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The duration of the EC merger control process: Determinants and the impact of the 2004 merger regulation reform

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THE DURATION OF THE EC MERGER CONTROL PROCESS: DETERMINANTS AND THE IMPACT OF THE 2004 MERGER REGULATION REFORM

Sven Heim^{*}, Kai Hüschelrath^{*} and Ulrich Laitenberger[°]

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Abstract

The duration of merger proceedings held by competition authorities is an important determinant of the efficiency of the entire merger control process. We use a dataset of 2953 Phase I and 92 Phase II investigations completed by the European Commission (EC) between 1999 and 2008 to examine the key determinants of their duration. Differentiating between authority- and case-related drivers, we find that while the duration of Phase I investigations largely depends on the type of decision and use of simplified procedure, the duration of Phase II investigations is driven by factors such as industry knowledge, the duration of the preceding Phase I investigation, the origin of the notifying firm or the number of identified relevant markets. We also provide evidence that the significant increase in average duration identified after the 2004 merger regulation reform does not imply a decrease in administrative efficiency, as the probability of in-depth investigations was correspondingly reduced.

Keywords Competition policy, ex-post evaluation, merger control, European Union

JEL Class K21, L41

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1 Introduction

Merger control has become an established tool of competition law and policy in many countries around the world. Securing a competitive market structure by *ex-ante* avoiding concentrations that are likely to significantly impede effective competition is likely to contribute substantially to the overall benefits created by competition policy. However, despite these undisputed benefits, the merger control process undoubtedly also creates a substantial amount of costs. In addition to the direct expenses of the competition authority and the affected firms such as, for example, labor costs, substantial indirect costs emerge for shareholders, stakeholders, business partners and competitors in the form of uncertainties about whether and under what conditions the merger will eventually be approved.

The existence of substantial time-dependent costs – quickly reaching millions of Euros per case according to a study by PriceWaterhouseCoopers (2003) – implies that the duration of the competition authority proceedings is a dimension of the efficiency of the entire merger control process. Against this background, we use a dataset of 2953 Phase I and 92 Phase II investigations completed by the European Commission (EC) between 1999 and 2008 to examine the key determinants of their duration. Differentiating between authority- and case-related drivers, we find that while the duration of Phase I investigations largely depends on the type of decision and use of simplified procedure, the duration of Phase II investigations is driven by factors such as industry knowledge, the duration of the preceding Phase I investigation, the origin of the notifying firm or the number of identified relevant markets. We also provide evidence that the significant increase in average duration identified after the 2004 merger regulation reform does not imply a decrease in administrative efficiency, as the probability of in-depth investigations (such as Phase I with commitments or Phase II) was correspondingly reduced.

The article is organized as follows. The second section reviews related literature to the *ex-post* evaluation of EC merger decisions. Section 3 is an initial characterization of the merger control process (Section 3.1) and the relevance of its duration (Section 3.2), complemented by a presentation and discussion of the corresponding EC merger control statistics from 1999 to 2008 in Section 3.3. In the fourth section, our hypotheses on possible determinants of the duration of the EC merger control process are developed. We not only differentiate between Phase I and Phase II investigations but also introduce two categories of possible drivers: authority-related and case-related. In the subsequent fifth section, we commence in Section 5.1 with a characterization of our data set and a discussion of the corresponding descriptive statistics, followed by the

presentation and discussion of our empirical models and estimation results in Sections 5.2 and 5.3, respectively. Section 6 concludes the article with a review of its main insights and the derivation of both important policy implications and avenues for future research.

2 Review of Related Literature

While the ex-post evaluation of U.S. antitrust policy in general, and merger policy in particular, has attracted the interest of both academics and practitioners for the last few decades (see, e.g., Elzinga (1969), Stillman (1983), Baker (2003) or Federal Trade Commission (1999)), the topic recently also gained in importance in the European Union. This increasing interest is not only reflected in more academic contributions on the topic – such as Davies and Lyons (2007) or the February 2010 Special Issue of the *International Journal of the Economics of Business* focusing on the ex-post evaluation of competition policy – but is also found in practice. For example, most recently, the European Commission (2015) itself published a very detailed review of the literature on the ex-post economic evaluation of competition policy enforcement, and aims to increase their (internal and external) ex-post evaluation activities in the future.

Limiting our review of the related literature to the evaluation of merger enforcement in the European Union, we found that the European Commission (2015) proposes a further differentiation in (1) studies analyzing merger decision outcomes, and (2) studies evaluating the impact of merger regulations and policies. The first set of studies apply various techniques such as event studies, econometric estimations (both structural and reduced form), surveys or quasi-experimental methods to evaluate the impact of merger decisions (with or without commitments) particularly on market prices, realized efficiency gains, (rival's) stock prices, profits and various market structure characteristics. Examples of such studies include Björnerstedt and Verboven (2012), Clougherty and Duso (2009), Friberg and Romahn (2015) and Ivaldi and Verboven (2005); but also the European Commission (2005) itself, in the form of its merger remedies study.

The second set of studies focuses on an evaluation of the impact of (changes in) merger regulations and policies, and therefore is of direct relevance to the research questions investigated in the remainder of this article. Again concentrating on literature referring to the European Union, Duso et al. (2007) investigate the determinants of EU merger control decisions and the potential anti-competitive consequences of these mergers from the reaction of the stock market price of competitors to the merging firms. Considering a sample of 167 EU mergers between 1990 and 2002, they find that the Commission's decisions are not solely guided by the motive of protecting

consumer surplus but also driven by the institutional and political environment. Bergman et al. (2005) provide an econometric investigation of 96 mergers investigated by the European Commission before 2002. Applying logit models, the authors find that the probability of a Phase II investigation (and of a prohibition of the merger) increases with the parties' market shares, the presence of high entry barriers and a collusion-friendly post-merger market structure.

The introduction of the new EC merger regulation in 2004 (see Section 3 below for further information) was not only accompanied by an intensive general discussion by both lawyers and economists, particularly on how it is best applied in practice (see, e.g., Christiansen (2006), De la Mano and Röller (2006) or Monti (2008)) but led to several econometric studies evaluating specific impacts of the reform (see, e.g., Duso et al. (2013), Martinez Fernandez et al. (2008), Andreasson and Sundqvist (2008) or Mai (2014)). For example, Duso et al. (2013) develop a general framework to assess merger policy effectiveness and then apply the framework as part of an event study to four different dimensions of effectiveness. After comparing the respective results before and after the merger policy reform, they conclude that the reform seems to have been a rather modest improvement of European merger policy. Mai (2014) confirms this general finding in her empirical investigation of measurable changes in the probability of a Phase II investigation following the 2004 merger regulation reform. She applies probit models to a data set consisting of 341 horizontal mergers investigated by the Commission from 1990 to 2012.

Last but not least, very few studies explicitly study the duration of the merger control process.¹ PriceWaterhouseCoopers (2003) empirically investigate the issue from a multi-jurisdictional perspective and find that the need to complete and consider an average of eight filings per merger deal substantially lengthens the overall merger process, inflating the costs involved (in financial and managerial terms). More recently, Ormosi (2012) examines the possible strategic delay of merger procedures by the merging parties. Using a sub-sample of merger decisions, he finds that firms in problematic mergers might engage in suspensions in Phase I in order to find a remedy proposal to avoid a lengthy and costly Phase II investigation. Phase II suspensions are not found to correlate with the probability of a prohibition.

In this article, we contribute to the ex-post evaluation literature by investigating the determinants of the duration of merger investigations in general and the impact of the 2004

¹ More generally, studies on the duration of investigations by competition authorities and courts have recently gained in importance. While Carree et al. (2010) generally study the duration of competition investigations by the European Commission, Hüschelrath et al. (2013) use an econometric framework to analyze the determinants of the duration of EC cartel investigations. Smuda et al. (forthcoming) apply a similar concept to appellate court proceedings in EC cartel cases.

merger regulation reform in particular. We not only find that the respective durations of Phase I and Phase II investigations are affected by different drivers, but also provide evidence that the significant increase in duration identified after the 2004 merger regulation reform has its origin in changes in the probability of the different types of merger investigations rather than a reduced administrative efficiency of the EC's internal procedures.

3 The EC Merger Control Process and its Duration

In this section we provide an overview of the EC merger control process. Following an initial characterization of its essential steps in Section 3.1, we focus on a discussion of the duration of the EC merger control process in Section 3.2. Section 3.3 then presents the corresponding EC merger control statistics for the observation period from 1999 to 2008 and provides an initial (descriptive) quantification of the duration of the EC merger control process.

