCAs that face a stream of merger proposals that involve at least some anti-competitive effects: indexed by  $\theta$ , where a higher  $\theta$  means a more anti-competitive merger proposal. In the

---

<sup>1</sup> Instead of national champion tendencies, one could also consider that national competition authorities give greater importance to regional and labor policies as compared to the EC; thus, these conditions could also give rise to a difference between EC and NCA priors on the optimal tenor of merger policy. As Vives (2009, p. 19) notes, a consistent challenge for EU-wide competition policy has always been “how to avoid opportunistic behavior by national regulators”.

relevant market, we have both domestic and foreign consumers with surpluses denoted respectively by  $CS^d(\theta)$  and  $CS^f(\theta)$  in the event of the merger being approved. Furthermore, all consumers suffer due to a higher level of anti-competitiveness; i.e.,  $\frac{dCS^d(\theta)}{d\theta} \leq 0$  and  $\frac{dCS^f(\theta)}{d\theta} \leq 0$ . But if the merger is remedied, then the level of anti-competitiveness is clearly lower. For simplicity, we normalize this level to zero,  $\theta=0$ ; i.e., we assume that remedies work perfectly. Similarly, the relevant market (i.e., focal industry) can consist of both domestic and foreign firms—firms whose profits are affected by the merger in relation to the degree of the merger’s anti-competitiveness, respectively denoted by  $\Pi^d(\theta)$  and  $\Pi^f(\theta)$ .<sup>2</sup> In particular, the anti-competitiveness of a merger enhances both domestic and foreign firms’ profitability, i.e.,  $\frac{d\Pi^d(\theta)}{d\theta} \geq 0$  and  $\frac{d\Pi^f(\theta)}{d\theta} \geq 0$ .

An NCA  $i$  must define a threshold  $\hat{\theta}_i$  above which it remedies merger proposals.

Furthermore, NCAs care only about domestic consumers and firms, and not about the foreign consumers and firms that are part of the relevant market.<sup>3</sup> NCAs do, however, care about dissent with regard to the EC’s position on merger control; i.e., they face a cost to being far away from the defined EC–level of scrutiny. The relevance of this concern can be found in several initiatives aimed at promoting a single competition policy within the European Union even if application is done by different entities. These costs may be related to (i) the EC

---

<sup>2</sup> Although prohibitions (the outright rejection of a merger due to anti-competitive problems) are an additional tool that competition authorities employ, we focus strictly on the possibility of remedies being imposed in order to avoid cluttering the model with further notation. Focusing on the proclivity of competition authorities to employ remedies to ameliorate the anti-competitive effects involved with merger proposals is, however, in line with recent developments in the cross-national context for merger policy where prohibitions have been less frequently used over the last decade (Seldeslachts *et al.*, 2009; Vives, 2009). Furthermore, accounting for prohibitions would substantially complicate the simple model we propose here, though such a model can lead to similar qualitative predictions.

<sup>3</sup> While many mergers with European-wide competitive implications must be notified to the EC, many other mergers that have European competitive implications due to exports will still be handled by NCAs. Thus, even mergers that are mainly domestic in nature – and thus handled by Member State NCAs – will still have export implications.

taking the next “borderline” merger case under its jurisdiction, which of course means that the national authority loses its decision power there, (ii) the EC starting a juridical procedure via the European ‘Court of First Instance’, (iii) being “punished” by the EC in other European policy areas, or (iv) a more stringent control of all financial flows toward the Member State.<sup>4</sup>

We model this concern with a simple quadratic loss function. The welfare measure for a national competition authority  $i$  is then given by:

$$W_i^d = \int_0^{\hat{\theta}_i} f(\theta)[CS^d(\theta) + \Pi^d(\theta)]d\theta + (1 - F(\hat{\theta}_i))[CS^d(0) + \Pi^d(0)] - \frac{1}{2}(\hat{\theta}_i - \hat{\theta}_{EC})^2,$$

where  $f(\theta)$  denotes the density of mergers with anti-competitive effects,  $F$  is the corresponding distribution function,  $\hat{\theta}_i$  is the threshold set by the national competition authority, and  $\hat{\theta}_{EC}$  is the threshold set by the European Commission.<sup>5</sup>

The optimal threshold choice for each national competition authority  $i$  is given by:

$$\frac{\partial W_i^d}{\partial \hat{\theta}_i} = f(\hat{\theta}_i)[CS^d(\hat{\theta}_i) + \Pi^d(\hat{\theta}_i) - CS^d(0) - \Pi^d(0)] - (\hat{\theta}_i - \hat{\theta}_{EC}) = 0 \quad (1),$$

and  $\frac{\partial^2 W_i^d}{\partial \hat{\theta}_i^2} < 0$ . It can then be easily shown that the impact of a change in the European

Commission’s threshold,  $\hat{\theta}_{EC}$ , on the threshold of the Member State NCA is positive. Using

the implicit function theorem, and labelling  $\frac{\partial W_i^d}{\partial \hat{\theta}_i} = G(\cdot)$ ,

$$\frac{\partial \hat{\theta}_i}{\partial \hat{\theta}_{EC}} = - \frac{\partial G / \partial \hat{\theta}_{EC}}{\partial G / \partial \hat{\theta}_i} = - \frac{1}{\partial^2 W^d / \partial \hat{\theta}_i^2} \quad (2),$$

<sup>4</sup> One could even consider the costs involved with not being held in esteem by one’s peers. For instance, if an NCA exhibits a workload of activity that does not hold up to standard – i.e., the benchmark set by the EC – then they could lose the respect of their peers in other NCAs. See also footnote 22, where we report some robustness checks of possible peer effects.

<sup>5</sup> The quadratic distance function is employed for simplicity. Any function that increases with the distance between the two policy thresholds will generate the same effects.

which is – given the second-order-derivative maximization condition from above – always positive. Therefore, for each Member State  $i$ ,

$$\frac{d\hat{\theta}_i}{d\hat{\theta}_{EC}} > 0 \quad (3).$$

Thus, we see that a change in the European Commission’s threshold for remedying mergers will result in a corresponding change in the thresholds for European NCAs.<sup>6</sup> This derivative represents the conceptual foundation for our empirical testing. Before stating our empirical prediction, we must first present the other integral part of the interplay between Member States and the EC. In particular, the EC acts like a ‘Stackelberg leader’ and chooses its threshold level taking into account the anti-competitive nature of the merger proposals falling under its jurisdiction, but while also taking into account the impact that the EC has on the thresholds set by the various Member States. The first element of the EC’s welfare function – which is irrespective of any welfare implications regarding NCA actions – can be denoted generically by  $V(\hat{\theta}_{EC})$ ; i.e., this first element captures the direct welfare effects of EC merger analysis based on the consumers and firms in the relevant EU market. With the above, the total welfare of the European Commission can be expressed as follows:

---

<sup>6</sup> Notice that this relationship can be empirically tested irrespective of whether  $\hat{\theta}_i > \hat{\theta}_{EC}$  or  $\hat{\theta}_i \leq \hat{\theta}_{EC}$ . Also introducing asymmetric dissent costs according to the NCA being above or below the threshold level of the EC does not change the sign but simply the magnitude of the effect so long as these costs are (strictly) larger than zero. We can show this with an example. Take dissent costs to be  $\frac{k_1}{2}(\hat{\theta}_i - \hat{\theta}_{EC})^2$  if  $\hat{\theta}_i > \hat{\theta}_{EC}$  and

