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The determinants of EU jurisdiction on merger cases:

An empirical analysis

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Contents

1 Introduction

Since the early 1990's the department of competition policy of the European Commission has examined nearly 3500 proposed merger cases as to their compatibility with the common market. In over 88 percent of the cases the permission to merge has been granted right away, over 4 percent were granted subject to commitments. In roughly 5 percent of cases a more thorough investigation was conducted. The remaining 3 percent account for withdrawals, referrals to a member state etc. Of these cases 25 percent led to permissions without obligations, 60 percent were permitted with structural and/or behavioral obligations and 15 percent of mergers were blocked. The criterion for the prohibition of a merger is, according to the EU Merger Regulation, the significant impediment of effective competition in the common market or in a substantial part of it.[1] Mergers entailing this effect are to be declared incompatible with the common market.

The aim of this diploma thesis is to assess what factors influenced the decisions of the European Commission in these respective cases. Which patterns of structural circumstances of a merger case are most likely to entail a clearance subject to conditions and obligations? Are these patterns dependent on the phase[2] in which the decision is made?

To answer these questions one needs to link the merger cases and the corresponding court verdicts with a data-set containing circumstantial information on the case. Then one can proceed to examine the relevance of the information to the outcome using suitable econometric methods. Since the outcomes observed are of a discrete, binary nature the model we will employ is a probit model; this will allow us to see the impact of the variables under consideration on the court verdict.

The examination of the determinants of the Commission's rulings will allow us to draw conclusions concerning the aims and goals of European competition policy. If the

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[1] See European Commissions' Merger Regulation (ECMR) Art 2.3.
[2] For a primer on the phases of the ECMR see section 2.

Directorate-General for Competition (DG Competition) is exclusively concerned with the maintenance and restoration of effective competition and the protection of consumer surplus, only variables that are proxies for market power and efficiency gains should yield significant results in the regression. The finding of other significant factors would strongly suggest that political and institutional factors influence the Commission's decisions.

The schedule is as follows. The next section gives an overview of European merger policy. Section 3 briefly reviews earlier work on the subject, section 4 proposes some intuitive predictions regarding possible determinants. Section 5 is concerned with the methodology, data-sets and variables our model employs. The presentation of the general findings can be found in section 6, while section 7 concludes.

2 European Merger Policy: A Summary

The European Communities Merger Regulation (ECMR) was passed in 1989 and came into force in September 1990.[3] It specifies the scope of intervention and juridical competence of the European Commission in merger cases with a 'community dimension'. In article 1.2 of regulation 4064/89 a combination is defined to have community dimension by meeting the following conditions:

(a) the aggregate worldwide turnover of all the undertakings concerned is more than ECU[4] 5 000 million, and

(b) the aggregate Community-wide turnover of each of at least two of the undertakings concerned is more than ECU 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.

That means that from 1990 on all major combinations have been scrutinized by the European Commission, whereas the importance of national competition authorities has been severely reduced. In 1997 the above definition was significantly widened by the passing of regulation 1310/97[5] which assesses a community dimension even if a merger does not meet the original two conditions, provided it satisfies the following four conditions:

(a) the combined aggregate worldwide turnover of all the undertakings concerned is more than EUR 2 500 million;

(b) in each of at least three Member States, the combined aggregate turnover of all the undertakings concerned is more than EUR 100 million

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[3]Council Regulation (EEC) No 4064/89 of 21 December 1989 on the control of concentrations between undertakings [Official Journal L 395 of 30 December 1989].

[4]ECU was replaced by Euro in 1998.

[5]Council Regulation (EC) No 1310/97 of 30 June 1997 [Official Journal L 180 of 9 July 1997].

(c) in each of at least three Member States included for the purpose of point (b), the aggregate turnover of each of at least two of the undertakings concerned is more than EUR 25 million; and

(d) the aggregate Community-wide turnover of each of at least two of the under-takings concerned is more than EUR 100 million, unless each of the undertak-ings concerned achieves more than two-thirds of its aggregate Community-wide turnover within one and the same Member State.

Notice that these definitions also include companies that are located, produce and sell outside of Europe, as long as their sales to European markets are sufficiently high. Thus, a merger can be subject to the jurisdiction of more than one competition authority. This has in the past led to diplomatic disgruntlement, most prominently when the combination of the two US companies *General Electric* and *Honeywell*, which was ratified by American authorities, was blocked by the European Commission.

In recent years, three of the EC's decisions to prohibit a merger have later been re-versed by the European Court of First Instance (CFI).[6] While these successful appeals certainly came as a shock for DG Competition, a Green Paper calling for a reform of the ECMR had been published as early as 2001. The reform was implemented in 2004. Its most important issues are probably the clarification of 'dominance', the inclusion of an efficiency defense[7] which might counteract competitive concerns and the reorga-nization of the Merger Task Force (MTF). The reform has in general been favourably received, for a detailed review of the reform see Lyons (2004).

Once it has been established that a combination is subject to EC jurisdiction, the merg-ing parties are obligated to notify the Commission prior to the implementation of the concentration. On receipt of the notification, the Commission publishes a note in the Official Journal of the European Communities, where third parties can comment on the

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[6]These cases are: *Airtours/First Choice*, *Schneider/Legrand* and *Tetra Lavel/Sidel*.
[7]For a detailed discussion see Ilzkovitz and Meiklejohn (2001).

proposed transaction. Figure 1 depicts the steps of the procedure that follows notification:

Figure 1: The European Merger Control Process
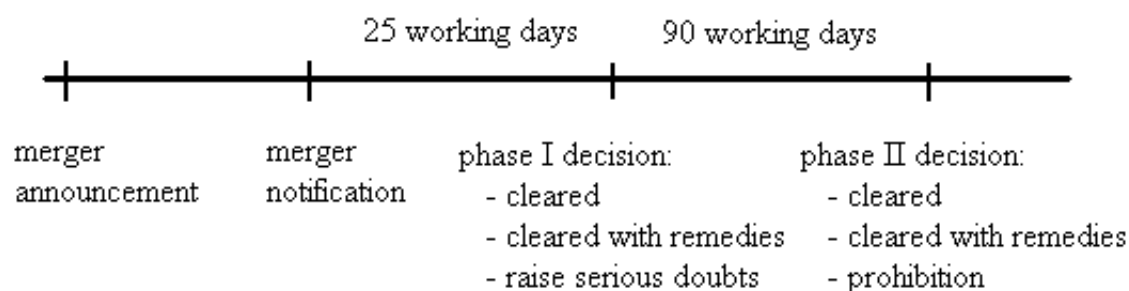
After the notification of the Commission (and the receipt of all necessary information), the so-called phase I proceedings are initiated. The Commission has 25 working days to evaluate the proposed combination as to its compatibility with the common market. There are four possible outcomes:

- *Art. 6.1a:* The combination does not have community dimension and hence is not subject to review

- *Art. 6.1b:* The combination does not raise competitive concern and is declared compatible with the common market

- *Art. 6.1c:* The combination raises serious doubts as to its compatibility with the common market, initiation of in-depth investigations.

- *Art. 6.2:* The combination is compatible with the common market subject to obligations to maintain effective competition.

Should the Commission conclude that an in-depth investigation of the combination (*vulgo* phase II) is in order, the timeframe of investigation is prolonged by 90 working days. At the end of this period, the Commission may issue the following verdicts:

- *Art. 8.1:* The combination is declared compatible with the common market.

- *Art. 8.2:* The combination is declared compatible subject to conditions and obligations.

- *Art. 8.3:* The combination is declared incompatible with the common market.

Evidently, the combination can be cleared subject to conditions and obligations either in phase I or in phase II. Whether the determinants differ in the respective phases will be subject of the present study. For an overview of the remedies employed by the EU see Motta (2003).

The application of Art. 8.3 (prohibition) is justified when the criteria laid down in Art. 2.3 of the ECMR are met. In the revised 2004 Merger Regulation the wording of the article has been changed to

> *'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'*

where 'dominance' has been defined as

> *'. . . a position of economic strength enjoyed by an undertaking which enables it to prevent effective competition being maintained on the relevant market by giving it the power to behave to an appreciable extent independent of its competitors, customers and ultimately of consumers'*

by the European Court of Justice.[8]

The pre-2004 practice, called the dominance test (DT), required the creation or strengthening of a dominant position as an absolute prerequisite for the prohibition of a business combination.[9] It has been argued that the DT shows deficiencies in cases of collective dominance and tacit collusion and that the SLC (substantial lessening of competition) test employed by the United States' Federal Trade Commission (FTC) would be preferable.[10] After the 2004 reform, the test used by the European Commission would be most accurately described as a significant impediment of effective competition (SIEC) test.

