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THE IMPACT OF THE MORE ECONOMIC APPROACH ON EU MERGER DECISIONS

LEA BERNHARDT
RALF DEWENTER

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Department of Economics
Fächergruppe Volkswirtschaftslehre

Autoren / Authors

Lea Bernhardt

Helmut-Schmidt-University Hamburg
Department of Economics
Holstenhofweg 85, 22043 Hamburg
lea.bernhardt@hsu-hh.de

Ralf Dewenter

Helmut-Schmidt-University Hamburg
Department of Economics
Holstenhofweg 85, 22043 Hamburg
dewenter@hsu-hh.de

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Helmut Schmidt Universität Hamburg / Helmut Schmidt University Hamburg
Fächergruppe Volkswirtschaftslehre / Department of Economics

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Koordinator / Coordinator

Ralf Dewenter
wp-vwl@hsu-hh.de

The Impact of the More Economic Approach on EU Merger Decisions

Lea Bernhardt
Ralf Dewenter

Zusammenfassung / Abstract

This paper analyses all final merger decisions by the European Commission from the beginning of 1990 up to the end of 2019. We use a novel dataset, containing information about 6245 merger cases from all economic sectors and combining all sorts of decisions, inclusive of withdrawn and prohibited cases. Using text analyses techniques, we first analyse merger decisions documents in order to find trends and differences in language and wording with respect to the 2004 regulation. As a result, we find a shift in favour of terms associated with the More Economic Approach. On the contrary, the concept of dominance has decreased since 2004, indicating a strong decline in structural market parameters for merger reviews. While the tonality is found to be largely positive (especially for cleared cases), again, a change under different merger regimes seems to be evident. Second, accounting for differences in the usage of competition-related terms and by using simple OLS and logit regressions, we find that the duration of the merger review has increased significantly after the 2004 reform. At the same time, the probability of a merger being prohibited has not changed significantly.

Schlagworte / Keywords: Merger policy, Competition policy, Regulatory reform, EU Commission
JEL-Klassifikation / JEL-Classification: D78, K21, L40

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1. Introduction

The implementation of the new merger regulation in 2004 represented a “*radical reform*” of the merger control procedure in the EU (Mario Monti, 2022). A greater focus on efficiency related arguments and more economic analysis, on consumer welfare and quantitative price and quantity effects are some of the main elements of the new merger regulation (Budzinski, 2007). Both a stronger theoretical economic analysis and the use of more elaborate empirical methods are the focus of this approach. Due to these massive changes, the 2004 reform has therefore a potentially strong influence not only on the procedure but also on the outcome of the decisions. Because of the massive change in methodological and theoretical analysis we also expect a change in the wording and language of the decision documents.

In order to shed some light on the impact of the 2004 reform, this paper analyses all final merger cases from the beginning of 1990 up to the end of 2019. After providing some simple descriptive analyses, we use text analysis to analyse potential changes in the wording of the merger decision documents due to the More Economic Approach (MEA). We focus on the detection of any trend regarding topics of structural market parameters or terms related to the 2004 reform. We furthermore analyse the overall tonality of the decisions and determine the impact of the 2004 merger control on the course of tonality over time. Subsequently, we analyse the impact of the 2004 merger regulation on the duration of merger reviews as well as on the likelihood of a merger being prohibited. As we do not have any information on markets’ competitiveness such as market shares, concentration ratios and mark-ups, we account for the occurrence of competition-related terms in the documents. By these means, as the European Commission has already incorporated the results of the market analyses into the decisions documents for each case, we are able to approximate such measures.

Starting with the text analysis, our results shows that after 2004, there is a greater emphasis on questionnaires for competitors, consumers or other third parties of the merger. The tonality of the cases is always more positive than negative which seems plausible since the overall majority of cases are cleared without any obligations based on competitive concerns. As expected, we find that terms regarding efficiency defences, the SIEC test or coordinated effects occur only after the 2004 reform. The concept of dominance is steadily declining in importance, whereas the mentioning of foreclosure does not follow such a clear trend. Entry barriers are becoming less influential, as well as market shares.

Our regression analyses show that the duration of the merger reviews is substantially increasing due to the 2004 reform. Controlling for various factors we also find a change in duration with the introduction of other regulations such as the 2007 merger guidelines and the 2013 merger simplification package. Using dummy variables accounting for the occurrence of competition-relevant terms sharpens the results but do not change them significantly. However, determining the impact of the merger regulation on the probability of a merger being prohibited, we found only little statically significant and almost none economically significant change after 2004 (or even after any other regulation).

The paper is now structured as follows: Section 2 reviews the theoretical foundations of merger reviews and the different merger regulation reforms in the EU. Section 3 describes the dataset in detail, focusing on the different decisions, economic sectors and Commissioners. In Section 4, the regression results as well as the findings of the semantic analysis are shown and discussed. Section 5 concludes.