$\frac{k_2}{2}(\hat{\theta}_i - \hat{\theta}_{EC})^2$  if  $\hat{\theta}_i \leq \hat{\theta}_{EC}$ . The ordering of  $k_1$  and  $k_2$  can be chosen freely, but it is perhaps more natural to assume that  $k_1 > k_2 > 0$ , i.e., it is more costly to be in dissent when an NCA is less strict than the EC. Then  $\frac{\partial \hat{\theta}_i}{\partial \hat{\theta}_{EC}} = -\frac{k_j}{\partial^2 W^d / \partial \hat{\theta}_i^2}$  for  $j=1,2$ . The sign of the derivate does, therefore, not change by including

asymmetric costs because the effect is now only multiplied by  $k_j$  (only in the limiting case of  $k_j = 0$  the effect goes to zero). In any case, we have empirically tested whether  $k_1 \neq k_2$ . This does not appear to be so; i.e., countries follow the EC in the same way, irrespective their being above or below the EC’s threshold.

$$\begin{aligned}
W^{EC} &= V(\hat{\theta}_{EC}) + \sum_i \int_0^{\hat{\theta}_i} f(\theta)[CS^d(\theta) + CS^f(\theta) + \Pi^d(\theta) + \Pi^f(\theta)]d\theta + \\
&\quad + \sum_i (1 - F(\hat{\theta}_i))(CS^d(0) + \Pi^d(0) + CS^f(0) + \Pi^f(0)) \\
s.t. \quad \hat{\theta}_i &= g(\hat{\theta}_{EC})
\end{aligned}$$

where the last constraint is the solution to first-order condition (1) with respect to  $\theta_i$ .

The first-order condition for the EC is then:

$$\frac{\partial W^{EC}}{\partial \hat{\theta}_{EC}} = \sum_i f(\hat{\theta}_i)[CS^d(\hat{\theta}_i) + CS^f(\hat{\theta}_i) + \Pi^d(\hat{\theta}_i) + \Pi^f(\hat{\theta}_i) - CS^d(0) - CS^f(0) - \Pi^d(0) - \Pi^f(0)] \frac{d\hat{\theta}_i}{d\hat{\theta}_{EC}} + \frac{\partial \mathcal{V}(\hat{\theta}_{EC})}{d\hat{\theta}_{EC}} = 0,$$

This expression, using the result of equation (1), can be re-written as

$$\frac{\partial W^{EC}}{\partial \hat{\theta}_{EC}} = \sum_i f(\hat{\theta}_i)(\Delta_i^f) \frac{d\hat{\theta}_i}{d\hat{\theta}_{EC}} + \sum_i (\hat{\theta}_i - \hat{\theta}_{EC}) \frac{d\hat{\theta}_i}{d\hat{\theta}_{EC}} + \frac{\partial \mathcal{V}(\hat{\theta}_{EC})}{d\hat{\theta}_{EC}} = 0 \quad (4),$$

with  $\Delta_i^f = CS^f(\hat{\theta}_i) + \Pi^f(\hat{\theta}_i) - CS^f(0) - \Pi^f(0)$  — i.e., the externality on the rest of the EU

due to an NCA decision. Equations (1) and (4) constitute the equilibrium solution for the interplay between the national competition authorities and the European Commission. In the absence of any strategic interaction between the EC and the NCAs, the first two terms in

expression (4) would be zero, thus  $\frac{\partial \mathcal{V}(\hat{\theta}_{EC})}{d\hat{\theta}_{EC}} = 0$ . However, starting from an initial situation

where  $\hat{\theta}_i = \hat{\theta}_{EC}$  (i.e., the EC and NCA's share the same view on merger policy

restrictiveness), a  $\Delta_i^f < 0$  leads the EC to being stricter than the NCA of country  $i$ . In other

words, these externalities are relevant in the sense that otherwise the (symmetric) NCAs and the EC would choose the same policy level (i.e. the same threshold). The EC increases

dissent by taking a stricter approach, which in turn leads to the NCAs being stricter than they would be in the absence of the EC's leadership role, due to the cost NCAs suffer from dissent with the EC.

With the above at hand, we can now present empirical predictions that are based on the theoretical model.<sup>7</sup> Whereas equation (4) shows that the EC has an interest in acting as a Stackelberg leader in setting its threshold for remedying merger notifications, equation (2) shows that NCAs optimally move their thresholds in the same direction when this happens. However, given that we cannot observe these thresholds for the application of remedies, an empirical manifestation of this logic would be an up-tick in the use of remedies by the European Commission leading to an up-tick in remedy use by the NCAs. These ideas lead to the following empirical prediction:

*Prediction: A change in the European Commission's cut-off level for the application of remedies (and thus its proclivity to employ remedies) is matched by a same-direction change on the part of European NCAs.*

In reality, the EC-leadership framework would be applied to a considerable extent via means of examples: by taking decisions and supporting them in a way that generates the adoption of these same principles and procedures by European NCAs. In terms of testable implications, the above reasoning implies that a surge of merger policy actions – e.g., remedies – by the European Commission should result in increased merger policy actions by Member States in subsequent years after accounting for the business cycle and other effects.<sup>8</sup>

We should be clear here and note that we are not attempting to analyze merger policy at the micro-level; i.e., we are not examining various merger policy decisions for Type I and II errors à la Duso et al. (2007). Instead, we think that ‘good’ antitrust in general is the key

---

<sup>7</sup> Our data do not permit the estimation of a fully structural empirical model; thus, it is not our aim to have a one-to-one correspondence between theory and empirics. Instead, the theoretical model's main aim is to show that, given its assumptions, (i) the EC acts as a leader in setting merger policy, and (ii) NCAs move in accordance with the EC. Both of these points represent the core of our reduced-form empirical model.

<sup>8</sup> Note that we cannot test whether the European Commission overshoots on its positioning regarding mergers, although the three consecutive defeats (Tetra/Laval, Airtours/First Choice, and Schneider/Legrand) some years ago in the European courts is certainly consistent with this interpretation.

concern (or at least over-arching concern) of the EC, and that the EC is not interested in micro policy tinkering. The EC shows through example to the NCAs its preferences by the decisions it makes for mergers that fall under EC jurisdiction; yet, these mergers reviewed by the EC are in general different mergers than those analyzed and reviewed by NCAs. Moreover, it would not be efficient from a public policy standpoint to engage in two parallel investigations for the same merger as that would involve repetitive investigatory efforts.<sup>9</sup>

Other types of cases may also emerge; e.g., the reverse may occur for  $\Delta_i^f > 0$  where the EC is less strict than the NCA. Further, member State heterogeneity may influence the magnitude of the effect, as national markets more sensitive to anti-competitive effects (i.e., a larger drop in consumer surplus for the same increase in a merger's anti-competitiveness) will tend to have stricter policies.