The last two verdicts signify that the Commission has serious doubts regarding the concentration's compatibility with the common market. In these cases, the Commission must communicate its concerns to the merging parties, which have the right to express their perspective of the subject matter at a hearing.

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[8] *United Brands*(27/67, E.C.R. 207, para. 65).

[9] Lyons (2004) shows how this can be the source of erroneous judgements.

[10] For a comparison of European and US merger policies see Bergman *et al.* (2007).

3 Similar Literature

The economic literature on mergers is relatively abundant and growing. Large parts of it are devoted to explore issues such as firms' incentives to merge, the effects of mergers on the market or in how far efficiency gains counterweigh market power. The empirical literature in the field is usually concerned with the impact of mergers on the market structure and tries to classify mergers as being pro-collusive or efficient.[11]

There is a rather long list of merger event studies in the Anglo-Saxon region and in recent years similar work has been conducted for European mergers. These papers usually either study a single, controversial merger case and evaluate it economically or they structure a sample of merger cases by chronologically important dates[12] to evaluate the effect of the new information being released at these dates on the market.

While the effectiveness of merger remedies has been studied for almost 40 years[13], the determinants of competition authorities' decisions have not yet been fully explored from an economic point of view.[14] The first papers in this strand of research have been put forward in the early 1990-ies, papers dealing with the EU's competition authority have - due to lack of data - only in recent years been able to take an econometric approach to the issue.

Studies using discrete-choice statistical models to investigate merger decisions have been conducted by Coate and McChesney (1992) for the US, Khemani and Shapiro (1993) for Canada and by Weir (1992) for mergers in the UK.

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[11]For a good example of this see Gugler *et al.* (2003).

[12]Usually the merger announcement, the notification of the Commission and the verdict.

[13]See for example Elzinga (1969) or Ellert (1976). For an in-depth evaluation of the effectiveness of European merger remedies we refer the reader to the Merger Remedies Study conducted by DG Competition in 2005.

[14]Although there is a range of legal literature on the subject.

A more recent example is Duso, Neven and Röller (2006), investigating the EU's decision in 164 merger cases. Using the reaction of competitor's stock market prices, they evaluate the degree of pro- or anti-competitiveness of a merger. They then employ a probit model over the pro- and anti-competitive subsamples to estimate the frequency of type I (prohibition of a pro-competitive merger) and type II (clearance of an anti-competitive merger) errors in the verdicts. Their findings indicate that about half of the mergers given unconditional clearance were evaluated as anti-competitive by the stock market and that the decisions of DG Competition cannot solely be explained by the motivation of protecting consumer surplus. Its decisions are, however, not sensitive to the interests of firms.

Aktas, de Bodt and Roll (2004) address the problem of multiple competition authorities judging the same case and study the probability of a merger case in the EU going to phase II. They use a logit model to examine phase II cases handled by DG Competition since 1990. The results indicate, that the price movements around the initial announcement of the merger are an indicator of the likelihood of a phase II investigation and of the final regulatory decision and that there is no discrimination between European and non-European firms.

Bergman, Jakobsson and Razo (2005) adress similar questions as this paper does: employing a logit model over a sample of 96 merger cases they estimate the likelihood of going to phase II or prohibition decision as a function of market-relevant and political variables. Their findings are compatible with the public interest hypothesis: Decisions of the EU Commission are only influenced by variables that directly affect welfare. In both models (likelihood of phase II and likelihood of prohibition) the probability of intervention increases with the market share of the companies involved. Dummy variables indicating the possibility of post-merger joint dominance and the existence of entry barriers are also relevant. Political/institutional variables are not significant.

In a very recent paper Bougette and Turolla (2006) analyze the characteristics of a merger case for unconditional clearance and clearance subject to conditions and obligations. Their sample of 229 merger cases is analyzed using three different, sophisticated multinomial-logit specifications accounting for up to eight different outcomes.[15] They also employ a special class of self-organized maps - Kohonen's maps - to make the 'closeness' of two respective cases apparent in topological terms. Among their results are significant industry- and country-effects on verdicts as well as political influences.

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[15]The authors differentiate between phase I/II, remedy/no remedy and structural/behavioural remedy.

4 Predictions

The main question we will investigate can be put as follows: '*Which factors influence the likelihood of a permission subject to obligations?*'. Furthermore we would like to examine possible differences in the determinants of the outcomes of phase I and phase II proceedings. We will thusly present three sets of results for each of our investigations: one concerning only the effect on phase I conditions and obligations, one concerning the effect on the phase II outcome and one concerning the overall effect. Since the European Commission has blocked only 19 mergers so far, the determinants for the blocking of a merger cannot be reliably econometrically estimated.

We will examine a number of propositions in relation with the economic and political circumstances of a merger. By verifying or falsifying these propositions we will hopefully be able to shed some light on the above question.

Proposition 1

It seems reasonable to assume that mergers up to a certain size have less potential to restrain effective competition in a given market and are thusly examined in lesser detail. Mergers that do not exceed a certain financial threshold or lack a community dimension of sufficient importance (measured by the amount of trade with EU members other than the company's country of origin) are delegated to national competition authorities. Mergers that only scarcely fulfill the criteria to be handled by the EU Commission evidently have less impact on market structure than those conducted by companies holding a significant market share in the common market.

This can be formulated as the proposition that the firm sizes and the deal size of a given merger increase the likelihood of regulatory intervention. If this proves to be true, both the likelihood of an in-depth investigation and of conditions and obligations should increase with the size of the companies concerned.

It would be preferable to test for the interdependency of case outcome and market share instead of firm or deal size, because it is a better indicator for market dominance than plain size. Regrettably, market shares are not included in the data-base employed, therefore size will have to suffice as a proxy for market share.

Proposition 2

The notion of failing firm defense is included in European and American merger law, but rarely applied. The basic idea is that a merger should be cleared if the target of the merger is not viable on its own. While this may be contested on the grounds of economic theory, the approach is justifiable from a political point of view (e.g. the preservation of employment).

According to European merger law, the definition of this concept is that it

> *'. . . enables the Commission to clear a concentration even though a dominant position is created or strengthened in its aftermath, provided that there is no causal link between the concentration and the dominant position, that is to say the merger does not lead to a deterioration of the competitive structure of the market. The Commission has developed the following criteria for the application of the rescue merger concept : (1) The undertaking to be acquired must be failing (i.e. it would in any event be forced out of the market). (2) There is no alternative buyer who could provide for a less anti-competitive solution. (3) The market share of the acquired undertaking would, in any event, be taken over by the acquiring undertaking, or its assets would inevitably exit the market if not taken over by another undertaking.[16]'*

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[16] Commission Decision of 14 December 1993 in case IV/M.308 - Kali+Salz (OJ L 186, 21.7.1994, p. 38), Commission Decision of 11 July 2001 in case COMP/M.2314 - BASF/Eurodiol/Pantochim.

In concord with this definition, we would expect a *positive* correlation of the outcome with the targets income. This would imply that strongly negative income - which seems to be a reasonable proxy for a firm to be 'failing' - decreases the probability of merger intervention.

Proposition 3

Aktas, de Bodt and Roll (2006) find statistical evidence, that the European Commission is protectionist in the sense that the amount of harm dealt to European competitors of a merging entity increases the chance of intervention. It increases even further, if the bidding firm is non-European. This harms European consumers who bear the burden of the market power of firms fostered by this practice.

This finding is, however, to be regarded with caution: Aktas, de Bodt and Roll (2004) find that non-European companies have a slightly increased probability of being subject to an in-depth investigation, but that they are not treated differently with respect to the final decision of the Commission. The result that the cumulative average abnormal returns around the announcement date of a merger of non-European firms substantially exceed those of European firms is discarded as a 'puzzle' in Aktas *et al.* (2004) and reinterpreted as a 'troubling trait of European regulators' (with respect to the allegation of protectionism) in Aktas *et al.* (2006).

The subject remains controversial: Accusations of protectionism were put forward when the GE/Honeywell merger was blocked by the EU Commission in 2001, despite having already been cleared by US authorities (see for example Priest and Romani (2001) or Varian (2001)). Contrarily, Bergman, Jakobsson and Razo (2005) do not find any statistical evidence of discrimination against non-European companies, neither in terms of the likelihood of a phase II investigation, nor in terms of the likelihood of prohibition.