3.1 General Characterization of the EC Merger Control Process

Although merger control processes differ between countries with respect to both the respective laws and regulations and the respective implementation of these rules by the competition authorities and the courts², it is still possible to identify three steps that every merger control process has to cope with (see generally Hüschelrath (2013)). First, of the entire group of mergers and acquisitions which are announced and completed in a given year, a subset of mergers must be selected for initial review by the competition authority. To facilitate the respective selection process, most European countries have implemented a compulsory notification system³ that forces merging parties to notify their planned transactions to the responsible competition authority as soon as certain threshold values⁴ are met. Secondly, for the selected cases, the competition authority has to assess the likely competitive effects in order to come to a conclusion about whether the transaction at hand is likely to significantly impede effective competition. This step is typically subdivided further into two separate phases: while Phase I investigations provide

² In an econometric investigation, Bergman et al. (2010) compare merger policies in the European Union and the United States. The authors find that, for dominance mergers, the EU is on average tougher than the US, however, the US is found to be tougher with respect to coordinated interaction and non-dominance unilateral effects cases. Overall, Bergman et al. (2010) find substantial differences in policies without being able to classify one regime as being more aggressive than the other.

³ A notable exception is the United Kingdom. Although merging parties can notify their planned transaction to the Competition and Markets Authority (CMA), they are not under any obligation to do so. However, the CMA has the right to review mergers whether or not they were notified, and it is therefore a risk for the merging parties not to report a merger that may later be found to violate UK Competition Law.

⁴ According to Karagök and Rutz (2014), most continental European countries use (different selections and levels of) the following three turnover thresholds: worldwide cumulative turnover (WCTT), domestic cumulative turnover (DCTT), and domestic individual turnover (DITT).

a first assessment of the case with respect to possible competition problems, Phase II investigations concentrate on a typically small set of cases where these concerns are considered particularly likely. Third, for those transactions with a sufficient likelihood of anticompetitive potential, the competition authority has to investigate whether and how certain commitments made by the merging parties (i.e., merger remedies) can possibly heal the competition concerns. Commitment negotiations can usually take place in both phases of the merger control process.

The history of European merger control is rather short.⁵ Although various national competition authorities had already implemented merger control procedures in the 1960s and 70s (e.g., the UK in 1965 or Germany in 1973), it took until September 1990 to design and implement a merger control procedure in the European Union. Although the existence of the three essential steps remained uncontested, EC merger control underwent several legislative changes over the years. Starting with initial Council Regulation (EEC) No 4064/89⁶, the substantial increase in merger cases – and therefore EC workload – was one motivation for the first significant reform of EC merger control: the introduction of a simplified procedure⁷ in 2000. The applicable notice sets out a simplified procedure for Phase I investigations under which the EC intends to treat certain concentrations that – based on experience gained by the EC – do not raise competition concerns. The thresholds used are 15 percent for combined market shares on horizontal markets and 25 percent in vertically related markets.

A major and complete reform of the entire EC merger control process was set out in Council Regulation (EC) No 139/2004⁸ in 2004. Although the reform was still partly motivated by the high workload of the EC, another reason must be seen in the quality issues of the EC's economic analysis in particular, which became apparent after three annulments of Commission decisions (*Airtours*⁹, *Schneider Electric*¹⁰ and *Tetra Laval*¹¹) by the European Court of First Instance (see, e.g., *Todorov and Valcke* (2006)). According to the EC itself¹², the 2004 reform included (a) a clarification of the substantive standard for the analysis of mergers on competition grounds, (b) a

⁵ For a more detailed characterization of the history of EU merger control, see, e.g., Levy (2004).

⁶ Council Regulation (EEC) No 4064/89 of 21 December 1989 on the Control of Concentrations between Undertakings.

⁷ Notice on Simplified Procedure for Treatment of Certain Concentrations, 29 July 2000 (OJ C217/32).

⁸ Council Regulation (EC) No 139/2004 of 20 January 2004 on the Control of Concentrations between Undertakings.

⁹ *Airtours v. Commission*, (2002) ECR II-2585 (CFI).

¹⁰ *Schneider Electric v. Commission*, (2002) ECR-II 4071 (CFI) and (2002) ECR-II 4201 (CFI).

¹¹ *Tetra Laval v. Commission*, (2002) ECR II-4381 (CFI).

¹² See EC Press Release IP/02/1856, Commission Adopts Comprehensive Reform of EU Merger Control (Brussels, 11 December 2002).

rationalization of the timing of the notification of proposed mergers, (c) a simplification of the system for the referral of merger cases from the Commission to national competition authorities (and vice versa), (d) the introduction of a degree of flexibility into the time frame for the conduct of merger investigations, and (e) the strengthening of the Commission's fact-finding powers.

Although the 2004 reform introduced several substantial changes in the EC merger control process – influenced by the ‘more economic approach’ in European competition policy – the most substantial change probably involved the assessment of the competitive effects of a merger. While the old merger regulation concentrated on a dominance test, the new merger regulation of 2004 aimed to protecting competition by prohibiting mergers which “...would significantly impede effective competition, in the common market or in a substantial part of it, in particular as a result of the creation or strengthening of a dominant position...” (Article 2 No. 3 of Council Regulation (EC) No 139/2004).

3.2 *The Duration of the EC Merger Control Process*

Although it is apparent that the optimal duration of a merger control process depends on its detailed aims and implemented structures, it still adds value to discuss the general importance of the duration of a merger control process for (1) firms that plan to notify a merger, (2) other related groups, and (3) public policy makers.

From a (merging) firm's perspective, the duration of the merger control process determines the respective direct costs associated with it. *Ceteris paribus*, the longer the merger control process the more expensive it becomes in terms of both in-house human resources spent and salaries for external lawyers. For example, a survey by PriceWaterhouseCoopers (2003) found that a typical (multi-jurisdictional) merger deal generates on average €3.3 million in external merger review costs with a few major deals reaching costs of more than €10 million. Arguably even more important, the longer the merger control process, the greater the indirect costs created by the respective continued uncertainties. These costs can stretch from reduced labor productivity (e.g., due to fears of post-merger job cuts or ‘preemptive’ job switches to competitors), via delays in the strategic positioning of the firm's products and services, to the adjustment or even termination of investment plans.

As mergers take place in specific industries, delays created by the merger control process are likely to affect other related groups, imposing significant costs on them as well. For example, before a merger decision has been made, shareholders have a hard time valuing the respective firms (or competing firms), increasing the likelihood of speculative (or outright erroneous)

actions. Competitors also face increased uncertainty with respect to the post-merger nature of competition in the industry (and how they should adopt their business strategy). Last but not least, upstream and downstream business partners might also suffer from uncertainties created by a lengthy merger control process with respect to their vending and purchasing activities.

Turning from firms and other potentially affected groups to (social welfare-maximizing) policy makers, they aim at reaching an effective and efficient decision. In this respect, apparently both the duration of the decision and its correctness are crucial. On the one hand, if any merger control decision were to take a prohibitively long time, say five years, firms would refrain from merging due to the legal uncertainties, imposing substantial costs on society due to the foreclosure of many welfare-increasing mergers. On the other hand, guaranteeing a very short duration of merger control process would increase the likelihood of erroneous decisions (damaging the deterrent effect of competition law) in the absence of further investment in additional investigation capacities. In any implementation of a merger control process, balancing the trade-off between investigation effort and decision quality must therefore be considered as main objective of the investigation and represents a measure of its success.

In the European Union the time-sensitivity of the merger control process is tackled through the implementation of a strict time schedule to which the European Commission is committed when investigating mergers. The maximum duration of the EC merger control process is determined in the Commission Regulation (EC) No 802/2004 of 21 April 2004 implementing Council Regulation (EC) No 139/2004. While the old regulation fixed a maximum time budget of one month for a Phase I investigation and four additional months for a Phase II investigation, the reform of the merger regulation in 2004 specified this process further. Figure 1 provides an overview of the possible steps in an EC merger investigation.