The identification of a leadership role is also interesting *per se*, as it would be consistent with a common complaint by many that the European Commission is too active in its pursuit of competition policy.<sup>10</sup> The implication regarding an overly active EC results from equations (3) and (4) under  $\Delta_i^f < 0$ . As discussed above, under certain conditions a Member State may have a more active policy than the EC, yet the Member State will still react in the same direction as the EC policy change so long as there are positive dissent costs; see also footnote 6. Note that the strategic use of merger-policy activity levels by the EC is only rational when  $d\hat{\theta}_i / d\hat{\theta}_{EC}$  is different than zero—an observation that only reinforces our

---

<sup>9</sup> This also suggests that the EC does not necessarily investigate whether NCAs make errors in their decisions on mergers that fall under NCA jurisdiction. It would seem to be very difficult for the EC to detect errors here, as to do so would require that the EC does parallel merger investigations. Yet as mentioned in the text, this would surely be an inefficient means of spending scarce European resources.

<sup>10</sup> It is of course true that the EC is to some extent constrained by the European courts; yet the European courts appear to focus on prohibitions and not remedies. Yet, our theoretical and empirical models focus on remedies—where most of the action occurs in merger policy. EC remedies are basically the outcome of a bargaining process between the merging firms and the EC, with the EC generally having more bargaining power (especially in phase I) when compared to firms (Duso et al., 2011). It seems then that the EC has some leeway in setting preferences during the bargaining process while not having to fear subsequent court cases.

interest in estimating the magnitude of these effects. Accordingly, we now turn to the empirical analysis.

### 3. The data

The core data consist of annual measures of merger policy for 16 national competition authorities in Europe – plus the European Commission – over the 1994-2005 period; thus, the principal unit of observation for the empirical tests is European NCA by year.<sup>11</sup> Merger policy data are obtained from annual OECD country reports on competition policy (Organization for Economic Co-operation and Development, 2005). The OECD asks members and associates to answer specific questions concerning the annual content of competition policy in those particular jurisdictions; thus, these annual reports provide raw data on cross-national competition policies that can be compiled into empirical measures. Further, the 1994-2005 period reflects when the annual OECD reports were delivered in a systematic manner. In addition to the data compiled from the OECD reports, we also gathered data via direct contact with – and specific reports from – individual NCAs. The aim of creating accurate and consistent measures of cross-national merger control represented the chief concern in data compilation. Furthermore, the data are necessarily characterized as unbalanced panels, as a number of annual observations were missing or necessarily dropped in order to yield consistent cross-national measures over time.<sup>12</sup>

The constructs of primary interest for our empirical analysis are the merger policy actions employed by the various NCAs and the European Commission. In keeping with the

---

<sup>11</sup> The 16 European NCAs include: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Sweden and UK. To be precise, we define EU Member States as those nations which were an EU member before 1994 (the start of our dataset), or became a member before 2005 (the end of our dataset) – the logic being that the competition policies of new entrants were already inclined to consider EC policy before entering, as competition policy represented a significant step in the accession process (Dutz and Vagliasindi, 2000). We also added Norway to this list of 16, as it is part of the European Economic Area (EEA) and thus required to adopt a great deal of EU legislation. Norway is thus a virtual Member State in the empirical analysis, though the results are not sensitive to this designation (Switzerland is not part of the EEA, and hence is not included in our EU sample).

<sup>12</sup> See Clougherty (2005) and Seldeslachts et al. (2009) for different applications of this OECD-based data.

theoretical section and in keeping with the fact that prohibitions have been more rarely applied in merger control over the last few decades (Seldeslachts *et al.*, 2009; Vives, 2009), we focus on the proclivity of competition authorities to employ remedies to ameliorate the anti-competitive effects involved with merger proposals. In doing so, we sum up those remedies applied in phase I and II for both the EC and the NCAs; i.e., we do not differentiate between Phase I and II remedies.<sup>13</sup>

Nevertheless, we will control in our regression specification for the proclivity of the EC and NCAs to employ prohibitions as a merger policy tool. Accordingly, we use as our dependent variable the annual number of remedies employed in the NCA divided by the annual number of notified mergers in the NCA (hereafter referred to as ‘remedy-intensity’).<sup>14</sup> Thus, remedy-intensity for the various competition authorities within the EU captures the proclivity to which that authority uses remedies as a policy tool. The variable construct capturing the use of prohibitions as a policy tool is constructed in a similar manner: annual number of prohibitions employed divided by the annual number of notified mergers in the authority (hereafter referred to as ‘prohibition-intensity’).

Using the remedy-intensity and prohibition-intensity measures involves three particular advantages. First, the construct itself has very little measurement error since competition authorities tend to accurately report the annual number of notified mergers, remedies and prohibitions in their jurisdiction (OECD, 2005). Second, by dividing merger remedies (and prohibitions) by the number of notified mergers, our construct of interest does not suffer from scaling issues. Third, our intensity measures are accordingly continuous, and

---

<sup>13</sup> Most NCAs mimic to a large extent the EC’s two investigation phases. In the first phase, a preliminary investigation is carried out (maximum 15 days with the EC). If the merger case is straightforward, then a decision is taken after this phase—which may include remedies. If the case needs further investigation, then it is carried over to the second phase (maximum 90 days with the EC)—which may also include remedies.

<sup>14</sup> Normalizing remedies by the contemporaneous measure of merger notifications does involve the risk of measurement error, as notifications in one year might spillover to the subsequent year as a remedy, if the review process takes some time. Nevertheless, the review process is generally much shorter than six months on average; hence, there would be more measurement error involved if merger notifications were lagged by one or more years.

allow then for the use of estimation methodologies better suited for continuous variables. In order to provide more clarity on the nature of the different remedy-intensity and prohibition-intensity variables, Table 1 presents the means for the ‘EC Remedy-Intensity’ and ‘EC Prohibition-Intensity’ variables, as well as the relevant means for the individual ‘NCA Remedy-Intensity’ and ‘NCA Prohibition-Intensity’ variables.

\*\*\* Insert Table 1 near here \*\*\*

#### **4. Empirical estimation strategy**

Our empirical analysis of leader-follower dynamics regarding the use of merger policy tools in the European competition-policy environment relies first on remedy-intensity in Member States as the dependent variable capturing the proclivity of an NCA to employ remedies. Furthermore, European Commission remedy-intensity represents the core explanatory variable, as we are interested in whether a change in the EC’s proclivity to employ remedies leads to an equivalent change in the proclivity of European NCAs to employ remedies. In order to identify a clear causal relationship and mitigate simultaneity bias, we use lagged values of EC remedy-intensities as explanatory variables to avoid potential endogeneity problems.<sup>15</sup> In addition, we also use lagged values of EC prohibition-intensity in order to more fully capture the different paths via which enhanced merger control may manifest.<sup>16</sup>

---

<sup>15</sup> We also performed some additional tests to ensure that the denominator in our dependent variable (NCA notified mergers) is not correlated with the denominator in our principal explanatory variable (EC notified mergers). If these variables exhibited substantial correlation, then the danger exists that we would be making spurious causal inferences regarding the impact of EC remedy-intensity (and prohibition-intensity) on NCA remedy-intensity. Using the same regression specification that we outline below (though replacing the intensity measures simply with the number of notified mergers for the NCAs and EC respectively), we find no evidence that the number of EC notified mergers significantly affects the number of NCA notified mergers.

