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Efficiency of EU Merger Control

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Declaration

Hereby I declare that I compiled this master thesis independently, using only the listed literature and resources.

Prague, 22 May 2009 Goran Serdarević

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Abstract

Main goal of this thesis is to provide analysis of the key regulatory changes of the European merger control and to evaluate their real impact on the efficiency of the merger regulation. Our main contribution is the empirical analysis of the unique representative sample of 161 mergers covering the final regulatory assessments in the period from 1990 to 2008. We use stock market data to identify mergers wrongly assessed by the Commission. PROBIT model is then used to further investigate the sources of these decision errors. Our results suggest that the Commission's decisions are not purely explained by the motive of protecting consumer welfare and that other political and institutional factors do play a role. We did not find evidence that the Commission protect competitors at the expense of consumers and foreign firms. Moreover, according to our results, the regulatory reform in 2004 has significantly enhanced efficiency of the European merger control. To the author's best knowledge, this is the first study using stock market data to evaluate the recent regulatory reform of the European merger control.

Keywords: Merger Control, European Union, Political Economy, Regulatory Reform, Stock Market Data
JEL Classification: L4, K21, C25, D78

Abstrakt

Tato práce má za cíl analýzu klíčových regulatorních změn v anti-monopolní politice Evropské unie a zhodnocení reálného vlivu těchto změn na efektivitu regulace fúzí a akvizic v rámci společného trhu. Hlavním přínosem této práce je empirická analýza jedinečného reprezentativního vzorku 161 fúzí, schvalovaných Evropskou komisí v období 1990-2008. S využitím informací z akciových trhů jsou identifikována chybná rozhodnutí Evropské komise a za pomocí PROBIT modelu jsou pak zkoumany hlavní faktory, ovlivňující výskyt chybných rozhodnutí regulátora. Výsledky ukazují, že rozhodnutí Evropské komise nelze plně vysvětlit motivem ochrany spotřebitelského blahobytu, a že jiné politické a institucionální faktory hrají významnou roli ve schvalovacím procesu. Zároveň se však nepodařilo potvrdit, že by Evropská komise chránila zájmy domácích konkurentů na úkor spotřebitelů a zahraničních firem. Výsledky navíc potvrzují, že regulatorní reforma v roce 2004 významně zvýšila efektivitu regulace fúzí a akvizic v Evropské únii. Toto je pravděpodobně první studie využívající data z akciových trhů, která analyzuje dopady reformy z roku 2004 na efektivitu regulace fúzí a akvizic v Evropské unii.

Klíčová slova: regulace fúzí a akvizic, Evropská unie, politická ekonomie, regulatorní reforma, data z akciových trhů
JEL Klasifikace: L4, K21, C25, D78

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List of Abbreviations

CFI	Court of First Instances
EAGCP	European Advisory Group on Competition Policy
ECMR	European Community Merger Regulation
HHI	Herfindahl-Hirschman Index
HMG	Horizontal Merger Guidelines
NHMG	Non-Horizontal Merger Guidelines
SIEC	Significant Impedance of Effective Competition test

Introduction

European merger regulation has been operating for almost two decades, promoting the idea of fair competition at the Common European market and protecting consumers from the negative effects of the anti-competitive mergers. Since 1990, merger regulation has undergone significant transformation process. While in the early years of merger control the European Commission evaluated several tens of merger cases, the number of evaluated cases exceeded 400 in 2007. With rising number of evaluated merger cases, increased also the confidence of the Commission in the adequacy of its own decisions. Number of merger cases charged with some form of remedy elevated significantly and number prohibited mergers reached its maximum in 2001, when five mergers were prohibited by the Commission. Major shock came in 2002, when the Court of First Instance reversed three of those controversial merger decisions, raising serious concerns about appropriateness of the Commission evaluation methods.

Court decisions only fostered already recognized need for the reform of the merger policy that would bring 'more economic approach' into the Commission appraisal process. The reform process culminated in 2004 with the introduction of new guidelines for assessment of horizontal mergers. New legislation should have been able to provide more transparent, efficient and economic oriented framework for the merger appraisal in the European Union.

Main goal of this thesis is to provide analysis of the key regulatory changes and to evaluate their real impact on the efficiency of the merger regulation in the European Union. Our main contribution is the empirical analysis of the unique dataset that covers European mergers in the period from 1990 to 2008. We use a representative sample of 161 merger cases to test the efficiency of the European merger control and to evaluate the effects of the 2004 reform. Thesis is divided in two main parts. First part (Chapter 1 – Chapter 4) offers detailed analysis of the European merger control and the main changes related to the 2004 reform. Second part (Chapter 5 – Chapter 6) presents our empirical analysis of the European merger control.

First three chapters provide an overview of the competition policy in the European Union. We describe main principles of the merger regulation before and after the 2004 reform. We highlight main procedural changes and provide a detailed analysis of the new horizontal merger guidelines.

We provide comprehensive overview of the concepts of modern industrial economics applied in the new merger regulation.

Chapter 4 present major trends in the European merger regulation. We discuss the major changes in the Commission decisions with respect to the key concepts of the new assessment framework. Based on the quantititative data, we analyze development of the merger regulation and discuss the main impacts of the 2004 reform. We also provide evaluation of the European merger regulation based on the international rankings and simple bargaining theory.

Chapter 5 provides main framework for our empirical analysis based on the stock market data. In the first part, we provide a theoretical model for competitive merger analysis. We use common models of industrial economics to derive the relation between consumer welfare and the merger effects on competitors. Secondly, we describe event study methodology - method widely used for evaluation of particular merger effects - and we discuss main advantages and disadvantages of this approach for our empirical analysis.

Chapter 6 offers a detailed description of our empirical analysis. Firstly, we provide description of our data sample. We work with the unique representative sample of 161 merger cases evaluated by the Commission in the period from 1990 to 2008. We further use sample of 348 relevant competitors to evaluate the anti-competitive consequences of these mergers from the reaction of the stock market prices of competitors. We then identify those cases where the Commission made an error in its final decision (prohibited a pro-competitive merger, or cleared an anti-competitive merger). Secondly, we construct an econometric model in order to identify main factors influencing the frequency of the errors. We construct seven hypotheses in order to test for impact of key institutional and political variables that might influence the decision making process of the Commission. In particular, we test the efficiency of the European merger regulation and the real impact of the 2004 reform.

Merger Control in the European Union

1. Overview of Competition Policy in the European Union

The Treaty of Rome of 1957 created the European Economic Community and its main institutions – the Council of Ministers, the European Parliament, the Court of Justice, and the European Commission. Treaty also included articles defining the rules to ensure free competition in the Single Market.

The competition rules are set out in Article 81 (formerly Article 85) and Article 82 (formerly Article 86) of the Treaty (see Appendix 1). Article 81 prohibits anti-competitive agreements which may have an appreciable effect on trade between Member States and which prevent, restrict or distort competition in the Single Market. Article 82 prohibits the abuse of a dominant position insofar as it may affect trade between member states. Merger control was not explicitly mentioned in those articles. In the early 1970s, the need for stronger merger control was recognized worldwide as a reaction at the 'Great Merger Wave' of 1960s. For instance legislation requiring pre-merger notification was enacted in the U.S. (Hart-Scott-Rodino Act) while Germany gave its antitrust authority (Bundeskartellamt) merger control powers.

Nevertheless, both Articles 81 and 82 might have been applied to mergers only in a limited way, which allowed some degree of influence by the Commission over potentially very unattractive mergers. However, it could only be used against a firm that was already considered dominant, and could not prevent the creation of a dominant position (see Lyons, 2008). The Commission did not obtain real merger control authority until 1989 when the main legislative text for merger regulation appeared – the European Community Merger Regulation (ECMR).

1.1. Merger Control in the European Union before 2004

Main reasons for creation of the ECMR were significant shortcomings of a real application of Article 81 and Article 82 to the merger problematic. Thus, enactment of the Commission in the area of merger control was viewed as one of many measures necessary to facilitate the development of a single European market. Nowadays, the Commission holds a vast power enforcing the competition policy in the Community. It can enter and search premises of any company anywhere in the EU and eventually impose fines on them up to 10 percent of their world-wide turnover.

It also has a power to completely block a merger – unless its decision is revoked by the Court of First Instances (CFI). Decision of the CFI may however come two or three years after the Commission decision and is likely to be irrelevant for merging companies. Therefore the Commission has enormously strong bargaining position for enforcing various commitments by the merging companies (in comparison with its US and UK counterparts).[1]

Regarding the whole concentration concept, the ECMR defines it as follows:

- Merger of two (or more) previously independent undertakings; or
- Acquisition
    - by one or more persons already controlling at least one undertaking or by one or more undertakings;
    - of control or joint control of the whole or part of another previous independent undertakings;
    - which brings the possibility of exercising decisive influence over strategic business decision undertaking (e.g. veto rights);
    - whether by purchase of securities or assets, by contract or by any other means.
- Creation of full-function joint-venture under the joint-control of two (or more) previously independent undertakings

[1] For detailed comparison of different regulatory practices see, for instance, Roeller, Stennek and Verboven (2000).

The Commission deals only with concentrations that have a 'Community dimension' using specific turnover based criteria in order to identify transactions that have a significant economic impact on the Community. Irrelevance of the physical assets location arising from the Community turnover criterion generates far-reaching jurisdiction of the Commission merger regulation.[2] Significant cross border (Community) effects are considered according to the following turnover-threshold criteria:

General thresholds - a concentration is deemed to have a Community dimension when it meets the following turnover thresholds (Article 1(2)):

- The combined aggregate worldwide turnover of all the undertakings concerned exceeds EUR 5 billion;
- And the Community-wide turnover of each of at least two undertakings concerned exceeds EUR 250 million;

unless

- each of the undertakings concerned achieves more than two-thirds of its aggregate Community-wide turnover within one and the same Member State.

Alternative thresholds for smaller, multi-jurisdictional transactions - under an alternative set of turnover thresholds introduced in 1998, the Merger Regulation also applies to concentrations that meet the following thresholds (Article 1(3)):[3]

- The combined aggregate worldwide turnover of all undertakings concerned exceeds EUR 2.5 billion; and
- the aggregate Community-wide turnover of each of at least two of the undertakings concerned exceeds EUR 100 million; and
- in at least the same three Member States:

[2] Such a wide jurisdictional scope might, however, generate an unnecessary administrative burden on both companies and the Commission. The Regulation will sometimes apply to transactions having only a marginal impact in the Community (particularly small joint ventures of large parent entities).

[3] For credit and financial institutions the turnover thresholds are replaced by consideration of financial income sources (i.e., interest income, income from securities) while for insurance companies turnover is replaced by gross premium written; see Turnover Calculation Notice, paras. 56-57.

- The combined aggregate turnover of all the undertakings concerned exceeds EUR 100 million; and
- the turnover of each of at least two of the undertakings concerned exceeds EUR 25 million;

unless

- each of the undertakings concerned achieves more than two-thirds of its aggregate Community-wide turnover within one and the same Member State.

1.2. Merger Control Procedures

The ECMR specifies the rules for notification of proposed merger transactions, establishes the timetable of the process, provides investigative powers for the Commission and sets out the rights of involved parties. The main procedural features of the Commission's merger control procedure include the following:

- A significant amount of informal pre-notification consultation of the parties with the Commission.
- Notification using a standardized form ('Form CO') that requires the provision of extensive information on the competitive situation in the markets concerned.
- Defined time limits for the Commission's initial investigation and a possible in-depth investigation.
- A prohibition on closing the transaction during the Commission's investigation.

As a first step in the merger control procedure, informal pre-notification consultations, are essential parts of the notification procedure, enabling the Commission to manage its workload efficiently and involved parties to reduce the risk their notification will be rejected as incomplete. The second step is the obligatory notification in case that transaction falls within the scope of the ECMR. Involved parties are obliged to advise the Commission no later than one week after a deal agreement (conclusion of a legally binding agreement, the announcement of a public bid or the acquisition of control). Notification must be made on a specific form (either Form CO or so called 'Short Form')

that include the complex list of all materials and information that parties involved in transaction must provide.

By provision of the transaction notification official decision making procedure of the Commission begins during which the examined transaction is automatically suspended.[4] The Commission has then approximately one month to complete its preliminary analysis – this period is called Phase I. As the statistics in Table 1 illustrate, the Commission attempts to resolve the majority of cases in this phase.

Based on the information contained in a notification the Commission delivers one of the possible decisions:[5]

a. the business combination falls outside the scope of ECMR (Article 6.1.a)
b. the combination is compatible with the rules of Common Market and approved (Article 6.1.b)
c. the combination is basically compatible with the rules of the Common Market, but will be permitted only if certain conditions are met (Article 6.1.b remedies (Article 6.2))
d. the combination cast doubts and more detailed analysis will be undertaken – this investigation is called Phase II (Article 6.1.c)

During Phase II proceedings the Commission engages in an extensive examination of the market conditions to determine whether the business combination will violate rules of the Common Market. The Commission's investigative powers are, as already mentioned, wide-ranging (Article 13). It has the authority to secure all information relevant to the execution of its authority (Article 11), and may, if necessary, enlist the assistance of competent member state authorities (Article 12). When it has concluded its investigation and analysis, the Commission takes a decision (Article 8). Phase II investigation takes up to four months and the Commission issue three possible rulings:

[4] The Merger Regulation bars the parties to a concentration from putting the concentration into effect until (i) it has been declared compatible with the common market or (ii) the Commission has failed to take a decision within the prescribed time limits (Article 7(1)).
[5] Article 6.1.a, 6.1.b and 6.1.c of ECMR, Article 1.5.a of Regulation 1310/97

a. the business combination is compatible with the rules of Common Market without modifications - approval (Art 8.1)
b. the approval subject to certain conditions (commitments) (Art 8.2)
c. the combination is unacceptable - prohibition (Art 8.3)

In case that combination has already been completed, the Commission may order the separation of the firms or of the grouped assets or any action that could restore the competition. Table 1 provides overview of the Commission decisions in the period 1990-2008.

Table 1: European Merger Control, Sep 1990 – Dec 2008

	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	otal 90-08
FIRST PHASE DECISIONS																				
Art 6.1 (a) out of ECMR scope	2	5	9	4	5	9	6	4	4	1	1	1	1	0	0	0	0	0	0	**52**
Cleared	5	47	43	49	78	90	109	118	196	225	278	299	238	203	220	276	323	368	307	**3472**
Phase I Remedies	0	3	4	0	2	3	0	2	12	16	26	11	10	11	12	15	13	18	20	**178**
Art 6.1 (c) Phase II initiated	0	6	4	4	6	7	6	11	11	20	18	21	7	9	8	10	13	15	10	**186**
Total Phase I	*7*	*61*	*60*	*57*	*91*	*109*	*121*	*135*	*223*	*262*	*323*	*332*	*256*	*223*	*240*	*301*	*349*	*401*	*337*	***3888***
SECOND PHASE DECISIONS																				
Phase II Cleared	0	1	1	1	2	2	1	1	3	0	3	5	2	2	2	2	4	5	9	**46**
Phase II Remedies	0	3	3	2	2	3	3	7	4	7	12	9	5	6	4	3	6	4	5	**88**
Phase II Prohibition	0	1	0	0	1	2	3	1	2	1	2	5	0	0	1	0	0	1	0	**20**
Total Phase II	*0*	*5*	*4*	*3*	*5*	*7*	*7*	*9*	*9*	*8*	*17*	*19*	*7*	*8*	*7*	*5*	*10*	*10*	*14*	***154***
TOTAL	**8**	**67**	**66**	**63**	**99**	**119**	**132**	**152**	**246**	**283**	**346**	**358**	**281**	**239**	**258**	**312**	**363**	**415**	**357**	**4164**
Phase I Withdrawal	0	0	3	1	6	4	5	9	5	7	8	8	3	0	3	6	7	5	10	90
Phase II Withdrawal	0	0	0	1	0	0	1	0	4	5	5	4	1	0	2	3	2	2	3	33

Source: European Commission

2. Analytical Framework of the old ECMR

This section provides a brief overview of the old ECMR's framework for the appraisal of proposed concentrations. We discuss the definition of the relevant markets as well as application of the 'dominance test' and its shortcomings in the assessing of particular merger cases.

2.1. Relevant Markets

Definition of the relevant markets is the necessary condition for objective appraisal of proposed concentrations. Relevant markets are defined both in terms of the products or services that belong to the market (product market) and the market geographic scope (geographic market). A product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer, by reason of the products' characteristics, their prices and their intended use[6].

Section 6 of Form CO defines the relevant geographic market as comprising "*the area in which the undertakings concerned are involved in the supply and demand of products or services, in which the conditions of competition are sufficiently homogeneous and which can be distinguished from neighboring areas because, in particular, conditions of competition are appreciably different in those areas*". Given the fact that single EU-market still do not exist for some products, notion of the geographic market is a necessary condition for the Commission to deal with appraisal of competitive consequences of the horizontal mergers that do not fit properly in the common product markets.[7]

2.2. Dominance Test

After defining the relevant markets the Commission has to determine the potential dominance effects of the proposed transaction. The substantive test in the original ECMR (before the 2004 reform) is commonly referred as a dominance test, stating that concentration should be prohibited

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[6] Commission Notice on the definition of the relevant market for the purposes of Community competition law, O.J. 1997 No. C 372/5 (Market Definition Notice)

[7] For example, in *Volvo/Scania* case, Sweden's strict truck roll-over test contributed to a finding that Sweden was a separate geographic market for heavy trucks.

if it leads to the "*strengthening or creation of a dominant position*" resulting in effective competition being "*significantly*" impended (Article 2(3)). The primary importance of establishing dominance test is that it encouraged a formalistic approach, though giving significant weight to market shares analysis and so prioritizing static market structure over the complex economic effects.

Focusing exclusively on the dominance test is sufficient if the goal of the merger control is preventing future abuses of dominant position, however, this might not capture broader purpose of the merger control sufficiently. The unclear ability of the dominance test to deal with anti-competitive mergers that do not result in the clear creation or strengthening of a dominant position was recognized as a significant weakness of the old ECMR. In practice, however, the Commission was able to gradually shift the focus of its analysis from a purely market share analysis to other relevant factor which at the end resulted in the 2004 reform of the ECMR.[8]

2.3. Shortcomings of the old ECMR

In early 1990's the concept of collective dominance was introduced allowing the Commission to prohibit the mergers that would not necessarily result in the creation (strengthening) of the position of a clear market leader. If the merger resulted in the situation where few big players could more easily coordinate their behavior, thus impeding the efficient competition, the Commission was able to prohibit the transaction. Using collective dominance principle Commission became able to deal with the cases where proposed transaction could result in the members of oligopoly could, by acting together, collectively occupy the dominant position at the relevant market.

2.3.1. Absence of Unilateral Effects

Another important question was whether the extended version of the dominance test could be used to prohibit mergers resulting in unilateral (non-coordinated) effects. Unilateral effects refer to the ability of post-merger firms to raise prices because of the removal of competitive constraints. Such anti-competitive effects can be pronounced when two significant competitors with highly substitutable products merge to create a large, but not dominant player, at the market with only few other competitors. In such a case, it will be rational for the merged company to raise prices to

[8] In *Alcatel/Telettra case*, the Commission authorized the creation of a firm with a post merger market share of 83 percent, primarily because of countervailing buyer power in the relevant markets and the ability of competitors to the merged firm to increase supply.

some degree, due to limited possibility of the customers to switch to previously competing product.[9]Nevertheless, in order to assess the unilateral effects by the traditional dominance test it would be necessary to define a sufficiently narrow product market that excludes other competitors, which on the other hand ignores real competitive dynamics of the relevant market and lessens the efficiency of the merger control.

Even though limited number of ways how to interpret ECMR to cover unilateral effects existed, each of them had serious shortcomings. The concept of collective dominance could for example be extended to include also situation where a number of non-cooperating oligopolists possess a dominant degree of market power together. However, as every stretch or reinterpretation of the plain meaning of dominance gave the Commission more space to pursue its objectives and deal with various types of transactions it also significantly decreased transparency and predictability of the merger control.[10]

2.3.2. CFI Reverses

Shortfalls of the former merger policy were confirmed by series of reverses by CFI in the following cases, rising serious concerns about both inadequate economic analysis and procedural weaknesses (see Lyons, 2008).

- *Airtours/First Choice*: The Commission did not conduct a sufficiently rigorous economic analysis of the incentives for and ability to coordinate behavior as a consequence of the proposed merger.

[9] For example, at the market for high-quality cars four suppliers A, B, C and D are present and their products are comparable in terms of technical features, comfort and price (and therefore belong to the same product market). However products are strongly differentiated by the brand image, A and B might have "sport car" image while C and D might have more "reliable car" image. Therefore, if car manufacturers A and B merge, a price increase in the "sports" segment would induce only a small number of "sports" customers to switch to the "reliability" segment, and may therefore be profitable for the merged entity at the costs of customers.

[10] For instance, the Commission's decision in *Airtour/First Choice* has often been described as a 'forced fit,' as the Commission seemed to stray from the established criteria of collective dominance in order to apply the concept despite the fact that the conditions for tacit collusion were not readily apparent (see Korah, Valentine , 2001).

- *Schneider/Legrand*: The Commission failed to take account of the different degree of competition in each of the national markets it identified, and did not provide Schneider with enough information to offer an appropriate remedy.
- *Tetra Laval/Sidel*: The Commission should have:
    a) taken account of the fact that its concern over leveraging market power between two otherwise separate markets would have required tactics that are illegal under Article 82;
    b) provided a proper appraisal of behavioral commitments before resorting to its favorite structural remedy (divestiture); and
    c) adopted a higher standard of proof.

- *GE/Honeywell*: although the prohibition decision was upheld due to a relatively minor horizontal part to the Commission's case, the CFI strongly condemned their analysis of conglomerate effects (i.e. the theory that the merger would result in exclusionary effects due to opportunities to bundle products).

The series of CFI reversals seriously undermined the Commissions merger control authority emphasizing the need for reform of competition policy that would provide more economic approach to merger control in the EU, in line with the up-to-date concepts of industrial organization theory.

3. The 2004 Reform

Reverses of 2002 played important role in fostering the reform process, however, the need for more efficient merger control had been recognized even earlier.

Table 2 provides some context for the way in which these Court landmark decisions related to the timing of Commission-led initiatives in merger policy. Green Paper[11] on reform from 2001 already outlined the merger regulation reform and the CFI reversals only hastened undergoing process. The need for new merger legislation was even more inevitable with respect to accession of ten new members in 2004 that was expected to generate a new merger boom (apart from increased case load related to state aids and other competition policy areas).

Table 2: Soft Law and Precedent in the ECMR since 1989

Date	Commissioner*	Commission led	Court landmarks**
1989	Sutherland	ECMR	
1990	Brittan		
1991			
1992			
1993			
1994	Van Miert	Joint ventures	
1995			
1996			
1997		Revisions to ECMR on full function joint ventures, Phase I remedies and procedure. Relevant market notice; access to file	
1998			Kali & Salz (ECJ)
1999			
2000	Monti	Simplified procedure for small, low market share mergers	
2001		Green Paper on ECMR reform; Remedies notice; role of hearing officer	CFI expedited procedure (<1 yr)
2002		EU-US cooperation agreement	Airtours/First Choice; Schneider /Legrand; Tetra Lavel/Sidel
2003			
2004		Major revisions to ECMR (inc. substantive test and efficiencies). Horizontal guidelines; procedural best practice guidelines	
2005	Kroes	Ancilliary restraints notice; referral to/from national authorities; access to file	GE/Honeywell
2006		Revisions to access to file	Impala appeal over Sony/BMG
2007		Non-horizontal guidelines; [consultation on revised remedies notice]	

* at beginning of year

** involving significant criticism of the Commission

Source: Lyons (2008, p. 17)

[11] Green Paper on the Review of Council Regulation (EEC) No 4064/89, COM (2001) 745/6 final, 11/12/2001.

3.1. Goals of the New Merger Policy

In some ways, reform of the merger regulation tries to improve and fine-tune features of the old policy, adding tools and methods that will enable the Commission to cope with different type of transactions more effectively. On the other hand, the reform included some new features that are in line with more 'consumer oriented' approach used in US a UK. In this chapter we try to provide an overview of the new merger policy with respect to relevant economic aspect. Our goal is not to provide exhaustive description of the legislative changes but to show most important features of the current merger policy and discuss their potential impacts on the quality of the Commission's merger decisions.