To see whether our data-set does or does not confirm the allegation of protectionism, we will check for the effect of the nationality of bidder and target on the outcome. This

procedure resembles the approach of Bergman *et al.* (2005) but is considerably less sophisticated than the approach of Aktas *et al.* (2006), where a two-step instrumental approach is used to take care of the endogeneity problem between market price movements and the regulatory action of the Commission. A significant result would thus imply a certain robustness of their findings, whereas a non-significant result cannot be regarded as a refutation.

Proposition 4

Like most things, the amount and strictness of competition policy deemed necessary is a matter of personal taste. Since our data range back to the early 1990's, we will compare the 'strictness' of competition policy conducted by Mario Monti (1999 - 2004) with those of Karel van Miert (1993 - 1999), his predecessor, and Leon Brittan (1989 - 1993), the predecessor of the latter. Neelie Kroes has headed DG Competition since 2004 and up to now roughly 1000 cases have been dealt with under her direction. However, since our data-set for market data only ranges up to 2002, we will have to omit this time period.

This question is particularly interesting since earlier analyses of these 'political' influences have reached different, conflicting conclusions. See for example Schinkel *et al.* (2006), Bougette and Turolla (2006) or Bergman *et al.* (2005).

To test for this, we will regress the merger outcomes on time dummies representing the respective commissioners and check if they differ considerably. If our findings are significant we can conclude that the individual Commissioners for Competition have been able to leave their personal mark on their period of heading DG Competition.

Proposition 5

Another interesting question is whether the jurisdiction of the Commission discriminates between industries. In Europe, this might be the case for sectors which were formerly to a large degree state-owned (construction services, postal services, telecommuni-

cations, transport services ...) and were in turn only to a lesser degree subject to competitive pressure than their international counterparts. Prohibitive competition policy could be abused to shelter these industries from their more efficient international competitors.

Alternatively, differences in the treatment of industries with respect to merger cases could be interpreted as a proxy for industry concentration. If a certain branch is subject to significantly harsher scrutiny than others, then - not taking into account effects concerning the specifics of the respective industry - one would assume that the industry under examination exhibits an already increased degree of concentration, causing the competition authority to apply stricter measures to maintain the current level of competition.

We will check for industry effects on two levels: First, we use one-digit SIC codes to classify our sample in five broad categories, namely manufacturing, trade, transportation, services and finance. After evaluating the effects on an aggregate industry level, we refine our analysis by using two-digit SIC codes. Using only those industry dummies which include at least 15 observations, this provides us with roughly 25 variables for specific industries.

A regression of the outcome of merger cases on the SIC code of the enterprises in question will show us if the proposition of industry-specific effects on the verdicts of the Commission is supported by our data-set.

Additionally, we will check whether horizontal mergers - that is, mergers taking place between two firms in the same branch of trade - are treated differently than vertical or conglomerate mergers. Since horizontal mergers most directly influence concentration and in turn market power on the respective market, one might expect them to be examined more scrupulously than vertical or conglomerate business combinations.

The test for joint significance

After examining the above propositions, we will merge a selection of variables found to be significant into a comprehensive model. This will show us how the individual determinants interact in a general environment.

The results of this approach will be presented in two specifications: Firstly, we will include most variables that have been found to be significant in other models (probably all of them, except for some of the industry dummies to keep the model reasonably parsimonious). This will undoubtedly cause a number of previously significant variables to become insignificant.

We will thus, secondly, present a 'cleaned-up' model, in which we discard most of the insignificant regressors. This model will give us the most robust results, since its regressors have been examined individually and in the joint model and were found to be significant in both of them.

5 The data

To perform the statistical analysis necessary to answer the above questions we have to combine a database containing information on the market data of companies with one containing the merger information. The following section explains how this was accomplished and elaborates on the variables and the statistical model employed in the subsequent sections.

5.1 Construction of the data-set

Detailed data on all merger cases in the EU are available on the website of DG Competition[17]. This data-set is used to identify the merging parties and link their information. For the market data of the enterprises the Global-Vantage database was utilized, which offers a vast choice of data for the period 1990 - 2002.

From the total of 3388 mergers handled by the EU in the period from September 1990 to April 2007, 2139 overlap with the data in Global-Vantage. We matched these mergers with a global merger database via the names of the companies involved, obtaining about 1200 matches for the 1991 - 2002 period. This step was necessary to link the individual companies with their 'gvkey', a unique identifier utilized by the Global-Vantage database.

From these remaining matches, we were able to link a total of 655 to the Global-Vantage data-base. These 655 matches are the working material for all statistical analysis performed within this paper. They consist of 590 cases (90 percent) in which the merger was granted unconditionally and of 65 cases (10 percent) subject to conditions and obligations. 34 cases (5.2 percent) underwent an in-depth investigation. Table 1 gives an overview of the decisions by year:

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[17]http://ec.europa.eu/comm/competition/mergers/cases/

Table 1: Regulatory decisions by year

Regulatory Decision

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Unconditional	16	19	19	32	38	37	44	69	83	74	82	77	590
(percent)	2,44	2,90	2,90	4,89	5,80	5,65	6,72	10,53	12,67	11,30	12,52	11,76	90,08
Conditions	4	0	1	1	2	3	4	6	16	13	10	5	65
(percent)	0,61	0,00	0,15	0,15	0,31	0,46	0,61	0,92	2,44	1,98	1,53	0,76	9,92
Phase II	2	0	1	2	4	4	2	2	6	3	8	3	37
(percent)	0,31	0,00	0,15	0,31	0,61	0,61	0,31	0,31	0,92	0,46	1,22	0,46	5,65

Tables 2 and 3 summarize the nationality of the companies concerned by year:

Table 2: Bidder nationality by year

Nationality of Bidder

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
EU Bidder	10	17	14	23	26	25	28	45	61	55	51	50	405
(percent)	1,53	2,60	2,14	3,51	3,97	3,82	4,27	6,87	9,31	8,40	7,79	7,63	61,83
Non-EU Bidder	10	2	6	10	14	15	20	30	38	32	41	32	250
(percent)	1,53	0,31	0,92	1,53	2,14	2,29	3,05	4,58	5,80	4,89	6,26	4,89	38,17

Table 3: Target nationality by year

Nationality of Target

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
EU Target	14	18	19	26	30	29	37	50	68	65	63	63	482
(percent)	2,14	2,75	2,90	3,97	4,58	4,43	5,65	7,63	10,38	9,92	9,62	9,62	73,59
Non-EU Target	6	1	1	7	10	11	11	25	31	22	29	19	173
(percent)	0,92	0,15	0,15	1,07	1,53	1,68	1,68	3,82	4,73	3,36	4,43	2,90	26,41

The following table illustrates differences between phase I and phase II cases on the basis of size-related variables. The overall mean values can be found in the next subsection.

Table 4: Means for phase I / phase II cases in million USD

Variable Means by Phase I / Phase II

	Phase I		Phase II	
	Mean	**Standard Error**	**Mean**	**Standard Error**
dealsize	3473,89	392,26	13299,45	6313,13
acq_ta	65990,83	5671,93	40161,73	8378,98
t_ta	16108,76	2964,64	9779,84	3506,81

Table 5 plots intra-EU mergers (both parties from the EU) against cross-border mergers (at least one party is from a non-EU country).

Table 5: Intra-EU / cross-border mergers by year

Crossborder Mergers

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Total
Intra-EU Mergers	9	17	14	20	19	20	25	39	49	46	45	46	349
(percent)	45,00	89,47	70,00	60,61	47,50	50,00	52,08	52,00	49,49	52,87	48,91	56,10	
Crossborder	11	2	6	13	21	20	23	36	50	41	47	36	306
(percent)	55,00	10,53	30,00	39,39	52,50	50,00	47,92	48,00	50,51	47,13	51,09	43,90	

Finally, table 6 partitions intra-EU and cross-border mergers according to their regulatory treatment.

Table 6: Intra-EU / cross-border mergers by regulatory decision

Crossborder Mergers vs. Regulatory Decision

	Total	Unconditional	Phase I Conditions	Phase II Conditions
Intra-EU Mergers	349	311	27	11
(percent)	100,00	89,11	7,74	3,15
Crossborder Mergers	306	279	16	11
(percent)	100,00	91,18	5,23	3,59

The final 655 matches allow us to directly link the Global-Vantage data on the merging parties to the decisions of the Commission and to investigate interdependencies between the former and the latter. 655 is the upper limit for the sample sizes in our experiments; in numerous cases the sample size is reduced below that value by the non-availability of certain variables for all companies concerned. While this is generally not a problem when using dummy variables, the utilization of variables that are not available for all observations in some cases reduces the sample size below 300.