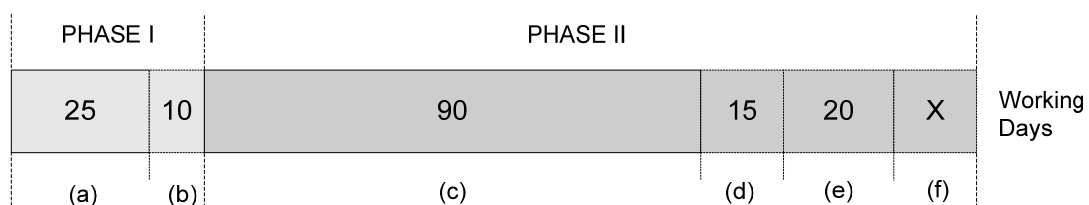


Figure 1. The duration of the EC merger control process

As shown in Figure 1, the duration of the EC merger control process can be subdivided further into six separate steps, with Phase I consisting of two steps (a+b) and Phase II consisting of four

steps (c+d+e+f).¹³ In a Phase I investigation, the EC has 25 working days to come to a decision on the case (a). If commitments are negotiated (b), the time budget is increased by 10 days; any Phase I investigation has to end after a maximum of 35 working days with one of three possible decisions: compatible, compatible with commitments or Phase II initiated. For all cases that enter a Phase II investigation, the EC has an additional 90 working days to investigate the case in greater detail (c). This time budget can be increased further by 15 working days if commitments are negotiated (d), and by an additional 20 working days if both the EC and the respective firms agree that more time is needed for the analysis (e). Furthermore, the EC has the ability to ‘stop the clock’ if, for example, necessary information requested from the parties is missing or incomplete (f). As a consequence, while the maximum time budget for Phase I investigations is fixed, Phase II investigations allow for more flexibility.

3.3 Quantification of the EC Merger Control Process and its Duration

Following the general characterization of the EC merger control process and its duration, this section provides a quantitative overview of this process for the observation period from 1999 to 2008. We concentrate on this observation period to have roughly equally sized periods before and after the 2004 merger regulation reform. As starting point for further discussions, we briefly discuss the frequency of different types of decisions over time. In this respect, Figure 1 shows the number of EC Phase I and Phase II decisions (excluding $57+27=84$ withdrawn cases in the two phases) from 1999 to 2008.

¹³ We abstract from pre-notification talks that usually take place between the Commission and the merging parties before the official merger control process is commenced. See Section 4.1 below for a detailed discussion.

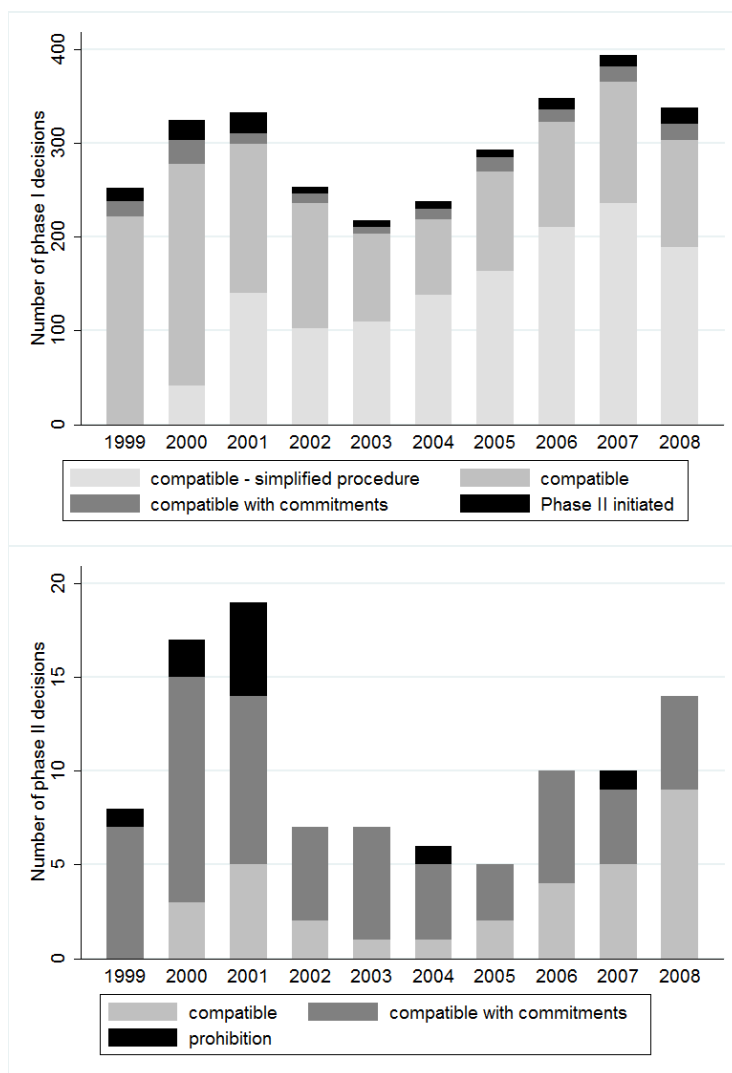


Figure 2. EC Phase I and Phase II merger decisions (1999-2008)

As revealed by the upper chart in Figure 2, there was an increase in the number of Phase I decisions experienced in the years just before 2001; followed by a substantial drop in subsequent years. From 2004, the years of the observation period were again characterized by a significant increase in the number of decisions. Furthermore, in all years, more than 90 percent of all notified mergers were found to be compatible with EC competition law; with an increasing number of cases that were handled under the simplified procedure over time. In all years of the observation period, a small but significant fraction of cases were either only cleared subject to commitments or were taken to an in-depth Phase II investigation.

In the sub-set of Phase II investigations, the lower chart in Figure 1 shows that – after substantial increases in the number of Phase II decisions (again excluding withdrawn cases) in

the years 2000 and 2001 – the subsequent years experienced a substantial fall, however towards the end of the observation period, significant increases in the number of cases can again be observed. In terms of types of decisions, almost every year in the observation period saw compatible cases both with and without commitments. Prohibitions appear to be a rather rare occurrence; especially after the 2004 reform of the merger regulation.

Based on this general characterization of elementary EC merger control statistics, our aim to draw a full picture of the process requires a brief descriptive analysis of the duration and average duration of Phase I and Phase II investigations from 1999 to 2008.

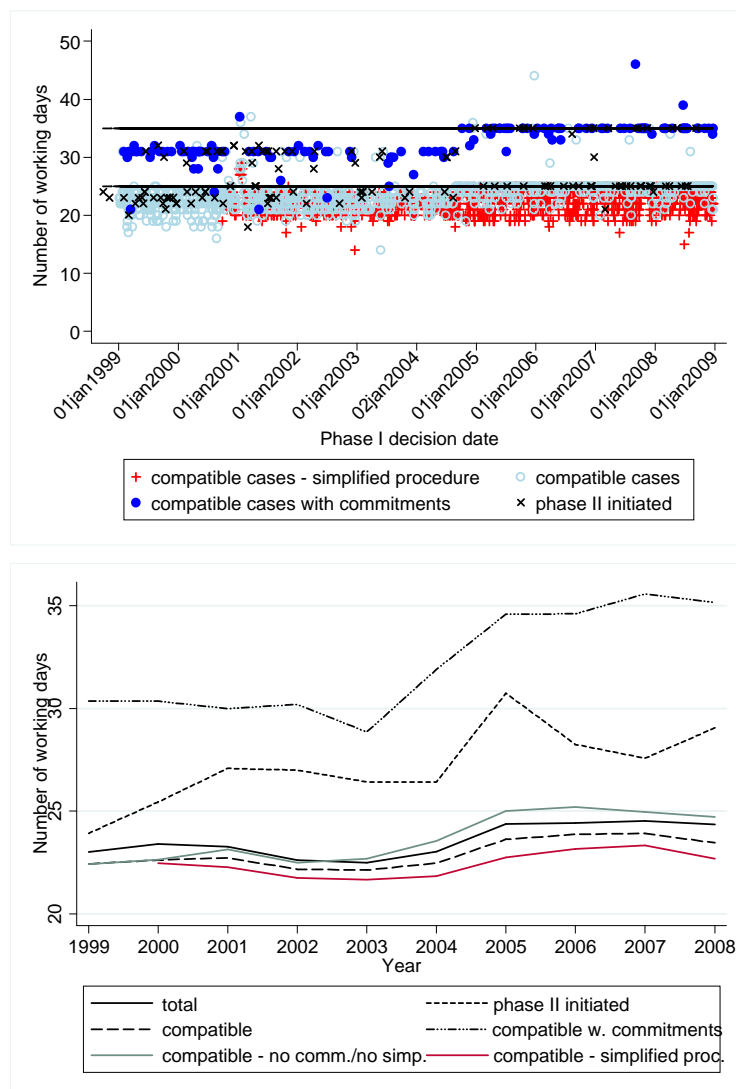


Figure 3. Duration and average duration of EC Phase I investigations (1999-2008)

The upper chart in Figure 3 plots the duration of all 2953 Phase I decisions (with an investigation length below 50 working days¹⁴) in our data set, split into four different sub-categories: compatible cases, compatible cases investigated under the simplified procedure, compatible cases with commitments, and cases for which a Phase II investigation was initiated. The two horizontal lines refer to the maximum time budget for standard cases (25 working days) and cases in which commitments were negotiated (35 working days). As expected, these maximum time budgets are taken seriously by the EC, resulting in only a handful of cases in which these limits were not met. In fact, the large majority of compatible cases are decided by the EC before reaching the maximum time budget of 25 working days. Cases investigated under the simplified procedure are indeed decided more quickly than their ‘standard case’ counterparts. Last but not least, the chart also suggests that the EC used the increased flexibility for Phase I investigations with commitments under the new merger regulation (reflected in the step from 30 to 35 working days in mid-2004).