Regarding the procedural main changes, the new legislation preserves the basic rules governing which mergers are subject to the merger control. In other words, so called 'one-stop shop'[12] rule remains; however, the new regulation recognizes shortfalls of the former allocation of jurisdiction to the Commission or national authorities based solely on turnover test. Therefore, the new regulation makes it easier for national authorities to take part in decision making process in merger cases which significantly affects competition within their member states.

The notification process has been made more 'user friendly', allowing merging parties to notify when they can show a good faith intention to proceed with a merger and will be able to notify at any time after concluding a binding commitment.[13] The timetable for the Commission's decision has been extended moderately and has been made more flexible. Phase I has been prolonged at maximum of 25+35=60 working days (formerly 10 weeks) while Phase II can currently take up to 90+20+15=125 working days (formerly four months). Extra time given by new pre-notification rules and extended timetable should therefore enable the Commission to cope with the case load more effectively. Moreover, the new ECMR gives the Commission the authority to impose fines up to 10 percent of aggregate turnover of merging undertakings in case they fail to comply with rules set by the merger regulation.[14]

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[12] Under "one-stop shop" rule, national authorities cannot carry out a competition review where the Commission has jurisdiction, and a decision by the Commission covers the whole EU.
[13] The requirement not to put a merger into effect until it has been cleared remains.
[14] For detailed information about fines see ECMR Arts. 14(1) and 14(2)

Regarding the organizational changes in the Commission there is new institution of the Chief Economist established within the Competition Directorate General. Chief Economist leads a team of ten PhD industrial economists that should provide more economic approach to the Commission's analysis. In addition, the European Advisory Group on Competition Policy (EAGCP) has been set up as an academic advisory body which consists of around 20 leading European industrial economists recommended by the Chief Economist.

However, most important and economically relevant changes in the new regulation are with respect to the new interpretation of primary goals of European merger regulation and the introduction of the new substantive test for merger appraisals.

3.2. Important Steps toward more Economic Based Approach

Substantive core of the new merger regulation is the new prohibition criterion that replaces the old dominance test. Article 2(3) ECMR now says: "*A concentration 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, shall be declared incompatible with the common market.*"[15] In comparison to the old dominance test reversal of main elements is the most significant feature of the new Significant Impedance of Effective Competition test (SIEC). While in the old test dominance could be considered as a necessary condition for merger prohibition,[16] the dominance criterion in the new test is incorporated as primary example of how concentration can impede effective competition.

Concrete form of the SIEC test is given by the Horizontal Merger Guidelines[17] – new document intended to provide a more economic framework for merger assessment. The new SIEC test and Horizontal Merger Guidelines can be considered as the most significant improvements of the

[15] This is therefore referred to as the prohibition criterion of "significant impediment to effective competition" (SIEC)

[16] The old Article 2 (3) ECMR was formulated as follows: "*A concentration which creates or strengthens a dominant position which would significantly impede effective competition in the common market or in a substantial part of it shall be declared incompatible with the common market*."

[17] Followed by Non-Horizontal Merger Guidelines

Commission's appraisal framework toward the more economic oriented approach in the merger regulation. On the one hand, explicit differentiation between coordinated and non-coordinated effects in the Guidelines closed the existing enforcement gap in cases of oligopoly markets where mergers would have anti-competitive effects without creating (fostering) dominance. On the other hand, the Guidelines also list explicitly the potential countervailing factors that can result in merger approval despite the market dominance of merging parties.

Following section offers a short overview of the analytical framework presented in the Guidelines demonstrating the main steps toward more economic approach in the Commission's appraisal process.

3.3. Horizontal Merger Guidelines

The main purpose of the Horizontal Merger Guidelines[18] (HMG) is to "*provide guidance as to how the Commission assesses concentrations when the undertakings concerned are actual or potential competitors on the same relevant market*" (HMG, para. 5). HMG defines the Commission's approach in competitive assessment of horizontal mergers: regarding the market shares and concentration levels, negative anti-competitive effects of the merger and possible countervailing factors that could influence competition positively.

3.3.1. Market shares and concentration levels

Market shares - of the merger relevant companies still play an important role in the assessment of market concentration. However, while in the past the Commission relied exclusively on market shares as a proxy for market power (dominance) and thus anti-competitive effects of the merger, HMG states that market shares and market share increases "*only provide first indications of market power and increases in market power*" (HMG, paras. 14 and 27). As a general rule the Commission considers combined market shares of merging parties based on volume (sales revenue). Simplified static approach is used where market share of a merged entity is computed as a sum of current market shares of merging companies before the transaction. As shortcomings of the simplified static

[18] Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2004/C 31/03)

approach are well known, HMG states that the Commission should also consider changes in historic market shares in order to gather information about market dynamics and likely future importance of various competitors.[19] Market shares of competitors are not explicitly mentioned in the HMG.

A broad distinction can be made between three market shares intervals:

- Combined market share less than 25 % - a concentration will generally not significantly impede effective competition, except in cases of coordinated effects (collective dominance)
- Combined market share between 25 % and 40 % - this category of mergers has in past generally not led to objections under the dominance test. Therefore those mergers will be affected most by the introduction of the SIEC test as the Commission can now challenge such mergers even if the combined entity is not the market leader
- Combined market share of more than 40 % - high probability that concentration could significantly impede effective competition – follows the practice of the old dominance test. Market shares of 50 % or more may in themselves be sufficient for a finding of dominance, although exceptions exist (HMG, para. 17)

Concentration levels - in order to measure concentration levels at the relevant market, the Commission often applies the Herfindahl-Hirschman Index (HHI)[20]. HHI allows the Commission to exclude some companies from the computation (those with very small market shares and lack of precise information about the companies) as they do not influence HHI results significantly. The absolute levels of HHI can give an initial indication of the competitive pressure after the merger. However, the Commission should also consider change in the HHI ('delta') as a "*useful proxy for the change in concentration directly brought about by the merger*" (HMG, para. 16).

[19] In any event, the Commission interprets market shares in the light of likely market conditions, for instance, if the market is highly dynamic in character and if the market structure is unstable due to innovation or growth (HMG para. 15)

[20] The HHI is calculated by summing the squares of the individual market shares of all the firms in the market. The HHI gives proportionately greater weight to the market shares of the larger firms (HMG, para. 16).

The HMG for the first time introduce 'safe harbor' rules based on HHI analysis; however criteria for fitting in one of three categories are set very strictly, so that the mergers between significant market players could hardly avoid the Commission's investigation.

The Commission is unlikely to identify horizontal competition concerns in the following scenarios:

- Post-merger HHI below 1000[21]; or
- Post-merger HHI between 1000-2000 and increase ('delta') below 250[22]; or
- Post-merger HHI above 2000 and increase ('delta') below 150. [23]

To make the entering into the 'safe harbor' even more difficult, the HMG list the number of exceptions with respect to the second and third scenario. The Commission should therefore concerns transactions that fit in a second or third scenario if, for example, a merger involves a recent entrant with a small market share; one of the merging firms is a 'maverick'[24] firm; or there are indications of past coordination (for detailed information see HMG, para. 20). However, according to HMG, exceeding the above HHI thresholds creates no presumption of competitive concerns (HMG, para 21). HHI levels or increases (deltas) serve mainly as an indicator of market concentration and do not contain any presumptions about anticompetitive effects in accordance with the new SIEC test.

3.3.2. Possible anticompetitive effects of horizontal mergers

HMG recognizes two main ways in which horizontal mergers may significantly impede effective competition and for the first time explicitly distinct between coordinated and non-coordinated effects.

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[21] This test is not met, for example, if any competitor has a market share exceeding 32 %, or there are two competitors with 25 % and 20 %, or there are three competitors with 20 %.

[22] This test is not met, for example, if any competitor has a 45% market share, or if a company with 30 % market share acquires another with a 5 % market share.

[23] This test is not met, for example, if a company with a 40 % market share acquires another with a 2 % market share.

[24] "Maverick" firms have characteristics not typical of the industry which therefore have a strong incentive to deviate from or disrupt coordination. A problem emerges especially if such a firm is likely to be removed as the result of a merger.

3.3.2.1. Non-coordinated effects

Two general circumstances in which a merger may lead to unilateral anticompetitive effects are:

a) where a merger creates or strengthens a dominant position of a single firm, one which, typically, would have an appreciably larger market share than the next competitor post-merger, or;

b) a merger in an oligopolistic market involving the elimination of important competitive constraints that the merging parties previously exerted upon each other with a reduction of competitive pressure on the remaining competitors (HMG, paras. 24 and 25).

Furthermore, the HMG describe a number of factors which may influence (positively or negatively) whether significant non-coordinated effects are likely to result from a merger (HMG, paras. 27-38):

- **Merging firms have large market shares** - the larger the post-merger market share, the more likely a firm is to possess market power (and to find a price increase profitable despite accompanied reduction in output).
- **Merging firms are close competitors** - non-coordinated effects can arise in concentrated markets where firms compete with differentiated products and the products of the merging firms are particularly close substitutes.[25] If close substitutes merge, the combined entity is more likely to increase price post-merger than if competitors merge that are not close substitutes.[26]
- **Customers have limited possibilities of switching supplier -** can raise or magnify competition concerns. Such difficulties can in particular result from the limited number of alternative suppliers or high switching costs.
- **Competitors are unlikely to increase supply if prices of merged entity increase (or output decreases) -** for example due to capacity constraints, high costs of capacity expansion; or a

[25] Competitors can also be particularly close substitutes because of the geographic location of their sales outlets, rather than by virtue of the products they sell.

[26] The Commission considers also ability of the competitors to extend their product portfolio in response to the merger so that they become close substitutes to the combined firm thus defeating concerns of non-coordinated effects.

high cost basis of the existing surplus capacity, this will increase the Commission's concerns.[27]

- **Merged entity able to hinder expansion by competitors –** for example by its influence over inputs or distribution possibilities, control over patents, brands or certain infrastructure, and its financial strength relative to competitors may also amplify the Commission's concerns.
- **Merger eliminates an important competitive force ('maverick' company) -** a maverick is in this case a company that exercises a stronger competitive influence on the market than its market share suggests (for example a recent entrant on the rise or a significant innovator). The elimination of such a firm (through merger) not only leads to the creation of a larger combined entity in the longer term but also may have additional anticompetitive effects in the market by reducing the competitive dynamics generally.

The adoption of non-coordinated effects concerns and their explicit definition in the HMG has two major effects. Firstly, it gives the Commission significantly greater discretionary power and enables it to deal more efficiently with transactions that have low dominance effect. Secondly, the wider scope of Commission's authorities might lead to increased uncertainty for merging firms who will be unclear whether their transactions might fall into the new category.

3.3.2.2. Coordinated effects

Concerns of anti-competitive coordinated effects (collective dominance) arise if the merger increases the likelihood that the merged entity and at least one other competitor in the market would consider it possible, economically rational, and hence preferable, to coordinate their market behavior on a sustainable basis.

Coordination may take various forms. In some markets, the most likely coordination may involve keeping prices above the competitive level. In other markets, coordination may aim at limiting production or the amount of new capacity brought to the market. Firms may also coordinate by

[27] Again, if remaining competitors have sufficient spare capacity and are likely to use it if the combined entity were to increase prices or reduce output, this may eliminate concerns even if the market shares of the combined entity are high.

dividing the market, for instance by geographic area or other customer characteristics, or by allocating contracts in bidding markets (HMG, para. 40).

The HMG set explicit criteria according to which the Commission assesses the likelihood of coordinated effects (tacit collusion) after the merger (see HMG, paras. 44-60):

- **Reaching terms of coordination** - the coordinating firms must have a common perception about how coordination should work and be able to reach a common understanding on the terms of coordination. Generally, few symmetric firms (especially in terms of cost structures, market shares, capacity levels and levels of vertical integration) with homogenous product and stable economic environment (relatively stable supply and demand conditions) will coordinate more easily than bigger group of asymmetric firms with hundreds of differentiated products at the dynamic market with volatile demand and frequent market entries.

  The Commission analyses number of different factors in order to assess likelihood of potential coordination: supply concentration, elasticity of supply and demand, homogeneity of products, cost structures, production technology and innovations, production capacities and entry barriers etc.

- **Monitoring deviations (transparency) -** there must be sufficient market transparency for each members of the coordinating entity to be aware of the others' market actions. As there is strong motivation for each coordinating firm to deviate from coordination policy to earn additional profits, high transparency of the relevant markets is a necessary condition for an efficient coordination. The transparency required for coordination consists both of the ability to observe behavior of the other firms but also of the ability of coordinating firms to interpret the others' behavior correctly. For example, firms must be able to distinguish between a price reduction of another firm in line with the coordinated policy and a cheating. Similarly, a firm with decreasing sales must be able to know whether this is due to declining general demand or because of cheating of others.

  According to HMG, market transparency is considered to be higher if the number of competitors and customers is low and markets are stable. Moreover, the transparency depends on how transactions are carried out: confidential bilateral negotiations lead to a low degree of transparency, while public pricing leads to high transparency.

- **Deterrent mechanisms (retaliation) –** sustainability of the coordination is determined by the likelihood of retaliation from the other firms in case that one firm cheats. This requires that coordinating firms have a credible and sufficiently strong punishment mechanism against potential cheaters that can offset the gains from cheating. Where gains from cheating are large, certain and immediate, a punishment that is uncertain, small and delayed will not be sufficient to stabilize the coordination. [28] The credibility of the deterrence mechanism depends on whether the other coordinating firms have an incentive to retaliate. For example, if given deterrent mechanisms punish the deviator in a way that generates short-term economic losses also to the firms carrying the retaliation (temporary price war or output increases) the credibility of the deterrence mechanism depends on the difference between short-term retaliation losses and long-term coordination benefits.
- **Reactions of outsiders** - for coordination to be successful, the actions of non-coordinating firms and potential competitors, as well as customers, should not be able to jeopardize the outcome expected from coordination. For example, if coordination aims at reducing overall supply at the relevant market, this will only hurt consumers if non-coordinating firms are unable or unwilling to increase their own output sufficiently. The other significant factors related to the outsiders' reactions (market entry, buyer power) are discussed in the next section (Countervailing Factors).

To support a finding of anti-competitive coordinated effects, the Commission must show that the concentration increases the likelihood of coordination or makes existing coordination between firms easier, more stable, or more effective (HMG, para. 39). The Commission has to take into account all structural features of the market as well as past behavior of the competitors.

3.3.2.3. Merger with potential competitor

The HMG assess a merger with potential competitor in the similar way as the merger with existing competitor; as it can generate similar anti-competitive effects if the potential competitor

[28] For example, if a market is characterized by infrequent, large volume orders, it may be difficult to establish a sufficiently severe deterrent mechanism, since the gain from deviating at the right time may be large, certain and immediate, whereas the losses from being punished may be small and uncertain and only materialize after some time (HMG, para. 51)

significantly constrains the behavior of firms active at the market.[29] For a merger with a potential competitor to have significant anti-competitive effects, two basic conditions must be fulfilled. First, the potential competitor must already exert a significant constraining influence or there must be a significant likelihood that it would grow into an effective competitive force. Second, there must not be a sufficient number of other potential competitors, which could maintain sufficient competitive pressure after the merger (HMG, para. 60).

3.3.2.4. Mergers creating or strengthening buyer power in upstream markets

The Commission may also analyze to what extent a merged entity will increase its buyer power in upstream (input) markets. On the one hand, a merger that creates or strengthens the market power of a buyer may significantly impede effective competition by creating dominant position. On contrary, increased buyer power may be beneficial for competition. If increased buyer power lowers input costs without restricting downstream competition or total output, then a proportion of these cost reductions are likely to be passed onto consumers in the form of lower prices. (HMG, paras. 61-62).

3.3.2.5. Countervailing Factors

HMG also list possible countervailing factors that the Commission should consider by assessing the anti-competitive effects of a proposed merger.

Entry

Market entry by potential competitor can positively influence competition at the post-merger market and therefore has ability to defeat the Commission's anti-competitive concerns. Market entry can occur in various ways, for example through output expansion of existing competitors, market entry by a firm active in related product market or by direct imports from areas outside the relevant geographic market. The Commission assesses potential competition based on three factors (HMG, paras. 68-75):

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[29] This is the case if the potential competitor possesses assets that could easily be used to enter the market without incurring significant sunk costs (HMG, para. 59)

- Likelihood of entry – the likelihood of entry depends in particular on the profitability of entry (potential price war costs, costs of failed entry etc.) and on the presence of legal, technical and other barriers to entry (sunk costs, patents, regulation etc).
- Timeliness of entry – entry must occur sufficiently soon after the merger to prevent or defeat the exercise of market power by the merged firm.
- Sufficiency of entry - Entry must be competitively meaningful and sufficient in magnitude and scope to remove the incentives for anti-competitive behavior.

Buyer power

Strong bargaining power on the demand side (monopsonist purchaser, large industrial players, or large retail groups) can be considered as a countervailing factor and defeat the Commission's initial concerns. In order to apply the buyer power argument successfully, following conditions must be fulfilled:

- Customers must pose a credible threat to reduce or delay[30] their purchases from the merged entity if faced with a price increase[31] or to refuse to buy other products from the same supplier.
- The buyers' incentive to utilize their buyer power must not be defeated by specific circumstances, e.g., concerns of free-riding by other buyers.[32]
- Buyer power must not be limited to a specific segment of particularly strong customers.

Failing firm

An otherwise problematic merger can be declared compatible with the common market if one of the merging parties is a 'failing firm'. The HMG set three conditions to be fulfilled for a successful failing firm defense:

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[30] Delay of the purchase might be a relevant argument in the case of durable goods.

[31] This would be the case if the buyer could immediately switch to other suppliers , credibly threaten to vertically integrate into the upstream market or to sponsor upstream expansion or entry for instance by persuading a potential entrant to enter by committing to placing large orders with this company (HMG, para. 65).

[32] For example, a downstream firm may not wish to make an investment in sponsoring new supplier entry if the benefits of such entry in terms of lower input costs could also be reaped by its competitors (HMG, para. 66).

- The acquired undertaking would in the near future be forced out of the market for financial difficulties if not taken over by another undertaking.
- There is no less anti-competitive alternative purchaser than the notified merger.
- In the absence of the merger, the assets of the failing firm would inevitably exit the market.

Efficiencies

Major change in the merger regulation brought by the 2004 reform is an explicit treatment of efficiencies as a countervailing factor. Although Article 2(1)(b) of the ECMR had always stated that the merger analysis shall take into account the development of technical and economic progress (i.e. efficiencies), the historical evidence shows, however, that the Commission had consistently rejected efficiency defenses in the assessed merger cases.[33] By giving the efficiencies more prominent role as a possible factor in defeating anti-competitive concerns, the merger control has made a significant step toward a more economically rational approach of merger appraisal that assesses overall benefits of the transaction rather than simply relies on the post-merger competition's effects at the relevant markets.

The HMG place the assessment of efficiency claims in the overall SIEC assessment and state that the Commission must determine whether, overall, consumers would be worse off as a result of the merger (HMG, paras. 77 and 79). Efficiencies can take the form of cost savings (e.g., in production or distribution) or of product/service improvements (HMG, paras. 80 and 81).

The efficiency claims can be considered only if all conditions listed below are met (see HMG, paras. 79 – 88). Burden of proof lies in this case on merging companies and they need to provide all documentation supporting their efficiency claims:[34]

a) Benefit to consumers – in order to generate a sufficient consumer benefit, efficiencies need to be timely (occur reasonably soon after the merger), substantial, passed-on (at least partially) to the consumer and to benefit consumers in those relevant markets where it is

[33] See, for instance, *Aerospatiale-Alenia/de Havilland,* or *Bertelsmann/Kirch/Premiere* case documentation (http://ec.europa.eu/competition/mergers/cases)

[34] For example, documents used by the management in the decision-making process, statements of the management to investors, pre-merger outside expert studies (for example by investment banks) or historical examples of efficiencies achieved through similar mergers.

otherwise likely that competition concerns would occur as a result of the transaction. In other words, only efficiency gains that benefit consumers will be taken into account as a countervailing factor.

b) Merger specificity – merging parties must proof that the claimed efficiencies are a direct consequences of the proposed transaction and cannot be achieved by any realistic and less anti-competitive means (e.g. a licensing agreement, or a cooperative joint-venture).

c) Verifiability - efficiency claims have to be verifiable and efficiencies and the resulting benefits must therefore be quantified.[35] Where that is not possible, a qualitative showing of efficiencies may suffice, but only if the positive consumer impact is clearly identifiable and not a mere possibility.

It is obvious that requirement for successful efficiency claims set by the HMG are strict and it is not be easy for merging companies to prove the transaction benefits to the Commission. However, inclusion of efficiencies as a countervailing factor remains the major change in the merger regulation approach of the Commission and only practice can show in how many cases the outcome were materially affected by proven efficiencies.

3.3.3. Non-horizontal mergers

The 2004 reform covered only horizontal mergers, afterwards also vertical and conglomerate guidelines appeared – Non-Horizontal Merger Guidelines (NHMG).[36] In the empirical part of this thesis we deal mainly with efficiency of the Commission's decisions in the horizontal merger cases. Therefore, detailed description of the NHMG is not relevant for our purposes and we will provide only a brief overview of the economic concepts used in the NHMG. According to NHMG, non-horizontal mergers are generally less likely to significantly impede effective competition than horizontal mergers. Firstly, unlike horizontal mergers, vertical or conglomerate mergers do not entail the loss of direct competition between the merging firms in the same relevant market.

[35] For example, internal documents that were used by the management to decide on the merger, statements from the management to the owners and financial markets about the expected efficiencies, historical examples of efficiencies and consumer benefit, and pre-merger external experts' studies on the type and size of efficiency gains, and on the extent to which consumers are likely to benefit (HMG, para. 88)

[36] Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2008/C 265/07)

Secondly, vertical and conglomerate mergers provide substantial scope for efficiencies (integration of complementary activities or products).

However, NHMG recognizes potential anti-competitive effects of non-horizontal mergers (both coordinated and non-coordinated) and list the number of countervailing factors (in line with those in HMG). The major anti-competitive concern discussed in the NHMG is a possibility of foreclosure arising from either vertical or conglomerate merger.

In case of the vertical foreclosure, when the merging parties operate at different levels of the production or distribution chain, the merger may lead to anti-competitive effects by foreclosing competitors in upstream or downstream markets. As a result, the merging companies – and, possibly, some of its competitors as well – may be able to profitably increase the price charged to consumers (NHMG, para. 30). In case of the conglomerate mergers, the NHMG recognizes potential anti-competitive effect arising from the creation of portfolio power, defined as the acquisition of a full-range of products that would lead to foreclosure of other suppliers at the distribution level. Portfolio power and other aspects of conglomerate mergers (bundling, tying, dominance leveraging) are addressed by NHMG paras. 93-110.

4. Evaluation of 2004 Reform

This section provides short overview of the real impacts of the regulatory reform on the appraisal of mergers in the EU. We do not intend to cover all relevant changes discussed in the previous chapters. We rather try to show application of the main principles of the new guidelines in practice and highlight the main changes in the Commission decision processes. Our analysis is mainly based on the findings from the recent overview of the EU merger policy provided by Lyons (2008).

4.1. Main Impacts of the Reform

4.1.1. Non-Coordinated Effects and Efficiency Defense

With respect to quantitative techniques of horizontal merger effects assessment, the Commission still relies heavily on the market share analysis. However, under the new ECMR, assessments of market share become more transparent and systematic. Moreover, full simulation models are often used in the quantification of unilateral effects by both the merging parties and the Commission (e.g. *Volvo/Scania*, *GE/Instrumentarium* cases). The full simulation models "…*might provide useful insights in the dynamic of the particular markets the results must be interpreted with caution – predictions of those models are usually extrapolations into unobserved market structures and not interpolations within past experience*" (Lyons, 2008, p. 25). Overall effect of the use of simulation model can however be regarded as positive – simulation results are usually only a small part of the concerns of the merger and do not appear to be decisive factor.