However, even after taking into account all constraints on the data-set it still remains substantially larger than most of those employed in previous works econometrically analyzing the decisions of DG Competition. The actual sample size for each regression is specified at the bottom of the respective regression printout.

5.2 Description of variables

The probit models in section 4 will estimate the significance of the following variables:

Variable	Description
$dealvalue$	Value of the merger in million USD
acq_ta	Acquirer total assets in million USD
t_ta	Target total assets in million USD
t_ni	Target net income in million USD
t_irate	Target net income divided by target total assets
acq_debt	Acquirer debt in million USD
acq_drate	Acquirer debt divided by acquirer total assets
t_fail	Equal to 1 if merger target is in the lowest 10 % percentile of income distribution
$bigeu$	Equal to 1 if acquiring company is situated in Germany, France, Spain, Italy or the UK
t_bigeu	Equal to 1 if target company is situated in Germany, France, Spain, Italy or the UK
us	Acquirer is situated in US
t_us	Target is situated in US
eu	Acquirer is situated in the EU
ger	Acquirer is situated in Germany
fra	Acquirer is situated in France
$brittan$	Time dummy 1989 - 1993: 1 if in this period, 0 otherwise
$miert$	Time dummy 1993 - 1999: 1 if in this period, 0 otherwise
$monti$	Time dummy 1999 - 2002: 1 if in this period, 0 otherwise
$hm3dummy$	Equal to 1 if the first three digits of acquirer's and target's SIC code coincide
$Manufacturing$	Acquirer/Target is in the manufacturing sector

$Trans., Comm., Elec.$	Acquirer/Target is in the transportation, communications, electric, gas or sanitary services sector
$Trade$	Acquirer/Target is in the wholesale or retail trade sector
$Finance$	Acquirer/Target is in the finance, insurance or real estate, sector
$Services$	Acquirer/Target is in the services sector
$Food$	Acquirer/Target is in the Food and Kindred Products sector
$Paper$	Acquirer/Target is in the Papers & Allied Products sector
$Chemical$	Acquirer/Target is in the Chemicals & Allied Products sector
$Petroleum\&Coal$	Acquirer/Target is in the Petroleum Refining And Related Industries sector
$Stone$	Acquirer/Target is in the Stone, Clay, Glass, And Concrete Products sector
$Metal$	Acquirer/Target is in the Primary Metal Industries sector
$Industrial Machines$	Acquirer/Target is in the Industrial And Commercial Machinery And Computer Equipment sector
$ElectricEquipment$	Acquirer/Target is in the Electronic And Other Electrical Equipment And Components, Except Computer Equipment sector
$Transport$	Acquirer/Target is in the Transportation Services sector
$Instruments$	Acquirer/Target is in the Measuring, Analyzing, And Controlling Instruments; Photographic, Medical And Optical Goods; Watches And Clocks sector
$Communications$	Acquirer/Target is in the communications sector
$Electric\&GasServices$	Acquirer/Target is in the Electric, Gas, And Sanitary Services sector
$TradeDurableGoods$	Acquirer/Target is in the Wholesale Trade-durable Goods sector

$TradeNondurableGoods$	Acquirer/Target is in the Wholesale Trade-non-durable Goods sector
$DepositoryInstitutions$	Acquirer/Target is in the Depository Institutions sector
$InsuranceCarriers$	Acquirer/Target is in the Insurance Carriers sector
$Nonclassifiable$	Acquirer/Target is in the Nonclassifiable Establishments sector

The following table summarizes the statistical properties of the numerical variables.

Table 7: Statistical properties in million USD

Statistical Properties

Variable	Mean	Standard Error	Observations
dealvalue	4011,222	512,263	512
acq_ta	64518,490	5374,503	614
t_ta	15704,780	2785,142	282
t_ni	207,826	32,167	285
t_irate	0,026	0,005	274
acq_debt	16003,600	1580,097	589
acq_drate	0,268	0,006	589

Most of the variables estimated in the following section are dummy variables. Since they only take the values 0 or 1, standard errors are of limited interest. Therefore, the table summarizing them only includes the mean and the number of observations equal to 1 for each dummy.

The observations for the SIC dummies include *both* acquirers and targets with SIC codes in the respective categories. The observations counted as 1 are only those used in the actual regressions.[18]

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[18]That is, observations equal to 1 that were later dropped because the sample size fell below 15 are not counted in this table.

Table 8: Dummy observations

Dummy Observations

Variable	Observations equal to 1	Dummy Mean
t_fail	21	0,032
bigeu	274	0,418
t_bigeu	347	0,530
us	167	0,255
t_us	132	0,202
eu	405	0,618
ger	105	0,160
fra	65	0,099
brittan	59	0,090
miert	236	0,360
monti	360	0,550
hm3dummy	188	0,287
Manufacturing	400	0,611
Trans., Comm., Elec.	98	0,150
Trade	114	0,174
Finance	128	0,195
Services	60	0,092
Food	34	0,052
Paper	30	0,046
Chemical	82	0,125
Petroleum & Coal	17	0,026
Stone	20	0,031
Metal	30	0,046
Industrial Machines	58	0,089
Electric Equipment	53	0,081
Transport	75	0,115
Instruments	30	0,046
Communications	35	0,053
Electric & Gas Services	31	0,047
Trade Durable Goods	35	0,053
Trade Nondurable Goods	16	0,024
Depository Institutions	48	0,073
Insurance Carriers	48	0,073
Nonclassifiable	24	0,037

5.3 Statistical method

To perform the econometric analysis of the data, we apply a probit model.[19] This model is appropriate when investigating binary dependent variables. It is often applied to questions of unionism (join/not join) or buying decisions concerning large purchases like cars or houses (buy/not buy).

The application of a multinomial probit model to investigate questions regarding decisions taken by authorities was proposed by McFadden (1976) who studied the decision rules underlying the freeway route selection by the California Division of Highways. The first application of a logit model to assess an authorities' decisions is Barton (1979), examining the Federal Communication Commission.

In our case a binary probit model will suffice: the dependent variable is the decision of the Commission to permit a given merger subject to conditions and obligations or without them.

The general form of the model is

$$Y_t = 1 \quad \text{if} \quad \alpha + \beta X_t + u_t > 0$$
$$Y_t = 0 \quad \text{if} \quad \alpha + \beta X_t + u_t \leq 0$$

By $F(z) = P(Z \leq z)$ we denote the cumulative distribution function of the standard normal distribution. We can thus write $P(Y_t = 1) = P(u_t > -\alpha - \beta X_t) = 1 - F(\frac{-\alpha - \beta X_t}{\sigma})$ and $P(Y_t = 0) = P(u_t \leq -\alpha - \beta X_t) = F(\frac{-\alpha - \beta X_t}{\sigma})$ where σ denotes the standard deviation.

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[19]A logit model yields virtually the same results.

The optimal parameters for the model are now obtained by maximizing the corresponding likelihood function:

$$L = \prod_{Y_t=0} F(\tfrac{-\alpha-\beta X_t}{\sigma}) \prod_{Y_t=1} [1 - F(\tfrac{-\alpha-\beta X_t}{\sigma})]$$

This is done numerically in a number of iterative steps until the model converges to the optimal parameters.

6 The Results

6.1 The critical mass hypothesis

Returning to the first proposition of section 4 we now investigate the interdependency of the outcome with several variables indicating the size of the companies concerned. These variables evidently serve as proxies for the impact of the merger on market structure. As mentioned before, data on market shares are not included in our database. Instead we employ deal value, acquirer's total assets and target's total assets to account for the size of the merger.

The original regression also contained data on the total sales of acquirers and targets. Though partly significant, these regressors are very strongly correlated with total assets and were therefore dropped from the final output.

The results are summarized in table 4:

Table 9: Estimation results critical mass hypothesis

Dependent Variable:	Conditions & Obligations		Phase I Conditions		Phase II Conditions	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Independent Variables						
dealvalue	0,0000329***	3,99	0,0000128**	2,37	0,0000296***	2,91
acq_ta	-0,0000024	-1,50	-0,0000012	-0,81	−0,00000851*	-1,69
t_ta	0,0000034	1,02	0,0000039	1,22	-0,0000008	-0,09
constant	-1,2108480	-9,86	-1,3738590	-10,53	-1,4614800	-8,85
Observations	248		248		248	
Pseudo R^2	0,212		0,0918		0,1286	
Log-likelihood	-73,279637		-63,974041		-47,089084	

*, **, *** Significant at the 10- , 5- and 1-% levels

Deal value is significant in all three specifications with a positive coefficient. This is a common result[20] and supportive of the critical mass hypothesis.