In addition to the study of the duration of all Phase I investigations, it is useful to take a brief look at the yearly average duration of these investigations. The respective results presented in the lower chart in Figure 3 generally show an increase in the average duration after the new merger regulation went into force in 2004. This is particularly true for cases that were found compatible with commitments only but – to a lesser degree – also for cases that entered Phase II. Both types of decisions (on average) take longer than the other types of decisions.

Figure 4 shows the duration and average duration of EC Phase II investigations¹⁵ for the observation period from 1999 to 2008.

¹⁴ Applying this restriction leads to the exclusion of the following two exceptionally lengthy cases: M.2922-Pfizer/Pharmacia (80 working days, decided in 2003) and M.3423-RWA/AMI/Inter-Fert (91 working days, decided in 2004).

¹⁵ The duration of a Phase II investigation is derived by subtracting the duration of the respective Phase I investigation from the entire duration of the merger case from notification to Phase II decision.

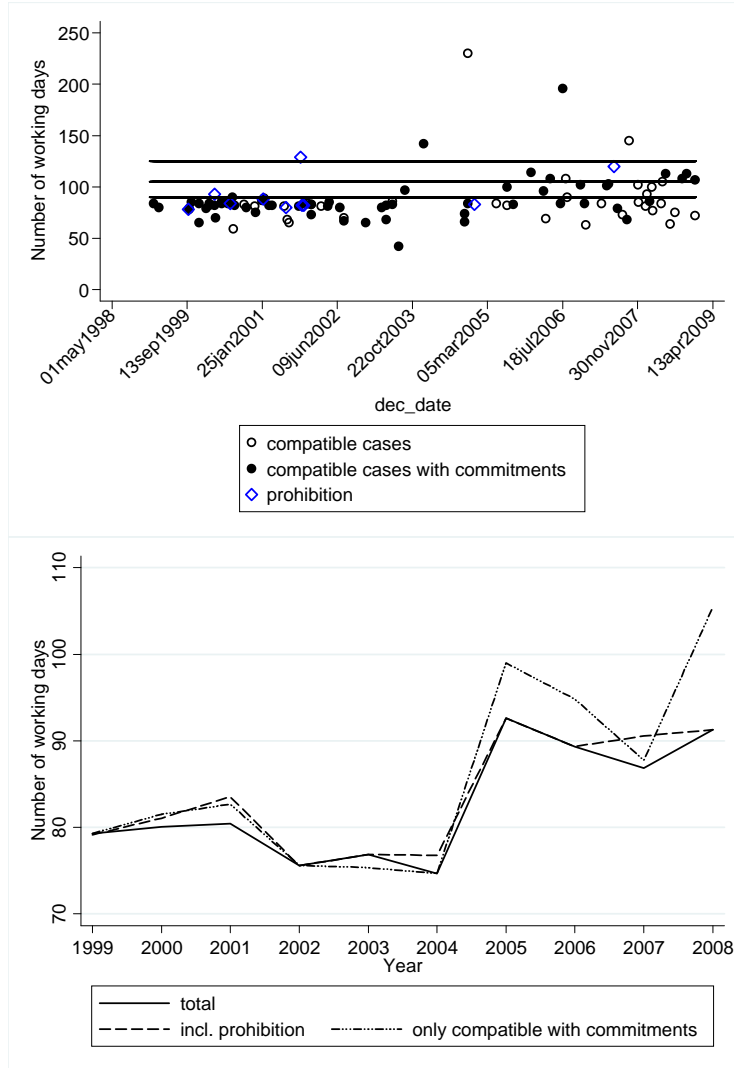


Figure 4. Duration and average duration of EC Phase II investigations (1999-2008)

The upper chart in Figure 4 plots the duration of all 92 Phase II decisions in the observation period.¹⁶ Despite the existence of several outliers with exceptionally short or long investigation lengths, the EC was able to close the respective cases within the set maximum time budgets; however the chart further reveals that the variation in the duration values increased substantially after the 2004 merger regulation reform. As revealed by the lower chart in Figure 4 – even when excluding all cases with an exceptionally long investigation length of more than 140 working days – the total average duration of a Phase II investigation increased substantially during the observation period. While the first years experienced rather constant development with an

¹⁶ The horizontal lines in the upper chart in Figure 4 stand for the maximum time budgets of Phase II investigations: 90 working days for Phase II investigations generally plus 15 working days if commitments are negotiated and a further 20 days if both the EC and the respective firms agree that more time is needed for the assessment.

average duration below 80 working days, the later years show a substantial increase, reaching more than 90 working days on average in 2005 and 2008.

4 Determinants of the Duration of the EC Merger Control Process

In this section, we develop our hypotheses on the possible determinants of the duration of the EC merger control process. Although maximum time budgets for the duration of Phase I and Phase II investigations are set by law, the discussion of the qualitative evidence above revealed substantial variation in the realized duration values (suggesting an empirical examination of the underlying drivers). In the following, we subdivide our hypotheses into two subsets: authority-related and case-related determinants.

4.1 Authority-Related Determinants

A first set of variables that possibly influence the duration of a Phase I or Phase II investigation relates to characteristics of the competition authority. In this respect, a key driver of the duration must first be considered in *legislative changes* (as they are likely to directly affect the organizational structure and the administrative procedures in the authority). In our observation period, two such changes occurred with, first, the introduction of the simplified procedure (referring to Phase I investigations) in 2000 and, second, the complete merger regulation reform in 2004 (referring to both phases). While it is obvious that the introduction of the simplified procedure should result in a reduction of the duration, particularly of Phase I investigations, the effects of the complete 2004 reform is less clear. At least two major arguments speak for an increase in duration after the reform: on the one hand, the new merger regulation introduced the ‘more economic approach’ that aims to increase the impact of economics in case investigations and therefore create, first, the time-consuming need to communicate and coordinate between lawyers and economists; second, the time-consuming need to construct complex data sets for the provision of empirical evidence (supporting the theoretical or anecdotal reasoning); and, third, the time-consuming need to write down richer (and therefore longer) decisions on the respective cases. On the other hand, the implementation of a new and complex regulation requires a substantial learning phase leading to (temporary) increases in the duration of the investigations.

Second, the duration of a Phase II investigation might depend on the duration of the *preceding Phase I decision*, however the direction of this effect appears to be undetermined *ex ante*. On the one hand, a longer Phase I investigation might speak for either a complex case or the ineffective cooperation of the merging parties with the EC, thereby also increasing the duration of

Phase II proceedings. On the other hand, a longer Phase I investigation might speed up the subsequent Phase II analysis, as, for example, missing data has already been gathered.

Third, we expect that, *ceteris paribus*, the duration of a Phase I or Phase II investigation would increase with *workload-related characteristics* at the EC. *Ceteris paribus*, it is reasonable to assume that the more cases the EC teams have to work on, the longer the average duration of a specific case. If an investigation falls into the summer or winter holiday period, a longer than average duration can also be expected. Last but not least, investigation speed is also likely to depend on industry knowledge gained: a second merger case in a certain industry within a short period of time allows the case team to profit from those prior experiences in the industry, thereby speeding up the decision-making processes.

Before we continue with a discussion of our case-related determinants, it is important to discuss an additional potential authority-related driver of the duration of merger proceedings: pre-notification talks. By definition, such talks regularly take place between the Commission and the merging parties before the official merger control process is commenced. Depending on length and the degree of detail in these discussions, it cannot be ruled out that they may have an impact on the duration of the subsequent official investigation. Although it would therefore be desirable to include a measure of (at least) the length of these talks into our empirical analysis below, data availability issues unfortunately do not allow this. In the absence of any indication that the design or general significance of pre-notification talks have changed after the 2004 merger regulation reform, however, we do not expect our main findings to be biased.