2. Literature Review and Theoretical Background

In this section, we focus on specific concepts related to the more economic approach, explain some aspects such as collective dominance or efficiency defence in more detail and review the latest research on the impact of the 2004 reform on the EC merger control.

2.1 The More Economic Approach

By implementing the 2004 merger reform, the EC introduced a “more economic approach”, explicitly taking efficiency gains into account and assessing coordinated and unilateral effects (Christiansen & Kerber, 2006, p. 218). The previously conducted test for dominance has been replaced by an analysis of a “*significant impediment to effective competition*” (SIEC) (Council Regulation (EC) No. 139/2004 of 20 January 2004 on the Control of Concentrations between Undertakings, 2004). As the SIEC standard also considers unilateral effects, a merger can be challenged if a reduction in effective competition is seen as likely, even without the assumption of a dominant position after the merger (Zimmer, 2004). For example, structural market parameters, such as high market shares, are no longer a necessity in order to challenge a merger. This new substantive test is therefore broader than the previously used test for dominance. If a SIEC is established, non-coordinated effects in oligopolistic setting can lead to a prohibition, without single or collective dominance (Jones & Sufrin, 2014, pp. 1182–1184). Some argue that the introduction of a more economic approach can be seen as an attempt of the EC to reach more case-specific decisions, resulting in a “*wider application of rules of reason*” (Christiansen & Kerber, 2006, p. 219). In a comparative study of the European with the US merger regime, Bergman, Coate, Mai, and Ulrick (2019) find that the implementation of the SIEC test has led to a convergence of the two merger policies as differences between the US and the EU have become smaller. They suggest that the policy of unilateral effects has led two regimes to converge.

Reasons for the revision of the merger policy in 2004 have been discussed extensively in the literature. One argument relates to some disputed court decisions in the early 2000s. In 2002, three final merger decisions of DG Comp were overruled by the Court of First Instance (CFI). In the first case, the British company Airtours challenged the prohibition of its merger with one of its competitors, First Choice, set by the Commission in April 1999. The CFI mostly criticised the lack of economic evidence which was supposed to prove a collective dominant position created by this merger in the market for tour operators. It therefore annulled the decision in June 2002 (*Airtours plc vs. Commission of the European Communities*). Two other cases were both overruled by the CFI in October 2002: The merger of the French manufacturers Schneider/Legrand in the market for electrical equipment and the merger of the companies Tetra Laval BV and Sidel (*Tetra Laval / Sidel*, 2003). The CFI annulled the prohibition decision in the Schneider/Legrand case based on “errors, omissions and inconsistencies [...] of undoubted gravity” (*Schneider Electric SA v Commission of the European Communities*, p. 108). In the second case, the merger between the then world-leader of packaging products for cartons Tetra Laval and the French manufacturer of PET plastic bottles, Sidel, the CFI rejected the Commission’s veto even without a detailed examination (*Tetra Laval BV v Commission of the European Communities*). In line with the previous annulments, the CFI strongly condemned the conducted economic analysis of the anticipated anti-competitive effects. Some researchers regard this ruling as one of the driving forces for the development of a revised merger review afterwards in order to avoid future setbacks (Bradford, Jackson, & Zytneck, 2018; Duso, Gugler, & Szücs, 2013). However, as argued for example in Lyons (2004), a reform process was already taking place before these events, following a formal consultation document which was published in December 2001. Lyons identifies three other main forces: “maturity in merger regulation; increasing use of economic analysis; and expanding membership of the EU” (Lyons, 2004, p. 249).

2.2 Coordinated Effects

In the EC's 2004 merger guidelines, collective dominance is referred to as one reason for an impediment of effective competition in oligopolistic settings (European Commission, 2004). Pro-collusive, or coordinated effects, may increase the likelihood of collusion in the industry (Röller & Neven, 2000). This is due to the smaller number of firms in the market post merger which can affect the scope for coordination strategies among firms. In the early years of European merger reviews, the EC used to focus solely on single market dominance (Kerber, 1994, p. 97). As Kerber (1994) points out, there was no discussion about possible collective market dominance, even though some markets showed high rates of concentration. Instead, the EC preferred highly concentrated markets in case when the market shares of the nearest competitor were relatively close to the ones of the industry leader, independent of aggregated, collective market shares (Kerber, 1994, p. 97). In case M.165, the merger of the German cable manufacturer *AEG Kabel* with *Alcatel*, the EC cleared the merger although the Bundeskartellamt raised concerns over the highly concentrated market structure (*AEG Kabel / Alcatel*, 1991). The German competition regulatory agency highlighted the aggregated market share of the three biggest suppliers in the market, which could lead to an emergence of a dominant oligopoly in several German markets for power and telecommunication cables (Bundeskartellamt, 1993, p. 28). Although the EC dismissed the analysis of collective market dominance, it introduced the concept one year later in several cases (for an overview, see Kerber, 1994, pp. 101–102). One of them was the landmark case M.190, the acquisition of French manufacturer and distributor of bottled waters *Perrier* by the Swiss company *Nestlé* in 1992 (Willis IV, 1993). The merger was only cleared after *Nestlé* agreed to a modified merger proposal, adhering to a series of commitments (*Nestlé/Perrier*, 1992). Importantly, it was the first time that the EC considered the oligopolistic market structure, in this case with three national water suppliers, as one crucial aspect which could potentially weaken price

competition and results in very high market transparency (*Nestlé/Perrier*, 1992, p. 92). In the next section, we will explore the use of the concept of coordinated effects over time in the EC's merger control.