In the phase II regression, acquirer's total assets turn out to be significant. The negative coefficient seems puzzling at first but could be interpreted as evidence for lobbying occurring during prolonged investigations of a merger case. This seems particularly plausible since the result is significant for phase II decisions (where the extended timeframe and the hearing of all parties permit lobbying) but not for phase I decisions (which cannot realistically be influenced by the companies). The target's total assets turn out to be insignificant in all specifications of the model.

Since the coefficient for $dealvalue$ is the largest significant coefficient in absolute size - more than three times as large as that of acq_ta - and the only one significant at a 1 % level we can safely conclude that the scrutiny of the proceedings by DG Competition increases with the size of the merger.

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[20]See for example Aktas *et al.* (2006).

6.2 The failing firm defense hypothesis

We now turn to the examination of the failing firm defense hypothesis. The key variable in this regression obviously is the income of the merger target. Target income has been converted to an income rate through division by total assets. Additionally, we will check for the effect of a dummy variable intended to capture the effect of particularly strong cases of a 'failing firm': t_fail is equal to 1 if the respective firm is in the lowest 10 % percentile of the income distribution, all firms in this percentile have negative incomes.

The results of regressing the merger outcomes on the target's income, the acquirer's debt and the failing firm dummy can be found in table 10:

Table 10: Estimation results failing firm defense hypothesis

Dependent Variable:	Conditions & Obligations		Phase I Conditions		Phase II Conditions	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Independent Variables						
t_irate	4,21966*	1,81	4,68353*	1,85	-0,378285	-0,11
t_fail	0,036596	0,06	0,339944	0,55	---	---
constant	−1,242337***	-8,52	−1,504489***	-9,17	−1,579523***	-8,23
Observations	274		274		253	
Pseudo R²	0,025		0,0255		0,0001	
Log-likelihood	-107,54545		-83,763486		-54,119974	

*, **, *** Significant at the 10- , 5- and 1-% levels

The coefficient for the target's net income rate is significant in the first two specifications on a 10 % level. In accordance with the failing firm defense concept, the parameter is positive, meaning that the takeover of a target company experiencing negative profits is more likely to be permitted without conditions than that of a target which fares well economically.

The failing firm dummy is not significant in the first two models and could not be estimated in the third specification, because apparently none of the endangered companies made it to phase II. This result suggests that the Commission is not over-proportionally influenced by severe cases of firm failure.

6.3 The protectionist hypothesis

The hypothesis that the EU discriminates between mergers on grounds of the nationality has been devised numerous times, especially after the controversial merger decision in the *General Electric / Honeywell* proceedings. In that specific case, the side of the Atlantic the observer was on seemed to be an unbiased (even though 'biased' probably nails it better) estimator for their findings.

The general results with regard to the allegation of protectionism remain a contentious issue. While some authors claim to have found evident interdependencies between nationalities and outcomes of merger proceedings, others dispute this conclusion. Not only about the existence, also about the direction of these supposed interdependencies a consensus can not be found. Although most authors in favour of protectionism would claim that the EU is herding their cattle, that is positively discriminating European firms, some come to conclusions indicating the opposite.

Duso, Neven and Röller (2006) estimate the probability of type I and type II errors made by the EU over a sample of 164 merger cases. They find that the probability of a type II error (which corresponds to the clearing of a merger that has been evaluated as anti-competitive by the stock market) increases by almost 26 % if one of the companies involved is located in a big EU-country.[21] Their finding is robust on a 9 % level and evidently supports the hypothesis that political pressure from large member states can influence the decisions of DG Competition in their favour. In a similar vein, Coate and McChesney (1992) find that political pressure from the US Congress has a significant influence on the decisions of the FTC.

Duso, Gugler and Yurtoglu (2006) reach very different conclusions. Using a similar data-set their logit regression yields the result, that being in a large EU-country[22] does not have any significant influence on the outcome. Another interesting finding of theirs is

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[21] France, Germany, Italy, Spain or the UK.
[22] France, Germany, Italy or the UK in this case.

that while being an EU-member reduces the probability of DG Competition intervening, being in the United States does even more so and additionally strongly increases the probability of an unconditional clearance.

Employing a sample of 229 cases and a quite different methodology, Bougette and Turolla (2006) surprisingly find that French and US acquirers are being negatively discriminated. They are subject to a higher probability of conditions and obligations in the merger outcome.

As already mentioned, Aktas, de Bodt and Roll (2004) acquit the EU of the allegation of protectionism. Studying a large sample of 602 major merger cases, they find no evidence for the favouring of European firms. Their 2006 paper, however, finds that competitive pressure exerted upon European rivals of the merging entity increases the likelihood of intervention and even more so, if the acquiring firm is non-European.

Finally, a paper that absolves DG Competition of the accusation of being partial in either direction is that by Bergman, Jakobsson and Razo (2005). The nationality of merging companies influences neither the likelihood of a phase II investigation nor that of prohibition. Khemani and Shapiro (1993) reach similar conclusions examining decisions from Canadian competition authorities.

In our first regression, we try to estimate the influence of being in a large EU member state versus that of being in the US. In both cases the merging parties supposedly have strong political backup. In a second regression, we include dummy variables for Germany and France. Since the results do not yield a lot of additional insight, they are included in the appendix. The results of the first regression are summarized in table 11:

Table 11: Estimation results protectionist hypothesis

Dependent Variable:	Conditions & Obligations		Phase I Conditions		Phase II Conditions	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Independent Variables						
bigeu	0,2668311	1,61	**0,3482133***	1,89	-0,0414006	-0,20
t_bigeu	**-0,2762284***	-1,66	-0,2175153	-1,15	-0,220017	-1,09
us	-0,0762267	-0,37	-0,3534172	-1,38	0,0871016	0,36
t_us	0,0232738	0,11	0,1596843	0,68	-0,2529254	-0,94
constant	**-1,255937***	-8,88	**-1,535611***	-9,31	**-1,488336***	-9,21
Observations	655		655		655	
Pseudo R²	0,0154		0,0361		0,007	
Log-likelihood	-208,57296		-152,94445		-129,84863	

*, **, *** Significant at the 10- , 5- and 1-% levels

The only significant variable in the overall specification is t_bigeu. It is significant on a 10 % level and indicates that merger targets from the big EU countries increase the likelihood of being cleared unconditionally by almost 5 %. [23] While $bigeu$, the variable for the acquirers, is not 10 % significant, its t-value is only 0.05 lower than that of t_bigeu. Interestingly - if one is to accept the approximately equal significance of both parameters - the effects of the two almost exactly cancel each other out.

In the phase I specification the $bigeu$ variable is robustly significant with a p-value of 0.059 and indicates that mergers involving an acquirer from a big EU country have a 4.3 % higher probability of being curtailed by DG Competition. This is something new: while previous studies have either found that big EU countries have an easier time of getting their mergers through, or that they do not have any influence on the merger authorities decision, the finding that big EU countries are actually subject to increased scrutiny has - to our knowledge - not yet been published.

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[23]This is obtained by estimating the marginal effect of the dummy variable switching from 0 to 1.

6.4 The time hypothesis

In section 4, the hypothesis that the outcomes of merger proceedings could be dependent on time, or more specifically, on the respective commissioner heading DG Competition at that time, has been put forward. Our data-set allows us to investigate this question for three commissioners: Leon Brittan, head of DG Competition from 1989 to 1993, Karel van Miert, head of DG Competition from 1993 to 1999 and Mario Monti, who has headed DG Competition from 1999 to 2004.[24]

To test this hypothesis, time dummies for the periods corresponding to the terms of office of the three different commissioners have been created. If a merger case falls in the respective period the time dummy is 1, otherwise it is 0. We then investigated the influence of these time dummies on the conditions and obligations variable, using our standard probit model.

Since we employ an exhaustive[25] set of dummy variables in this regression not all three can be utilized at once due to issues of collinearity. This gives us a set of three possible permutations of the regression, one of which we will examine here. The other two regressions - one with the Monti and Miert dummies, the other including the Brittan and the Miert dummies - are largely symmetric to the first and can be found in the appendix.