<sup>16</sup> As a robustness check, we created a Challenge-Intensity variable ((Remedies + Prohibitions)/Merger-Notifications) and ran similar leader-follower estimations that yielded qualitatively similar results. However, we – and an anonymous referee – decided not to report such estimations, as they do not yield precise results concerning the relationship between the EC and NCAs. Moreover, controlling for prohibition-intensity is fundamental in order to be able to interpret an increase in remedy-intensity as indicating increased intervention.

We must also take into account other factors driving the merger policy of NCAs in the European context if we are to make solid inferences on the impact of EC remedy-intensity on European NCAs' remedy-intensity. Accordingly, as a first step, we include the lagged remedy-intensities and prohibition-intensities for the specific NCA; thus, we control for any general tendencies that may be developing in the individual Member State, and therefore better isolate the impact of the EC's merger policy actions on the actions of Member States in subsequent years. Accordingly, the list of explanatory variables begins with lagged 'EC remedy-intensity', lagged 'EC prohibition-intensity', lagged 'NCA remedy-intensity', and lagged 'NCA prohibition-intensity'.<sup>17</sup> Davies and Majumdar (2002) report that the FTC considers its enforcement efforts to involve a two-year lag in terms of benefits. Leary (2002) and Seldeslachts et al. (2009) also move beyond a year-to-year impact for merger policy actions. Thus, we employ a two-year average for both remedy-intensity and prohibition-intensity when they are used as explanatory variables.<sup>18</sup>

In addition to the core constructs above, we need to control for additional factors influencing the proclivity of an NCA to employ remedies in order to elicit better causal inferences on the relationship between EC remedy-intensity and European NCA remedy-intensity. First, and as already noted, the European Union began applying a whole new set of rules in 2004 that created inter alia a new EU competition enforcement system that was

---

<sup>17</sup> The inclusion of lagged NCA Remedy-Intensity as an explanatory variable does suggest that this model specification is somewhat akin to a dynamic panel data model. However, it should first be noted that lagged NCA remedy-intensity is, of course, actually an average over the t-1 and t-2 periods per the definition that follows above. Furthermore, any bias introduced to the estimation should be a downward bias (i.e., underestimation) on our coefficient estimates of principal concern (Bond, 2002). Moreover, omitting the measure of lagged NCA Remedy-Intensity from the specification leads to even stronger coefficient estimates for the impact of EC remedy-intensity on NCA remedy-intensity in subsequent years in our mainline estimations—see Table 2.

<sup>18</sup> Accordingly, the value for "EC Remedy-Intensity" in one particular observation year will be the following:  $(\text{Number of EC Remedies}_{t-1} + \text{Number of EC Remedies}_{t-2}) / (\text{Number of Merger Notifications}_{t-1} + \text{Number of Merger Notifications}_{t-2})$ . Notice how taking the two-year average helps reduce the measurement error concern noted in footnote 14, as it is now less likely that a remedy in that two-year period can be attributed to a merger notification in the prior period. Note that moving the level of analysis to two-years is not a feasible solution as there would still always be a year of remedies that would not find one of its corresponding match years in the two subsequent years. Furthermore, moving to a two-year level of analysis would cut the sample in half to some 50 observations and thus reduce degrees of freedom significantly. The Prohibition-Intensity variables are constructed in the same fashion.

‘ostensibly’ to be more de-centralized than the previous system, but to also have closer cooperation between the EC and NCAs via the European Competition Network (ECN). Given its potential direct impact on European NCAs, we included a dummy variable – ‘EU 2004 Reform’ – set to one in 2004 and 2005 to capture this effect.

Second, since remedy-intensity includes the number of notified mergers in the denominator, it behooves us to control for changes in notification thresholds (the line over which mergers must be notified to competition officials). Thus, observed changes in remedy-intensity may be due to a change in notification thresholds instead of a change in the employment of remedies (since fewer pro-competitive mergers must be reported for vetting when the notification threshold is raised). Merger thresholds tend to be composed of three different elements (worldwide sales, domestic sales, and market shares); furthermore, different competition authorities mix-and-match their use of these three elements with some authorities employing all three elements to elicit notifications and others employing only one or two elements. Moreover, these elements can sometimes be based on individual firm measures or on combined merger entity measures.<sup>19</sup> Given the sheer complexity and variation in the different types of threshold regulations manifest in the cross-national environment for merger policy, we decided to use dummies for threshold changes. The nations in our sample experienced a maximum of three threshold changes in our sample period 1994-2005. Twelve EU NCAs experienced at least one change, nine experienced two changes, and one

---

<sup>19</sup> We provide two examples here to show the complexity and multidimensionality of the notification thresholds. First, as of 1999, a merger in Germany must be notified when the combined worldwide turnover of all participating entities exceeds about €1.02 billion and at least one participating entity had a turnover in Germany higher than €25.5 million, unless one of the following applies: (i) one participating party has a worldwide turnover of less than about €10.3 million, or (ii) the relevant market (that must have existed for at least five years) had a total annual value of less than about €15.3 million. Furthermore, the German merger rules state that the calculation of turnover depends on the type of business (e.g., for companies only involved in buying/selling, the relevant turnover for the merger notification thresholds is only 75% of their real turnover). Second, Portugal holds that a merger must be notified when the market share of the merged entity is larger than 30% in the relevant national market, or a substantial part therein; or if the turnover in Portugal of the combined entity was more than about €150 million after deduction of taxes directly related to the turnover (Global Competition Review, 2002).

experienced three changes in notification thresholds.<sup>20</sup> Accordingly, we created three dummy variables: ‘Threshold-Change 1’, ‘Threshold-Change 2’ and ‘Threshold-Change 3’ were respectively set to one for the year (and subsequent years) when NCAs experience a first, second and third change in notification threshold.

Third, our sample includes the end of the 1990s, thus encompassing the period which includes the largest ever global merger wave. The fact that many more mergers are notified during certain periods may influence remedy-intensity due to the changing workloads for competition authorities. For example, it may be that during the peak of a merger wave, the amount of remedies – relative to the number of mergers notified – declines, as the competition authority is not able to keep up with the workload. Given that merger waves typically coincide with economic booms and high stock markets (Gugler, Mueller & Yurtoglu, 2006; Harford, 2005), we add two relevant control variables to help capture merger waves. First, we add growth as a percentage of GDP – hereafter referred to as ‘Growth’ – in order to control for general economic conditions. Second, we add capitalization of listed companies as a percentage of GDP – hereafter referred to as ‘Stock-Market’ – in order to control for financial market conditions.

The addition of Growth and Stock-Market represents two means via which we control for merger waves and the potential impact of merger waves on remedy-intensities; yet, we have additional means to control for merger waves and other factors. Our dynamic specification – where right-hand-side constructs include lagged measures of NCA Remedy-Intensity – also helps control for wave-like tendencies in the data; see Seldeslachts et al. (2009) for an extensive discussion of how lagged measures help control for merger waves. We also include a time trend (logged) to capture additional common time trends – including

---

<sup>20</sup> Data were collected mainly from Global Competition Review yearbooks and complemented with the OECD reports. The remaining countries that experienced ‘no change’ in notification thresholds (Australia, Italy and Norway) officially do not have threshold-levels for merger notification. Furthermore, all of the threshold changes we observed involved increases in the notification levels, hence these were all raisings of the ‘bar’.

merger wave tendencies – in merger policy for all European NCAs.<sup>21</sup> Finally, we employ robust standard errors clustered on the panel (i.e., the European NCA) in order to deal with potential serial correlation in the dependent variable. The influential work by Bertrand et al. (2004) argues that this clustering on the panel is a procedure that addresses such serial correlation in the dependent variable—serial correlation which might manifest due to the wave-like nature of NCA remedy-intensity.