One of the major changes in the new ECMR is the official 'efficiency defense'. The new position is supposed to be that merger-specific efficiencies are considered as a countervailing factor to the increased market power of the merged entity, as long as they are beneficial to consumers. The evidence on the existence of efficiency defense in the horizontal mergers is not overwhelming, but there are several cases in which efficiency effects played a important role in the Commission decision. In *Korsnäs/AD Cartonboard* case, the Commission accepted there would be efficiencies and that these would be passed through to consumers, in *Inco/Falconbridge*, the Commission thought that the efficiencies could have been achieved without the merger and in *Metso/Aker Kvaerner* case, the Commission did not accept that the efficiencies would outweigh the anti-competitive effects. Overall, it seems that efficiency argument can work as a countervailing factor, though it still remains a high hurdle for firms to achieve an efficiency defense in the merger proceedings.

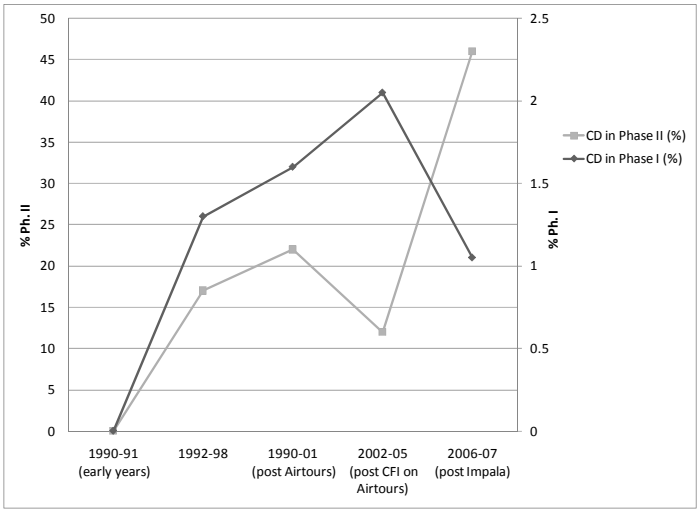
The fact that we do not observe firms offering an efficiency defense more often under the new ECMR is rather puzzling:

- First possibility is that mergers rarely achieve efficiencies that could not be attained by some other means.
- Another possibility is that is too difficult to defend claimed efficiencies in front of the Commission. Firms might prefer to offer remedies in Phase I rather than risk a costly Phase II investigation in the hope of a successful efficiency defense.[37]

4.1.2. Coordinated Effects

It should be noted that the assessment of coordinated effects under the new ECMR corresponds with the modern game-theory models on the sustainability of collusion.[38] The evolution of coordinated effects treatment is continuous with steadily increasing importance attributed to coordinated effects by the Commission since 2002. One very imperfect but simple way to 'measure' the importance attributed to coordinated effects by the Commission is to identify the number of merger decisions which non-trivially mention either collective dominance or coordinated effects.

Figure 1: Trend Incidence of Coordinated Effects Analysis



Source: Lyons (2008, p. 28)

[37] The unpublished research by Peter Ormosi from Center for Competition Policy – University of East Anglia provides empirical evidence on this particular question.
[38] See, for instance, Tirole (1988)

Few events should be highlighted that significantly influenced treatment of the coordinated effects in the recent years. In the period 1999-2001, *Airtours/First Choice* and several other '4-to-3' mergers were prohibited on the basis of collective dominance argument. Confidence of the Commission grew and there were seven cases were both single and collective dominance were found and remedies were required. However, in 2002 the CFI reverses *Airtours/First Choice* and period of retrenchment starts. While it seems that Phase I decisions still considered collective dominance, there was much greater caution in Phase II proceedings. In 2005 case *Sony/BMG*, the CFI shocks the Commission in the opposite direction, opening the possibility of coordinated effects in a '5-to-4' case. Commission responded with enormous caution in Phase II cases to ensure serious consideration of coordinated effects in nearly half of all Phase II cases.

According to Lyons "*the new substantive test introduced in May 2004 has likely have changed the Commission assessment of non-leading mergers in the last period"* (Lyons, 2008, p. 28). Two examples confirming the change in the assessment are *T-Mobile/tele.ring* and *Linde/BOC* cases from 2006. Both decisions were prosecuted as non-coordinated effects while it is likely that the Commission would have felt it to tackle these as collective dominance cases.[39] Furthermore, the change in the method used for the Phase I cases under new ECMR might also explain surprising drop in coordinated effects analysis in Phase I proceedings. However, this analysis says little about quality of individual decisions. We can only conclude that there is a change in the treatment of the coordinate effects under the new legislation.

4.1.3. Remedies

With respect to the Commission's intervention (remedies), there are several significant changes observable in the period related to the EU merger regulation reform (since 2002):

- First, percentage of cases resolved in Phase I is increasing, while number of cases referred in Phase II is decreasing.

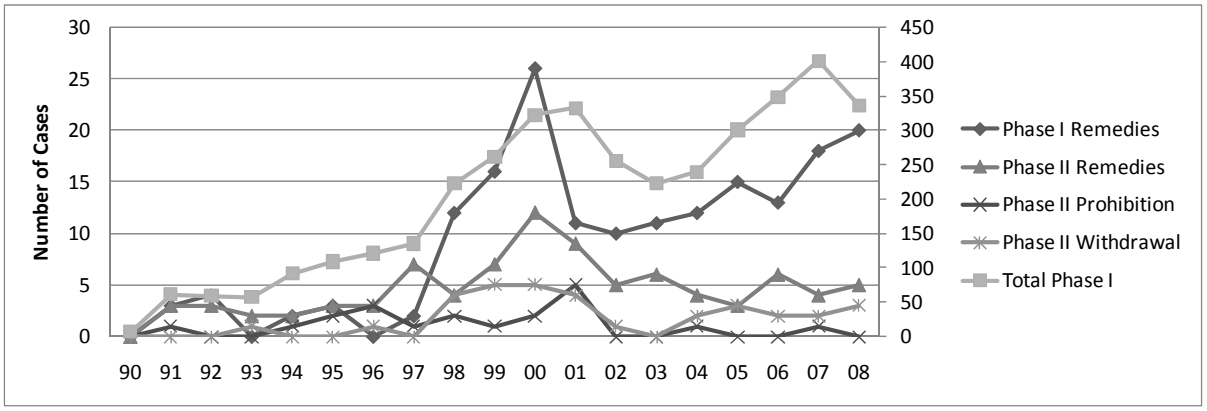
[39] In both cases merger resulted in situation, where three main competitors of comparable size have aggregated market share between 80% and 100%. Those mergers have been ideal candidate for coordinated effects prosecution under the old ECMR.

- Second, more mergers are being remedied as opposed to prohibited.
- Last but not least, number of intervention has seen a substantial reversal in recent years.

Two figures illustrating changes in intervention rate are provided. The top line in Figure 2 shows the trend in mergers decided by the Commission (right hand scale). In order to avoid double counting, this trend is based on Phase I decisions. It shows the great merger boom at the turn of the century, with the number of mergers qualifying for scrutiny doubling between 1997 and 2000, followed by a dip then record numbers of qualifying mergers in 2006 and again in 2007. In 2008, total number of evaluated mergers decreased slightly, probably given the tighter situation at the global capital markets and overall market illiquidity.

All other trends are measured on the left hand scale. Four main levels of interventions are provided: prohibitions, withdrawals during Phase II,[40] and merger remedies (both in Phase I and in Phase II).

Figure 2: Merger and Interventions Trend



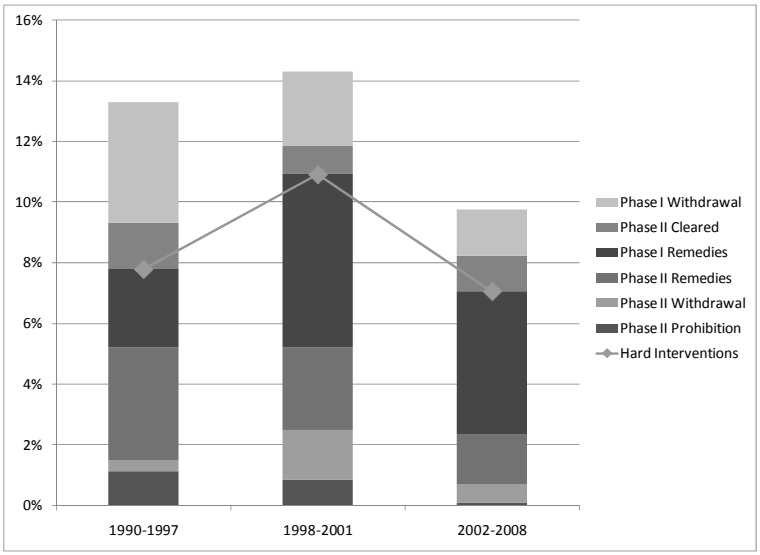
Source: Author based on Lyons (2008)

Figure 3 expresses interventions relative to merger decisions and groups them into three periods. The first, 1990–97, can be thought of as a period of settling into the new regulation during a period with a steadily growing number of qualifying mergers, and finished with the first revision of the ECMR in 1997, which included significant procedural changes affecting Phase I remedies. The next four years, 1998–2001, was a period of acceleration in mergers combined with growing confidence

[40] Withdrawals during Phase II are often due to the parties deciding that their merger proposal was likely to be prohibited.

of the Merger Task Force. Thirdly, the most recent seven-year period began with the Court reverses and Monti reforms (Green Paper of 2001). Additional two dimensions of interventions are provided: firstly, clearance in Phase II can be thought of as an intervention in that it imposes unnecessary costs on a merger that could have been cleared in Phase I. Second, some Phase I withdrawals may be due to the parties anticipating that their merger proposal would be referred to Phase II. In general, Figure 3 arranges interventions with the strongest (i.e. prohibitions) at the bottom and the weakest at the top of each column. Total percentage of 'hard interventions' is highlighted by a solid line.

Figure 3: Intervention Rate (1990-2008)



Source: Author based on Lyons (2008)

Main conclusions that can be drawn from the Figure 2 and Figure 3 are as follows:

- **Prohibitions are on the trend decline** - they peaked with five prohibitions in 2001, three of which were subject to CFI appeals,[41] since when there have been just two prohibitions.[42]
- **Interventions are less often in the recent years -** rate of 'hard' interventions[43] reached 10.8% in the second period, before falling to 6.4% in the reformatory period after 2002. Soft interventions follow similar trend.

[41] Namely *Tetra Laval/Sidel*, *Schneider/Legrand* and *GE/Honeywell*
[42] *ENI/EDP/GDP* in 2004 and *Ryanair/Aer Lingus* in 2007
[43] Prohibitions, Phase II withdrawals and remedies in both phases.

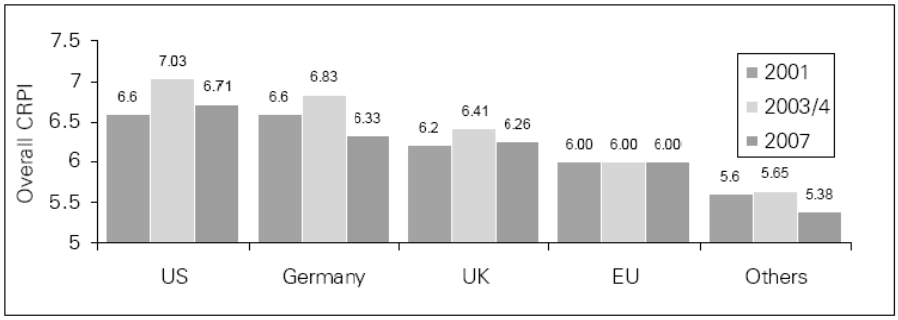
- **Number of Phase I withdrawals is steadily decreasing** – possible explanation is a learning effect of merging firms.
- **Lower occurrence of Phase II proceedings -** Phase II referral rate has halved from 7% to 6% to 3.5% over the three periods.
- **Increasing importance of remedies** - ratio of remedies to prohibitions has grown rapidly. While in the second period it rose from 5 to 10, it reached 53 during the last period!

4.2. Evaluation of the Reform

4.2.1. International Rankings

Objective assessment of the EU merger policy and the effects of recent regulatory reform aren't a trivial task. According to independent rankings, the EU merger regulation belongs to the world best antitrust agencies. For instance, every 3 or 4 years UK government conducts and independent peer review of national and international authorities, by lawyers, competition economists and firms. Recent peer review of national and international authorities, prepared by consulting company *KPMG* for Department of Trade and Industry ranked DG Competition fourth behind the USA, UK and Germany. The results show that the UK is ranked similarly to the US, Germany and the EU relative to the 2003/4 review. However, what is evident from the chart is that all regimes have fallen relative to the EU. As all countries are ranked relative to the EU and have decreased their absolute score, the survey suggests that the EU regime has improved over the last three years. Relative to USA, EU scored 94 percent in 2007, which is a significant improvement compared to 86 percent in 2003/4.

Figure 4: Competition Policy Rankings



Source: UK Department of Trade and Industry Peer Review (2007, p. 28)

According to Global Competition Review, which conducts annual survey of competition lawyers and their mergers survey,[44] DG Competition has risen to join first place alongside the FTC and UK Competition Commission in the 2007. Although explanatory power of such rankings might be limited, it does imply that the Commission is fulfilling its regulatory function fairly satisfactory in comparison with other antitrust agencies.

4.2.2. Bargaining Theory Approach

Instead of using benchmarking approach, Lyons (2008) offers alternative measure of the efficiency of EC merger control based on elementary bargaining theory. Basic principle of this theory is that, in the absence of asymmetric information, if there is a mutually beneficial deal to be done, it will be agreed. In the presence of asymmetric information, mistakes will be made in that negotiations break down but this should be infrequent if there is an effective information gathering process. The second principle is that deal should be reached quickly, as every delay imposes a deadweight loss during which the beneficial improvement is not implemented. Breakdown in negotiations can thus be manifested in either a prohibition or the parties walking away. According to bargaining theory approach, a prohibition arises only as a mistake of one involved agent. Either is the Commission unduly harsh, or is the merging party making mistake in proposing an irredeemably uncompetitive merger.[45] Withdrawals in this context occur due to the expectation of the merging parties, developed during the investigation, that the agency will not agree with what the merger parties believe would be an acceptable deal.[46]

Thus, in a context of the EU merger appraisal, the bargaining theory implies that an improvement of the efficient system should imply:

1. *Increased number of reached deals* (less prohibitions and withdrawals)
2. *Fostering of the agreement process* (more cases resolved in the Phase I)

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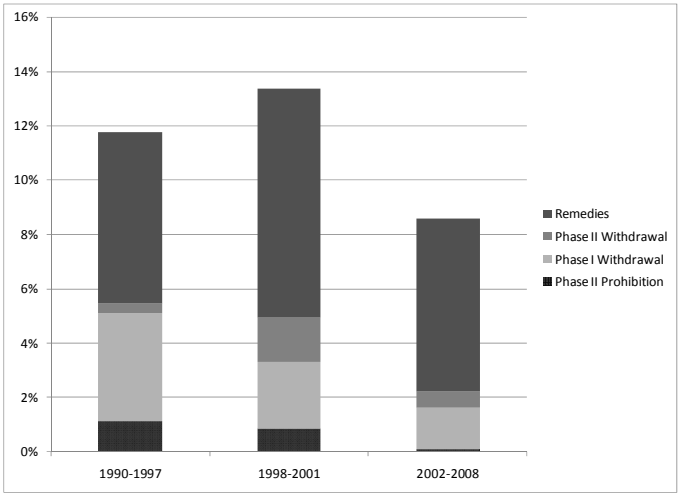
[44] Global Competition Review – Rating Enforcement 2008
[45] Alternatively, merging party is not offering sufficient remedy for a potentially beneficial merger.
[46] Some of the withdrawals might of course occur due to exogenous changes in market conditions.

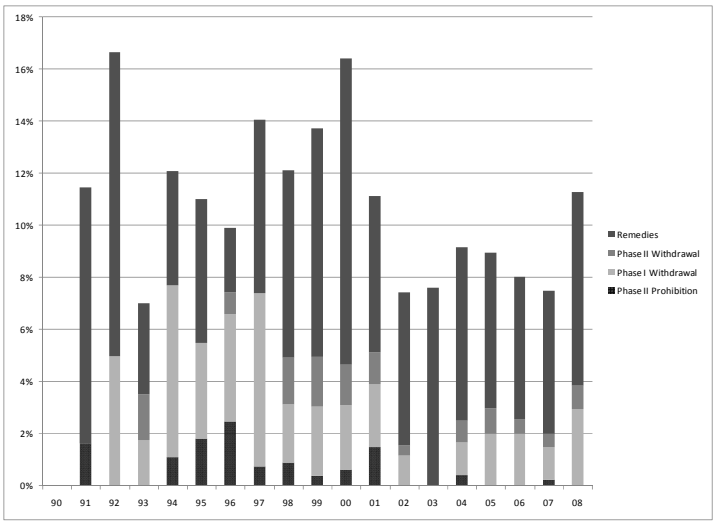
Figure 5 illustrates the evolution of the deal breakdowns, along with remedy agreements for context. Total number of failures to agree defined as prohibition plus withdrawals in either phase (columns below the bar) has a decreasing trend, suggesting an increasing efficiency of communication between merging firms and the Commission. According to Lyons, reasons for this include experience, more written guidance, a more economic approach and the impact of the Courts. If we observe yearly data from Figure 6, instead of averages for the particular three periods, we are able to draw several interesting conclusions. First of all, reversals of the three controversial merger cases in 2002 had a significant impact on the bargaining process between antitrust agency and the merging parties – there was a zero failure to agree in a the 2003. Secondly, we observe significant increase in the number of Phase I withdrawals in 2008 as it almost doubled in comparison with 2007. As Phase I withdrawals are probably the most influenced by the external factors, worsening financial market conditions can be a key factor behind the increase in the Phase I withdrawals.

Figure 5: Failure to Agree – Average Failures



Source: Author based on Lyons (2008)

Figure 6: Failure to Agree – Annual Failures



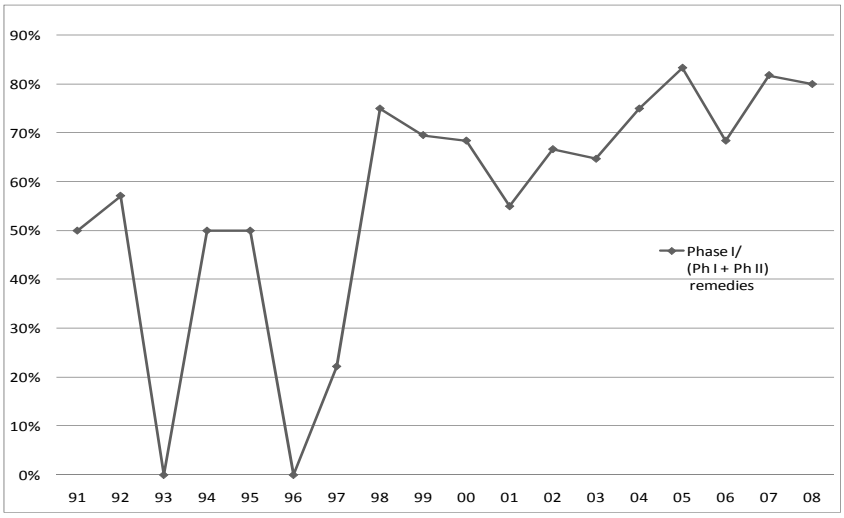
Source: Author

The main measurable dimension of speedy agreement is remedies agreed in Phase I as compared with Phase II. This trend is shown in Figure 7.

There is a significant legal reason for the distinct change in the pattern from 1998 because the 1997 amendment to the ECMR clarified the legal position of remedies agreed in Phase I. A change in the 2004 revisions to the ECMR may also have had some effect because it no longer requires firms to notify one week after the conclusion of the deal.[47] As we can see from the Figure 7, before legislative change in 1998, only 38% remedy agreements were achieved already in the Phase I. In the contrast, the last decade shows significant increase in the agreements reached in Phase I, averaging at about 70% in the period (1998-2008). We thus see a significant efficiency increase in the last decade.

[47]See Lyons (2008, pp. 46) for further discussion.

Figure 7: Speed of Agreement between the Commission and Merging Parties



Source: Author based on Lyons (2008)

Note, however, that the efficiency interpretation of the agreement speed must be taken very cautiously. Given the limited time for detailed evaluation of the mergers in the Phase I proceedings and steadily increasing workload, it is also possible that more mistakes are made in Phase I remedies than in Phase II.[48]

Apart from the reducing failure-to-agree rate and the early-agreement rate, Lyons suggests that we should take into account also the positive deterrence effect of the ECMR – the hidden benefits resulting from a power of merger regulation in deterring anti-competitive mergers from being proposed. The main argument is the fact that if firms completely ignore the ECMR when making merger proposals, we would expect a large number of harmful mergers to be proposed and consequently large number of prohibitions. As we do not observe this, real benefits of the ECMR might be underestimated by looking only at actual mergers.

According to the principles of the simple bargaining theory, the European merger regulation has substantially increased its efficiency in the last decade, but with a little continuing improvement after the 2004 reform. One possible explanation is that merger policy has reached some sort of

[48] See section 6.3.5. Econometric Results

steady-state optimum and therefore, we will hardly observe any significant efficiency improvements in the future. Other possibility is that every regulatory reform needs a certain period of time to generate significant results and it will take a little longer till the effects of 2004 will be fully absorbed.

Bargaining theory might provide some interesting insights in the problematic of merger regulation efficiency; it is however significantly limited by the fact that it evaluates efficiency of the merger policy per-se, without any independent 'outside' assessment enabling the comparison of its findings. Researchers often apply the event study methodology in order to overcome the absence-of-independent-assessment, using stock market data for the objective evaluation of merger decisions made by relevant antitrust agency. Next section will provide detailed description of this branch of empirical research and offer our own evaluation of EU merger policy based on the event study approach.

Empirical Analysis

5. Theoretical Background for Competitive Merger Analysis

Main purpose of this chapter is to provide theoretical background for the empirical assessment of the EU merger policy provided in the Chapter 7. Firstly, we will use two well known models to derive simple method how to evaluate competitive effect of a horizontal merger. Secondly, we will provide overview of the studies that use stock market data (event-study-method) to evaluate the merger decisions. In the third section of this chapter, we will present main principles of event-study methodology and discuss main advantages and disadvantages of this approach for our particular analysis.

5.1. Welfare Analysis of Merger Effects

In order to be able to identify anticompetitive mergers in our empirical analysis, we need to present the theoretical basis that enables us to create an effective framework for competitive merger assessment. Let us assume that the main goal of the antitrust authority is to protect consumers from abusive behavior at the after-merger market. In that case, every market configuration resulting in decrease of consumer welfare (surplus) should be seen as anticompetitive and therefore rejected.

In our empirical analysis, we use *external effects of merger on competitors in order to assess welfare changes* instead of direct measurement of consumer surplus' changes. Using the two well-known theoretical models, widely applied in the merger literature[49] (Cournot Quantity Competition and Bertrand Price Competition), we will show there is a *unique correspondence between change in consumer surplus* and change in competitors' profits generated by the level of efficiency created in the merger.

5.1.1. Cournot Oligopoly with Homogeneous Goods

We will illustrate the clear link between changes in consumer surplus and changes in profit of merger parties' competitors in the following simplified model. Let us assume a market where *N*

[49] See, for instance, Roeller, Stenek, Verboven (2000)

firms with identical cost and production structure produce the same homogenous good. The marginal costs are constant and identical for all firms (denoted by *c*). Firms decide simultaneously on their production quantity (Cournot oligopoly) and face a linear demand function of the following form:

$$Q(P) = A - P \quad where \;\; A, c > 0; A > c$$

Profits of the firms can be denoted as:

$$\Pi_i = (A - \sum_{j=1}^{N} q_j - c) q_i \quad for \; \forall i$$

where q_i represents a quantity produced by firm *i*.