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[24]Given the range of our data-set, we can only examine cases handled in the period 1999 - 2002. Since this is still over 300 observations, we do not expect any statistical difficulties due to this constraint.

[25]Exhaustive in the sense that for every observation one of the dummy variables is equal to one. This means that it is possible to create a linear combination of the unity vector, which implies perfect collinearity.

Table 12: Estimation results time hypothesis

Dependent Variable:	Conditions & Obligations		Phase I Conditions		Phase II Conditions	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Independent Variables						
brittan	0,1185647	0,45	-0,1025663	-0,3	0,041958	0,14
monti	**0,3284546****	2,17	**0,3586919****	2,07	0,0601528	0,34
constant	**−1,492404*****	-11,95	**−1,72379*****	-11,87	**−1,67865*****	-11,93
Observations	655		655		655	
Pseudo R^2	0,0119		0,0182		0,0004	
Log-likelihood	-209,30578		-155,77289		-130,70523	

*, **, *** Significant at the 10- , 5- and 1-% levels

If we regress the outcome of the proceedings on the dummies for commissioners Monti and Brittan, we do get significant results in two of our three specifications: In the overall specification as well as in the phase I specification the Monti dummy is 5 % significant with a positive coefficient. The estimation of marginal effects shows that cases handled by the Monti administration were approximately 5 % more likely to be subject to intervention than the sample mean.

This result is in line with the findings of Schinkel *et al.* (2006) and Bougette and Turolla (2006), which associate the period of office of Mario Monti with increased interventions. In multiple specifications of Bougette's and Turolla's multinomial logit model, the Monti dummy turns out to be 1 % significant.

6.5 The industry hypothesis

We now return to the proposition that the industry of the companies involved in a given deal might affect the outcome. This could be due to political motives to foster certain branches by shielding them from effective competition. Evidently, this would be to the detriment of the consumer.

Unfortunately, the data-set is not large enough to test for the influence of a very specific branch on the likelihood of conditions and obligations. There are, for example, only 4 mergers involving construction companies in the data-set. Instead we have grouped the sample via SIC codes into five broad categories: Manufacturing, transportation, trade, services and finance. For each of these categories a dummy variable was created (equal to 1 if the firm is in the corresponding industry, 0 otherwise). We examined the influence of the acquirer's as well as the target's SIC code, giving us a total of 10 dummy variables.

As already mentioned in section 4 we will also check for effects on a less aggregated level by creating variables for smaller, more specific branches. To this end, 2-digit SIC codes were used to create dummy variables for roughly 90 industries. Keeping only those with at least 15 observations, we obtain 18 variables for the acquirers and 14 for the targets.

The variable $hm3dummy$ is the dummy for horizontal mergers we proposed earlier. It takes the value 1 if the first three digits of acquirer's and target's SIC code are identical and is 0 otherwise.

There are a few results missing in the regressions output. These estimations had to be dropped due to issues of collinearity arising with the use of multiple dummy variables (see footnote 25).

Let us first examine the regressions on the aggregated level:

Table 13: Estimation results industry hypothesis 1

Dependent Variable:	Conditions & Obligations		Phase I Conditions		Phase II Conditions	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Independent Variables:						
Acquirer SICs						
hm3dummy	-0,0381608	-0,24	-0,1705783	-0,91	0,0825826	0,44
Manufacturing	0,4139369	1,28	0,1774102	0,51	**0,8781313***	1,68
Trans., Comm., Elec.	0,2923561	0,81	0,3180885	0,82	0,2973835	0,52
Trade	0,2506523	0,59	0,1078466	0,23	0,7898388	1,35
Finance	-0,0980264	-0,27	-0,0522944	-0,14	-0,0626674	-0,10
Services	-0,2324194	-0,42	---	---	0,4814614	0,70
constant	−1,527876***	-4,96	−1,56592***	-4,74	−2,324978***	-4,53
Observations	628		601		628	
Pseudo R^2	0,0216		0,0073		0,0581	
Log-likelihood	-204,43171		-153,69467		-121,82241	

*, **, *** Significant at the 10- , 5- and 1-% levels

There is only one significant result on the acquirer's side, namely the dummy for manufacturing industries regressed on the phase II decisions. Robust on a 10 % level, the coefficient implies that being in the manufacturing industry increases the likelihood of a clearance subject to conditions and obligations by almost 8 %. This appears to be compatible with Duso, Neven and Röller (2006) who estimate the interdependency of branches and type II errors. They find that the manufacturing industry is 48 % less likely to get an anti-competitive merger cleared than the sample mean.

Table 14: Estimation results industry hypothesis 2

Dependent Variable:	Conditions &		Phase I Conditions		Phase II Conditions	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Independent Variables: **Target SICs**						
hm3dummy	-0,0451523	-0,29	-0,1950282	-1,07	0,1344288	0,72
Manufacturing	0,3693814	1,19	0,5560908	1,48	-0,3145804	-0,90
Trans., Comm., Elec.	0,1498712	0,42	0,5751639	1,37	**−0,8247101***	-1,84
Trade	-0,4132769	-1,25	-0,1292445	-0,37	**−0,7474674***	-1,67
Finance	0,1148321	0,36	0,5012695	1,35	---	---
Services	-0,0871337	-0,21	0,1979633	0,41	**−0,9536428***	-1,80
constant	**−1,472721***	-4,98	**−1,917195***	-5,31	**−1,174987***	-3,62
Observations	655		655		557	
Pseudo R^2	0,0274		0,0219		0,0317	
Log-likelihood	-206,02519		-155,18519		-121,28571	

*, **, *** Significant at the 10- , 5- and 1-% levels

The regression on target SIC codes yields three significant results in phase II: the dummy for transportation, communication and electricity, the one for services as well as the trade dummy are significant on a 10 % level, the negative coefficient indicating that being in those industries increases the probability of unconditional clearance by roughly 5.5 % for the former two sectors and by roughly 5 % for the trade sector.

Since the dummy variable for horizontal business combinations did not yield any feasible results in these two regressions, it will not be utilized in the 2-digit SIC regressions.

Apparently the aggregated SIC regressions lend only limited support to the hypothesis of discrimination between industries: Significant results are only observed in phase II regressions and very limited in number. This may, however, be due to an overly aggregated point of view. Regarding only five categories it appears more than plausible that

industry discrimination is being cancelled out by positive and negative discrimination being present in the same category.

A more detailed picture is obtained by using the 2-digit SIC dummies. The results of the regression using acquirer SIC codes is presented in the following table:

Table 15: Estimation results industry hypothesis 3

Dependent Variable:	Conditions & Obligations		Phase I Conditions		Phase II Conditions	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Independent Variables: Acquirer SICs						
Food	0,5797223	1,64	**0,7703225****	2,08	---	---
Paper	0,4737817	1,24	0,4317371	1,00	**1,143459*****	2,75
Chemical	**0,8878152*****	3,42	**0,794655*****	2,73	**0,6848033***	1,88
Petroleum & Coal	**0,9026088****	2,33	0,2500048	0,47	**1,181981*****	2,59
Stone	**0,8324925****	1,97	0,7471607	1,59	0,6456464	1,12
Metal	0,241137	0,58	0,0830669	0,16	0,7278861	1,57
Industrial Machines	0,241137	0,67	-0,0997746	-0,21	0,5176614	1,17
Electric Equipment	-0,2522274	-0,53	---	---	0,5611743	1,25
Transport	0,3239777	1,11	-0,033865	-0,09	**0,8996481****	2,55
Instruments	0,1230452	0,23	0,3136453	0,58	---	---
Communications	0,4257514	1,13	0,6163516	1,58	---	---
Electric & Gas Services	0,241137	0,58	0,4317371	1,00	0,3792158	0,70
Trade Durable Goods	0,5133595	1,14	0,3136453	0,58	0,6097943	1,06
Trade Nondurable Goods	0,1588973	0,29	0,3494975	0,63	0,6456464	1,12
Depository Institutions	-0,2522274	-0,53	-0,0616273	-0,13	---	---
Insurance Carriers	0,44437	1,40	**0,6349702***	1,89	0,3992049	0,74
Nonclassifiable	0,4737817	1,24	0,4317371	1,00	0,3792158	0,70
constant	**1,624131*****	-8,36	**1,814731*****	-8,17	**2,11088*****	-7,44
Observations	610		577		490	
Pseudo R^2	0,0568		0,0562		0,059	
Log-likelihood	-195,19774		-144,41587		-113,76568	

*, **, *** Significant at the 10- , 5- and 1-% levels

The overall regression indicates that three of the dummies are significant. With a t-value of 3.42 the dummy for the chemical industry is significant on a 1 % level, t-values of 2.33 and 1.97 indicate significance on a 5 % level for both the petroleum & coal and the stone industry respectively. Since all of the parameters are positive, we conclude that being in one of the aforementioned industries increases the chance of conditions and obligations. The estimation of marginal effects provides us with a range 21 to 24 % for that increase.