We will also control for fixed panel effects (an NCA specific effect); thus, helping to control for any institutional differences across jurisdictions, and for any other non-time-varying omitted variables. For instance, an antitrust jurisdiction’s non-time-varying tendency to have either a high or low notification threshold will be subsumed in this fixed effect. Summarizing the above, we estimate how the remedy-intensities of Member State NCAs depend on the remedy-intensity and prohibition-intensity of the EC in the previous two years, the remedy-intensity and prohibition-intensity of the NCA in the previous two years, and additional control variables: the EU 2004 reform, dummies for the first, second and third threshold changes (Threshold-Change 1, Threshold-Change 2 and Threshold-Change 3), economic growth, and stock market valuation. Furthermore, we also include a time trend and fixed panel-specific effects. The base regression specification can accordingly be summarized as follows:

$$\begin{aligned}
 NCA\text{RemedyIntensity}_{i,t} = & \alpha_0 + \alpha_1 \left( \sum_{k=1}^2 EC\text{Remedy-Intensity}_{i,t-k} \right) + \alpha_2 \left( \sum_{k=1}^2 EC\text{Prohibition-Intensity}_{i,t-k} \right) \\
 & + \alpha_3 \left( \sum_{k=1}^2 NCA\text{Remedy-Intensity}_{i,t-k} \right) + \alpha_4 \left( \sum_{k=1}^2 NCA\text{Prohibition-Intensity}_{i,t-k} \right) + \beta \text{Controls}_{i,t} \\
 & + \log(\text{Time-Trend}_t) + \omega_i + \varepsilon_{i,t},
 \end{aligned}$$

where  $i$  indexes the NCAs,  $t$  indexes time (year), and  $k$  allows for convenient expressions,  $\omega_i$  represents the unobserved country-specific effect and  $\varepsilon_{i,t}$  the disturbances. In order to

---

<sup>21</sup> The inclusion of a time-trend as opposed to fixed time-effects is driven in part by the need to identify EU 2004 Reform and additional variables that would correlate with fixed time effects.

contrast our dynamic model with a more “classic” approach, we will also estimate a specification identical to the above but where the lagged NCA remedy-intensity construct is omitted from the right-hand-side of the equation.

## 5. Empirical results

Table 2 presents the empirical results for our two baseline regression specifications—specifications which will test whether the EC has a leadership role in setting the tenor of merger policy in European NCAs. Both specifications appear to be reasonably well specified (R-squared of 0.414 and 0.556 for the specification with and without lagged NCA Remedy-Intensity, respectively), and yield relatively similar results. Accordingly, we will take a variable by variable approach here in discussing the results.

\*\*\* Insert Table 2 near here \*\*\*

Considering the pure control variables first: The coefficient estimates for EU 2004 Reform (positive and significant for both specifications) provide some evidence that Member States tended to have stricter merger control after this package of reforms; thus, a direct effect is involved with the initiation of this comprehensive reform package.<sup>22</sup> The first change in notification threshold levels (Threshold-Change 1) indicates a positive effect on NCA remedy-intensity as expected, but does not indicate statistical significance. This lack of

---

<sup>22</sup> We also checked whether the EC’s leadership became stronger from 2004 onward, as the ECN may have led to a more efficient peer-pressure mechanism among NCAs. This mechanism might have generated a faster and stronger leader-follower relationship. We interacted EC remedy-intensity with the EU 2004 Reform dummy and added that interaction effect to the right-hand-side of the regression specification. However, we did not find any significant interaction effect. We also checked on whether this effect may have played out earlier due to NCAs’ anticipating the ECN’s formation, but we also did not find any significant interaction effect when extending the effective EU reform date to years prior to 2004. Finally, we also checked on whether a subgroup of NCAs reacted differently post-2004. The Member States most likely to diverge from EC leadership are likely to be small and more export-oriented (to other EU nations), since these countries gain more from creating national champions (Barros and Cabral, 1994). Accordingly, the ECN might succeed in keeping these country-types in line. However, we again found no significant extra-effect for these NCAs.

significance may be due to the fact that virtually all of the NCAs with notification obligations (with the exception of France and Italy) experienced at least one threshold change during our sample period; thus, these common effects may be partly subsumed in the common time-trend variable. The second change in notification threshold levels (Threshold-Change 2) indicates the expected statistically-significant positive effect on NCA remedy-intensities, as higher notification thresholds naturally lead to a higher percentage of mergers being remedied since the population of notified mergers will consist of more anti-competitive mergers. The third change in notification thresholds (Threshold-Change 3) actually indicates a negative effect on remedy-intensities; however, it is important to underscore that we only had one NCA experiencing a third change in merger notification levels. Accordingly, this variable could be driven by the idiosyncrasies with this particular Member State. The coefficient estimates for growth are negative and significant in both estimations: the negative impact of economic growth on NCA remedy-intensities suggests that competition authorities find it difficult to keep their antitrust scrutiny levels at a constant rate when they experience the upward trend in merger notifications that is associated with higher growth rates. The coefficient estimate for Stock Market is positive in both specifications, but only significant in the second estimation when the lagged NCA remedy-intensities are excluded; thus akin to Harford's (2005) results, financial-market variables appear to be relatively less influential.

Turning to the remedy-intensity and prohibition-intensity variables, it is first clear that previous levels of both remedy-intensity and prohibition-intensity in the particular NCA (NCA Remedy-Intensity and NCA Prohibition-Intensity) very much affect current remedy-intensity levels in that NCA. Thus, Member States that experience an increased proclivity to remedy and prohibit merger proposals will tend to have higher proclivities to remedy merger proposals in subsequent years. In particular, an increase in NCA prohibition-intensity by 1% leads to a further increase in that same NCAs' remedy-intensity by around 1.1% in the

subsequent year (specification 1), and by a little over 1.3% if the long-run effects are estimated (specification 2).<sup>23</sup> Furthermore, specification 1 indicates that an increase in NCA remedy-intensity by 1% will generate a further increase in NCA remedy-intensity of 0.2% in subsequent years. Thus, NCA remedy-intensity exhibits a relatively rapid adjustment pace; i.e., the past is not a huge predictor of the present in this context (Martin, 1979).