4.2 Case-Related Determinants

A second set of variables that possibly influence the duration of Phase I and Phase II investigations relate to characteristics of the merger case under investigation. First, we expect that the duration of a Phase I or Phase II investigation depends on the *type of decision* made by the EC. In particular, we hypothesize that the duration of a Phase I and a Phase II investigation increases if the EC and the merging parties have negotiated commitments. In addition to the obvious argument that the new merger regulation offers an additional time budget for such investigations – which the case handlers are likely to make use of – the negotiation of such remedies is generally a time-consuming process during which the merging parties offer commitments and the EC has to investigate and decide whether the proposed commitments are sufficient to heal the identified competition concerns (taking claimed merger efficiencies into

account as well). The same general argument applies to ‘Phase II initiated’ cases in Phase I and ‘prohibition’ cases in Phase II.

Second, we expect that, *ceteris paribus*, the duration of an investigation decreases if the *notifying firm originates from outside Europe*. In the case of a parallel investigation by another competition authority, coordination between authorities could extend the duration of the EC investigation, however, the EC is also likely to profit from parallel investigations which may even increase the speed of their own proceedings in such mergers with a global dimension.

Third, the duration of Phase II investigations particularly could depend on the *type of merger*. *Ceteris paribus*, it can be expected that horizontal mergers are more likely to cause serious competition concerns than vertical or conglomerate mergers (thereby triggering longer investigation lengths), however a possible counterargument could be that EC staff are more familiar with the analysis of horizontal mergers (see the descriptive statistics later on) therefore increasing the speed of investigation in such mergers.

Fourth, we expect that the duration of a Phase II investigation increases with the *complexity of the merger*. For Phase I investigations, we proxy complexity with the number of affected (NACE code-based) industries that must be screened by the EC. For Phase II investigations, we use the number of relevant markets identified by the EC as a measure to consider the complexity of the merger (from the workload-related perspective of the EC). *Ceteris paribus*, a larger number of relevant markets need more time for investigation than a smaller set of markets.

Last but not least, we expect that the duration of Phase II investigations in particular increases with the *number of competition concerns* (i.e., single dominance or unilateral effects, coordinated effects, vertical restraints) raised by the EC. One justification for this hypothesis lies in the fact that it is, *ceteris paribus*, more complex (and/or controversial) to investigate two or even three different types of possible competition concern compared to just one type. Further measures of complexity or controversy could be seen in, for example, the number of newspaper articles written about the respective case or variables which take the institutional and/or political environment into account, however data availability issues unfortunately do not allow this as part of our empirical analysis below.

Alongside the authority- and case-related determinants, market-related determinants constitute a third subset of variables that possibly influence the duration of Phase II investigations in particular, however variables such as ‘premerger HHI’, ‘combined market share of the merging parties’, ‘delta HHI post-merger’ or ‘high entry barriers’ by definition relate to the characteristics

of specific relevant markets within the merger case under investigation (see also Bergman et al. (2005)). As most investigated mergers affect more than one relevant market, the variables in this setting could only refer to, for example, the relevant market in the respective investigation in which competition concerns were the greatest, however such an approach would ignore the situation in all remaining relevant markets and therefore appears problematic as a potential driver of the speed of Phase II investigations. We therefore refrain from including market-related variables in our empirical analysis.

5 Empirical analysis

In this section, we present our empirical analysis of the determinants of the duration of Phase I and Phase II investigations by the EC from 1999 to 2008. Section 5.1 characterizes our data set and discusses the corresponding descriptive statistics, and Sections 5.2 and 5.3 present and discuss our empirical models and estimation results.

5.1 Data Set and Descriptive Statistics

We use two separate data sets for our empirical analysis. For Phase I investigations, we accessed the EC website to gather information on all Phase I investigations including case numbers, the dates of notification and decision, the types of decision, the numbers and origins of the notifying companies and the merger-specific NACE codes. The data set includes all 2955 Phase I merger cases that were decided by the EC between 1999 and 2008, but excludes all withdrawn cases and two outliers¹⁷ with exceptionally long investigation lengths.

For Phase II investigations, we use the EU Merger Case-Law Database (Version 2.1) provided by the Center for European Law and Economics (CELEC) in Stockholm.¹⁸ The database contains detailed information on all Phase II merger cases decided by the EC between 1999 and 2009. Data covers basic information about the notifying parties, notification and decision dates, relevant markets and a large selection of factors assessed by the Commission. In total the data set covers 126 mergers, of which 27 were eventually withdrawn (and therefore excluded from our analysis). As 2008 is the last year fully available in the database, we removed two cases that were decided in 2009. Last but not least, we removed one case with an exceptionally short (less than

¹⁷ The cases are M.2922-Pfizer/Pharmacia (80 working days, decided in 2003) and M.3423-RWA/AMI/Inter-Fert (91 working days, decided in 2004).

¹⁸ Further information on the database can be found at www.mergerdata.net. As the CELEC database only includes detailed information on Phase II cases, we used the EC merger decision online data base to collect the available information for all Phase I cases, however, the limited information available for the large majority of Phase I cases foreclosed any attempt to collect the same set of variables as available for Phase II investigations.

50 days)¹⁹ and three cases with an exceptionally long duration (more than 140 days)²⁰ of Phase II investigation, and one additional case²¹ in which the number of relevant markets was unusually high (indicating 300 separate relevant markets). We therefore included 126-27-2-3-1-1=92 cases for our empirical analysis, with 57 cases decided under the old, and 35 cases decided under the new EC merger regulation.

Starting with a discussion of Phase I data, Table 1 presents the descriptive statistics of all variables included in our empirical analysis below. A detailed description of the construction of these variables – which correspond to the development of the respective hypotheses in the preceding Section 4 – can be found in Table 8 in the Annex.

Table 1. Descriptive statistics – Phase I investigations

	Old merger regulation		New merger regulation		Total	
	Mean	s.d.	Mean	s.d.	mean	s.d.
Duration Phase I (working days)	23.04	(3.20)	24.26	(3.42)	23.66	(3.37)
Simplified procedure (Phase I)	0.30	(0.46)	0.59	(0.49)	0.45	(0.50)
Phase I decision with commitments	0.05	(0.22)	0.05	(0.21)	0.05	(0.22)
Phase II initiated	0.04	(0.20)	0.02	(0.15)	0.03	(0.17)
Average daily Phase I cases in Phase I	27.66	(6.70)	35.67	(7.23)	31.72	(8.04)
Average daily Phase II cases in Phase I	4.37	(2.36)	4.49	(1.45)	4.43	(1.95)
Staff	88.44	(5.98)	109.31	(5.08)	99.03	(11.81)
Average daily Phase I cases in Phase I, adj. by staff	0.32	(0.05)	0.33	(0.06)	0.32	(0.07)
Average daily Phase II cases in Phase I, adj. by staff	0.05	(0.03)	0.04	(0.01)	0.05	(0.02)
Industry knowledge	0.72	(0.45)	0.79	(0.41)	0.75	(0.43)
No. notifying companies	2.45	(0.67)	2.44	(0.68)	2.44	(0.67)
No. NACE codes reported	1.11	(0.50)	1.23	(0.64)	1.17	(0.57)
Observations	1455		1498		2953	

As shown in Table 1, the average duration of a Phase I investigation (measured in working days at EU institutions) increased from around 23 working days under the old regulations to around 24 working days under the new regulation. While only 30 percent of all cases were investigated under the simplified procedure under the old regulation, the share increased to 59 percent after the reform. In terms of case workload, we assume that the merger control staff at the EC has to

¹⁹ The case is M.2972-DSM/Roche Vitamins (decided in 2003).

²⁰ The cases are M.2978-Lagardere/Natexis/VUP (142 working days; decided in 2004), M.3216-Oracle/Peoplesoft (246 working days; decided in 2004) and M.3796-Omya/J.M. Huber PCC (213 working days; decided in 2006).