The chemical dummy remains (highly) significant in the phase I regression. The food and insurance carrier dummies are significant on a 5 %- respectively 10 %-level. All three dummy variables exhibit positive parameters suggesting that these branches are being negatively discriminated.

Regarding the results of the phase II regression, we observe four significant results. With t-values of 2.75 and 2.59, the paper and the petroleum and coal dummy are both significant at 1 % levels, the t-value of 2.55 of the transport dummy grants significance at a 5 % level, whereas the chemical dummy is only 10 % significant in this specification.

The regression of outcomes on target SIC codes can be found in the following table:

Table 16: Estimation results industry hypothesis 4

Dependent Variable:	Conditions & Obligations		Phase I Conditions		Phase II Conditions	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Independent Variables:						
Target SICs						
Food	0,2517853	0,79	0,2777106	0,80	-0,0600821	-0,13
Paper	0,3050139	0,83	0,2583042	0,63	**0,7221301***	1,89
Chemical	**0,522293***	2,35	0,3192155	1,25	0,3492082	1,22
Stone	0,1546158	0,37	-0,0248707	-0,05	0,193837	0,38
Metal	0,4329894	1,28	0,2046781	0,51	**0,6617599***	1,76
Industrial Machines	-0,1237865	-0,39	0,074622	0,23	---	---
Electric Equipment	-0,0707403	-0,22	-0,3980757	-0,88	0,5064439	1,57
Transport	-0,2911007	-0,81	---	---	**0,6236468****	2,03
Instruments	0,4653044	1,36	0,4722853	1,28	0,0901723	0,18
Transportation Services	-0,2232792	-0,44	-0,0248707	-0,05	---	---
Communications	0,1664605	0,47	0,364869	1,02	0,0078774	0,02
Electric & Gas Services	-0,370228	-0,77	---	---	0,0468881	0,10
Depository Institutions	0,0598957	0,18	0,2583042	0,75	---	---
Insurance Carriers	-0,0415469	-0,13	0,1568617	0,47	---	---
constant	**−1,341447*****	-10,15	**−1,539856*****	-10,40	**−1,758563*****	-10,26
Observations	600		538		499	
Pseudo R^2	0,0324		0,0192		0,0408	
Log-likelihood	-199,13958		-147,00323		-116,55782	

*, **, *** Significant at the 10- , 5- and 1-% levels

In the overall specification, only the chemical dummy is significant at a 5 % level. Once again the chemical industry appears to be treated more harshly than others: if the target of a business combination is in the chemical industry, the probability of conditions and obligations increases by almost 12 %.

We find no evidence for discrimination by industry in the phase I regression. In the phase II regression the dummies for paper, metal and transport turn out to be significant, each increasing the probability of invention by 10 - 13 %.

The regressions using 2-digit SIC codes yield a more differentiated picture than the aggregated regressions. We do find significant differences in the treatment of branches, especially the chemical, petroleum & coal, paper and transport industries appear to be subject to different handling.

While these results can be regarded as evidence for discrimination, they certainly are not proof: Statistical differences in the treatment of branches could be entirely due to differences in market structure and concentration. In fact, if we assume the EU to be non-discriminatory between industries, the differences in severity of jurisdiction allow us to draw conclusions as to the concentration of the industry in question, that is merger jurisdiction could be used as a proxy for industry concentration. Even though this explanation is tempting, it does not very well accord with empirical observations of the market structure: Among those industries that seem to be the most harshly judged - namely the paper industry, the transport industry, the chemical industry and the petroleum & oil industry - only the petroleum & oil industry is heavily concentrated. In the other three branches the aggregated market shares of the three biggest companies do not exceed 40 %.[26]

Nonetheless the stern jurisdiction in these branches might be compatible with the defense of effective markets and consumer surplus. Take for example the chemical and paper industries. Both branches are characterized by largely homogenous products and relatively high transportation costs (thus the transportation industry also enters the equation). These factors facilitate the emergence of collusion among market participants.[27] The increased harshness of merger jurisdiction could thus be explained as a pre-emptive measure to avert inefficiencies in markets susceptible to collusion.

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[26]see Deutscher Bundestag, 'Anlagenband zum Fünfzehnten Hauptgutachten der Monopolkommission', Drucksache 15/ 3611, 14.07.2004.

[27]The interested reader is referred to the case *ICI/Solvay* for the chemical industry and the so called 'woodpulp' case for the paper industry.

Similar investigations have been conducted by Duso, Neven and Röller (2006). They find that being in the 'transportation, storage and communication' industry significantly increases the probability of getting a pro-competitive merger curbed, whereas being in the 'manufacturing' or 'financial intermediation' industries decreases the likelihood of getting an anti-competitive merger cleared.

Bougette and Turolla (2006) find that three sectors influence the merger decision: energy, communications and retail trade. The former two increase the likelihood of intervention, possibly due to concentration issues linked to economies of scale and access to key facilities, whereas the retail trade sector has a higher chance of being cleared unconditionally.

6.6 The joint model

After having examined individually the five propositions put forward in section 4, we will now test them in a joint framework. To that end, we will select a choice of determinants that have previously been found to be significant and plug them into the familiar probit model.

The joint model contains the following variables from the previous hypotheses: from the critical mass hypothesis we include $dealvalue$, from the failing firm defense hypothesis we include t_irate, from the protectionist hypothesis the $bigeu$ and t_bigeu variables are included. Furthermore there's the $monti$ dummy from the time hypothesis and four SIC dummies from the industry hypothesis, namely $manufacturing$, $petrocoal$, $transport$ and $t\_chemical$. Even though more SIC dummies were found to be significant in the previous subsection, only the most robust industry results were selected.

Regressing these determinants in our usual model yields the following results:

Table 17: Estimation results joint model 1

Dependent Variable:	Conditions &		Phase I Conditions		Phase II Conditions	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Independent Variables						
dealvalue	**0,0000312***	3,93	**0,0000127****	2,26	**0,0000184****	2,54
t_irate	2,15392	1,07	2,46099	1,07	1,16041	0,45
bigeu	0,1893072	0,79	**0,5307049****	2,07	-0,5222924	-1,37
t_bigeu	-0,0370164	-0,15	-0,057403	-0,22	-0,279959	-0,76
monti	**0,40925***	1,77	0,387444	1,49	0,1577356	0,5
manufacturing	**0,436963***	1,83	0,1693304	0,66	**0,6410881***	1,75
petrocoal	-0,5666753	-0,90	-0,4071102	-0,64	-0,2393384	-0,31
transport	-0,4476315	-1,06	---	---	0,2884642	0,70
t_chemical	5,29E-01	1,50	0,354822	0,94	,126289	0,27
constant	**−1941569***	-6,95	**−1998266***	-6,72	**−2,151303***	-5,53
Observations	252		228		252	
Pseudo R^2	0,1805		0,1196		0,1818	
Log-likelihood	-87,579907		-71,232254		-44,23976	

*, **, *** Significant at the 10- , 5- and 1-% levels

Three variables turn out to be significant in the overall specification: $dealvalue$ is 1 % significant with a positive coefficient, very much like in the critical mass regression. The $monti$ dummy also remained significant in this setting, lending some robustness to the finding of Mario Monti's influence on the jurisdiction of the Commission and further confirming the results of Bougette and Turolla (2006) and Schinkel *et al.* (2006). Finally, the result of the manufacturing dummy is similar to that found in table 13: 10 % significance and a positive coefficient.

In the phase I specification the $dealvalue$ variable remains significant and, surprisingly, the $bigeu$ dummy jumps to 5 % significance. As in our previous regression, the coefficient of $bigeu$ is positive. This is an original and surprising result, indicating that mergers involving acquirers from large, politically influential countries are, as a matter

of fact, examined *more* scrupulously. The phase II regression once again confirms the importance of $dealvalue$ and the $manufacturing$ dummy.

As announced in the predictions section, we will now attempt to further trim down this model, weeding out insignificant regressors. Of course, this was achieved step by step, eliminating insignificant variables one after another and using information criteria to compare the models obtained. For the sake of brevity, only the final result of this iterative elimination process will be presented here.