From the first order condition we derive the reaction function for each of the firms:

$$\frac{\partial \Pi_i}{\partial q_i} = 0 \qquad => \qquad q_i^*(q_j) = \frac{A - \sum_{j=1}^{N-1} q_j - c}{2} \qquad for \;\; \forall i$$

From firms' symmetry follows that $q_i^* = q_j^* \quad for \;\; \forall i, j$ and we get the optimal quantity produced by each firm at equilibrium.

$$q_i^* = \frac{A - c}{N + 1} \qquad for \quad \forall i$$

Let us further simplify by assuming *N=3*. Then, we get:

- Quantity produced by each firm $q_i^* = \frac{A - c}{4} \quad for \;\; i \in \{1,2,3\}$
- Total equilibrium quantity $Q^* = \frac{3}{4}(A - c)$
- Equilibrium price $P^* = \frac{1}{4}(A + 3c)$
- Profit of each firm $\Pi_i = \frac{(A - c)^2}{16} \quad for \;\; i \in \{1,2,3\}$

Consumer surplus is in that case equal to:

$$CS = \frac{(A - P^*)Q^*}{2} = \frac{9}{32}(A - c)^2$$

Let us now assume two firms decide to merge. We further assume merger generates efficiencies for the merging firms (denoted by *e*). We do not specify the efficiencies' nature; we only presume ability of merging parties to decrease their marginal costs due to the efficiency effects. We do not assume any 'spill-over' effects of the merger - cost structure of the other firms in the market remains unchanged.

Profit of the merged entity is therefore:

$$\Pi^m = (A - q_m - q_c - (c - e))q_m$$

While profit of competitor firm remains unchanged:

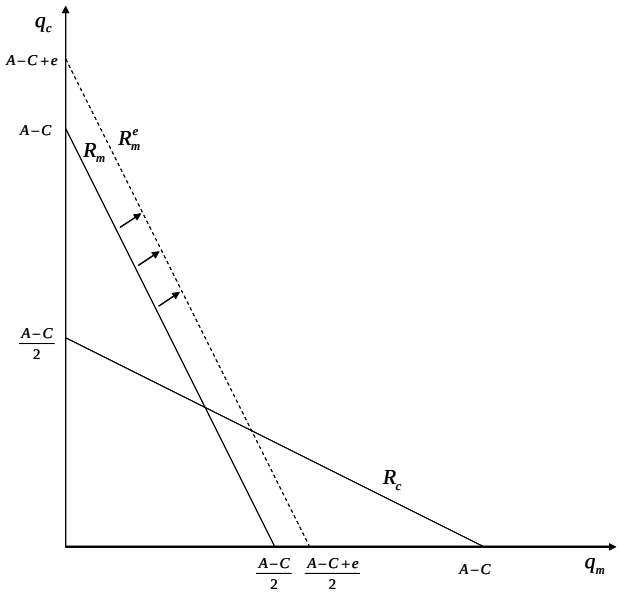
$$\Pi^c = (A - q_m - q_c - c)q_c$$

From the first order conditions we derive reaction functions of both firms:

$$q_m^*(q_c) = \frac{A - q_c - c + e}{2}$$
$$q_c^*(q_m) = \frac{A - q_m - c}{2}$$

Figure 8 shows the reaction functions of merged entity (R_m) and its competitor (R_c). The efficiency effect is demonstrated through a movement of the R_m to the right and illustrated by a new reaction function of the merged entity (R_m^e).

Figure 8: Efficiency and Reaction Functions



Source: Author

We thus derive quantities produced by both firms in equilibrium as well as total produced quantity and new equilibrium price at the market:

- Quantity produced by merged entity $q_m^* = \frac{A-c+2e}{3}$
- Quantity produced by competitor $q_c^* = \frac{A-c-e}{3}$
- Total equilibrium quantity $\tilde{Q}^* = \frac{2}{3}(A-c)+\frac{1}{3}e$
- Equilibrium price $\tilde{P}^* = \frac{1}{3}(A+2c)-\frac{1}{3}e$

With higher level of efficiencies achieved by the merger, production of merged entity increases while production of competitor decreases, resulting however in an increase of total production and thus in lower prices.

Profits after merger are distributed subsequently:[50]

$$\Pi^m = \frac{(A-c+2e)^2}{9}$$
$$\Pi^c = \frac{(A-c-e)^2}{9}$$

while consumer surplus after merger is equal to:

$$\tilde{\tilde{CS}} = \frac{2}{9}(A-c+\frac{1}{2}e)^2$$

In order to evaluate the total effect of the merger more easily, let us define the welfare change as sum of the surplus changes:

$$\Delta W = \Delta\Pi^m + \Delta\Pi^c + \Delta CS$$

where

$$\Delta\Pi^m = \Pi^m - 2\Pi_1 = \frac{(A-c+2e)^2}{9} - 2\frac{(A-c)^2}{16}$$
$$\Delta\Pi^c = \Pi^c - \Pi_1 = \frac{(A-c-e)^2}{9} - \frac{(A-c)^2}{16}$$
$$\Delta CS = \tilde{\tilde{CS}} - CS = \frac{2}{9}(A-c+\frac{1}{2}e)^2 - \frac{9}{32}(A-c)^2$$

[50] we further assume that $A > c + e$ ensuring that the competitors do not exit the market

As we see above, both the change in profit of merged entity and change in consumer surplus are increasing in *e,* while change in competitors profit decreases in *e*.

$$\frac{\partial \Delta \Pi^m}{\partial e} > 0;\ \frac{\partial \Delta \Pi^c}{\partial e} < 0 \ \ and \ \ \frac{\partial \Delta CS}{\partial e} > 0$$

See also that for $e = 0 \quad \Delta \Pi^m < 0;\ \Delta CS < 0$ but $\Delta \Pi^c > 0$. In other words, *merger is not profitable for merging firms if there are no efficiencies present*. Intuitive explanation could be that the new merged entity supplies 'half of the market', while prior to the merger merging parties supplied 'two thirds' of the market, due to the symmetry of firms active in the market. At the same time, price increase generated by the merger is not large enough to compensate for decrease in production of the two firms. Increased market concentration is beneficial only for competitors as they can fully exploit the concentration effects of the merger - they market share increases while prices are higher than before the merger.

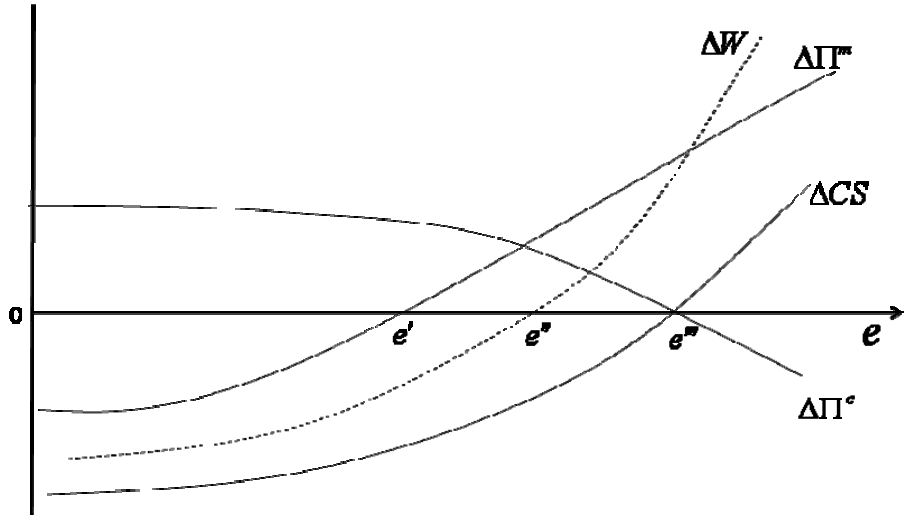
First, when a certain level of efficiencies $e' = 0.03(A - c)$ is reached, merger becomes profitable for merging parties. Note that $\Delta W[e = e'] < 0$, i.e. at the *low level of efficiencies* e'*, total welfare decreases as increased profits of merged firms and their competitors (producer surplus) do not outweigh the decrease in consumer surplus*. When level of efficiencies increases further and reaches $e'' = 0.05(A - C)$, total after-merger change in welfare rises above zero. However, even in this case merger should be considered as anticompetitive - the change in consumer surplus remains negative even at the e'' level of efficiencies.

When level of efficiencies generated by merger reaches the point $e''' = 0.25(A - c)$, *consumer surplus' change is equal to zero. The most interesting outcome of this comparative analysis is the fact that at the same time change in competitor's profit is equal to zero*. In other words, it holds that:

$$\Delta CS \geq 0 \ \ iff \ \ e \geq e'''$$
$$\Delta \Pi^c \leq 0 \ \ iff \ e \geq e'''$$

Using the results from above, it is possible to illustrate the correspondence between consumer surplus and competitor's profit at the following figure:

Figure 9: Efficiency and Welfare Changes



Source: Author based on Neven and Roeller (2000, p. 7)

As we can observe from the Figure 9, *change in competitors profits 'mirrors' the changes in consumer surplus.* As the level of efficiencies increases profits to competitors fall and the level of efficiency which ensures that competitors do not gain (denoted by e''') is exactly the level which ensures that consumers are not hurt. In this framework therefore, *if a merger hurts competitors, it will benefit the consumers and vice versa.*

As shown by Farrell and Shapiro (1990), correspondence between the consumer surplus and competitors' profits holds in wide variety of homogenous Cournot games that satisfy some weak conditions, such as uniqueness and stability. In other words, property that $\Delta CS > 0$ if and only if $\Delta \Pi^f < 0$ shown in our simplified model, is valid for homogenous Cournot games in general.[51] Moreover, as shown by Kreps and Scheinkman (1983), in the two-stage game where firms decide first about their

[51] Interestingly, clear correspondence between the sign in CS and competitors' profits is lost in quantity games with product differentiation. Some prices may go up, while other may go down as a result of merger. Exact change in consumer surplus depends then on the consumer preferences, and is independent of the change in competitor profits. For more details, see for instance, Werden and Froeb (1994).

capacities and then compete with each other by setting their prices simultaneously, the equilibrium results correspond with those from traditional Cournot model.[52]

5.1.2. Bertrand Competition with Product Differentiation

In order to further illustrate correspondence between consumer surplus and competitors' gains, we will analyze those effects in another widely used model where firms compete with each other by setting prices. We will use the analysis from Duso, Neven and Roeller (2007, p. 33) in order to illustrate the outcomes of price competition with product differentiation, as the results for the case with homogenous goods are rather straightforward.[53]

> Let us assume well known Bertrand competition with product differentiation. Let the sum of the competitors' profits be denoted by $\Pi_c(p_c, p_m)$, where p_c is a price vector of competitors' prices and p_m is a price vector of the merging firms. Further let the products be substitutes such that $\Pi_c(p_c, p_m)$ is increasing in p_m. Assume that there are well-defined reaction functions, and that there is a unique and (locally) stable Nash equilibrium that depends smoothly on the efficiency *e*. Let the pre-merger equilibrium be denoted by (p_c^*, p_m^*). Note that the merger will have two effects: a change in efficiency (*e*) and a collusive price setting amongst the merging firms (*m*).
>
> Consider first a sole increase in efficiency and denote the resulting equilibrium prices by
>
> (p_c^e, p_m^e). As has been shown by Fudenberg and Tirole (1994) (see also Vives 2000, page 213-217), the comparative statics with respect to *e* under the above assumptions are such that all prices decrease, competitors profits decrease, and consumers benefit. In particular,

[52] However, results of this two-stage model depend heavily on the rationalization rule. For more details, see Davidson and Deneckere (1986)

[53] In standard price competition with homogeneous goods, efficiency gains from merger will be fully absorbed by increased profits of merged parties. In the new after-merger equilibrium price will be almost equal to marginal costs of competitors (price thus remaining almost unchanged), while merged entity will supply the whole market and make positive profit due to lower marginal costs generated by merger's efficiencies. Consumer surplus will thus remain virtually unchanged and competitors' profits will still be equal to zero.

we have $p_c^e < p_c^*$ and $p_m^e < p_m^*$, that is all prices fall. Consider now the effect of collusion that is the *m* firms set their prices collusively. Denote the post-merger equilibrium by p_c^{**}, p_m^{**}, where $p_c^e < p_c^{**}$ and $p_m^e < p_m^{**}$. There are two cases, depending on whether the efficiency or the collusion effect dominates:

Case (i): Suppose $p_m^* < p_m^{**}$, that is post-merger prices of the merging firms are higher. Given that prices are strategic complements, we also have that $p_c^* < p_c^{**}$. Furthermore, we have

$$\Pi_c(p_c^*, p_m^*) < \Pi_c(p_c^*, p_m^{**}) < \Pi_c(p_c^{**}, p_m^{**})$$

The first inequality is due to the assumption of substitutes (i.e. $\Pi_c(p_c, p_m)$ is increasing in p_m) and the second is from the equilibrium definition of p_c^{**}, p_m^{**}. This implies that a merger yields higher profits for competitors, while consumers are hurt (all prices rise), i.e. *CS<0* and $\Pi_c > 0$.

Case (ii): Suppose $p_m^* > p_m^{**}$, that is post-merger prices of the merging firms fall. Given that prices are strategic complements, we also have that $p_c^* > p_c^{**}$. Furthermore, we have

$$\Pi_c(p_c^*, p_m^*) > \Pi_c(p_c^*, p_m^{**}) > \Pi_c(p_c^{**}, p_m^{**})$$

The first inequality is due the equilibrium definition of p_c^*, p_m^* and the second is from the assumption of substitutes. This implies that a merger yields lower profits for competitors, while consumers benefit (all prices fall) i.e. *CS>0* and $\Pi_c < 0$.

5.1.3. Summary

Using the well known theoretical framework we have showed that, under some general assumptions, there is a clear correspondence between the effect of a merger on consumers and competitors. However, it should be noted that we analyzed only external effects of horizontal mergers only and that the clear correspondence is lost in cases of vertical mergers where firms

involved in the merger are the different level of the supply chain. Therefore, we will restrict our empirical analysis only to the cases where merger is of a horizontal nature.

For the merger cases between firms involved in totally unrelated business activities (conglomerate mergers), the correspondence between consumer welfare and competitor's profits may break down too. If particular conglomerate merger leads to marginalization (or even foreclosure) of competitors, the negative reaction in competitors' profits does not necessarily mean that consumers will not be hurt by the merger. As vertical (conglomerate) effects played role in several horizontal merger cases in our sample, we will control for those effects in our further empirical analysis (see Chapter 8).

5.2. Event Study Approach and Merger Control Evaluation

5.2.1. Literature Overview

Event study is widely used approach to assess the effect of particular event on the firm value. This methodology was firstly applied by Dolley (1933) who examined the effects of stock-splits on share prices. However, first studies that introduced the methodology used today were those of Ball and Brown (1968) and Fama, Fisher, Jensen and Roll (1969).

Most of the researches applying event study approach on the analysis of mergers and acquisitions tend to focus on ability of mergers to create value for shareholders of merging parties.[54] These studies show substantial gains of between 20 and 40% to shareholders in target firms; and typically show abnormal losses to acquiring company shareholders.

Considerably less attention has been given to the applications of this methodology for competition policy purposes or overall assessment of anticompetitive effects of the mergers. One class of study of particular interest involves an examination of market data for competitor firms to allow inferences about the competitive effects of the merger to be made.

Such an analysis firstly appeared in the work of Eckbo (1983) who evaluated 259 US mergers of which 79 were challenged by the antitrust authorities. Restricting his analysis at the challenged mergers, Eckbo examined movements in the share prices of competitors to see whether they supported anticompetitive nature of the merger (market power hypothesis) and found they did not. According to his results, challenged mergers had been based on synergic effects rather than increases of market power and potential collusive behavior. Stillman (1983) conducted a smaller study with a similar aim whose results were consistent with those of Eckbo. Both studies found a

[54] See Sudarsanam (2003) for a summary of the numerous studies in this area. Andrade, Mitchell and Stafford (2001) also provide extensive overview of M&A research.

lack of statistical evidence from share price movements to support referral to the antitrust authorities on competition grounds.[55]

Wier (1983) examined the costs of defending mergers challenged by the US antitrust enforcement agencies. Analysing abnormal returns at the key events in the regulatory procedure he found that wealth gains earned at the time of bid announcement are cancelled out by losses suffered by the time the inquiry concludes. Franks and Harris (1993) examined shareholder value changes in merger cases referred to UK antitrust authorities. They found losses to shareholders on referral to antitrust agency and on the announcement of an adverse finding, as well as substantial losses when merger bids were prohibited. However, the effects were only statistically significant for the target company, this result was further confirmed by Forbes (1994). Those findings were not fully supported by recent UK study of Arnold and Parker (2007), as they did not find evidence to support an overall loss of shareholder value to target company shareholders when a merger is prohibited.

Regarding the studies that analyze EU merger regulation, Brady and Feinberg (2000) analyze the effects of particular news on EU merger procedures (for instance decision to open phase II investigation) using the event study approach. They focus on stock market reactions of the merging parties shares and do not consider the effects on competitors. They found that enforcement of the merger regulation has had a substantial effect on individual company stock values.

Neven and Roeller (2002) examine 100 EU merger cases from the first ten years of EU merger control in order to explore main factors that may account for discrepancies between Commission's decisions and stock market's anticipations. They found that discrepancies could be associated with the political economy of merger control, that discrepancies are more frequent in Phase I investigations and when large countries are involved, and that competitors may play important role in favor of anti-competitive deals.

[55] Those conclusions rely on the assumption that negative returns of the competitors signal the anticipated higher competitiveness at the relevant market and do not reflect potential exclusionary effect of the merger on competitors (i.e. anticipated foreclosure would also generate negative returns for competitors around the announcement day). For more information about the theories behind these studies and problems involved in interpreting the results see Cox and Porter (1998).

Beelders and Ozden (2002) analyse a sample of mergers evaluated by the Commission, trying to account for the decision to open a phase II investigation. They focus on external factors such as nationality of the firms and the geographical distribution of their output as the determinants these decisions. Bergman et al. (2003) use the insights of Coate and McChesney (1992) analyzing EU merger cases and trying to account for the decision to open a phase II decision and the decision to prohibit the merger in terms of factors listed in the decision. They test whether the Commission gives appropriate weight to the factors regarded as important ex-ante (for instance published in merger guidelines) and to factors regarded as important by economic theory (market shares, barriers to entry etc.). Although this approach provides limited insights with respect to overall quality of competitive assessment it provides good test of the consistency of antitrust authorities.

Duso, Gugler and Yortuglu (2005) analyze the stock market reaction - around the announcement day as well as the day of Commission's final decision - to identify the potential anticompetitive effects in the sample of 167 EU mergers and the remedial provisions on these transactions. They found that the market seems able to predict effectiveness of the remedies applied in phase I and to produce good prior to phase II's clearances and prohibitions, but not to remedies.

Duso, Neven and Roeller (2007) followed the method of Eckbo (1983) and Stillman (1983) in order to identify the discrepancies in the Commision's merger decisions (cases where pro-competitive merger was prohibited resp. anti-competitive merger was cleared). They analyzed a sample of 164 EU merger cases from the period 1990-2002 investigated by the Commission. In contrast with Eckbo and Stillman studies, Duso, Neven and Roeller found the evidence that the anti-competitive mergers were often cleared by the EU antitrust agency. Their results suggest that the Commission's decisions cannot be solely accounted for by the motive of protecting consumer welfare, but they do not find the evidence that the Commission protect the interests of merging parties and/or their competitors. Instead, they suggest that other factors – such as country and industry effects, as well as a market definition and procedural aspects – do play significant role.

Aktas, de Bodt, and Roll (2007) use event study approach to evaluate their hypothesis that EU merger regulation is protectionist. They analyze whether the market considers the prospect for

regulatory intervention in its initial assessment of the proposed mergers and test whether the EU is biased against mergers involving non EU firms. Based on 290 cases from the period 1990-2000, they conclude that for mergers initiated by foreign bidders, the probability of regulatory intervention was increasing with the magnitude of (negative) stock returns of European competitors around the merger announcement date.

5.2.2. Event study methodology

The method of event study examination is usually focusing on the effect of equity prices. The necessary condition for any event study is the availability of listed financial instrument that tracks the value of the firm under examination and sufficient development of the relevant financial market – the instrument must be sufficiently traded so that its posted price may competently reflect changes in value of the company. The real ability of the financial market to efficiently evaluate changes in the firm's value and other characteristics of event study methodology will be discussed in the following paragraphs.

According to Campbell, Lo and MacKinley (1997) seven key stages could be identified to a typical event study:

1. *Event definition:* the first step in an event study is to define the event of interest (announcement date of the merger, decision date of antitrust proceeding etc.) and choose the period over which the prices of the relevant financial instrument will be followed – so called 'event window'. Theoretically, in a perfectly efficient market one would expect all value effects to be reflected immediately in asset prices and event window could be reduced solely to the particular event of interest. In practice however, the market may acquire relevant information prior to the event, speculate on the content of the announcement before it is made; or take time to assimilate information and react to it. Therefore it is common in studies of such type to use an event window of a few days before and after the event. However, there is no consensus about how long the event window should be, as there is obvious trade-off: the longer the event window, the more information we capture and at the same time the higher is the risk that our measurement of price change will be biased by another information that is assimilated by the stock market and that does not correspond to our event of interest. However, there is no consensus about the

optimal length of the event window and we offer the overview of the different approaches adopted in the previous studies in the Table 3.

Table 3: Some Recent Studies – Event Window and Estimation Period

Study	Purpose of Study	Model	Event Window	Estimation Period
Arnold & Parker (2007)	Value effects of regulatory regime	Market	1 day before to 1 day after	1 calendar year ending 2 days before event
Cox & Portes (1998)	Horizontal merger - competitive effects analysis	Market	1, 2 and 5 days following event	1 calendar year ending 1 day before event
Eckbo & Wier (1989)	Horizontal merger - competitive effects analysis	Market	20 days before to 10 days after; and 1 day before to 1 day after the event	200 days before event to 10 days after
Forbes (1994)	Value effects of regulatory regime	Market	1 day before to 1 day after; and 10 days before to 10 days after the event	120 days beginning 300 days before referral to CC
Oxera (2006)	Value effects of regulatory regime	Market	Event day and day before; event day and 3 days before; 1 day before to 3 days after	Not stated

Source: Author based on Beverley (2007, p. 15)

2. *Selection Criteria:* next task is to determine the selection criteria for the firms to be included in the study. The criteria may involve restrictions imposed by data availability such as listing on the stock exchange, or may involve restrictions such as membership in a specific industry. It is also useful to collect some characteristics of the data sample at this stage and note potential biases which may have been introduced through the sample selection.

3. *Normal and abnormal returns:* in order to measure the real impact of a particular event on the return from a financial instrument we must first establish what that return would be in the absence of the event (the 'normal return'). The normal return is usually modeled by one of the two statistical approaches – the constant-mean-return model or the market model. The constant-mean-return model assumes that the mean return of a given security is constant through time. The market model assumes a stable linear relation between the

market return and the security return.[56] The model linear specification follows from the assumed joint multivariate normality and independence of asset returns:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

$$\mathrm{E}[\varepsilon_{it}] = 0 \qquad Var[\varepsilon_{it}] = \sigma_\varepsilon^2$$

Where R_{it} and R_{mt} are the period-t returns on security *i* and the market portfolio respectively, and ε_{it} is the zero mean disturbance term. α_i, β_i and σ_ε^2 are the parameters of the market model. In practice, the market portfolio is represented by an appropriate stock index (S&P Composite, FTSE All-share etc.). Main advantage of the market model compared to constant-mean-return model is its ability to reduce the variance of the abnormal return by removing the portion of the return that is related to variation in the market's return.[57] Since the use of the market model generally improves the chances of being able to isolate the effects of specific events, we decided to adopt this model also in our empirical analysis.

4. *Estimation procedure:* once a model suitable for computation of normal returns has been selected, the parameters of the model must be estimated using a subset of the data known as the *estimation windows.* Campbell, Lo and MacKinlay suggest an estimation window of 120 days prior to the event, but this is by no means a convention, as can be seen from the Table 3. Note that event itself should not be included in the estimation period to prevent the event from influencing the normal performance model parameter estimates.

5. *Testing procedure:* with the estimated parameters of the normal performance model we should be able to calculate the abnormal returns. In case of the market model the abnormal returns should be calculated as follows:

$$AR_{it} = R_{it} - \left(\hat{\alpha}_i + \hat{\beta}_i R_{mt}\right),$$

[56] It is also possible to use economic models such as Capital Asset Pricing Model (CAPM). However, in the last twenty years, deviations from the CAPM model have been discovered, and this casts doubt on the validity of the restrictions imposed by the CAPM on the market model and the use of the CAPM in event studies has almost ceased.