²¹ The case is M.2547-Bayer/Aventis Crop Science (decided in 2002).

work on both Phase I and Phase II cases: an increase in the number of cases in one phase is likely to affect the duration of the investigation in the other phase. Interestingly, our two measures show rather different developments. While the average daily Phase I cases in Phase I value²² increased substantially from 28 cases to 36 cases, the corresponding value for Phase II cases shows a very moderate increase from 4.4 cases to 4.5 cases. Our measure of industry knowledge – created by former cases in the same (4-digit NACE code) industry – increased from around 72 percent pre-merger reform to about 79 post-merger reform. The share of Phase I decisions with commitments and the number of notifying companies show no change in their mean values before and after the reform of the merger regulation. The number of cases in which a Phase II investigation was initiated, however, decreased from about 4 percent to about 2 percent while the number of NACE codes reported in the case increased slightly from about 1.1 to about 1.2. Last but not least, even though detailed information on the evolution of the number of EC staff working in merger control was unavailable, the EC provided us with an approximation, reporting that staff grew from 80 in 1999 to 120 in 2009.²³ We use this information to construct a linear trend of *staff* and a measure for the staff-weighted number of cases investigated in parallel (variables additionally marked with *adj. by staff*).

Table 2 presents the corresponding descriptive statistics of the data set for Phase II investigations. While no substantive change can be identified for the duration of the respective Phase II cases at the time they were in Phase I, it is shown that the duration of Phase II investigations increased substantially from about 80 working days under the old regulation to 92 working days after the reform, an increase of about 15 percent. The two workload variables again show quite distinct developments: while the average number of daily Phase I cases in Phase II investigations increased from about 27 cases to 36 cases, the average number of daily Phase II cases in Phase II even decreased slightly from 5.9 to 5.2. The industry knowledge variable, however, shows a slight increase from about 26 percent before, to 29 percent after the reform of the merger regulation.

²² The measure is constructed as follows. In a first step, for each working day, we counted the number of pending merger cases X (categorized as Phase I and Phase II cases). In a second step, for one specific merger case, we calculated the daily average of X for the time span of this specific merger investigation.

²³ E-Mail communication with COMP MERGERS (COMP-MERGERS@ec.europa.eu) on 3 November 2014.

Table 2. Descriptive statistics – Phase II investigations

	Old merger regulation		New merger regulation		Total	
	mean	s.d.	Mean	s.d.	mean	s.d.
Duration Phase II (working days)	80.02	(11.18)	91.57	(15.58)	84.41	(14.13)
2004 Merger Regulation	0.00	(0.00)	1.00	(0.00)	0.38	(0.49)
Duration Phase I (working days)	0.82	(0.38)	0.80	(0.41)	0.82	(0.39)
Average daily Phase I cases in Phase II	27.45	(5.11)	35.90	(4.47)	30.66	(6.37)
Average daily Phase II cases in Phase II	5.92	(1.59)	5.22	(1.14)	5.65	(1.47)
Staff	88.44	(5.98)	109.31	(5.08)	99.03	(11.81)
Average daily Phase I cases in Phase II, adj. by staff	0.31	(0.07)	0.32	(0.05)	0.32	(0.06)
Average daily Phase II cases in Phase II, adj. by staff	0.07	(0.02)	0.04	(0.01)	0.06	(0.02)
Industry knowledge	26.39	(3.94)	28.94	(4.96)	27.36	(4.51)
Phase II decision with commitments	0.67	(0.48)	0.46	(0.51)	0.59	(0.50)
Prohibition	0.14	(0.35)	0.03	(0.17)	0.10	(0.30)
Notifying firm is from outside Europe	0.26	(0.44)	0.34	(0.48)	0.29	(0.46)
Horizontal merger	0.93	(0.26)	0.83	(0.38)	0.89	(0.31)
Number of relevant markets identified	7.56	(13.36)	11.26	(17.68)	8.97	(15.16)
Number of concerns	1.53	(0.66)	2.34	(0.87)	1.84	(0.84)
Observations	57		35		92	

Table 2 reveals further that both Phase II decisions with commitments and prohibitions were reduced substantially after the merger regulation reform. While the former variable experienced a drop from 67 percent to 46 percent, the latter was reduced from 14 percent to 3 percent. Interestingly, the share of horizontal mergers also decreased slightly from 93 percent pre-merger reform, to 83 percent post-merger reform. While 26 percent of the notifying firms were from outside Europe under the old regulation, the number increased to 34 percent under the new regulation. Table 2 shows that the number of possibly problematic relevant markets identified by the EC increased from some eight cases before the reform to about eleven cases afterwards. Last but not least, the number of different concerns investigated by the EC in a case increased from 1.5 to 2.3 concerns.

5.2 Main Empirical Model and Estimation Results

In order to investigate the determinants of the duration of an EC Phase I or II investigation, we estimate the following equation by OLS:

$$Dur_investigation = \beta_0 + \beta_1' Authority + \beta_2' Case + u \quad (1)$$

The dependent variable *Dur_investigation* equals the number of working days needed by the EC to investigate either a Phase I or a Phase II case. The duration of a Phase II investigation is derived by subtracting the duration of the respective Phase I investigation from the entire duration of the merger case from notification to Phase II decision. The independent variables included into our model are the two sets of variables identified in Section 4 above as potential drivers of the duration of an EC Phase I or Phase II investigation: authority-related (*Authority*) and case-related (*Case*). Because we expect that the interruption of the investigation procedure by summer or winter holidays increases the investigation duration (due to decreased staff availability) we add two corresponding control variables.²⁴ The error term is denoted by *u*. Table 3 presents our regression results for the duration of Phase I investigations with ‘pre-reform Phase I decisions without commitments and without applying the simplified procedure’ acting as reference category.

Table 3. Regression results - Duration of Phase I investigations

	(1)		(2)	
Simplified Procedure (Phase I)	-1.426***	(0.086)	-0.643***	(0.110)
Phase I decision with commitments	9.012***	(0.396)	8.107***	(0.695)
Phase II initiated	3.841***	(0.452)	3.752***	(0.526)
2004 Merger Regulation	1.773***	(0.095)	2.284***	(0.129)
2004 Merger Regulation × Simplified procedure			-1.378***	(0.164)
2004 Merger Regulation × Phase I dec. w. commit.			1.822**	(0.723)
2004 Merger Regulation × Phase II initiated			0.218	(0.973)
Average daily Phase I cases in Phase I, adj. by staff	0.646	(0.574)	0.975*	(0.571)
Average daily Phase II cases in Phase I, adj. by staff	0.670	(2.095)	2.444	(2.112)
Industry knowledge	0.064	(0.103)	0.072	(0.102)
No. notifying companies	0.036	(0.063)	0.047	(0.062)
No. NACE codes reported	0.042	(0.077)	0.040	(0.077)
Summer holidays	2.486**	(0.691)	2.436***	(0.646)
Winter holidays	1.329***	(0.325)	1.362***	(0.324)
Constant	22.311***	(0.248)	21.897***	(0.246)
Observations		2955		2955
Adjusted R^2		0.515		0.530

Robust standard errors in parentheses; significant at * 10%, ** 5% and *** 1%.

²⁴ We define cases as interrupted by summer and winter holidays, respectively, when the investigation was initiated before and decided after August (summer holidays) or initiated in the old and decided in the new year (winter holidays).

As shown in the first column of Table 3, an application of the simplified procedure does lead to a quicker decision in the respective case – on average by about 1.4 working days compared to an ‘ordinary’ Phase I decision without commitments. If the EC ends a Phase I investigation with a decision with commitments, such a decision takes on average about 9 working days longer than compatible decisions. Generally, we find that the average duration of a Phase I investigation increased by approximately two days after the new merger regulation went into force.

In the second column of Table 3, we further differentiate the effect of the 2004 merger reform for the respective decision types. We find that the new merger regulation was accompanied by an increase in the duration of Phase I decisions without commitments of 2.3 days. For simplified procedure investigations, this increase is 1.4 days less, while the duration of a decision with commitments was increased by further 1.8 days. Last but not least, the duration of Phase I merger proceedings for which a Phase II was initiated does not differ significantly from the duration of Phase I decisions without commitments.

In the second model, we further find that the (staff members adjusted) EC workload with respect to Phase I cases significantly increases the investigation duration, and that it is not affected by the workload resulting from Phase II cases. As expected, the interruption of an investigation by summer or winter holidays clearly increases the duration of the investigation significantly. Interestingly, the duration of a decision to initiate a Phase II investigation is not affected by the merger regulation reform. Insignificant coefficients are found for the industry knowledge variable, the number of notifying firms and the number of NACE codes reported.