In terms of EC remedy-intensity and prohibition-intensity, it is first clear that any changes in the proclivity of the EC to prohibit merger proposals (EC Prohibition-Intensity) do not appear, however, to significantly impact remedy-intensity in the NCA in subsequent years. Yet more importantly, changes in the proclivity of the EC to remedy merger proposals (EC Remedy-Intensity) do appear to significantly impact remedy-intensity in the NCA in subsequent years. The first specification in Table 2 includes a lagged ‘NCA remedy-intensity’ variable; thus, the coefficient for the lagged ‘EC remedy-intensity’ variable indicates the short-term effect of EC leadership on NCA remedy-intensity (i.e., a deviation from the remedy-intensity trend of NCAs). That coefficient estimate of 0.182 in the first specification suggests that when the EC increases its remedy-intensity by 5.5 percentage points, then the NCAs will increase their remedy-intensities by 1 percentage point on average—a short-term/lower-bound estimate of the leadership effect. On the other hand, the coefficient estimate of 0.229 for EC remedy-intensity in the second specification of Table 2 directly elicits the long-term/upper-bound estimate of the leadership effect.<sup>24</sup> Accordingly,

---

<sup>23</sup> The first specification in Table 2 includes the lagged ‘NCA remedy-intensity’ variable, thus the coefficient of the lagged ‘NCA prohibition-intensity’ of 1.092 indicates the short-term effect of NCA prohibition-intensity on future remedy-intensity (i.e. a deviation from the remedy-intensity trend of NCAs). Taking into account the coefficient of the lagged NCA remedy-intensity of 0.207 leads to a long-term/upper-bound effect of  $1.092/(1-0.207) = 1.324$ . Thus, the same increase in NCA prohibition-intensity by 1 percentage point leads to an NCA remedy-intensity increase of about 1.3 percentage points on average in the long-term. Therefore, the long-term effect is 0.3 percentage points higher than the short-term effect. One can also directly see this long-term/upper-bound effect in the second specification of Table 2, which does not include the lagged NCA remedy-intensity variable and thus directly elicits the total (long-term) effect. The coefficient estimate here for lagged NCA prohibition-intensity is precisely 1.324.

<sup>24</sup> One can also indirectly elicit the long-term effect from the first specification in Table 2. In particular, by taking into account the coefficient estimate for the lagged NCA remedy-intensity of 0.207, one can generate a long-term/upper-bound effect by calculating  $0.182/(1-0.207) = 0.229$ .

the same increase in EC remedy-intensity by 5.5 percentage points would lead to NCA remedy-intensity increases of some 1.25 percentage points on average in the long-term—some 0.25 percentage points higher than the short-term effect.

While the above interpretations of economic significance may appear to suggest that the EC must massively distort remedy-intensities to get a significant effect in Member States, it is important to underscore that there are several European NCA's affected by EC leadership. To be exact, we have 16 European NCAs in our data sample; further, the European Community now consists of 27 Member States. Accordingly, that 5.5 percentage point increase in EC remedy-intensity to elicit a 1% (1.25%) short-term (long-term) increase in NCA remedy-intensity is spread out over the merger policy tendencies of some 27 Member States. In this vein, Hildebrand (2009: 25) notes that DG Competition lacks the necessary resources to enforce competition rules throughout the Community; thus, the EC sets merger policy as a means to elicit optimal policy for the majority of European merger activity (those mergers under the jurisdiction of the 27 NCAs).<sup>25</sup>

In sum, there is some evidence here that Member States tend to follow the lead of the Commission by altering their tendency to remedy merger proposals when the EC alters its tendency to remedy merger proposals. Our empirical results are consistent with our theoretical model where Member States follow the EC's lead due to it being costly when they operate too far from the Commission's stance in terms of remedy-intensities.

## **6. Robustness checks**

In order to provide more confidence in our finding that European Member States follow the lead of the European Commission in setting the tenor of NCA merger policy, we engage in a

---

<sup>25</sup> The same point can be made from a theoretical perspective. In principle it is true that when NCAs do not react strongly to the EC's actions, then producing the same ultimate impact on NCA behavior requires the EC to distort more. But this reasoning does not solve the full model. If the impact is small, then the optimal 'distortion' by the EC is also small, as the marginal benefit from doing so is small. The 'target distortion' is, accordingly, endogenous to our reasoning (and to our model).

set of three robustness checks. In particular, we test to see – in addition to the ECN reform of 2004 – whether another potentially important policy shift took place in 1998. We also consider estimations on a limited number of observations where we can control for the amount of resources (competition authority staffing levels) that an authority can deploy to vet merger notifications. Finally, we consider whether EC leadership is different for NCAs involving voluntary merger notification schemes as compared to mandatory notification schemes.

First, we previously noted that the reforms of 2004 involved the application of a whole new set of rules for European competition policy involving both more decentralization and closer cooperation between the EC and NCAs via the ECN. Yet a second major policy shift also occurred over the span of our sample period; namely, an amendment to European merger control came into force in March of 1998 that allowed for more effective policy in the context of “ever-increasing market integration ... [and] intensified ... trans-national merger activity” (Kekelekis, 2006, p. 14). Accordingly, we created a dummy variable that is set to one from 1998 onwards (hereafter referred to as ‘EU 1998 Reform’) and added this dummy to our set of controls in the two main regression specifications. Table 3 reports the empirical results for the series of robustness tests, and the first two specifications report the empirical results of regressions identical to those in Table 2 with the exception of the ‘EU 1998 Reform’ variable being included. As can be seen in the estimation results, the dummy variable for the 1998 reform is not significant, and the impact of EC remedy-intensity on NCA remedy-intensity remains positive and significant. Accordingly, it appears that the 1998 reforms did not change the overall remedy behavior of Member State NCAs; though, this package of reforms might have been influential in other domains of merger policy.

\*\*\* Insert Table 3 near here \*\*\*

Second, we controlled for merger waves in our two main specifications via a few different means (e.g., control variables, dynamic panel data approach, a time-trend, and cluster robust standard errors); however, we did not necessarily control for the amount of resources that a competition authority can deploy to handle an up-tick in merger activity. While a wave of merger activity could directly impact NCA remedy-intensities (i.e., make it difficult to keep antitrust scrutiny levels high), such effects might be mitigated – or countered – by a commensurate increase in the resources that competition authorities can deploy to deal with a wave of merger activity. Accordingly, we collected data on the annual number of employees per NCA (hereafter referred to as ‘Total Staff’) in order to capture the resources of a particular competition authority. We then added this construct as a right-hand-side variable to our two main regression specifications from Table 2, and respectively report these results as the third and fourth specification in Table 3.

Despite the fact that we lose some twenty-four observations due to missing values for this new construct, the impact of EC remedy-intensity on NCA remedy-intensity actually becomes substantially larger in these specifications. It appears then that including a measure of competition-authority resources tends to ‘clean’ the regression in terms of better eliciting the impact of the EC on NCA remedy-intensity. The impact of total staffing on NCA remedy-intensity is, however, surprisingly negative. Perhaps this result indicates that NCAs – although they increase staffing due to an anticipated uptick in merger notifications – still cannot fully keep up with merger waves. Unfortunately, our limited number of observations does not allow deeper investigation of this issue. Finally, it should also be noted that these estimations perform remarkably well in light of the relatively small number of observations available (i.e., 79 and 83 observations respectively for the two specifications).