[57] The benefit from using the market model will depend upon the R^2 of the market model regression.

where $\hat{\alpha}_i, \hat{\beta}_i$ are estimated parameters for the stock *i.* The next step is to design the testing framework for the abnormal returns in order to prove their statistical significance. Important consideration are defining the null hypothesis and determining the techniques for aggregating the abnormal returns of individual firms. For example, an equally weighted portfolio may be constructed to test the effect of an event (period between t_1 and t_2) on *N* firms:

$$\overline{AR}_t = \frac{1}{N}\sum_{i=}^{N} AR_{it} \qquad \text{and} \qquad \overline{CAR}(t_1, t_2) = \sum_{t=t_1}^{t_2} \overline{AR}_t$$

and to test the null hypothesis that the given event has no impact on the mean or variance of returns hence the expectation of abnormal return is zero. Inferences about the average CAR can be drawn using a test statistic:

$$t = \frac{\overline{CAR}}{\sigma_c \sqrt{n}}$$

where *n* is the length of event window and σ_c estimation period standard error.[58]

6. *Presentation of empirical results:* the presentation of the empirical results follows the formulation of the econometric design. For example when looking at a portfolio of securities it may be desirable to show aggregated results rather than those for individual instruments. In our analysis, we use cumulative abnormal returns for relevant competitors in order to compute average competitors gain for each merger case (see Chapter 4 for more details).

7. *Interpretation and conclusion:* Empirical results will ideally lead to insights about the mechanisms by which the event affects security prices. In our case, event study approach is the only a part of a more complex analysis that enables us to identify the discrepancies in the decision making of antirust agency and we do not analyze this mechanism in further detail.

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[58] The variance of average CAR is equal to $\frac{1}{N^2}\sum_{i=1}^{N}\sigma_i^2(t_2 - t_1 + 1)$ where *N* is the number of companies (securities), t_1 the beginning and t_2 the end of event window. Note that this method is suitable for examining individual merger cases. In our sample, we simply compute average CAR for each of 161 cases and apply standard t-statistic using standard error of average CAR sample.

5.2.3. Pros and Cones of the Event Study Approach

5.2.3.1. Independent assessment

In order to identify the discrepancies in the antitrust authority decisions we need to compare those with to some 'objective' criterion. In our case, it is necessary to find another independent alternative competitive assessment of the proposed transactions against which the Commission's decision can be evaluated. In contrast to US antitrust procedure where independent evaluations are undertaken by both the bureau of economics and the bureau of competition, EU merger regulation does not offer any alternative competitive assessment as the Commission is solely responsible for the whole appraisal process. Therefore, by using the stock market reaction we do not rely on the information provided by the Commission decisions, which is possibly incomplete and endogenous. Stock market approach suffers itself from significant shortcomings (as discussed below), but it offers us an independent competitive assessment of M&A transactions that is necessary for our further analysis.

5.2.3.2. Elimination of potential censoring problem

Other significant advantage of the stock market data is an elimination of the potential censoring problem. Without the independent ex ante assessment provided by the stock market data we would be entirely dependent on ex post performance of the merging parties and their competitors. However, that would be possible only for the mergers that were cleared by the Commission. As we observe stock market reactions on the day of the announcement, we are able to identify the impact of the merger on competitors' stocks even when the merger is blocked, thus avoiding the censoring problem in our data sample.[59]

5.2.3.3. Availability

Another advantage of a stock market data is their availability, considering the alternative of obtaining the measures of consumer surplus through the estimation of structural demand parameters. Structural estimation of demand might be suitable approach if we are working with several case studies however given the size of our data sample and limited resources, this approach

[59] However, the censoring is not fully eliminated as there is no documentation available for the several cases that were voluntary withdrawn by the merging parties. Thus, we were not able to identify the competitors and we could not include those cases in our sample.

would not be feasible. Last but not least, stock market data are much better suited to capture dynamic effects of mergers on firm performance than historic accounting data that would require an explicit dynamic specification.

However, there are also potential disadvantages arising from stock market data use that have been explored in the event-study related literature (see, for instance, Cox and Porter, 1998). In the following section, we will present main arguments identifying significant weaknesses of the event-study approach.

5.2.3.4. Quality of Stock Market Evaluation

The event study approach relies on the assumption that the stock market reaction provides timely and unbiased estimate of the firm's change in profit, even though that estimate may not be very precise. This assumption is closely connected to the one of the most important concepts in modern financial economics, known as The Efficient Market Hypothesis (EMH), in particular its semi-strong version. The semi-strong version of the EMH states that in an efficient market, "*market prices reflect all publicly available information*" and "*respond quickly and without bias to new information*" (see Brealey and Mayers, 1995). The semi-strong version of EHM does not mean that market is always right; it merely means that the market is not systematically wrong. If the EMH holds, it is possible to derive the market's estimate of the change in the firm's future performance resulting from a particular event by observing the change in stock price when news of particular event (i.e. merger announcement date) reaches the market. The empirical evidence of EHM is long-dated and there have been literally hundreds of finance papers confirming the general conclusion that the developed stock markets are semi-strong efficient (for a recent overview, see Chan, et. al, 2003). Although event study approach has also been subject to criticism, there is a lot of evidence in support of semi-strong EMH with respect to mergers (see, for instance, Schwert, 1996). [60]

[60] See, for instance, Ravenscraft and Scherer (1987), or Cox and Portes (1998). For more sophisticated critique of the general approach to financial market analysis, based on the fractal analysis, see Mandelbrot et al. (2006)

Another important question related to the event study approach is a significance of observed stock market changes. The market may consistently and efficiently reflect anticipated effects of the mergers; however question arises, whether the information provided by stock market is significant. Existing studies typically report that the announcements of mergers generate relatively large changes in stock market prices (see Clougherty and Duso, 2008). Moreover, this finding is also confirmed by recent studies that analyze large samples of EU mergers which partially overlap with our sample. As we discussed below, we confirm those results at our sample too.

The significance of the competitors' stock reaction around the announcement date is of particular importance in our analysis. Announcement date of the merger may have insignificant effect on competitors' stock in case that the merger affects only a small part of the competitors business. In our empirical analysis, however, we evaluate the stock prices of main competitors present at the majority of relevant markets stated in the Commission's documentation. Overall presence of main competitors and usually large market shares at those markets suggest that merger effect large part of their businesses. However, we did not have sufficient resources to prove this assumption for each and every merger case examined and we therefore recognize it as a potential source of measurement error.

Last but not least, there is a question of stock market accuracy. The accuracy of market estimates with respect to merger announcements was analyzed by number of studies in order to assess the predictive power of the stock market data. As the EMH only suggest that the market's estimate is not systematically biased, it does not provide any guarantee that this estimate of the event's effect will be right ex post. Several studies[61] have tried to compare ex ante estimates of merger's effect with ex post realizations of those transactions. They all conclude that the ex ante stock market reactions are positively and significantly correlated with ex post performance. According to Duso Neven and Roeller (2007, p. 10) "*these studies show that the market predicts actual outcomes with some accuracy, but they only consider merging firms. The reliability of the ex ante reaction to the stock market price of competitors has not, to the best of our knowledge, been investigated.*"

[61] See, for instance, Ravenscraft and Pascoe (1989)

5.2.3.5. Changes in the Likelihood of Future Market Configuration

In case that there are several possible mergers at the relevant market, efficient stock market should reflect those expectations in the stock prices of prospective merging parties. Therefore, the announcement of a particular merger will change the probability of alternative market configurations. Thus, stock reaction of the firms not involved in the merger need not to purely reflect the pro-competitiveness (anti-competitiveness) of the announced merger, as it could also reveal some information about possible future merger activities. Fall in competitor's stock price after the merger announcement could mean that market anticipated an increase in the value of the competitor as a potential merger candidate. After the announcement, this potential merger configuration becomes irrelevant and the stock market correction results in the fall of competitor's stock price. This 'out of play' effect influences the competitor's stock negatively without revealing any information about competitiveness of the market configuration after merger (see, for instance, Molnar, 2007; or Stennek and Fridolfsson, 2005).

On the other hand, as mergers usually come in waves[62], announcement of a merger may indicate increased probability that other firms will be involved in mergers in the near future – so called 'in play effect'. In this case, the increase in the value of stock price of competitors may not be reliable indicator of anti-competitiveness of the merger. However, 'in play effect' does not seem to be important empirically. On the other hand, announcement of a merger may indicate 'in play' effects as it may increase the likelihood that 'competitors' will themselves be involved in subsequent mergers.

Overall, it is thus difficult to predict the direction of various potential 'in-' and 'out of play' effects and it is unclear whether they matter. Salinger and Shuman (1988) test for the presence of such effects and conclude that it may matter in some cases, but it does not matter on average across a sample of cases. Duso and Clougherty (2008) examine 165 EU merger cases[63] and found that the

[62] For recent theoretical explanation of the merger wave phenomenon; see Toxvaerd (2008)
[63] That partially overlaps with our dataset.

stock reaction of rivals to merger events is not sensitive to merger waves; hence, 'future acquisition probability' does not drive the positive abnormal returns of rivals.

In our work, we follow the Duso, Neven and Roeller (2007) approach and we do not consider this issue in our further empirical analysis, while recognizing that it may be a potential source of measurement error.

5.2.3.6. Changes in Probability of Merger Being Consummated

An announcement of a merger states an intention of merging parties and it is usually subject to review by both the merging companies and government antitrust agencies. Therefore, the stock market reaction at the particular event of interest is not reflecting only the estimate of change in future performance of merging parties, but also the likelihood that the deal will be cleared. The change in value of the stock at the time of announcement is equal to the probability of clearance times the value that will be generated by the transaction. Therefore, anticipated profits cannot be seen as exogenous as market takes into account the antitrust procedure (see Aktas, Bodt and Roll, 2007, for the evidence on this). In our analysis, we only need the sign of the expected stock price change in order to identify anti-competitive deals which corresponds fully with the real change in value given the merger takes place (as probability is always non-negative). Hence, the anticipation of the antitrust procedure does not introduce the bias in our analysis, however we need to control for endogenity of expected changes (which is further discussed in the Chapter 4).

6. Empirical Assessment of the EU Merger Control

Chapter 7 is devoted to our own empirical analysis of the EU merger policy. Firstly, we will describe our dataset. We will describe selection criteria for construction of our representative merger cases and provide the overview of our data sources. Secondly, we will discuss the method for construction of competitor gains based on collected stock market data. Competitor gains are then used for identification of anti-competitive mergers in our sample. Third part of this chapter presents our econometric model and discusses some important estimation issues. Last section shows descriptive and econometric results and summarizes our main findings.

6.1. Data

6.1.1. Merger Cases Selection and Competitors Identification

First step in our analysis was a selection of suitable merger cases. We used publicly available information from the Commission's website.[64] We selected all Phase II cases from the beginning of 1990 until October 2008. We had to exclude some most recent cases because of unavailability of Commission reports.[65]

Second step was identification of relevant competitors. One option, widely used in older studies[66], was to identify competitors according to industry classification codes (i.e. SIC, NACE) and include all firms that belong to the same industry as merging parties. Such a method assures sufficient number of observations; on the other hand it also increases the risk of including the firms that are irrelevant for the competitive effects of the merger - as industry classification codes provide only rough estimate of the real competitive setup of particular markets. Some firms with the same classification

[64] http://europa.eu.int/comm/competition/mergers/cases

[65] Another censoring problem may arise due to sample selectivity of EU merger data. Note that we cannot collect relevant information for withdrawn cases, cases with no documentation and for the cases that were resolved in the "simplified procedure" under the New ECMR. However, this potential censoring issue has not been tackled in any of the previous studies.

[66] See Aktas, Bodt and Roll (2007) for overview of relevant studies.

code might be customers or suppliers of the merging parties. Therefore, empirical results from such a sample will be significantly biased.[67]

In our analysis we followed approach applied in more recent studies that deal with the EU merger regulation and we worked only with the competitors identified by the Commission's economic team. The biggest advantage of this approach is that Commission experts have made a careful market definition – in every merger case report there is a clear definition of relevant product and geographical market as well as a list of competitors present at those markets. The expert-assessment of rival identity is thus a particular strength of our merger sample.

For those cases with relevant documentation, we analyzed the Commission's reports in detail and excluded all transactions where Commission evaluated nature of the merger as mainly vertical, for reasons mentioned previously. We further need to exclude all '2 to 1' cases – situation where merging parties are the only two firms present in the market and there is no competitor left after the merger (and we cannot evaluate reaction of relevant competitors). For the similar reason, we excluded all those cases where competitors (or their parent company) were not publicly listed.

We end up with 74 Phase II to cases suitable for our analysis. In order to obtain a representative[68] sample and to avoid sample selection problems we randomly selected a sub-sample of 90 Phase I merger cases. For our sample of total 164 merger cases, we then collected all relevant information from the Commission reports: name and location of merging firms, name of all relevant competitors, product and geographical market definition and final Commission decision.

6.1.2. Announcement Dates

For each case we determined the first day that merger was officially publicly announced. The announcement date was obtained from "Merger Market" (independent intelligence service that

[67] As pointed out by Clougherty and Duso (2008), in case that we treat customer-firms as competitors, the abnormal returns would be biased upwards – synergies generated by merger will lead to lower prices for customer firms. Including the firms with no relation to the merging parties in our sample would generate bias of competitors' abnormal returns toward zero – because such firms would be unaffected by the merger.

[68] We realize overrepresentation of Phase II cases in our analysis compared to their real occurrence. However, we do not consider this as significant measurement problem.

provides information about M&A deals across the world) and from "Dow Jones Factiva" (customizable business news and research product that integrates content from newspapers, newswires, journals, research reports, and web sites).

6.1.3. Stock Market Data

Stock market data were obtained from "Thomson Datastream" (world largest statistical and financial database)[69]. We collected data on stock prices[70] (P_{it}) as well as number of shares (S_{it}) for all firms in our sample on the announcement date, 260 before this date as well as 3 days after, in order to be able to construct the abnormal returns. We also collected 'market data' for the same period, in particular we used country relevant industry index provided by the Datastream (I_{it}).

[69] Access to Thomson Datastream was provided by Economic & Business Data Center (EBDC), a combined platform for empirical research in business administration and economics of the Ludwig–Maximillian University of Munich (LMU) and the Ifo Institute for Economic Research.

[70] All prices have been transformed in thousands of constant 2000 USD.

6.2. Construction of Abnormal Returns and Competitors Gains

6.2.1. Competitor Gains

In order to estimate abnormal returns at the announcement date, we use market model approach described in the previous chapter:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

In order to estimate the parameters of the market model we use stock returns over the 200-day trading period ending 60 days prior the announcement date. We exclude the 60 days period in order to minimize potential 'pre-announcement rumors' effect - information about prospective merger usually appears at public before the official merger announcement and including this period might therefore bias our estimation. Using the standard OLS approach we estimate model parameters α and β, which we then use to predict firm *i's* normal return at the announcement date – i.e. we estimate the stock price return for the event where the merger would not have been announced ($\hat{R}_{it}$).

We then calculate the abnormal return at the around the merger's announcement date *t* (AR_{it}) as follows:

$$AR_{it} = R_{it} - \hat{R}_{it} = R_{it} - (\hat{\alpha} - \hat{\beta} R_{mt})$$

Given the possibility of information leakages – which influence firm *i*'s return before (or after) the merger announcement and the fact that market might not be able to absorb the announcement information promptly, we define the total effect as the cumulative abnormal return (CAR) - a sum of the daily abnormal returns within an event window of particular length. We compute CAR for the event windows of different lengths (τ_1 before and τ_2 after announcement date), in particular 1, 2 and 3 days around the announcement date:

$$CAR_{i,\tau_1,\tau_2} = \sum_{t=\tau_1}^{\tau_2} AR_{it}$$

This approach help us to cope with the trade-off mentioned in the previous chapter – conservative selection of short event window might not fully capture the full effect of the announcement while

by using longer event window we risk that firm *i's* return will be affected by some merger irrelevant information.

Based on this data we construct the 'competitor's gains from mergers' that we use to evaluate the Commission merger decisions. In order to optimally estimate average merger effect on competitiveness, we include only the 'main competitors' in our analysis – those firms that are present at all relevant markets identified in the Commission reports. In those cases, where main competitor was absent, we use major rivals from each relevant market and control for those cases in our further analysis.[71] Competitor *i's* gains (Π_i^{CG}) are calculated as follows:

$$\Pi_i^{CG} = \sum_{t=\tau_1}^{\tau_2} (AR_{it} \cdot P_{it} \cdot S_{it})$$

For each merger case *J* in our sample, we then calculated 'average' competitors' gain from a merger (Π_J^{CG}) as a weighted average of above defined competitors' gains, where average market capitalization for given 200-day trading period is used as a weight.

$$\Pi_J^{CG} = \frac{\sum_{i \in J} \Pi_i^{CG} \cdot \overline{P}_{it} \cdot \overline{S}_{it}}{\sum_{i \in J} \overline{P}_{it} \cdot \overline{S}_{it}}$$

6.2.2. Identification of Decision Errors

As discussed in the section presenting theoretical framework of our analysis, under some weak assumptions we are able to use the change in competitors' profit as an indicator of the competitive consequences of the merger. In our further empirical analysis, we thus compare average competitor gains for every merger case with the Commission decision in order to identify discrepancies between the actual decision and competitive assessment of the merger by stock market.

[71] Right treatment of competitors is with no doubt complex question. Method suggested by Duso, Neven and Roeller (2007) is to use all competitors available for one specific merger irrespectively on the relevant market that is involved. Another approach is to use each single relevant market as one separate observation and then correct for the correlation among these observation with a clustering procedure at the merger level. Our approach might be considered as a compromise between those two methods.

Following the approach from Duso, Neven and Roeller (2007), we evaluate Commission decision as a 'type I error'[72] in case that merger was prohibited by Commission (Article 8.3) while market consider this merger as pro-competitive ($\Pi_J^{CG} < 0$). Furthermore, we define 'type II error' only for those cases cleared by the Commission with no objections (Article 6.1.b or Article 8.1) where stock market reaction of relevant competitors was positive ($\Pi_J^{CG} > 0$) – thus indicating anti-competitive nature of the merger. Definition of the type II errors is based on the conservative assumption that the stock market cannot anticipate the future remedies and that consequently imposed remedies work to the benefit of consumer.[73]

Given the low number of prohibited mergers in the EU merger regulation history (less than 0.5 percent of all cases were actually prohibited), occurrence of type I errors might not have significant explanatory power. Instead of use prohibitions, the Commission usually set particular obligations and conditions (remedies) that must be fulfilled by merger parties in order to get the Commission's approval. Therefore, we define 'weak type I error' for those cases that were consider pro-competitive by the market ($\Pi_J^{CG} < 0$), however were subject to remedies given by the Commission decision (Article 6.1.b with conditions and obligations, Article 6.2 or Article 8.2).

Weakness of this parameter is given by the fact that market reaction might be seen as a proxy for an average pro-competitiveness of a particular merger. However, this does not exclude the possibility that merger might impede competitiveness at some submarkets influenced by the proposed merger – it just states that the overall effect of the merger on consumers is considered positively by the market. Therefore, remedies imposed by the Commission with respect to those markets might further increase the overall competitiveness (consumer welfare) and we cannot include those cases into the same category with 'strong type I errors'.

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[72] We use "error" term merely for the explanatory reasons. Discrepancy is in fact more suitable expression.

[73] Given that remedies are the outcome of a negotiation between the Commission and the parties, it appears difficult to form a prior. Note, however, that if the market does anticipate remedies, the definition of our dependent variables in econometric model are affected. In this case, any instance where the market anticipates that the merger would be anti-competitive would be associated with a type II error. But of course, any instance where the market anticipates that the merger would be pro-competitive and is cleared with remedies would not be associated with a type I error; Duso, Neven and Roeller (2007, p. 20)

6.3. Econometric Analysis

Next step in our empirical analysis is to identify factors that influence the occurrences of discrepancies in the Commission decision. Our model is based on the theoretical framework of Neven and Roeller (2002) according to which an antitrust agency maximizes its own utility and where third parties (competitors, merging firms, member states' governments and other agents can affect its utility. Our econometric model follows methodology applied in Duso, Neven and Roeller (2007) and Aktas, Bodt and Roll (2007).

6.3.1. Introduction - Benevolent Agency Model

According to the above set-up, a benevolent agency blocks a merger if and only if consumer surplus is reduced. Decision dummy for the benevolent agency (*D*) is then defined as follows:

D=1 (clear) if *ΔCS>0*

D=0 (block) otherwise

Let *P* be the actual decision taken by the agency, which is equal to 1 when the merger is cleared and zero otherwise. Discrepancies in the agency decisions are then defined as follows:

E1=1 iff P=0 and D=1 (Type I error)

E2=1 iff P=1 and D=0 (Type II error)

Thus, functional form of our theoretical model can be represented by following two equations:

$$E1 = \sum_{i=1}^{k} \alpha_i X_i + \varepsilon_i \qquad for\ D = 1 \qquad (1)$$

$$E2 = \sum_{i=1}^{k} \beta_i X_i + \varepsilon_i \qquad for\ D = 0 \qquad (2)$$

We thus assume that there is a linear relationship between occurrence of both type of errors (*E1, E2*) and various explanatory variables (*X*). We then identify potential factors that may influence

occurrence of both types of errors. Let us first consider the influence of competitor firms on the antitrust agency.

We should differ between two cases. First, let us assume that merger is anti-competitive, that is *D=0*. In this case, competitors profit from the merger and they have strong motivation to influence the agency to approve the merger. Therefore the greater increase in competitors' profit is expected as result of an anticompetitive merger, the more motivated competitors to influence the agency decision. If they are successful, a type II error occurs (*E2*). Vice versa, if merger is pro-competitive *(D=1)*, competitors' profits fall if merger is cleared and incentives of competitors to influence the agency increases relatively to the expected decrease in their future profits. If the agency blocks such a merger, type I error occurs (*E1*).

6.3.2. Factors Influencing Decisions of the Antitrust Agency

We analyzed several older studies in order to identify factors that might play significant role in the decision making of the European antitrust agency. We will provide short discussion regarding the potential influence factors and use relevant factors for specification of parameters in equations *(1)* and *(2).*

6.3.2.1. Power of Competitors

In fact, the Commission is often criticized for giving excessive attention to the welfare of competing firms.[74] During the merger evaluation procedure, the Commission usually takes into account also concerns of competitors and their evaluation of the competitive effects of proposed merger. This apparent willingness of the agency to listen to the competitors rise justified concerns about the potential influence of the competitors on the final agency decisions. Thus, we include a proxy for the competitors' influence in our econometric model (see below).

6.3.2.2. Institutional Factors

Moreover, there are also a number of institutional and political economy variables that may influence the anti-trust agency. As suggested in previous studies, the size of the country in which the

[74] See Neven and Roeller (2002) for further details

merging firms originate does play a role in the Commission's decision – large countries might exercise significant political pressures to have anti-competitive transaction cleared, thus increasing the occurrence of type II errors. The pattern of errors may also vary across the sectors in which the mergers are taking place, as some industrial sectors have more political cloud than others, mostly as the level of member states. We thus control for industry specifics in our model.

6.3.2.3. Procedural Issues

Regarding the procedural issues, some critics pointed out the inadequacy of the Phase I proceedings the Commission might not have enough time and resources to evaluate complex merger cases properly. Therefore, we should test whether occurrence of type II errors is positively correlated with Phase I proceedings (strong type I errors are in this case irrelevant as merger cannot be blocked in the Phase I proceeding).

Another question arises with respect to rapidly increasing workload of the Commission's expert team. While average number of evaluated transactions in the period 1990-1999 was only 124 cases per year, amount of workload almost tripled in the last decade, reaching 321 cases per year between 2000 and 2008. We should thus control for this potential effect on frequency of both type of errors.

Issue of concern is also market definition applied in Commission's analysis. It is often asserted (see for instance, Neven et al., 1994) that the EU merger guidelines are biased towards excessively narrow market definitions, both in terms of the wording of the guidelines and in actual practice. As a result, narrow market definition may thus be associated with a higher frequency of errors – especially the occurrence of type I errors, as too narrow market definition might result in exaggeration of anti-competitive effects of the merger at particular submarkets neglecting the overall competitive dynamics of the market concerned.