Turning from Phase I to Phase II proceedings, Table 4 presents the respective regression results. We use three different specifications. In column 1 we only include authority-related variables, and column 2 adds several objective case-related variables. In column 3 we add further case-related variables which are, however, based on subjective assessments by the EC. In our interpretation of the results, we will concentrate on the results shown in column 3 as this richest specification shows the largest R^2 value by far.

Table 4. Regression results - Duration of Phase II investigations

	(1)	(2)	(3)
2004 Merger Regulation	13.490 ^{***} (3.145)	20.427 ^{***} (3.198)	20.806 ^{***} (3.459)
Average daily Phase I cases in Phase II, adj. by staff	-5.842 (24.658)	-10.639 (27.850)	-18.807 (24.565)
Average daily Phase II cases in Phase II, adj. by staff	76.606 (73.893)	70.511 (73.692)	75.579 (72.917)
Duration Phase I (working days)	-0.284 (0.297)	-0.463 [*] (0.258)	-0.506 ^{**} (0.250)
Industry knowledge	-1.660 (3.504)	-4.301 (2.711)	-6.753 ^{**} (2.746)
Summer holidays	12.058 ^{***} (3.703)	9.998 ^{***} (3.542)	7.572 ^{**} (3.264)
Winter holidays	8.986 ^{***} (2.665)	8.669 ^{***} (2.245)	7.725 ^{***} (2.342)
Phase II decision with commitments		2.640 (2.768)	-0.184 (2.761)
Prohibition		13.912 ^{**} (5.623)	8.625 ^{**} (3.416)
Notifying firm from outside Europe		-1.997 (2.785)	-0.850 (2.346)
Notifying firm from outside Europe × 2004 Regulation		-11.754 ^{**} (5.027)	-14.060 ^{***} (4.376)
Horizontal merger		4.499 (3.038)	4.426 (3.223)
Number of relevant markets identified			0.319 ^{***} (0.099)
Number of concerns			-2.287 (1.384)
Constant	79.432 ^{***} (13.190)	81.542 ^{***} (11.956)	91.361 ^{***} (11.967)
Observations	92	92	92
Adjusted R^2	0.264	0.418	0.519

Robust standard errors in parentheses; significant at ^{*} 10%, ^{**} 5% and ^{***} 1%.

As revealed in Table 4, the introduction of the new merger regulation is followed by a substantial average increase in the duration of a Phase II investigation of a bit less than 21 working days. Interestingly, we also find evidence of a negative impact of the duration of the respective Phase I investigation: a longer Phase I investigation of a specific case speeds up the corresponding Phase

II investigation. While neither the average number of Phase I cases nor the average number of Phase II cases are found to have an impact on the duration of the Phase II investigation, both summer and winter holidays again show the expected increase (of about 7 working days) in the duration of the investigation. Additionally, if the EC has already gained industry knowledge as part of (a) prior investigation(s) recently, the duration of a Phase II investigation is reduced by a bit more than six working days.

The type of Phase II decision is found to have no statistically significant influence on its duration, however when the EC eventually decided to block a merger, such a decision took on average almost nine days longer than other decisions. Surprisingly, while the characteristic ‘notifying firm is from outside Europe’ has no significant impact on the duration of a Phase II investigation, the interaction term ‘notifying firm is from outside Europe × 2004 Regulation’ has a large and highly significant negative coefficient. One explanation for this finding may be the increased international cooperation efforts by the EC (allowing quicker decisions on the more recent cases). Last but not least, we found no significant difference in the duration of the investigation for horizontal compared to vertical or conglomerate mergers.

In terms of subjective case-related variables, Table 4 shows that the number of relevant markets identified by the EC has the expected positive impact on the duration of a Phase II investigation, however surprisingly, we do not find a statistically significant relationship between the number of concerns (i.e., single dominance/unilateral effects, coordinated effects and vertical restraints) and the duration of the investigation.²⁵ A possible explanation for this observation is that raising several different issues at the end of the rather short Phase I investigation does not necessarily say much about their seriousness.

5.3 Additional Empirical Model and Further Estimation Results

A key finding of our main empirical model was the large and highly significant increase in the duration of the merger control process – of both Phase I and Phase II – after the 2004 reform. This result immediately suggests the important policy-related question of whether the increase can be associated with either structural changes (e.g. increased efforts as a result of the EC’s more economic approach) in the process as such or rather speak for a reduced administrative

²⁵ In principle, it would have been desirable to include different combinations of competition concerns in the regression analysis in order to be able to control for differences in the duration between, for example, cases in which only unilateral effects played a role compared to cases in which coordinated effects were also investigated, however, the rather small number of Phase II investigations did not allow the construction of the corresponding five different competition concern variables.

efficiency of the Commission’s procedures. Generally, an answer to this question has to take possible post-reform shifts in the respective probabilities of specific types of merger cases into account. In this respect, it was already shown in Table 1 above that (1) the share of Phase I without commitments decreased (*p1*); (2) the share of Phase I with commitments remained generally equal (*p1co*); (3) the share of simplified procedures increased (*p1simple*); and (4) the share of Phase II cases decreased (*p2*) after the 2004 merger regulation reform went into force. To further account for other compositional effects that might drive these descriptive findings – such as workload, industry knowledge or case complexity – we run a multinomial logistic regression to measure how the probability of a specific type of merger being observed changed after the implementation of the new regulation. Technically, we estimate the following model

$$Prob(y_i = j) = \alpha_{0,j} + \alpha_{1,j}Reg2004 + \alpha'_{2,j}X + \varepsilon_j \quad (2)$$

with $j \in \{p1, p1co, p1simple, p2\}$ and the dependent variable being equal to 1 if the investigation is of type j (i.e., one of the four types identified above). *Reg2004* is a dummy variable indicating the new merger regulation and X is a row vector of control variables including the number of notifying companies, the number of NACE codes reported, dummy variables indicating whether the investigation process was interrupted by summer or winter holidays, the number of average daily Phase I cases in Phase I, the number of average daily Phase II cases in Phase I (both variables weighted by available staff members) and, last but not least, a dummy variable indicating the Commission’s industry knowledge. Table 5 shows the estimated coefficients with Phase I decisions without commitments representing the base category.

Table 5. Estimation results – Multinomial logit model

	Phase I w/o commitments	Phase I with commitments	Phase I, simplified procedure	Phase II initiated
Regulation 2004		0.393** (0.187)	1.239*** (0.086)	-0.089 (0.240)
No. notifying companies		-0.886*** (0.208)	0.511*** (0.064)	-0.597*** (0.227)
No. NACE codes reported		0.206 (0.142)	-0.239*** (0.076)	0.457*** (0.134)
Avg. daily PI cases in PI (adj)		-2.282* (1.345)	-1.476** (0.605)	1.646 (1.561)
Avg. daily PII cases in PI (adj)	<i>Base category</i>	3.675 (4.182)	-13.262*** (2.103)	2.036 (5.022)
Industry knowledge		-0.033*** (0.012)	-0.001 (0.004)	0.001 (0.009)
Summer holiday		1.918*** (0.599)	0.306 (0.484)	1.586** (0.705)
Winter holiday		0.138 (0.343)	-0.113 (0.169)	-0.286 (0.533)
Constant		0.013 (0.636)	-0.588** (0.257)	-2.552*** (0.740)
Observations	2955			
Pseudo R ²	0.088			

Standard errors in parentheses; significant at * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Each column in Table 5 reports the change of the odd ratio (e.g., “Phase I decisions with commitments” vs. “Phase I decisions without commitments”) for an increase of one unit of each

variable while holding all other variables constant. It is shown, for instance, that after the new regulation went into force, the odd ratio of Phase I decisions with commitments increased compared to Phase I decisions without commitments. As is common in such applications, we continue by predicting the probabilities for the observation of a specific type of merger case before and after the new regulation by calculating the average marginal effects. Table 6 shows the results.

Table 6. Predicted probabilities for specific types of merger cases

	Phase I w/o commitments	Phase I with commitments	Phase I, simplified procedure	Phase II initiated
Before 2004 Merger Regulation	0.60 ^{***} (0.01)	0.05 ^{***} (0.01)	0.31 ^{***} (0.01)	0.04 ^{***} (0.01)
Change after 2004 Merger Regulation	-0.24 ^{***} (0.02)	-0.01 [*] (0.01)	0.27 ^{***} (0.02)	-0.02 ^{***} (0.00)
<i>N</i>	2955	2955	2955	2955

Average marginal effects of new regulation and constant, at reg2004=1 and reg2004=0 respectively; Standard errors in parentheses; significant at * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

As shown in Table 6, probabilities differ slightly from the relative frequencies reported in Table 1 (as other compositional effects are now taken into account), but they still confirm the general trends: while the probability of Phase I decisions with commitments barely changes, Phase II cases are found to be less likely after the merger regulation reform. The probability of Phase I decisions under the simplified procedure increased substantially after the 2004 reform went into force.