Third, it is important to consider that some jurisdictions have a voluntary – versus a mandatory – merger notification scheme and that reporting-scheme differences may consequently yield different leader-follower relationships. Only the UK and Norway involve a voluntary reporting scheme in our sample of NCAs. Thus as a robustness check, we created a dummy variable for these ‘voluntary’ jurisdictions and interacted this dummy variable with the measure of EC remedy-intensity (i.e., our main variable of interest). This interaction was inserted into our two main regression specifications as an additional right-hand-side variable, and the empirical results for these estimations are reported as the fifth and sixth specifications in Table 3. The positive interaction variable indicates that the voluntary-notification NCAs actually follow the EC’s leadership role more than the mandatory-notification NCAs. It should be noted, however, that the enhanced leadership effect is only statistically significant in the second specification where lagged NCA remedy-intensities are excluded. These results may suggest that voluntary-regimes involve additional long-term effects as compared to mandatory-regimes, but do not involve additional short-term effects as compared to mandatory-regimes.

## **7. Conclusion**

Motivated by the question of whether the European Commission (EC) influences the setting of competition policy in the various national competition authorities (NCAs) of Europe, we investigate whether the tenor of merger policy for 16 European NCAs is influenced by changes in EC merger control. Our theoretical model highlights how the EC can provide leadership in the definition and application of merger policy and can ensure that a consistent set of rules and procedures is applied within the European Union (EU) area. We find evidence in support of the EC leadership role when employing panel data on the cross-national merger policies manifest in the European context over the 1994-2005 period.

Namely, increases in the EC's proclivity to remedy merger proposals appear to generate same-direction changes in the proclivity of European NCAs to remedy merger proposals.

Accordingly, our empirical analysis suggests that the European Commission sets the tenor for merger policy in the EU environment, as Member States tend to reflect in subsequent years any changes in the proclivity of the EC to employ remedies. While we are heartened by the robustness of the results despite the small number of observations, the lack of observations also represents a limitation to this study. Nevertheless, the seeming presence of this leadership role indicates that the EC can use competition policy activity levels as a strategic tool in its interactions with European NCAs. In particular, the EC may have a strategic incentive to be overly strict in its application of competition policy – i.e., overshoot optimal policy – in order to raise the scrutiny levels of Member States.

While Member States generally react to changes in EC merger control, it is quite plausible that individual EU NCAs might respond differently to any changes in the scrutiny level for EC merger control. In particular, some NCAs may react in step with the EC, while other NCAs may be inert to any changes in EC merger control. Thus, in addition to the obvious task of extending the scope of study to all 27 Member States, future work may endeavor to consider the possibility of European Member States varying in the degree to which they follow the lead of the EC. Exploratory tests that consider whether voluntary and mandatory merger-notification schemes involve differences in EC leadership represent the potential for further research in this vein. Yet moreover, the main contention of this paper is simple but important: to completely understand the competition policies of European national competition authorities, one must consider the leadership role of the European Commission.

**Acknowledgements**

We wish to thank Christophe Crombez, Gergely Csorba, Benny Geys, David Myatt, Lars-Hendrik Röller, and participants from the 2010 IIOC in Vancouver, the 2010 ACLE workshop in Amsterdam and a seminar at the Portuguese Competition Authority for helpful comments and suggestions, as well as Claudia Baldermann and Jennifer Rontganger for excellent research assistance.

## References

- Amato, G. (1996). 'The impact of Europe on national policies: Italian anti-trust policy', in (Y. Mény *et al.*, eds.), *Adjusting to Europe: the impact of the European Union on national institutions and policies*, pp. 157-174, New York: Routledge.
- Barros, P.P. and Cabral L. (1994). 'Merger Policy in Open Economies'. *European Economic Review*, vol. 38, pp. 1041-1055.
- Bertrand, M., Duflo, E. and Mullainathan, S. (2004). 'How much should we trust Differences-in-Differences Estimates?' *Quarterly Journal of Economics*, vol. 119(1), pp. 249-275.
- Bond, S.R. (2002). 'Dynamic Panel Data Models: A Guide to Micro Data Methods and Practice'. *Portuguese Journal of Economics* vol. 1(2), pp. 141-162.
- Clougherty, J.A. (2005). 'Antitrust Holdup Source, Cross-National Institutional Variation, and Corporate Political Strategy Implications for Domestic Mergers in a Global Context'. *Strategic Management Journal*, vol. 26(8), pp. 769-790.
- Davies, S., and Majumdar, A. (2002). 'The Development of Targets for Consumer Savings Arising from Competition Policy'. Working Paper No. 4, Office of Fair Trading, UK.
- Duso, T., Neven, D. and Röller, L.-H. (2007), "The political economy of European merger control: evidence using stock market data", *Journal of Law and Economics* vol. 50 (3), pp. 455-489.
- Duso, T., Gugler, K. and Yurtoglu, B. (2011), "How effective is European merger control?", *European Economic Review* 55 (7), 980-1006
- Dutz, M. A. and Vagliasindi, M. (2000). 'Competition Policy Implementation in Transition Economies: An Empirical Assessment', *European Economic Review*, vol. 44, pp. 762-772.
- European Commission (2003) 'Joint Statement of the Council and the Commission on the Functioning of the Network of Competition Authorities', January, 2003; (downloaded December 7, 2009). [http://ec.europa.eu/competition/ecn/joint\\_statement\\_en.pdf](http://ec.europa.eu/competition/ecn/joint_statement_en.pdf).
- Global Competition Review. (2002). *Merger Control: The International Regulation of Mergers and Joint Ventures*, sixth ed., Law and Business Research Ltd.: London.
- Gugler, K., Mueller, D. and Yurtoglu, B. (2006). 'The Determinants of Merger Waves'. Working Paper No. SP II 2006-01 Wissenschaftszentrum Berlin (WZB), Berlin, Germany.
- Harford, J. (2005). 'What Drives Merger Waves?'. *Journal of Financial Economics*, vol. 77(3), pp. 529-560.
- Hildebrand, D. (2009). *The Role of Economic Analysis in the EC Competition Rules*, Kluwer: The Netherlands.

Kekelekis, M. (2006). *EC Merger Control Regulation: Rights of Defence, a Critical Analysis of DG Comp Practice and International Competition Law*, Kluwer: The Netherlands.

Leary, T.B. (2002). 'The Essential Stability of Merger Policy in the United States'. *Antitrust Law Journal*, vol. 70, pp. 105-142.

Lyons, B.R. (2004). 'Reform of European Merger Policy' *Review of International Economics*, vol. 12(2), pp. 246-261.

Martin, S. (1979). 'Advertising, Concentration and Profitability' *Bell Journal of Economics*, vol. 10, pp. 639-647.

Neumann, M. (1990). 'Industrial Policy and Competition Policy', *European Economic Review*, vol. 34, pp. 562-567.

OECD. (2005). *Competition Policy in OECD Countries*, OECD: Paris, France.

Seldeslachts, J., Clougherty, J.A. and Barros, P.P. (2009). 'Settle for Now but Block for Tomorrow: The Deterrence Effects of Merger Policy Tools'. *Journal of Law and Economics*, vol. 52, pp. 607-634.

Van Den Bergh, R. (1996). 'Economic Criteria for Applying the Subsidiarity Principle in the European Community: The Case of Competition Policy', *International Review of Law and Economics*, vol. 16, pp. 363-383.

Van Waarden, F. and Drahos, M. (2002). 'Courts and (Epistemic) Communities in the Convergence of Competition Policies', *Journal of European Public Policy*, vol. 9(6) (December), pp. 913-934.