6.3.2.4. Preference for Domestic Firms

Disagreement of the EU and US regulators in the cases that fall under both legislations (in particular in the *GE/Honeywell* merger and in the *Microsoft* antitrust cases) uncover another important issue – potential protectionism of the European antitrust agency. The American financial press raises

suspicion that EU focuses more on protection of domestic competitors rather than consumers. Aktas et al. (2006) find that the more harm suffered by European rival firms when the acquirer is coming from outside the European Community, the greater the likelihood of European regulatory intervention against the proposed combination. Such evidence cannot support an unambiguous conclusion of protectionism but it certainly raises some doubts. We therefore distinguish the type of the mergers in our sample (intra-European, extra-European and Cross-euro-border) to control for this possible effect on error occurrence – i.e. type I errors.

6.3.2.5. Effect of the 2004 Reform

Last but not least, we also include the variable that reflects the recent legislative changes in the EU merger regulation. More consumer-oriented approach in the evaluation of mergers, clear specification of countervailing factors and prolonged investigation periods might have a positive effect on the Commission's decisions accuracy – we thus expect lower occurrence of both type I and type II errors since the introduction of the new legislation.

6.3.3. Econometric Model

With respect to the arguments stated above we specify equations *(1)* and *(2)* as follows:

$$E1 = \alpha_0 + \alpha_1 \tilde{\Pi}^{CG} + \alpha_2 BIG + \alpha_3 PH\_II + \alpha_4 T + \alpha_5 NAT + \alpha_6 CROSS + \alpha_7 EXTRA + \alpha_8 ECMR + \alpha_x X + \varepsilon_1 \quad (3)$$

$$E2 = \beta_0 + \beta_1 \tilde{\Pi}^{CG} + \beta_2 BIG + \beta_3 PH\_II + \beta_4 T + \beta_5 NAT + \beta_6 CROSS + \beta_7 EXTRA + \beta_8 ECMR + \beta_x X + \varepsilon_2 \quad (4)$$

In light with the above discussion, the right side of both equations consists of key factor that could potentially determine the occurrence of both types of errors. Vector X consists of other important controlling variables, which will be discussed later. For detailed description of variables see Table 4:

Table 4: Model Variables

Variable	Definition
Decisions	
Clear	Dummy = 1 if the merger was cleared without remedies (Art. 6.1b or Art. 8.1.)
Prohibition	Dummy = 1 if the merger was blocked (Art. 8.3)
Remedies	Dummy = 1 if the merger was cleared with remedies (Art. 6.1b with remedies or Art. 8.2 with remedies)
Phase_I	Dummy = 1 if the merger was in phase I
Phase_II	Dummy = 1 if the merger was in phase II
Competitors Gains	
Cgains	Gains from mergers for the competitors Cumulative change in stock market value (relative to an index) for the competitors on the day around the first announcement date of the merger. The value is expressed in 2000 constant USD.
Competitive Assesment	
Anticompetitive	Dummy = 1 if the merger was anti-competitive (CGAINS > 0)
Procompetitive	Dummy = 1 if the merger was pro-competitive (CGAINS < 0)
Discrepancies	
Type_I	Dummy = 1 if the commission made a type I error, i.e. a pro-competitive merger was blocked.
W_Type_I	Dummy = 1 if the commission blocks or impose remedies on a pro-competitive merger
Type_II	Dummy = 1 if the commission made a type II error, i.e. a anti-competitive merger was cleared without remedies. The assumption is that the remedies restore competition but the market did not anticipate the use of remedies.
Geographic Factors	
Big_EU	Dummy = 1 if one of the merging part comes from one big EU country (France, Germany, Italy, Spain, UK)
Same_Country	Dummy = 1 if the both merging parties come from the same country
Intra_EU	Dummy = 1 if the both merging parties come from the EU
Extra_EU	Dummy = 1 if the both merging parties come from the countries outside of the EU
Cross_EU2	Dummy = 1 if the acquier comes from the country outside the EU and the merger target comes from the EU
Market Factors	
Network	Dummy = 1 if if the merger concerns telecom, transports, electricity or the financial industry
Foreclosure	Dummy = 1 if the Commission identified threat of the competitors foreclosure due to the merger
National	Dummy = 1 if the relevant geographic market is national
Vertical_Eff	Dummy = 1 if the Commission identified vertical or conglomerate effects
Temporal Variables	
Trend	Official number of the merger case - captures increasing number of evaluated cases more efficiently then the date (year) of the official merger announcenment.
ECMR_2004	Dummy=1 if the merger was evaluated after the reform of EU merger regulation
Other Variables	
No_Main_Competitor	Dummy=1 if there is not at least one competitor active at all merger-relevant product markets.

Source: Author

6.3.3.1. Model Estimation

Probit Regression

Following the methodology applied in previous studies, we use probit regression techniques to estimate equations 3) and 4). The probit model can be derived from the assumption that there exist a latent (unobservable) variable *P**, which would in our case represent the Commission's view on the merger's anti-competitive effects. If the latent variable takes a value above some critical level, then merger is prohibited (*P=0*). Thus, for each subsample (pro-competitive and anti-competitive mergers) we estimate the parameters of the model using the probit regression - assuming that the latent variable is generated by the model:

$$P^* = \beta' X + \varepsilon$$

Where β vector of parameters (weights) is, X is a vector of explanatory variables and $\varepsilon \sim N(0,1)$ is a random shock. It is then easy to show that:

$$\Pr(P = 1) = \Phi(\beta' X)$$

This gives us the likelihood for both cases *P=0* and *P=1*. Assuming the observations are i.i.d. it is easy to construct the sample log likelihood. This can be maximized using standard nonlinear maximization algorithms.

As mentioned above, we estimated parameters of the equations (*3)* and (*4)* using subsamples of pro-competitive (respectively anti-competitive mergers). In order to divide our samples in the two particular subsamples, we used a consumer surplus criterion. In other words, if *ΔCS>0* the merger is considered as pro-competitive. Rather to apply direct measurement of consumer surplus changes, we analyze the merger external effect on the competitors' profits – merger is considered profitable iff $\Pi^{CG} < 0$. Note however, that there is a censoring problem connected with the competitors' gains from merger – we observe Π^{CG} only if merger is cleared and takes place. However, we also need to know what would have been, when a merger is blocked. This is a censoring problem.

Measurement Issues

We follow the Duso, Neven and Roeller (2007) approach and solve this problem using stock market reaction data. In particular, we consider the change in competitor's stock price around the date of announcement. Let V be the abnormal change in the value of competitor's stock on the day of announcement of the merger. Let the p be the probability that the market assigns to the event that merger is cleared. Then $V = p\Pi^{CG}$ can be interpreted as expected change in competitor's value conditional on the event that merger is cleared by antitrust authority. Since p must be non-negative, V and Π^{CG} have a same sign, thus enabling us to identify the anti-competitive (pro-competitive) cases using only observed reaction of competitors' stocks.

The probit model is consistent if the explanatory variables are exogenous. However, the observed V around the announcement date cannot reasonably be presumed exogenous. Investors who evaluate the value creation (destruction) for competitors around the announcement day know that the EU merger regulation might come in play – therefore they must take into account probability that the merger will be clear (prohibited). Including V in our model as an independent explanatory variable would generate endogeneity problem, as unobserved factors in the error term influencing the Commission decision (*P*) are surely correlated with the probability that merger will be cleared. Dealing with endogeneity requires the formation of instrumental variables. We have opted for indirect variation of a standard two-step method.[75] The first step in this method is to regresses potentially endogenous variables on a set of genuine exogenous variables. Fitted values are then used as instruments in the probit model. In our particular case, we estimate a reduced form probit on the full sample using all instruments (see Table 7) to obtain a consistent estimate of probability that merger will be cleared (p). Having estimated p we can easily derive measures for our instrument $\tilde{\Pi}^{CG} = \frac{V}{\hat{p}}$ that we use as an explanatory variable in the equations (*3)* and (*4),* thus avoiding the endogeneity problem.

[75] See for instance Wooldridge, 2001.

There are several other measurement issues that might be considered important for our analysis (see Aktas, Bodt and Roll, 2007). In particular, when resolving endogeneity problem by using a two-step instrumental variable approach, the quality of the instruments is important. If the instruments are poorly correlated with the original variables (so called 'weak instruments problem'), asymptotic p-values might be seriously misleading (see Wooldridge, 2001). In our case correlation between instrument $\tilde{\Pi}^{CG}$ and original variable V reaches 0.86 and does not raise serious concerns about 'weakness' of the instrument. Nonetheless, we do not apply any advanced statistical tests and we do not further examine the potential weakness issue.

Goodness-of-fit Measures

We include several goodness-of-fit measures in order to assess explanatory power of our estimations. One of the widely used methods is to test that all coefficients in the model, except the constant, are zero ($H_0 : \beta_1 = \beta_2 = ... = \beta_k = 0$). This hypothesis can be tested by the likelihood ratio $\lambda = \frac{L_c}{L_u}$, where L_c denotes the log-likelihood of the constrained model and L_u is the log-likelihood of the unrestricted model. We then construct the statistic for testing the null hypothesis $\chi^2 = -2\ln(\lambda)$ that is asymptotic χ - squared distributed variable with K degrees of freedom.

The other principal measure is a pseudo R^2 which is a simple measure of goodness of fit that corresponds intuitively to the wide used coefficient of determination - R^2 – in a standard linear regression models. In particular, we use McFadden's R^2 defined as:

$$R_p^2 = 1 - \frac{L_u}{L_c}$$

We also include percentage of correct predictions in our estimated model. We use estimated equation to compute prediction ($\hat{E}$) of the dependant variable value (E). We define $E_s = 1$ iff $\hat{E} \geq 0.5$ and $E_s = 0$ iff $\hat{E} < 0.5$. Success rate is then computed as a percentage of corrected prediction (if $E_s = E$) on the total number of observations in the used sample.

Estimation of Marginal Effects

Equation coefficients in the probit model do not provide a straightforward illustration partial effects of change in particular explanatory variable on dependent variable, as in case of linear regression models. Widely applied method to overcome this interpretation difficulty of probit models is an estimation of marginal effect of every dependant variable. Consider general form of the single-equation regression model $E(y \mid x) = F(\beta x)$ where βX denotes linear combination of parameters and explanatory variables. Marginal effects measure the change in the expected value of the dependent variable when *i*th independent variable increases by a marginal unit (other variables unchanged). Default method offered by majority of statistical software is the computation of marginal effects (partial derivatives) at the values of independent variables fixed at their sample means:

$$\frac{\partial E(y \mid \bar{x}, \beta)}{\partial x_i} = \beta_i f(\beta \bar{x})$$

Where $f(\cdot)$ denotes he derivative $F(\cdot)$ with respect to βx.

However, this formula is limited by two problems. Firstly, the formula is not meaningful in presence of dummy variables – the sample means used during the calculation of marginal effects refer to nonexistent observations (as dummy variable never takes a value of its sample mean). Secondly, this method might generate estimation bias in a presence of observations where continuous variable takes extremely high (low) values.[76]

To remove these limitations, we follow the method suggested by Bartus (2005), and define average marginal effects (AME) as the average amount of change in the expected value of y :

[76] This is exactly case of our sample. PCgains takes extremely high values for observations, where gigantic corporations are indentified as competitors (such as AT&T with market capitalization of almost USD 30 billion). Those observations increases sample mean of PCgains extremely, and most of the observations in the sample have PCgain lower than the mean. Computing marginal effects at the fixed means results in underestimation of dummy variables effect, making variable PCGain a perfect predictor. Instead of excluding observation with extremely high PCgains, we applied method suggested by Bartus (2005) that overcomes this problem.

$$AME_i = \beta_i \frac{1}{n} \sum_{k=1}^{n} f(\beta x^k)$$

Where βx^k denotes the value of the linear combination of parameters and variables for the *k*th observation.

In order to estimate marginal effects for dummy variables we use following formula:

$$AME_i^D = \frac{1}{n} \sum_{k=1}^{n} \left\{ F(\beta x^k \mid x_i^k = 1) - F(\beta x^k \mid x_i^k = 0) \right\}$$

Using the formulas above, we avoid the problem of setting dummy variables at means, as well as potential negative effect of extreme values of continuous variables in our sample.[77] Note however, that we henceforth use 'marginal effects' only for explanatory reasons – in fact we always refer to AME.

6.3.3.2. Hypothesis

Assuming that we can measure the variables and estimate both equations consistently, we construct the following hypothesis in line with our previous discussion:

H1 (Benevolence): $\alpha's = 0,\ \beta's = 0$, no systematic errors of type I or II.

That is the decision process produces errors that can be characterized by white noise through the error terms of. As can be seen from the definition of *E1* and *E2* this is likely to be the case whenever *P* and *D* are similar.

H2 (Influence): $\alpha_1 = 0,\ \beta_1 = 0$, no systemic influence of competitors on the agency.

H2 tests whether there is significant effect of competitors on the occurrence of both types of errors.

H3 (Preference): $\alpha_2 = 0,\ \beta_2 = 0$, no preference for big countries.

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[77] For more details on statistical properities of AME, see Bartus (2005)

That is the decision process of the Commission does not depend on the country of origin of merging parties and there is no discrimination of firms from other then large EU member states.

H4 (Inadequacy): $\alpha_3 = 0,\ \beta_3 = 0$, no systemic bias in Phase I (Phase II) proceedings.

In other words, we test whether there is any significant change in occurrences of errors if final decision was made after Phase II proceeding (compared to decisions in Phase I proceedings).

H5 (Workload): $\alpha_4 = 0,\ \beta_4 = 0$, increased number of cases does not affect occurrence of errors.

Number of cases investigated by the Commission increased exponentially in the last two decades. Hypothesis H5 centers around possible negative impact of increased workload on the frequency of both type of errors.

H6 (Market Definition): $\alpha_5 = 0,\ \beta_5 = 0$, no effect of narrow market definition.

In this case, we test whether narrowly defined markets[78] significantly influence the error occurrence.

H7 (Protectionism): $\alpha_6 = \alpha_7 = 0,\ \beta_6 = \beta_7 = 0$, no discrimination of outsiders.

If we cannot reject H7 that means that there is no significant effect of cross-euro-borders mergers (extra-European mergers) on the frequency of errors made by the Commission, compared to the intra-European mergers.

H8 (2004 Reform): $\alpha_7 = 0,\ \beta_7 = 0$, no effect of the new merger regulation.

Last hypothesis is of main importance - we test whether the 2004 reform has any significant impact on the occurrence of both types of errors.

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[78] In our analysis, we use all cases where the Commission identified relevant geographical market as "national" as a proxy for a narrow market definition.

6.3.4. Descriptive Results

Our sample includes selected EU merger cases completed by the Commission in the period 1990-2008. A list of all cases and the decision dates are provided in Appendix 2. For each case, we identified merging firms and main competitors from the case reports, as well as other relevant information (market definition, foreclosure concerns etc.). The date of the merger announcement was obtained from the financial database Merger Market and checked in the financial press. Because of careful selection[79] of cases suitable for our analysis and difficulties in identifying publicly listed competitors, we end up with 72 Phase II cases, 89 Phase I cases and total number of 348 competitors with complete information.[80]

As described in previous sections, we have computed abnormal return on the day of announcement for each competitor as well as the abnormal change in the value of equity. Average abnormal return in our sample is -0.30% and is statistically significant at 10% significance level (see Appendix 1). When several main competitors are identified in the decision, we computed average change in the value of equity across competitor firms to obtain the aggregate effects on competitors.[81] According to above described definitions, we used competitors' gains to assess the overall expected competitive effects of the merger and to identify the discrepancies in the Commission decisions.

As can be seen from the Figure 10 and Figure 11, number of identified anti-competitive mergers (respectively frequency of errors) does not vary with the length of the event window and the selected method of competitors gains aggregation. We choose five day event window with weighted average competitor gains as a compromise reference scenario for our further analysis.[82]

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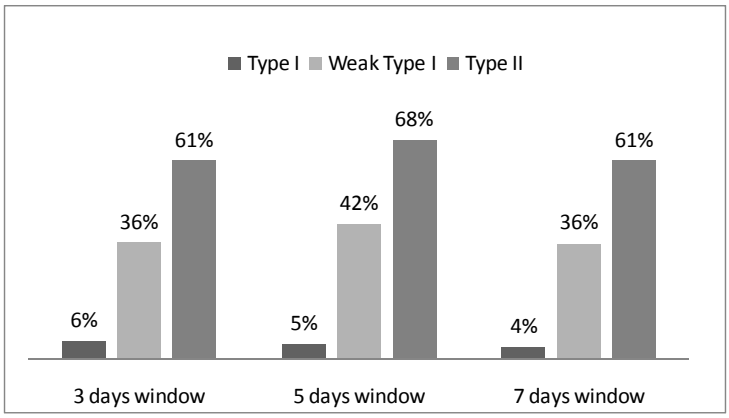
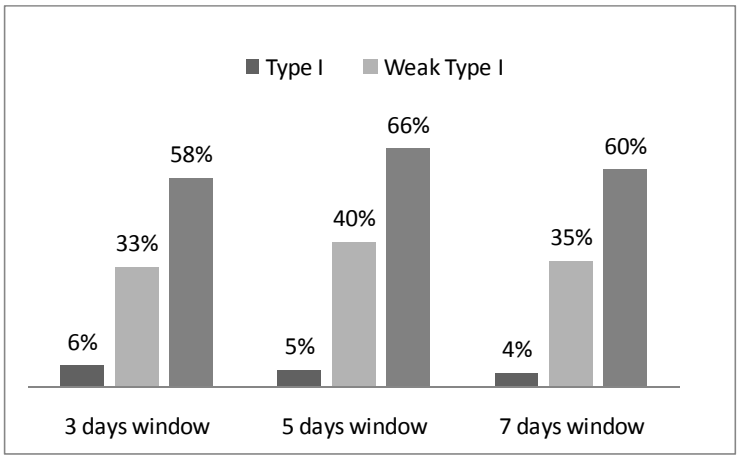
[79] For more details on the selection criteria, see Chapter 6.1.1.
[80] Number of the individual firms is lower as many competitors figure in several merger cases.
[81] We calculated the aggregate gains using both market capitalization as weight, as well as the equal weighting. Gains of individual competitors (its sign respectively) correspond with the aggregate gains in about two thirds of cases.
[82] We choose one reference scenario in order to provide our further results in the more transparent and understandable way. We provide the results for '5-day-equal-weights' case in the APPENDIX 1.

Figure 10: Frequency of Errors – Weighted Average Gains



Source: Author

Figure 11: Frequency of Errors – Equal Weighting of Gains



Source: Author

Table 5 reports the number of cases in our sample according to the decisions taken by the Commission and according to the stock market evaluation of their competitive consequences for our reference scenario. We observe that 52 percent of all cases are classified as pro-competitive. Recalling the welfare analysis in the Figure 9, this implies that the distribution of efficiency gains

across mergers has a median roughly equal to the level of efficiency e''' that assures that consumers will not be hurt by the merger.[83]

Table 5 also distinguishes between different types of decisions depending on the article of the ECMR that was applied. Unconditional clearance are associated with Article 6.1.b decisions in Phase I, as long as they do not involve conditions, and with Article 8.1 decisions in Phase II. Similarly, prohibitions are associated with Article 8.3 decisions (only in Phase II). Cases cleared with remedies imposed on the merging parties are associated with Article 6.1b - decisions with conditions (Phase I) or with Article 8.2 decisions (Phase II). Frequency of type I and II errors might be summarized as follows:

- Given that a merger is pro-competitive, only 4 out of 84 (4.75%) of the cases are blocked and involve strong type I errors. Weak type I errors are observed in 36 out of 84 cases, or some 43%.
- Given that a merger is anti-competitive, 52 out of 77 cases (67.5%) involve type II errors.

Table 5: Decisions and Competitors' Gains

	Phase I		**Phase II**			
	Art 6.1.b (Cleared)	Art 6.1.b (Cleared with remedies)	Art 8.1. (Cleared)	Art 8.2. (Cleared with Remedies)	Art 8.3. (Prohibited)	
Negative Gains (pro-competitive)	37	7	12	24	4	84
Positive Gains (anti-competitive)	42	3	10	18	4	77
	79	10	22	42	8	**161**

Source: Author

[83] Note that this also implies that median merger should create value for the merging parties, which should be contrasted with the usual finding of event studies that majority of mergers fail to generate values for the shareholders of acquirers. For further discussion see Duso, Neven and Roeller (2007).

Note also that our data identify as strong type I errors two of three cases that have later been overturned on appeal of the CFI - namely *Airtours/First Choice* and *Tetra Laval/Sidel* cases. However, other controversial case (*Schneider/Legrand*) was not identified as an error.[84]

Conditioning error occurrence on the particular Commission's decision, our data find that the number of strong type I error as a percentage of the total number of prohibition is 4 of the 8 (50%). Excluding those cases where the Commission raised serious concerns about possible foreclosure of competitors, we get 3 out of 8 (37.5%).[85] Regarding the type II errors, as a percentage of all mergers that were cleared, our data suggest that the Commission made an error in about 51% of the cases. This implies that both types of errors occur with similar probabilities.[86]

[84]Fourth appealed case *General Electric/Honeywell* was not included in our analysis do to the fact that merger resulted in monopoly creation at the market for large commercial jet engines – so called 2-to-1 case. For more details on selection criteria see section 6.1.1..

[85] In cases where serious threat of competitors' foreclosure is identified, negative competitors' gains around date might reflect possible competitor's exit from the market, rather than increased competitiveness due to the proposed merger.

[86] Compared with the findings of Duso, Neven and Roeller (2007), our results differ in several aspects. Their dataset also identified about half of all cases as pro-competitive, but the frequency of errors conditional on merger competitiveness diverge - 4.75% of type I errors, 56% of weak type I errors and 42% of type II errors. Our dataset thus shows higher occurrence of type II errors and lower frequency of weak type I errors. They also find out the similar probabilities of the occurrence of both types of errors, but in their case errors occur roughly one in four mergers that are cleared (or blocked).

6.3.5. Econometric Results

Estimations of equations *(3)* and *(4)* proceeds by splitting our dataset into anti- and precompetitive sub-samples. In particular, we estimate *(3)* as a probit model on the sample of pro-competitive deals ($\Pi_J^{CG} < 0$). We use the weak definition of type I errors for construction of our dependant variable – we set *E1=1* when a pro-competitive merger was blocked or cleared with remedies. Equation *(4)* was estimated on the sample of anti-competitive deals ($\Pi_J^{CG} > 0$) and we set *E2=1* if an anti-competitive deal was cleared without conditions.[87]

The explanatory variables that are available for each merger case are described in Table 4. Summary statistics are provided in Table 11 (Appendix 1). As can be seen from Table 9, we include various types of explanatory variables. CGAINS denotes the expected change in the profit of the competitors as measured through the abnormal return around the merger announcement date.

Geographic aspects of the merger are characterized by several dummy variables. In particular, we include dummy BIG_EU that takes the value 1 if at least one merging party has its main operation in one of the large EU countries and dummy SAME_COUNTRY, which is equal to 1 if both merging companies have the same country of origin. In order to capture possible protectionism of the EU companies, we include dummy called CROSS_EU2, which is equal to 1 if foreign firm is acquiring EU target and dummy EXTRA_EU that takes the value 1 if merger takes place outside the EU.

To characterize narrow market definition we include dummy called NATIONAL, which is equal to 1 if at least one of the relevant product markets was defined as national by the Commission's experts. Variable VERTICAL_EFF controls for those cases where the Commission reports identify possible vertical or conglomerate effects of the proposed merger. In terms of industry specifics, we include

[87] Estimations were carried out using STATA 9.2 software. We controlled for co-linearity and potential outliers. All standard errors are heteroskedasticity robust.

dummy NETWORK that is equal to 1 if the merger concerns telecom, transports, electricity or the financial industry.[88]

To capture procedural issues, we include dummy variable PHASE_II, which is 1 when a decision was taken in the Phase II and a variable TREND that correspond with the official EU merger case number.[89] We also include dummy ECMR_2004, which s equal to 1 if the merger was evaluated according to new horizontal merger guidelines (i.e. in the period after May, 2004).[90]

Last but not least, we include NO_MAIN_COMPETITOR to identify those cases, where the Commission identified several product markets that will be influenced by the proposed merger and where merging entity will face competition from different firms. In other words, we were not able to identify a 'main competitor', company active at all relevant markets, whose change in equity could be used as a proxy for an average impact of the merger across all relevant markets.