After stepwise elimination of t_irate, t_bigeu, $petrocoal$ and $transport$, the final joint model is presented in the following table.

Table 18: Estimation results joint model 2

Dependent Variable:	Conditions & Obligations		Phase I Conditions		Phase II Conditions	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Independent Variables						
dealvalue	0,0000347***	4,76	0,0000156***	3,1	0,0000193***	3,08
bigeu	0,2919949*	1,8	0,3754013**	2,14	-0,166489	-0,76
monti	0,3720831**	2,22	0,4671994**	2,47	0,061231	0,29
manufacturing	0,5077646***	2,91	0,220976	1,19	0,7993959***	3,12
t_chemical	0,5170437**	2,23	0,351705	1,33	0,168363	0,60
constant	−2,128763***	-10,50	−2,171371***	-9,98	−2,31673***	-8,51
Observations	512		512		512	
Pseudo R^2	0,1525		0,0903		0,1231	
Log-likelihood	-151,55473		-123,16119		-87,573923	

*, **, *** Significant at the 10- , 5- and 1-% levels

The $dealvalue$ variable turns out to be even more significant than in the previous regressions: 1 % significance in all three specifications leaves little room for doubt as to this determinant. The dummy variable for big EU countries also seems statistically stronger

than in previous regressions: in the protectionist hypothesis subsection $bigeu$ was 10 % significant in the phase I specification, here we obtain 10 % significance in the overall specification and 5 % significance in the phase I specification.

The result for the $monti$ dummy resembles that obtained in the time hypothesis, namely 5 % significance in the overall and phase I specifications and a coefficient that corresponds to an approximately 5.5 % increased probability of intervention.

Industry effects remain crucial as well. The $manufacturing$ dummy is 1 % significant in the overall and the phase II specification, the dummy for a merger target in the chemical industry is 5 % significant in the overall regression. In all cases, the respective industries are associated with an elevated likelihood of regulatory action.

7 Conclusions

The aim of this thesis was to analyze empirically the determinants of the EC's decisions in merger cases with a community dimension. After a brief introduction to European merger law and an overview of the relevant literature, five hypotheses concerning possible determinants were proposed. Then the data-set used for the regressions was presented alongside with descriptions of the relevant regressors and statistical and methodological remarks relevant to our subject matter.

Having taken care of all preliminary and introductory issues we then turned to the statistical evaluation of the propositions.

Our probably most robust finding, significant in various specifications of the model, is the strong correlation of regulatory scrutiny and deal value. This finding is in line with the conjecture that large mergers (in terms of financial volume) tend to have a stronger impact on market structure and are therefore subject to increased scrupulousness of regulators.

Examining the concept of failing firm defense - a notion that allows a so-called 'rescue merger' to be cleared even if there are competitive concerns - we indeed find the proposed positive correlation between the merger target's income and the probability of intervention. Accordingly, negative profits increase the probability of unconditional clearance. This result, however, does not carry over to the joint model.

The investigations on the existence of protectionism and proneness to political pressure from big countries yielded mixed and interesting results. On the one hand, we found in one specification that merger targets from a big EU country decrease the probability of intervention. On the other hand, we found that mergers involving acquirers from big EU countries are actually more likely to be cleared with conditions and obligations. This result is robust in the joint model as well and is - to our knowledge - an original finding.

7 Conclusions

The results of our regression to evaluate the effects of different commissioners confirm what has been widely suspected: Mergers in the era of Mario Monti had an increased likelihood of regulatory intervention. This intuition has been statistically confirmed by Bougette and Turolla (2006) and now receives further support from the larger data-set employed in this paper.

Our evaluation of industry effects on an aggregate level indicated negative discrimination against the manufacturing branch, a result that retained its significance even in the joint setting. The finding of positive discrimination in case of targets from the transport, communications and electricity industry as well as from the trade industry did not carry over to the joint model. Evaluating on a less aggregated level we found industry effects in multiple branches. The strongest and most robust influences were found for the chemical, petroleum & coal and transport services industries. However, only the finding of negative discrimination against the chemical industry remained significant in the joint model.

In conclusion, the results we obtained from the data-set at hand are - to a large extent - in line with predominant results in the literature. Most of our findings confirm what our intuition would have predicted. The most surprising finding is probably that of increased scrutiny in cases with acquirers from a large EU country. Apart from that, our results blend in nicely with the choir of previous investigations on the subject.

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A Appendix

Time dummy regression

Table 19: Estimation results time hypothesis 2

Dependent Variable:	Conditions & Obligations		Phase I Conditions		Phase II Conditions	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Independent Variables						
miert	-0,1185647	-0,45	0,1025663	0,3	-0,041958	-0,14
monti	0,2098899	0,84	0,4612582	1,41	0,0181948	0,06
constant	**−1373839*****	-5,88	**−1826356*****	-5,83	**−1636692*****	-5,98
Observations	655		655		655	
Pseudo R^2	0,0119		0,0182		0,0004	
Log-likelihood	-209,30578		-155,77289		-130,70523	

*, **, *** Significant at the 10- , 5- and 1-% levels

Estimating the influence of Mario Monti on outcomes against that of his predecessor, Karel van Miert, we find no statistically significant evidence for a difference. This corresponds to the findings of Bergman *et al.* (2005).

Table 20: Estimation results time hypothesis 3

Dependent Variable:	Conditions & Obligations		Phase I Conditions		Phase II Conditions	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Independent Variables						
brittan	-0,2098899	-0,84	-0,4612582	-1,41	-0,0181948	-0,06
miert	**-0,3284546**	-2,17	**-0,3586919**	-2,07	-0,0601528	-0,34
constant	**-1,16395**	-13,66	**-1,365098**	-14,51	**-1,618497**	-14,79
Observations	655		655		655	
Pseudo R^2	0,0119		0,0182		0,0004	
Log-likelihood	-209,30578		-155,77289		-130,70523	

*, **, *** Significant at the 10- , 5- and 1-% levels

The regression with the Miert and Brittan dummies is largely symmetric to that printed in the text. The coefficient for Miert is negative, indicating increased lenience, whereas that for Monti is positive, which corresponds to stricter rulings.

Protectionist regression

Table 21: Estimation results protectionist hypothesis

Dependent Variable:	Conditions & Obligations		Phase I Conditions		Phase II Conditions	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
Independent Variables						
t_bigeu	−0,2651018*	-1,87	-0,2464719	-1,52	-0,1957811	-1,12
eu	0,3951676	1,60	0,6704457**	2,07	0,1482134	0,50
us	0,1456173	0,55	0,103218	0,29	0,1975147	0,64
ger	0,2339195	1,07	0,1505522	0,63	0,0425449	0,14
fra	-0,0448443	-0,22	-0,0248397	-0,11	0,2303828	0,96
constant	−1,469348***	-6,52	−1,898375***	-6,24	−1,734221***	-6,52
Observations	655		655		655	
Pseudo R^2	0,0203		0,0422		0,0088	
Log-likelihood	-207,52743		-151,97042		-129,60662	

*, **, *** Significant at the 10- , 5- and 1-% levels

The results are quite similar to the regression in the text. Dummies for Germany and France (which were found to be significant by i.e. Bougette and Turolla (2006)) do not appear to have any influence in this regression.

Zusammenfassung

Das Ziel der vorliegenden Diplomarbeit ist es, die Determinanten der Rechtssprechung der EU Kommssion in Fusionsfällen empirisch zu ermitteln. Als Grundlage für diese Analyse dient ein Datensatz von 655 Fusionsfällen aus den Jahren 1990 bis 2002, die von der Kommission hinsichtlich ihrer Kompatibilität mit dem gemeinsamen Markt untersucht wurden. Diese Fälle wurden mit einer umfassenden Datenbank verknüpft, welche uns Details zu den Rahmenbedingungen der jeweiligen Fusion liefert. Die zum Einsatz kommende statistische Methode ist, der binären Natur der zu erklärenden Variable (genehmigt ohne Auflagen, genehmigt mit Auflagen) entsprechend, ein Probit Modell.

Basierend auf fünf Arbeitshypothesen werden fünf verschiedene Modelle konstruiert, welche untersuchen ob die jeweilige Hypothese vom Datensatz empirisch unterstützt wird. Die Ergebnisse werden interpretiert, mit der relevanten Literatur verglichen und schließlich werden die statistisch signifikantesten Variablen in einem gemeinsamen, umfassenden Modell auf ihren Einfluß hin untersucht.

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