Wilks, S. (2005). 'Agency Escape: Decentralization or Dominance of the European Commission in the Modernization of Competition Policy?' *Governance, An International Journal of Policy, Administration, and Institutions*, vol. 18(3), pp. 431-452.

Vives, X. (2009). 'Introduction: Competition Policy in Europe', in ((X. Vives), ed.), *Competition Policy in the EU: Fifty Years on from the Treaty of Rome*, pp. 1-20, Oxford: Oxford University Press.

TABLE 1  
 DESCRIPTIVE STATISTICS FOR REMEDY-INTENSITY & PROHIBITION-INTENSITY  
 BY COMPETITION AUTHORITY

		Variable Means	
<i>Competition Jurisdiction</i>	<i>Observation Numbers</i>	<i>Remedy-Intensity</i>	<i>Prohibition-Intensity</i>
<i>European Commission</i>	<i>13*</i>	.0678020	.00732903
Austria	5	.0112386	.0013201
Belgium	7	.0019802	.0159658
Czech Republic	6	.0501667	.0051186
Denmark	4	.0821687	0
Finland	5	.0275368	.0009174
France	5	.0105596	.0012237
Germany	11	.0043073	.0028664
Hungary	9	.0186262	.0057031
Ireland	7	.0051948	.0014773
Italy	10	.0058579	.0011255
Netherlands	4	.0145037	.0007042
Norway	7	.0532208	.0098807
Poland	2	.0062406	.0020802
Portugal	6	.0141802	0
Sweden	10	.0106682	.0043268
United Kingdom	9	.0157362	.0066423
<i>EU NCAs</i>	<i>107</i>	.017923	.0044906

\* Since EC data on Remedy-Intensity & Prohibition-Intensity are only used for explanatory variable purposes, the EC variables do not actually constitute 'observation lines' from the sample.

TABLE 2  
REGRESSIONS OF NCA REMEDY-INTENSITY ON EC MERGER POLICY INTENSITY

Variable	(1)	(2)
$\sum_{k=1}^2 EC\ Remedy- Intensity_{i,t-k}$	0.182** (0.0629)	0.229** (0.0949)
$\sum_{k=1}^2 EC\ Prohibition - Intensity_{i,t-k}$	-0.0935 (0.416)	0.394 (0.542)
$\sum_{k=1}^2 NCA\ Remedy- Intensity_{i,t-k}$	0.207** (0.0900)	
$\sum_{k=1}^2 NCA\ Prohibition - Intensity_{i,t-k}$	1.092** (0.473)	1.324*** (0.416)
<i>EU 2004 Reform</i>	0.0128** (0.00598)	0.0217** (0.00956)
<i>Threshold-Change 1</i>	0.0128 (0.0132)	0.0123 (0.0135)
<i>Threshold-Change 2</i>	0.0218** (0.00909)	0.0219** (0.00859)
<i>Threshold-Change 3</i>	-0.0221*** (0.00452)	-0.0258*** (0.00633)
<i>Growth</i>	-0.00299* (0.00167)	-0.00496** (0.00182)
<i>Stock-Market</i>	0.147 (0.104)	0.437** (0.161)
<i>Time-Trend</i>	-0.0175 (0.0148)	-0.0192 (0.0122)
<i>Constant</i>	0.0223 (0.0263)	0.00576 (0.0264)
Observations	103	107
R-squared	0.414	0.556

NOTE.—The dependent variable is an NCA's remedy-intensity. All estimations involve country-specific effects. Standard errors (clustered by country) are in brackets. Furthermore, \*\*\* = 1%, \*\* = 5%, and \* = 10% Significance.

TABLE 3  
ADDITIONAL REGRESSIONS OF NCA REMEDY-INTENSITY ON EC MERGER POLICY INTENSITY

Variable	(1)	(2)	(3)	(4)	(5)	(6)
$\sum_{k=1}^2 EC\ Remedy - Intensity_{i,t-k}$	0.175*** (0.0572)	0.171* (0.0849)	0.202** (0.0797)	0.254** (0.117)	0.139** (0.0541)	0.156* (0.0827)
<i>Voluntary</i> * $\sum_{k=1}^2 EC\ Remedy - Intensity_{i,t-k}$					0.263 (0.173)	0.429** (0.177)
$\sum_{k=1}^2 EC\ Prohibition - Intensity_{i,t-k}$	-0.156 (0.490)	-0.114 (0.344)	-0.00300 (0.411)	0.444 (0.615)	-0.0386 (0.443)	0.441 (0.559)
$\sum_{k=1}^2 NCA\ Remedy - Intensity_{i,t-k}$	0.207** (0.0912)		0.197* (0.103)		0.188 (0.112)	
$\sum_{k=1}^2 NCA\ Prohibition - Intensity_{i,t-k}$	1.094** (0.478)	1.324*** (0.431)	0.954** (0.331)	1.078*** (0.337)	1.157** (0.465)	1.408*** (0.393)
<i>EU 1998 Reform</i>	-0.00165 (0.00628)	-0.0125 (0.00769)				
<i>EU 2004 Reform</i>	0.0118** (0.00510)	0.0135** (0.00564)	0.00981 (0.00583)	0.0199* (0.00994)	0.0127* (0.00596)	0.0210** (0.00915)
<i>Total Staff</i>			-0.000407** (0.000167)	-0.000418** (0.000177)		
<i>Threshold-Change 1</i>	0.0128 (0.0133)	0.0124 (0.0138)	-0.00291 (0.00873)	-0.00768 (0.0117)	0.0140 (0.0132)	0.0143 (0.0131)
<i>Threshold-Change 2</i>	0.0217** (0.00905)	0.0207** (0.00888)	0.0199* (0.0100)	0.0175 (0.0106)	(0.0132) (0.00992)	0.0249** (0.00936)
<i>Threshold-Change 3</i>	-0.0222*** (0.00459)	-0.0255*** (0.00606)	-0.0245*** (0.00543)	-0.0285*** (0.00681)	-0.0222*** (0.00446)	-0.0258*** (0.00637)
<i>Growth</i>	-0.00295* (0.00163)	-0.00464** (0.00166)	-0.00207 (0.00153)	-0.00397** (0.00163)	-0.00313* (0.00176)	-0.00498** (0.00184)
<i>Stock-Market</i>	0.151 (0.112)	0.453** (0.161)	0.150 (0.158)	0.550*** (0.164)	0.168 (0.116)	0.446** (0.153)
<i>Time-Trend</i>	-0.0159 (0.0132)	-0.00634 (0.0141)	0.00192 (0.0153)	-0.000381 (0.0143)	-0.0186 (0.0151)	-0.0213 (0.0123)
<i>Constant</i>	0.0209 (0.0255)	-0.00442 (0.0274)	0.0396 (0.0246)	0.0227 (0.0278)	0.0224 (0.0261)	0.00756 (0.0253)
Observations	103	107	79	83	103	107
R-squared	0.414	0.564	0.539	0.649	0.426	0.574

NOTE.—The dependent variable is an NCA's remedy-intensity. All estimations involve country-specific effects. Standard errors (clustered by country) are in brackets. Furthermore, \*\*\* = 1%, \*\* = 5%, and \* = 10% Significance.