6.3.5.1. Weak Type I Errors

The results are presented in Table 7 and Table 8 (Appendix 1). Let us first concentrate on weak type I estimation results. As we can see from the Table 7, the Chi-squared statistics is 53.26, indicating that $\alpha's \neq 0$ with over 99% probability. This implies that the Commission decisions are not consistent with benevolent agency procedures (making only random errors). We therefore reject *H1*.

Regarding the influence of competitors, we see that variable PCGAIN is strongly insignificant. Thus, we cannot reject the hypothesis *H2* that competitors have no influence over the Commission decisions, as far as pro-competitive mergers are concerned.

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[88] We experimented with dummies for industry specification at various industry classification levels. Given the small number of observations in our sample and wide range of sectors involved, we did not find any statistically significant effects. We thus decide to follow approach of Bergman, Jakobsson and Razo (2003) and control only for potential effect of network industries.

[89] Case numbers in our sample range from 12 up to 5123. Including only the simple linear time trend variable might not properly capture the exponentially increasing number of cases evaluated by the Commission.

[90] We also experimented with potential effects of the Green Paper from 2001 that outlined future regulatory reform. We did not find any significant effect.

With respect to preferential conditions for the large EU countries, we found effect significant at the 5% level of significance. We thus can reject the *H3*. In terms of extent of the BIG_EU variable, Table 8 presents marginal effects. According to our estimates, the large EU countries have about 20% lower chance of getting a pro-competitive deal curtailed by the Commission.

Regarding the procedural issues, we see that variable PHASE_II is highly significant (at 1% significance level) implying that weak type I errors are more likely in Phase II. Therefore *H4* can be rejected. As can be seen from the Table 8, marginal effect of PHASE_II variable is estimated at 0.50 – probability of a weak type I error is about 50% higher in Phase II. Steadily increasing number of cases that are appraised by the Commission every year does not seem to have any significant effect on occurrence of weak type I errors. We therefore cannot reject *H5*. [91]

The effect of the NATIONAL variable is not statistically significant at 10% level. Thus we cannot reject *H6*. In other words, too narrow market definition does not lead to unnecessary burden imposed on pro-competitive deals by the Commission.[92]

Our estimates suggest that there is no evidence of protectionist behavior of the EU antitrust agency (*H7*). While variable EXTRA_EU is statistically insignificant, the effect of the CROSS_EU is significant at the 5% level. Considering the marginal effect of -0.23, we see that probability of unnecessary remedies (or a prohibition) is about 23% lower in case that acquirer comes from outside the EU. One possible explanation is that these kinds of mergers usually get under the scope of several antitrust agencies. Therefore, existence of another independent assessment of the proposed transaction might generate a disciplinary effect on the EU regulator.

[91] As we can see from Table 8, P-values in probit estimation might differ from those in 'marginal effects' estimation. This is rather technical issue, exact P-values depending heavily on the exact algorithm (prediction function) used by STATA for computation of marginal effects. For testing of above stated hypothesis, we rely on P-values estimated in probit regressions.

[92] Note again that we assumed that remedies increase consumer welfare even further. Therefore, from the definition of weak type I errors, imposing conditions and obligations at the particular product markets only increases overall positive effect of the pro-competitive mergers.

With respect to the effects of the EU regulatory reform, we see that variable ECMR_2004 is not significant at the 10% level. We thus cannot reject *H8* that the reform has no sizeable effect on the occurrence of weak type I errors at this level of significance.

With respect to other controlling variables, we did not find any effect of network industries, neither had existence of vertical effects of the merger showed any significant impact. Variable SAME_COUNTRY is insignificant too. The only significant controlling variable is NO_MAIN_COMPETITOR - probability of weak type I errors is about 17% higher for the cases where several product market were identified, but none of relevant competitors was present at all of the markets.[93]

We also control for potential bias that might be associated with presence of foreclosure effects. As already mentioned in previous sections, negative competitor gains might be induced by expected foreclosure of the competitors, rather than with increased competition at the relevant markets that will benefit consumers – those mergers would thus be wrongly classified as pro-competitive. Therefore, exclude those cases from our sample where Commission raised concerns about foreclosure effects of the merger and re-estimate the equation *(3)* on this restricted sample. As we can see from the TABLE, parameter estimates do not change considerably. We observe significant change in two parameters only.

Firstly, variable NATIONAL becomes significant at the 10% level. If the Commission identify at least one of the concerned markets as national, the probability of weak type I error increases by approximately 13%. Secondly, vertical effects of the proposed transaction seem to play a significant role. Probability that unnecessary remedies will be imposed on the pro-competitive deal decreases by 17% in the presence of vertical effects generated by the proposed horizontal merger. Interpretation of this is rather ambiguous. One possible explanation is that our restricted sample

[93] Interpretation of this result is rather unambiguous. One possible explanation is to connect those errors with too narrow product market definition. However, there is also potential measurement error resulting from the inability to capture overall competitive effect of the merger. Note that we aggregated the gains of the main competitors from all identified markets. In about 55% of cases the stock reaction of individual competitors had the same sign as the aggregate competitors gain.

does not cover any mergers where vertical (conglomerate) effects could potentially lead to foreclosure of competitors. Vertical mergers that do not lead to marginalization of competitors are usually considered beneficial for consumers. The incentive of the Commission to impose remedies might therefore be lower for those merger cases, where positive vertical effects are observed.[94]

6.3.5.2. Type II Errors

Turning to the analysis of type II errors, we again find evidence that the decisions by the Commission are not consistent with those that would have been taken by a benevolent agency making random errors (the Chi-squared statistic is 34.12) – we reject the hypothesis *H1* with over 99% probability. Regarding the influence of competitors, we reject hypothesis *H2* at the 1% level.

Interestingly, PCGAIN variable coefficient has a negative sign. In other words, the more positive increase in competitors' equity value around the announcement date, the less probable is that anti-competitive merger will be cleared. However, as we can see from Table 8, the marginal effect of PCGAIN is neglectable, even with respect to magnitude of the PCGAIN variable. For illustration, increase in the equity value of about USD 240 million (which is a median gain in our anti-competitive sample) would result in approximately 5% lower probability of type II error.[95] We thus consider competitors influence as of a minor importance.

Variable BIG_EU is not significant at the 10% level and we cannot reject hypothesis *H3*. Our results suggest that large EU countries cannot extract their political power in order to get the Commission to clear anti-competitive deals that include their 'national champions'.

Regarding the procedural issues, we see that variable PHASE_II is highly significant and large in magnitude (at 1% significance level) implying that we can reject hypothesis *H4*. Marginal effects show moreover that probability of waving an anti-competitive merger through is some 48% larger in

[95] Note that the "marginal" effects provided in table represent average change in probability resulting from the unit of measurement change in the relevant explanatory variable.

Phase I. This observation is further supported by the significance of the TREND variable representing the increased workload coupled with a relatively higher proportion of cases necessarily being cleared decided in Phase I proceedings. Probability that anti-competitive merger will be cleared increases slightly (on average 2% p.a.) in the last decade.[96] We therefore reject hypothesis *H5*.

Significance of the NATIONAL variable is at about a 10% level - we reject hypothesis *H6*. In other words, the narrow market definition increases chance that anti-competitive effects of the proposed merger will be recognized. If the Commission identifies at least one of the concerned markets as national, the probability of anticompetitive merger being cleared decreases by 13%. Note that, according to our data, the positive effect of national market definition (lower frequency of type II errors) is about the equal magnitude as the negative effect arising from unduly narrow geographic market definition (higher occurrence of weak type I errors in 'foreclosure corrected sample'). However, given the significantly higher number of mergers cleared by the Commission and potential effects of anti-competitive mergers, higher frequency of weak type I errors might be seen as a reasonable price to pay for higher probability of identification of anti-competitive merger effects.

As in case of weak type I errors, our estimates suggest that there is no clear evidence of protectionist behavior of the EU antitrust agency (*H7*). While variable EXTRA_EU is statistically insignificant, the effect of the CROSS_EU is significant at the 5% level. Negative marginal effect implies that anti-competitive mergers involving EU firms (both target and acquirer) have about 21% higher probability of being cleared. Again, this might be explained by more careful examination of cross-euro-border cases by the Commission, rather than systematic discrimination of foreign acquirers.

Frequency of type II errors decreases by 22% as a result of the merger regulation reform and we can reject hypothesis *H8* at the 10% significance level. Prolonged periods of both investigation phases and more efficient merger assessment under the new ECMR shows significant effect by the

[96] Average number of cases evaluated yearly is about 314 in the period 1998-2008. Using a crude estimate of the 'average' marginal effect, we can simply multiply average number of cases by the estimated marginal effect to get the change in probability of type II error occurrence.

identification of anti-competitive mergers. Regarding the control variables, none of them proved significant.

6.3.5.1. Summary of Econometric Results

Summary of our econometric results is following:

- We reject the hypothesis that the Commission act as benevolent agency (making only random errors) with respect to both pro- and anti-competitive samples.
- We did not find an evidence for significant influence of competitors on the Commission decision making.
- Our results suggest that mergers involving firms from the large EU countries have significantly lower probability to bear unnecessary remedies imposed by the Commission. However, we did not find any evidence that the Commission is willing to clear anti-competitive deals involving firms from the large Member states.
- Procedural issues matter. Probability that anti-competitive merger will be cleared in the Phase I proceeding is significantly higher. On the other hand, mergers decided in the Phase II are more likely to bear unnecessary remedies. Bigger workload in the recent years increases probability of type II errors significantly.
- Often criticized tendency of the Commission to define relevant markets too narrowly, significantly increases probability that anti-competitive merger will be identified. However, we cannot fully reject the hypothesis that narrow definition of markets generates unnecessary remedies to pro-competitive mergers.
- We did not find any evidence for protectionist behavior of the Commission. Our results suggest only that mergers involving foreign acquirer are examined under closer scrutiny – probability of both types of errors is thus lower.
- Reform of 2004 seems to have positive impact. We found statistically significant effect with respect to occurrence of type II errors. For mergers appraised under the new merger

regulation, the probability of anti-competitive deal being cleared decreases by approximately 20 percent.[97]

Table 6: Hypothesis Test Results

Hypothesis	Description of H0	Result	Details		Conclusion
			Pro-competitive mergers	*Anti-competitive mergers*	
H1 (Benevolence)	The Commission act as a benevolent agency, protecting solely interest of consumers and making only random errors.	**REJECT**	Commission decisions are not consistent with benevolent agency.	Commission decisions are not consistent with benevolent agency.	Commission's decisions are not purely explained by the motive of protecting consumer welfare.
H2 (Influence)	Competitors do not have an influence on the Commission decisions.	**CANNOT REJECT**	NO SIGNIFICANT EFFECT	NO SIGNIFICANT EFFECT**	We reject the claim that the Commission listens too much to competitors at the expense of consumer interest.
H3 (Preference)	Firms from large EU countries do not receive 'special treatment' from the Commission.	**REJECT**	Large EU countries have about **20% lower chance** of getting a pro-competitive deal curtailed by the Commission.	NO SIGNIFICANT EFFECT	Large EU countries can protect their firms from bearing unnecessary remedies. No evidence that the Commission is willing to clear anti-competitive deals involving firms from the large Member States.
H4 (Inadequacy)	Type of proceeding does not influence the frequency of errors.	**REJECT**	Probability of an unnecessary remedies is about **50% higher** in Phase II proceedings.	Probability of waving an anti-competitive merger through is some **48% larger** in Phase I.	Phase I proceedings are too short and unadequate - anti-competitive mergers being cleared more often. Phase II proceedings usually result in unnecessary remedies.
H5 (Workload)	Increased workload in recent years does not affect occurrence of errors.	**REJECT**	NO SIGNIFICANT EFFECT	Probability that anti-competitive merger will be cleared **increases slightly (on average 2% p.a.**) in the last decade.	Increased workload means more mergers evaluated in Phase I proceedings - thus increasing the frequency of cleared anti-competitive mergers.
H6 (Market Definition)	Narrow market definition does not lead to higher/lower number of error decisions.	**REJECT**	If the Commission identifies at least one of the concerned markets as national, the probability of weak type I error **increases by approximately 13%**.*	The probability of anticompetitive merger being cleared **decreases by 13%.**	Narrow market definition induces higher occurrence of both type of errors by approximately equal magnitude - unnecessary remedies as a reasonable price to pay for higher probability of identification of anti-competitive merger effects?+F1
H7 (Protectionism)	No 'special treatment' for mergers involving foreign firms.	**REJECT**	Probability of unnecessary remedies (or a prohibition) is about **23% lower** in case that acquirer comes from outside the EU.	Anti-competitive mergers involving foreign acquirer have about **21% lower probability** of being cleared, compared to Intra-European mergers.	More careful examination of cross-euro-border cases by the Commission, rather than systematic discrimination of foreign acquirers.
H8 (2004 Reform)	Reform process did not affect the efficiency of decision making.	**REJECT**	NO SIGNIFICANT EFFECT	Frequency of type II errors **decreases by 22%** as a result of the merger regulation reform	Prolonged Phase I proceedings, increased transparency and more efficient analytical evaluation result in lower occurrence of unidentified anti-competitive mergers.

**effect of the narrow market is significant for restricted subsample 'foreclosure effect' corrected sample*
***effect of competitors is statistically significant, but coefficient has a negative sign and only neglectable magnitude. Protection-of-competitors motive can thus be rejected.*

[97] We should interpret those results with caution. As we can see in Appendix 1, the significance of some parameters changes with different method of competitor gain computation. However, magnitude and sign of coefficients are does not vary – assuring that our interpretation of results is not seriously flawed.

Source: Author

Summary and Conclusion

European merger regulation is a relatively new institution, established in 1990 to promote efficient competition at the Common Market. Since then, merger regulation has undergone significant transformation process that culminated in the 2004 with the introduction of new guidelines for the assessment of horizontal mergers. New legislation should have been able to provide more transparent, efficient and economic oriented framework for the merger appraisal in the European Union.

The first goal of this thesis was to present detailed analysis of the current regulatory practice related to assessment of horizontal mergers in the EU. We provided an overview of the merger control activity in the last two decades and discuss the key points of the 2004 regulatory reform. We concentrated on the changes in the assessment of horizontal mergers and provide a comprehensive analysis of the new merger guidelines.

In order to assess the real impacts of the reformatory process, we analyzed evolution of commission's final decisions since 1990. Applying the principles of simple bargaining theory, we found that the EU merger regulation has substantially increased its efficiency in the last decade, but with a little continuing improvement after the 2004 reform.

Second part of the thesis was devoted to our own analysis of the EU merger control. Firstly, we provided theoretical background for our analysis. Using standard industrial organization models we derived unique correspondence between consumer welfare and the gains of competitors that arise from horizontal mergers. We also provided a comprehensive overview of the event study methodology and we discussed key advantages and disadvantages of the application of this approach in our analysis.

We worked with the unique representative sample of 161 merger cases evaluated by the Commission in the period from 1990 to 2008. Note that none of the previous studies analyzing EU merger control worked with merger cases evaluated after 2002. Thus, our sample offers unique opportunity for assessment of the recent regulatory reform. We collected information about 348 relevant competitors and used stock market data to identify mergers that stock market anticipated as anti-competitive. From this we identified instances where the Commission had prohibited mergers that the stock market regarded as pro-competitive as well as the instances where the

Commission had failed to prevent anti-competitive mergers. Using probit model, we further investigated the sources of these decision errors with particular focus on the potential influences that can be brought to bear on the decision making process.

In line with previous studies, our results suggest that the commission's decisions are not purely explained by the motive of protecting consumer welfare. We also reject the claim that the Commission listens too much to competitors at the expense of consumer interest. Instead, the evidence suggests that other political and institutional factors do play a role.

In particular, mergers involving firms from the large EU countries have significantly lower probability to bear unnecessary remedies imposed by the Commission. However, we did not find any evidence that the Commission is willing to clear anti-competitive deals involving firms from the large Member States. We neither find any evidence for protectionist behavior of the Commission. Our results suggest only that mergers involving foreign acquirer are examined under closer scrutiny.

Procedural issues still play a significant role. Probability that anti-competitive merger will be cleared is significantly higher if the final decision is made in the Phase I proceeding. This is further accompanied with significant effect of the increasing workload on the occurrence of these types of errors. On the other hand, Phase II proceedings often result in imposing of unnecessary remedies on pro-competitive mergers. However, given the significantly larger proportion of transactions decided in Phase I, unnecessary remedies can be considered as a reasonable price to pay for higher probability of identification of anti-competitive mergers.

Last but not least, our data suggest positive effect of the 2004 reform. We found that for mergers appraised under the new regulation, the probability of anti-competitive deal being cleared decreases significantly. We conclude that prolonged Phase I proceedings, increased transparency and more efficient analytical evaluation under new guidelines result in lower occurrence of unidentified anti-competitive mergers.

However, our results do not suggest that the occurrence of unnecessary remedies have significantly decreased as the result of the new merger control. One possible explanation is that firms still believe it to be difficult to defend claimed efficiencies in front of the Commission. Therefore, firms

might prefer to offer remedies in Phase I rather than risk a costly Phase II investigation in the hope of a successful efficiency defense.

Nevertheless, we recognize a need for a further research in this area, with more data that would confirm robustness of our results and fully capture the real effects of the recent regulatory reform of the EU merger control.

Appendix 1: Results and Statistics

Table 7: Probit Results - Reference Case*

Dependent Variable	WTYPE I Errors		WTYPE I Errors Foreclosure Correction		TYPE II Errors	
	Coef.	P-Values	Coef.	P-Values	Coef.	P-Values
PCgains	-1.74E-07	0.2310	-2.59E-07	0.2550	-1.63E-06	0.0000
Big_EU	-0.9480	0.0470	-1.0807	0.0350	-0.8586	0.1280
Phase_II	2.0985	0.0000	2.0629	0.0000	-2.7779	0.0000
Trend	0.0002	0.3120	0.0001	0.7560	0.0005	0.0880
National	0.5671	0.1240	0.6832	0.0970	-1.1176	0.0530
Cross_EU2	-1.1965	0.0340	-1.1272	0.0500	-1.6912	0.0120
Extra_EU	-0.2228	0.7710	-0.1091	0.8900	0.3541	0.6850
ECMR_2004	-1.0484	0.1370	-0.4232	0.5690	-1.7101	0.0930
Network	0.1995	0.7350	0.3486	0.5690	0.1978	0.7280
Same_Country	-0.1772	0.6760	-0.4050	0.3680	-0.7581	0.1590
Vertical_Eff	-0.7326	0.1240	-0.9050	0.0650	0.5698	0.2800
No_Main_Comp	0.8185	0.0160	0.8707	0.0100	0.0047	0.9940
_cons	-0.9263	0.1090	-0.7546	0.1910	3.6229	0.0000
Observations	84		78		77	
Log Likelihood	-30.738206		-28.687419		-16.832526	
Chi-Squared	53.26		44.85		34.12	
Significance level	0.0000		0.0000		0.0006	
Pseudo R2	0.4612		0.4527		0.6532	
Correct Predictions	0.8095		0.7949		0.8961	

The estimation of Weak Type I errors is on the sub-sample of pro-competitive mergers, while the estimation of Type II errors is on the sub-sample of anti-competitive mergers. The dependent variables are type1 and type2. The PCGain variable is corrected for p, the predicted probability of the case being cleared obtained from a probit estimation on the full sample, where dependent variable is Clear and the exogenous variables are a constant, Big_EU, Phase_II, Trend, National, Cross_EU2, Extra_EU, ECMR_2004, Network, Same_Country and Vertical_Eff.

Source: Computed from eq. (3) and (4)

Table 8: Marginal Effects – Reference Case*

Dependent Variable	WTYPE I Errors		WTYPE I Errors Foreclosure Correction		TYPE II Errors	
	Coef.	P-Values	Coef.	P-Values	Coef.	P-Values
PCgains	-3.48E-08	0.2280	-5.22E-08	0.2440	-1.95E-07	0.0000
Big_EU	-0.1976	0.0240	-0.2262	0.0120	-0.0981	0.1580
Phase_II	0.4977	0.0000	0.4747	0.0000	-0.4705	0.0000
Trend	0.0000	0.3000	0.0000	0.7550	0.0001	0.0600
National	0.1107	0.1470	0.1299	0.1320	-0.1354	0.0630
Cross_EU2	-0.2250	0.0050	-0.2104	0.0070	-0.2100	0.0090
Extra_EU	-0.0437	0.7650	-0.0217	0.8880	0.0411	0.6740
ECMR_2004	-0.2054	0.0850	-0.0845	0.5430	-0.2092	0.1090
Network	0.0407	0.7380	0.0730	0.5820	0.0233	0.7260
Same_Country	-0.0349	0.6710	-0.0784	0.3400	-0.0974	0.1820
Vertical_Eff	-0.1420	0.1030	-0.1720	0.0360	0.0736	0.2220
No_Main_Comp	0.1694	0.0270	0.1821	0.0200	0.0006	0.9940

Coefficients represent average effects of partial derivative of E[y]=F[βX]. For the binominal (dummy) variables, coefficients represent the effect of discrete change of dummy variable from 0 to 1.

Source: Computed from eq. (3) and (4)

**Reference case: abnormal change in equity of competitors (variable PCgains) for each merger is computed as a weighted average of abnormal equity change of each competitor on a 5-day event window, with market capitalization as a weight*

Table 9: Probit Results - Control Case*

Dependent Variable	WTYPE I Errors		WTYPE I Errors Foreclosure Correction		TYPE II Errors	
	Coef.	P-Values	Coef.	P-Values	Coef.	P-Values
PCgains	0.0000	0.2080	0.0000	0.1770	0.0000	0.0000
Big_EU	-0.7469	0.1170	-0.8729	0.0870	-0.8977	0.0810
Phase_II	2.2242	0.0000	2.1723	0.0000	-3.3401	0.0000
Trend	0.0002	0.3710	0.0000	0.9560	0.0003	0.3030
National	0.4966	0.1990	0.6239	0.1490	-1.7659	0.0250
Cross_EU2	-1.1567	0.0340	-1.0422	0.0580	-2.7135	0.0080
Extra_EU	0.0821	0.9210	0.2470	0.7760	1.7505	0.1050
ECMR_2004	-1.2279	0.0810	-0.4924	0.5060	-1.6620	0.1610
Network	0.1951	0.7180	0.3471	0.5210	0.5396	0.5230
Same_Country	-0.3913	0.3500	-0.6612	0.1600	-2.2139	0.0050
Vertical_Eff	-0.5361	0.2830	-0.7514	0.1480	1.6278	0.0210
No_Main_Comp	1.1078	0.0010	1.1384	0.0010	0.9647	0.2950
_cons	-1.2344	0.0310	-1.0540	0.0690	4.4967	0.0000
Observations	87		80		74	
Log Likelihood	-29.677522		-27.548662		-14.940987	
Chi-Squared	42.57		38.32		59.18	
Significance level	0.0000		0.0001		0.0000	
Pseudo R2	0.4938		0.4795		0.6843	
Correct Predictions	0.8276		0.8375		0.9189	

The estimation of Weak Type I errors is on the sub-sample of pro-competitive mergers, while the estimation of Type II errors is on the sub-sample of anti-competitive mergers. The dependent variables are type1 and type2. The PCGain variable is corrected for p, the predicted probability of the case being cleared obtained from a probit estimation on the full sample, where dependent variable is Clear and the exogenous variables are a constant, Big_EU, Phase_II, Trend, National, Cross_EU2, Extra_EU, ECMR_2004, Network, Same_Country and Vertical_Eff.