Combining the predicted probabilities in Table 6 with the estimated coefficients from Tables 3 and 4 above allows us to predict the average length of a specific type of case before and after the new merger regulation went into force. For instance, a Phase I investigation with commitments took 30.004 days (21.897+8.107) before the new regulation went into force and 34.11 days (21.897+8.107 + 2.284 + 1.823) afterwards. Weighting the average lengths by the respective types allows us to calculate the average expected length of a procedure before and after the 2004 merger regulation reform, as shown in Table 7.

Table 7. Changes in the ex-ante expected length of a case

Old merger regulation			
	Average length	Predicted probability	Weight
Simplified procedure	21.25	0.31	6.59
Phase I	21.90	0.60	13.14
Phase I with commitments	30.00	0.05	1.50
Phase II	104.90	0.04	4.20
<i>Average Length: 25.43</i>			
New merger regulation			
	Average length	Predicted probability	Weight
Simplified procedure	22.16	0.58	12.85
Phase I	24.18	0.36	8.71
Phase I with commitments	34.11	0.04	1.36
Phase II	120.68	0.02	2.41
<i>Average Length: 25.33</i>			

Table 7 shows that the average length of the merger control process do not differ substantially after the new merger regulation regime went into force; in fact, a slight decrease of 0.1 working days is even observed. The reason for this lies in the shift of the respective probabilities by which a certain case is handled by the Commission through a certain procedure. Specifically as a fraction of the cases that would have entered Phase II under the old regime are now decided during a (slightly longer) Phase I, investigation nevertheless leads to a net gain in the overall duration of these investigations. Similarly, the probability that a decision is made in a simplified procedure almost doubles after the reform. We can therefore conclude that – while the Commission was successful in their efforts to reduce the number of Phase II cases by extending Phase I cases – this was not accompanied by an increase in the average duration of the merger control process. This is particularly interesting in light of the key finding by Duso et. al. (2013) that the 2004 reform (slightly) improved the effectiveness of European merger policy.

6 Conclusion

The merger control process in the European Union is likely to create substantial benefits for society. For example, the European Commission itself estimates customer savings – only created by 2014 EC merger control interventions – in a range from 0.0145 percent to 0.0363 percent of GDP²⁶ (see European Commission (2015), p. 85). The overall annual benefits of EC merger

²⁶ The reported range of estimates is created by changes in the underlying guiding principles and methodologies. Although the estimated percentage values appear to be rather small at first sight, the fact that, in 2014, the

control must be seen as substantially larger as soon as the selection of (presumably highly anticompetitive) mergers that were never proposed (but deterred) by the presence of a credible and well-functioning EC merger control process, is taken into account.

Despite these substantial benefits, the merger control process also generates substantial amounts of costs for the involved firms, other affected groups and the tax payer. As these costs typically increase over time, the question of the determinants of the duration of the merger control process is raised. Against this background, we use a data set of 2953 Phase I and 92 Phase II investigations completed by the European Commission (EC) between 1999 and 2008 to examine key determinants of the duration of the EC merger control process. Differentiating between authority- and case-related drivers, we find that while the duration of Phase I investigations largely depends on the type of decision and use of simplified procedure, the duration of Phase II investigations is driven by factors such as industry knowledge, the duration of the preceding Phase I investigation, the origin of the notifying firm or the number of identified relevant markets. In both phases, the 2004 merger regulation reform is found to be followed by significant increases in the duration of the investigations.

Although our results are certainly of interest for merging firms (and the other affected groups) estimating the respective amount of time (and costs) needed for the completion of EC merger control process, the most important conclusions are probably with regards to competition policy. We found that while all types of procedures experienced an increase in duration, the efficiency of the Commission's procedures was (at least) not hampered, as lengthy investigations (such as Phase I with commitments or Phase II) became less likely after the 2004 merger regulation reform. Although our empirical study was unable to include the quality dimension of EC merger decisions in the empirical analysis, it can at least be said that – although appeals against EC merger decisions still exist²⁷ – the majority of these recent cases have turned out to be unsuccessful for the respective plaintiffs. This observation not only speaks for an increased quality of recent analyses and decisions by the Commission but can also be taken as confirmation of the success of the entire 2004 merger regulation reform.

nominal GDP of all Member States of the European Union added up to about EUR 14.303 trillion (according to data provided by the International Monetary Fund) suggests very substantial savings as a result of EC merger control interventions.

²⁷ Interestingly, while most of the plaintiffs before the merger regulation reform were merging parties, the majority of appeals in more recent times appear to be brought by competitors of the merging companies (arguing that the Commission should have made a different decision). See, for example, *Cisco Systems and Messagenet v Commission* (2013) T-79/12 (GC) or *Spar Österreichische Warenhandels AG v. Commission* (2013) T-405/08 (GC).

Our empirical results, together with a few identified shortcomings, suggest several avenues for future research. One interesting area are field studies in competition authorities to learn more about the real bottlenecks in their everyday investigation work. Such studies are likely to allow the inclusion of further variables (possibly) achieving an even better explanatory value of an empirical analysis. Another fruitful area for future research may be international comparison of investigation lengths and their determinants. Although it is obvious that legislative (and related) differences between countries will complicate such an endeavor, benchmarking exercises would still enable efficiency comparisons and would therefore allow policy conclusions to be based on more robust foundations. A third promising area of future research could be to complement our efficiency measure for the merger control process – its duration – with richer measures that explicitly take the relationship between investigation length and the likelihood (and severity) of errors (i.e., the quality of the respective decisions) into account. In this respect, it would also be important to learn more about the possible motivations of both merging parties and competitors to strategically delay the merger proceedings of the Commission.

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Annex

Table 8. List of variables

Variable	Description	Phase
<i>Authority-related variables</i>		
2004 Merger Regulation	=1 if the 2004 merger regulation was applied by the EC	1 & 2
Simplified procedure (Phase I)	=1 if the simplified procedure was applied by the EC	1
Duration Phase I	Duration (in working days) of the respective preceding Phase I investigation	2
Average daily Phase I cases in Phase I	Number of concurrent daily Phase I investigations during a Phase I investigation divided by the duration of the Phase I investigation (in working days)	1
Average daily Phase II cases in Phase I	Number of concurrent daily Phase II investigations during a Phase I investigation divided by the duration of the Phase I investigation (in working days)	1
Average daily Phase I cases in Phase II	Number of concurrent daily Phase I investigations during a Phase I investigation divided by the duration of the Phase II investigation (in working days)	2
Average daily Phase II cases in Phase II	Number of concurrent daily Phase II investigations during a Phase II investigation divided by the duration of the Phase II investigation (in working days)	2
Industry knowledge	=1 if prior investigation in the same industry in the last two years (4-digit NACE codes)	1 & 2
Staff	Number of EC staff working in merger control approximated by linear interpolation of information provided by the EC ('approx. 80 staff members in 1999 and 120 in 2009').	1 & 2
Average daily phase X cases in phase X, adjusted by staff	Variables <i>Average daily phase X cases in phase X</i> , normalized by <i>Staff</i>	1 & 2
Summer holidays	=1 if the investigation was initiated before and decided after August	1 & 2
Winter holidays	=1 if the investigation was initiated in the old and decided in the new year	1 & 2
<i>Case-related variables</i>		
Phase I decision compatible with commitments	=1 if merging parties negotiated commitments with the EC in Phase I	1
Phase II initiated	=1 if the EC decided to open a Phase II investigation (in Phase I)	1
Phase II decision compatible with commitments	=1 if merging parties negotiated commitments with the EC in Phase II	2
Prohibition	=1 if the merger is prohibited	2
No. of notifying companies	Number of companies involved in the proposed merger	1
No. of NACE codes reported	Number of industries affected by the proposed merger (4-digit NACE codes)	1
Notifying firm is from outside EU	=1 if the notifying firm is located outside the EU	2
Horizontal merger	=1 if the merger is horizontal	2
Number of relevant markets	Number of relevant markets investigated by the EC	2
Number of concerns	Sum of concerns (differentiating between unilateral effects, single dominance, coordinated effects and vertical restraints)	2