Source: Computed from eq. (3) and (4)

Table 10: Marginal Effects – Control Case*

Dependent Variable	WTYPE I Errors		WTYPE I Errors Foreclosure Correction		TYPE II Errors	
	Coef.	P-Values	Coef.	P-Values	Coef.	P-Values
PCgains	0.0000	0.2020	0.0000	0.1590	0.0000	0.0000
Big_EU	-0.1477	0.0830	-0.1751	0.0440	-0.0881	0.1760
Phase_II	0.5052	0.0000	0.4814	0.0000	-0.5284	0.0000
Trend	0.0000	0.3610	0.0000	0.9560	0.0000	0.3130
National	0.0934	0.2210	0.1149	0.1870	-0.1925	0.0360
Cross_EU2	-0.2101	0.0050	-0.1867	0.0120	-0.3043	0.0000
Extra_EU	0.0159	0.9220	0.0491	0.7840	0.1527	0.0360
ECMR_2004	-0.2198	0.0330	-0.0916	0.4680	-0.1842	0.2420
Network	0.0382	0.7230	0.0694	0.5400	0.0555	0.4780
Same_Country	-0.0725	0.3320	-0.1168	0.1140	-0.2838	0.0060
Vertical_Eff	-0.1003	0.2570	-0.1366	0.0930	0.1793	0.0010
No_Main_Comp	0.2215	0.0030	0.2303	0.0030	0.0878	0.2280

Coefficients represent average effects of partial derivative of E[y]=F[θX]. For the binominal (dummy) variables, coefficients represent the effect of discrete change of dummy variable from 0 to 1.

Source: Computed from eq. (3) and (4)

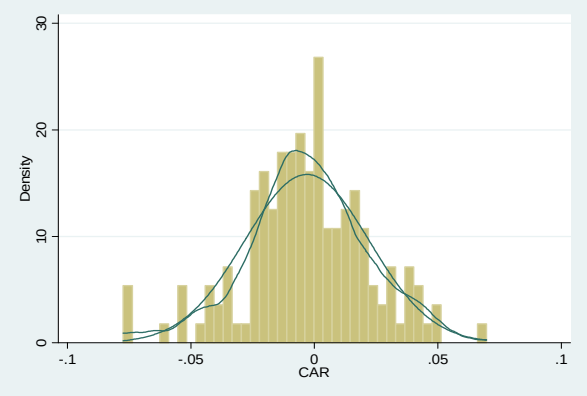
**Control case: abnormal change in equity of competitors (variable PCgains) for each merger is computed as an arithmetic average of abnormal equity change of each competitor on a 5-day event window.*

Table 11: Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Clear	161	0.6273	0.4850	0	1
Prohibition	161	0.0497	0.2180	0	1
Remedies	161	0.3230	0.4691	0	1
Phase_I	161	0.5528	0.4988	0	1
Phase_II	161	0.4472	0.4988	0	1
Anticompetitive	161	0.4783	0.5011	0	1
Foreclosure	161	0.0621	0.2421	0	1
Type_I	84	0.0476	0.2142	0	1
W_Type_I	84	0.4167	0.4960	0	1
Type_II	77	0.6753	0.4713	0	1
Cgains	161	63302	1704696	-8105858	11500000
Trend	161	2275	1489	12	5123
Big_EU	161	0.7019	0.4589	0	1
Same_Country	161	0.2609	0.4405	0	1
National	161	0.3665	0.4833	0	1
ECMR_2004	161	0.2857	0.4532	0	1
Network	161	0.1429	0.3510	0	1
Intra_EU	161	0.6087	0.4896	0	1
Extra_EU	161	0.1180	0.3236	0	1
Cross_EU2	161	0.1863	0.3906	0	1
Vertical_Eff	161	0.3230	0.4691	0	1
No_Main_Comp	161	0.2360	0.4260	0	1

Source: Author's own computations

Figure 12: Distribution of Cumulative Abnormal Returns



Source: Author's own computations

Table 12: Significance of Cumulative Abnormal Returns

One-sample t-test

Variable	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
CAR	-0.003016	0.0020465	0.0252309	-0.00706	0.0010271

mean = mean(CAR)		t-statistic
Ho: mean = 0		t = -1.4739
Ha: mean < 0	Ha: mean != 0	Ha: mean > 0
Pr(T < t) = 0.0713	Pr(|T| >| t|) = 0.1426	Pr(T > t) = 0.9287

Source: Author's own computations

Appendix 2: Sample of EU Merger Cases 1990-2008

Notificaton Date	Case Number	Acquirer	Target	Merger Type	Phase	Decision Type
2/25/1991	12	Varta	Bosch	Intra-European	2	Art. 8(2) (conditions&obligations)
11/26/1990	24	Mitsubishi Corp.	Union Carbide Corp.	Extra-European	1	Art. 6(1)(b)
12/10/1990	42	Alcatel	Fiat	Intra-European	2	Art. 8(2) (conditions&obligations)
12/7/1990	50	At&T	Ncr Corporation	Extra-European	1	Art. 6(1)(b)
1/22/1991	57	Digital Equipment Int.	Mannesmann	Cross-Euro-Border	1	Art. 6(1)(b)
11/14/1991	126	Accor	Wagons-Lits	Intra-European	2	Art. 8(2) (conditions&obligations)
7/31/1991	129	Digital Equipment Corp.	Philips Electronics	Cross-Euro-Border	1	Art. 6(1)(b)
11/5/1991	165	Alcatel Cable SA	Aeg Kabel	Intra-European	1	Art. 6(1)(b)
2/25/1992	190	Nestle'	Eaux Vittel	Intra-European	2	Art. 8(2) (conditions&obligations)
4/30/1992	214	Du Pont	Imperial Chemical Ind.	Cross-Euro-Border	2	Art. 8(2) (conditions&obligations)
6/5/1992	236	Ericsson	Ascom	Intra-European	1	Art. 6(1)(b)
7/15/1992	253	Btr	Pirelli	Intra-European	1	Art. 6(1)(b)
1/4/1994	269	Shell	Montedison	Intra-European	2	Art. 8(2) (conditions&obligations)
8/18/1993	315	Mannesmann	Vallourec/Dalmine	Intra-European	2	Art. 8(2)
3/1/1993	331	Fletcher Challenge	Methanex	Extra-European	1	Art. 6(1)(b)
8/31/1993	354	Cyanamid	Shell	Cross-Euro-Border	1	Art. 6(1)(b)
7/30/1993	358	Pilkington	Societa' Italiana Vetro	Intra-European	2	Art. 8(2)
7/20/1994	437	Matra Marconi Space	British Aerospace	Intra-European	1	Art. 6(1)(b)
6/30/1994	447	Schneider Electric SA	AEG AG	Intra-European	1	Art. 6(1)(b)
5/17/1994	458	Electrolux	AEG AG	Intra-European	1	Art. 6(1)(b)
9/13/1994	468	Siemens	Italtel	Intra-European	2	Art. 8(2)
9/13/1994	477	Daimler Benz	Kässbohrer	Intra-European	2	Art. 8(2)
9/20/1994	484	Thyssen Stahl	Acciai Speciali Terni SpA	Intra-European	2	Art. 8(2)
8/9/1994	498	Commercial Union	Suez	Intra-European	1	Art. 6(1)(b)
9/29/1994	508	CCF	BHF	Intra-European	1	Art. 6(1)(b)
11/17/1995	619	Gencor	Lonmin (Lonrho PLC)	Cross-Euro-Border	2	Art. 8(3)

8/8/1995	623	Kimberly-Clark	Scott Paper	Extra-European	2	Art. 8(2) (conditions&obligations)
8/18/1995	632	Rhône Poulenc Rorer	Fisons Plc	Intra-European	1	Art. 6(1)(b)
1/5/1996	685	Siemens	Lagardere	Intra-European	1	Art. 6(1)(b)
7/31/1996	706	Alcatel	Daimler	Cross-Euro-Border	1	Art. 6(1)(b)
3/11/1996	731	Kvaerner A.S.	Trafalgar House Plc	Intra-European	1	Art. 6(1)(b)
11/14/1996	754	Anglo American Corp.	Lonmin	Cross-Euro-Border	2	Art. 8(2) (conditions&obligations)
7/1/1996	774	Saint Gobain	Hoechst Wacker	Intra-European	2	Art. 8(3)
10/28/1996	818	Cardo	Thyssen	Intra-European	1	Art. 6(1)(b)
1/3/1997	850	Fortis	Abn-Amro Bank	Intra-European	1	Art. 6(1)(b)
12/18/1996	856	British Telecom	MCI	Cross-Euro-Border	2	Art. 8(2) (conditions&obligations)
6/24/1997	913	Siemens	Elektrowatt	Intra-European	2	Art. 8(2) (conditions&obligations)
7/31/1997	942	Veba	Degussa	Intra-European	2	Art. 8(2) (conditions&obligations)
9/1/1997	950	Roche	Boehringer Mannheim	Intra-European	2	Art. 8(2) (conditions&obligations)
7/31/1997	954	Bain Capital Inc.	Hoechst AG	Cross-Euro-Border	1	Art. 6(1)(b)
8/21/1997	967	Klm	Air UK	Intra-European	1	Art. 6(1)(b)
9/1/1997	984	DuPont De Nemours	Imperial Chemical	Cross-Euro-Border	1	Art. 6(1)(b)
9/8/1997	986	Bayer Group	DuPont De Nemours	Cross-Euro-Border	2	Art. 8(2) (conditions&obligations)
12/1/1997	1042	Eastman Kodak	Dainippon Ink	Extra-European	1	Art. 6(1)(b)
2/3/1998	1069	Worldcom	MCI	Extra-European	2	Art. 8(2) (conditions&obligations)
1/20/1998	1094	Caterpillar	Lucas Varity	Cross-Euro-Border	1	Art. 6(1)(b)
3/27/1998	1142	Commercial Union Plc	General Accident Plc	Intra-European	1	Art. 6(1)(b)
6/18/1998	1225	Enso Oyj	Stora	Intra-European	2	Art. 8(2)
6/23/1998	1232	Ingram	Tech Data Corporation	Cross-Euro-Border	1	Art. 6(1)(b)
7/27/1998	1258	General Electric Company	Finmeccanica	Cross-Euro-Border	1	Art. 6(1)(b)
7/23/1998	1265	Chs Electronics Inc.	Metro AG	Cross-Euro-Border	1	Art. 6(1)(b)
1/4/1999	1363	DuPont De Nemours	Hoechst AG	Cross-Euro-Border	1	Art. 6(1)(b)
1/14/1999	1405	Tnt Post Group N.V.	Jet Services SA	Intra-European	1	Art. 6(1)(b)

3/2/1999	1452	Ford Motor Company	Volvo Car Corporation	Cross-Euro-Border	1	Art. 6(1)(b)
3/1/1999	1466	Eaton Corporation	Aeroquip Vickers	Extra-European	1	Art. 6(1)(b)
2/25/1999	1476	Adecco SA	Delphi	Intra-European	1	Art. 6(1)(b)
4/27/1999	1484	ALSTOM	ABB	Intra-European	1	Art. 6(1)(b)
4/29/1999	1524	Airtours	First Choice	Intra-European	2	Art. 8(3)
5/4/1999	1532	Bp Amoco Plc.	Atlantic Richfield	Cross-Euro-Border	2	Art. 8(2) (conditions&obligations)
6/2/1999	1539	CVC European Equity II	Groupe DANONE SA	Intra-European	1	Art. 6(1)(b)
6/9/1999	1551	AT&T Corp.	MediaOne Group	Extra-European	1	Art. 6(2) (conditions&obligations)
5/11/1999	1561	Getronics N.V.	Wang Laboratories	Cross-Euro-Border	1	Art. 6(1)(b)
9/15/1999	1571	NEW HOLLAND N.V.	CASE Corporation	Cross-Euro-Border	1	Art. 6(2) (conditions&obligations)
7/15/1999	1601	AlliedSignal	Honeywell	Extra-European	2	Art. 8(2) (conditions&obligations)
8/24/1999	1628	Total Fina	Elf Aquitaine	Intra-European	2	Art. 8(2) (conditions&obligations)
8/16/1999	1630	L'Air Liquide SA	The BOC Group plc.	Intra-European	2	Art. 8(2) (conditions&obligations)
10/29/1999	1636	Matra Marconi Space	DASA	Intra-European	2	Art. 8(2) (conditions&obligations)
9/1/1999	1641	Linde AG	AGA AB	Intra-European	2	Art. 8(2) (conditions&obligations)
10/6/1999	1663	Alcan Aluminium Ltd.	Alusuisse	Cross-Euro-Border	2	Art. 8(2) (conditions&obligations)
11/22/1999	1671	Dow Chemical	Union Carbide	Extra-European	2	Art. 8(2) (conditions&obligations)
9/22/1999	1672	AB Volvo	Scania AB	Intra-European	2	Art. 8(3)
1/11/2000	1741	MCI WorldCom	Sprint	Extra-European	2	Art. 8(3)
1/3/2000	1797	Bae Systems+ Investor	Celsius AB	Intra-European	1	Art. 6(1)(b)
2/18/2000	1806	Novartis AG	AstraZeneca Plc.	Intra-European	2	Art. 8(2) (conditions&obligations)
3/10/2000	1871	Arrow Electronics Inc.	Tekelec Europe SA	Cross-Euro-Border	1	Art. 6(1)(b)
3/14/2000	1882	Pirelli Cavi e Sistemi	BICC General	Intra-European	2	Art. 8(2)
8/16/2000	1990	Unilever PLC	Bestfood	Cross-Euro-Border	1	Art. 6(2) (conditions&obligations)
6/22/2000	2020	Metsä-Serla Corporation	Modo	Intra-European	1	Art. 6(2) (conditions&obligations)
8/7/2000	2033	Svedala Industri AB	Metso Corporation	Intra-European	2	Art. 8(2) (conditions&obligations)
7/13/2000	2059	Siemens AG	Atecs Mannesmann	Intra-European	1	Art. 6(2) (conditions&obligations)
7/13/2000	2060	Robert Bosch GmbH	Mannesmann Rexroth	Intra-European	2	Art. 8(2) (conditions&obligations)

8/11/2000	2097	SCA Mölnlycke Holding	Metsä Tissue Corp.	Intra-European	2	Art. 8(3)
8/24/2000	2116	Flextronics International Ltd.	Italdata S.p.A.	Cross-Euro-Border	1	Art. 6(1)(b)
10/31/2000	2202	Stinnes AG	Holland Chemical	Intra-European	1	Art. 6(1)(b)
2/19/2001	2283	Schneider	Legrand	Intra-European	2	Art. 8(3)
1/25/2001	2302	H.J. Heinz Company	CSM N.V.	Cross-Euro-Border	1	Art. 6(1)(b)
2/12/2001	2314	BASF AG	Pantochim SA	Intra-European	2	Art. 8(2)
6/15/2001	2337	Nestlé SA	Ralston Purina Company	Cross-Euro-Border	1	Art. 6(2) (conditions&obligations)
5/18/2001	2416	Tetra Laval SA	Sidel SA	Intra-European	2	Art. 8(3)
4/10/2001	2434	Grupo Villar Mir (Inmobiliaria Espacio SA)	Cantabrico SA	Intra-European	2	Art. 8(2) (conditions&obligations)
6/20/2001	2499	Norske Skog	Parenco	Intra-European	2	Art. 8(2)
9/26/2001	2504	Cadbury Schweppes	Pernod Ricard SA	Intra-European	1	Art. 6(1)(b)
9/21/2001	2577	GE Capital Corporation	Heller Financial, Inc	Extra-European	1	Art. 6(1)(b)
10/25/2001	2602	Gerling-Konzern	NCM	Intra-European	1	Art. 6(2) (conditions&obligations)
9/18/2001	2608	INA Holding Schaeffler KG	FAG Kugelfischer Georg Schäfer AG	Intra-European	1	Art. 6(1)(b)
10/11/2001	2629	Flextronics International	Xerox Corporation	Extra-European	1	Art. 6(1)(b)
11/29/2001	2659	Fortum Oyj	Birka Energi AB	Intra-European	1	Art. 6(1)(b)
11/19/2001	2679	Electricité de France	TXU EUROPE	Cross-Euro-Border	1	Art. 6(1)(b)
1/9/2002	2693	ADM	Alfred C.	Cross-Euro-Border	1	Art. 6(1)(b)
2/4/2002	2705	EnerSys	Energy Storage	Cross-Euro-Border	1	Art. 6(1)(b)
5/3/2002	2796	Siemens AG	Aerolas GmbH	Intra-European	1	Art. 6(1)(b)
4/12/2002	2801	RWE AG	Innogy Holdings plc	Intra-European	1	Art. 6(1)(b)
5/17/2002	2804	Vendex KBB Nederland	Brico Belgium SA	Intra-European	1	Art. 6(1)(b)
12/6/2002	2861	Siemens	Dräger Medical	Intra-European	2	Art. 8(2) (conditions&obligations)
7/16/2002	2882	Terex	Demag	Cross-Euro-Border	1	Art. 6(1)(b)
12/20/2002	2947	Verbund	Energie Allianz	Intra-European	2	Art. 8(2) (conditions&obligations)
3/31/2003	2972	DSM	Roche	Intra-European	2	Art. 8(2) (conditions&obligations)
10/14/2002	2977	Compass plc	Onama SPA	Intra-European	1	Art. 6(1)(b)

4/14/2003	2978	Lagardere	Natexis Banques Populare	Intra-European	2	Art. 8(2) (conditions&obligations)
12/18/2002	3056	Celanese AG	Degussa AG	Intra-European	2	Art. 8(2)
2/28/2003	3083	General Electrics	Instrumentarium OYJ	Cross-Euro-Border	2	Art. 8(2) (conditions&obligations)
1/30/2003	3096	TotalfinaElf	Mobil Gas	Intra-European	1	Art. 6(1)(b)
3/13/2003	3113	General Electric	Jenbacher	Cross-Euro-Border	1	Art. 6(1)(b)
11/4/2004	3178	Bertelsmann AG	Axel Springer AG	Intra-European	2	Art. 8(1)
6/26/2003	3213	Umicore	OMG	Cross-Euro-Border	1	Art. 6(1)(b)
10/14/2003	3216	Oracle	Peoplesoft	Extra-European	2	Art. 8(2)
1/9/2004	3333	Sony	BMG	Cross-Euro-Border	2	Art. 8(2)
4/21/2004	3424	CIBA	Raisio Chemicals	Intra-European	1	Art. 6(1)(b)
5/18/2004	3431	Sonoco	Ahlstrom	Intra-European	2	Art. 8(2) (conditions&obligations)
5/12/2004	3436	Continental	Phoenix	Intra-European	2	Art. 8(2) (conditions&obligations)
5/25/2004	3446	Uniqa	Mannheimer	Intra-European	1	Art. 6(1)(b)
8/20/2004	3486	Magna	New Venture Gear	Extra-European	1	Art. 6(1)(b)
1/20/2005	3625	Blackstone Crystal Holdings Capital Partners	Acetex	Extra-European	2	Art. 8(1)
1/10/2005	3653	Siemens	VA Tech	Intra-European	2	Art. 8(2) with (conditions&obligations)
1/13/2005	3664	Repsol Group	Shell Gass	Intra-European	1	Art. 6(1)(b)
6/17/2005	3746	Tetra Laval	SIG	Intra-European	1	Art. 6(1)(b)
8/4/2005	3796	Omya	J.M.Huber PCC	Cross-Euro-Border	2	Art. 8(2) with (conditions&obligations)
11/4/2005	3905	Tesco	Carrefour	Intra-European	1	Art. 6(1)(b)
9/21/2005	3916	Deutsche Telekom	Tele.ring	Intra-European	2	Art. 8(2) with (conditions&obligations)
12/12/2005	3942	Adidas	Reebok	Cross-Euro-Border	1	Art. 6(1)(b)
1/4/2006	3946	Renolit	Solvay	Intra-European	1	Art. 6(1)(b) (conditions&obligations)
10/13/2005	3969	Societe Generale	Ford Lease-Business Partner	Cross-Euro-Border	1	Art. 6(1)(b)
10/21/2005	3975	Cargill Inc	Degussa AG	Cross-Euro-Border	2	Art. 8(1)
1/20/2006	4000	Inco	Falconbridge	Extra-European	2	Art. 8(2) with (conditions&obligations)
12/14/2005	4028	Flaga	Progas	Intra-European	1	Art. 6(1)(b)

12/1/2005	4036	TPG IV	Q-Telecom	Cross-Euro-Border	1	Art. 6(1)(b)
4/24/2006	4062	SKF	SNFA	Intra-European	1	Art. 6(1)(b)
3/13/2006	4092	Andritz	Kuesters	Intra-European	1	Art. 6(1)(b)
5/10/2006	4180	GDF	Suez	Intra-European	2	Art. 8(2) with (conditions&obligations)
6/23/2006	4187	Metso Corporation Oy	Aker Kvaerner ASA	Intra-European	2	Art. 8(2) with (conditions&obligations)
10/4/2006	4384	Hombergh Holdings	Ovako	Intra-European	1	Art. 6(1)(b)
11/3/2006	4404	Universal Music Group	BMG	Cross-Euro-Border	2	Art. 8(2) with (conditions&obligations)
10/20/2006	4417	Telecom Italia	AOL German Access Business	Intra-European	1	Art. 6(1)(b)
11/16/2006	4426	SABIC	Huntsman Petrochemicals UK	Intra-European	1	Art. 6(1)(b)
3/12/2007	4518	Alcoa	Orkla	Cross-Euro-Border	1	Art. 6(1)(b)
3/23/2007	4523	Travelport	Worldspan	Extra-European	2	Art. 8(1)
5/4/2007	4525	Kronospan	Constantia	Intra-European	2	Art. 8(2) with (conditions&obligations)
2/28/2007	4591	Weather Investments	Hellas Telecomunications	Intra-European	1	Art. 6(1)(b)
6/29/2007	4647	Austrian Energy & Environment AG	Lentjes GmbH	Intra-European	2	Art. 8(1)
6/5/2007	4662	Syniverse	Billing Service Group	Extra-European	2	Art. 8(1)
8/2/2007	4730	Yara	Kemira	Intra-European	1	Art. 6(1)(b) (conditions&obligations)
7/19/2007	4734	Ineos Group	Kerling	Intra-European	2	Art. 8(1)
8/29/2007	4747	IBM	Telelogic	Cross-Euro-Border	2	Art. 8(1)
7/30/2007	4781	Norddeutsche Affinerie AG	Cumerio SA	Intra-European	2	Art. 8(1)
3/14/2008	4919	StatoilHydro	Conocophillips	Intra-European	2	Art. 8(2) with (conditions&obligations)
11/16/2007	4956	STX	Aker Yards	Cross-Euro-Border	2	Art. 8(1)
8/24/2007	4965	Arques	Actebis	Intra-European	1	Art. 6(1)(b)
11/16/2007	4971	MPC	MAN AG	Intra-European	1	Art. 6(1)(b)
2/25/2008	5009	Randstad	Vedior	Intra-European	1	Art. 6(1)(b) (conditions&obligations)
6/9/2008	5010	Munich RE	Gaum	Cross-Euro-Border	1	Art. 6(1)(b)
4/7/2008	5123	Autogrill	World Duty Free	Intra-European	1	Art. 6(1)(b)

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Project of Diploma Thesis

Date of state examination: summer semester 2008/2009

Author of diploma thesis: Bc. Goran Serdarević

Supervisor of diploma thesis: PhDr. Petr Teplý

Title: The Efficiency of the European Commission´s Merger Decisions

Objective:

Objective of the thesis is to analyse the efficiency of European M&A regulation using the empirical evidence. The core of the thesis is application of the results from a well-known Cournout oligopoly model in order to predict pro-competitiveness (efficiency) of particular M&A cases monitored by the European Commission (EC) (by deriving correspondence between consumer surplus and future profits (change in share prices) of merging parties' competitors). Based on those results we will be able to identify those M&A cases where the EC made a type I error (prohibition of pro-competitive merger) or a type II error (allowance of anti-competitive merger). We will then provide further econometric evidence regarding the determinants of those particular errors. Using the LOGIT model we will analyse which factors may have contributed to error decisions of the EC - bargaining power of competitors, institutional and political economy variables etc..

Thesis deals with the following questions:

1. How to measure efficiency of EC competition policy using the market data?
2. Is there any statistically significant improvement in EC decision making since the legislative change in 2004?

Hypotheses:

European merger regulation has undertaken significant legislative changes in 2004 that should increased efficiency of the EC's decision making process. Therefore two hypotheses might be as follows:

1. Occurrence (in percent) of both type I and type II errors should decrease after 2004 in comparison to previous period;
2. Occurrence of wrong decisions should become less systematic after 2004.

Outline:

1. Introduction
2. Background for analysis (EU Competition policy, comparison with US and recent legislative changes)
3. Theoretical background (oligopoly models as a tool for describing M&A market in the EU)
4. Empirical analysis (based on stock market data)
5. Conclusion

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In Prague, August 31, 2008 Signature of the consultant