2.3 Efficiency defence

Closely followed by the publication of the 2004 merger regulation, the first horizontal merger guidelines were published by the EU, explicitly stating that efficiency claims are also considered by the EC (European Commission, 2004). In the literature, this concept is referred to as “efficiency defence” (Bergman et al., 2019). Thus, efficiency gains are taken into account when assessing the impact of a merger. As Motta (2009) points out, the net effect of a merger could be ambiguous, depending on whether efficiency gains outweigh higher prices or not. This is because mergers can also create synergies between the merging companies, leading to lower production costs and higher overall efficiency. If these benefits compensate the higher levels of market power, then consumer surplus is stabilised by lower prices due to these efficiency gains. On the other hand, if a merger does not create any synergy effects, it will instead contribute to higher prices (Farrell and Shapiro, 1990).

2.4 Impact of the reform

Several studies have analysed the impact of the 2004 reform on the relevance of certain concepts of competition policy. For instance, Affeldt, Duso, and Szücs (2021) focus in their seminal paper on specific geographic and product markets and estimate the probability of a challenge by the EC. In a comprehensive study, they analyse 5109 merger case from 1990 up to 2014, excluding referrals and withdrawals in Phase I. Furthermore, they use observations on the product and geographic markets affected by the merger and estimate linear probability models in order to identify the impact of specific merger characteristics on decision to intervene by the EC. The analysed determinants for concerns are concentration, market share, entry barriers and

foreclosure. In addition, the study contains an implementation of a causal forest algorithm in order to uncover heterogeneous effects which can arise due to different correlations of the determinants in different merger settings. The authors identify a shift towards more complex indicators such as barriers to entry a market after 2004 whereas dominance is less important. The relevance of concentration seems to remain stable over time and shows a high correlation for concerns in markets with high market share and entry barriers.

Duso et al. (2013) also examine the merger reform empirically, focusing on different concepts of effectiveness, for example as measured in decision errors or deterrence. Their sample consist of 368 merger cases, from 1990 until 2007. The authors implement two probit models with observable characteristics based on firm-level data. According to their results, the MEA improved the predictability of the EC's decisions and therefore, a reduction of systematic mistakes can be observed. With regards to specific factors which are likely to correctly predict the outcome, Duso et al. (2013) identify barriers to entry, dominance, market definitions and Phase II referrals. After 2004, market definition becomes increasingly significant whereas Phase II investigations are less important.

In another study by Mai (2016), the author uses a sample of 341 mergers from 1990 up to 2012 and estimates the probability of a challenge by the EC. The results contain robust evidence for changes in the EC's policy after the 2004 reform. By distinguishing between "unilateral-effects mergers" and "coordinated-effects mergers", it is shown that it is more likely that a merger with coordinated effects is being challenged after 2004 compared to before the reform. Thus, Mai (2016) concludes that the merger review has been less strict for mergers with unilateral effects post reform. With regards to specific aspects of the merger review, market shares are shown to become less important after 2004, similar to the study by Affeldt et al. (2021).

Covering a rather small sample of 50 cases, Fernandez, Hashi, and Jegers (2008) estimate the probability of a merger not being cleared after the 2004 reform, in a time span ranging from January 2005 up to the end of 2006. The authors use the information provided in the decision documents and extract them manually. Additionally, they interpret some phrases for competitive concerns, such as entry barriers or the geographic scope of the merger, in case it was not explicitly stated. For non-cleared cases, the study uses some Phase I conditionally cleared cases and some Phase II cases which are also all cleared. It is argued that this selection is due to the lack of prohibitions but it remains difficult to identify finally cleared cases as non-cleared as these are rather “challenged” cases. For their results, the authors present an increase in market shares and the contestability of the market as the main drivers for “non-clearance”. Entry barriers are assumed as “*the most serious concern*” (Fernandez et al., 2008, p. 807). Since the sample selection of the study does not include both cases before and after the reform, an interpretation of the results regarding changes due to the reform of 2004 remains unclear.

In a similarly designed study, Mini (2018) estimates challenges rates of cases pre- and post-reform with a special focus on concerns regarding unilateral effects. Explanatory variables of the probit model contain, inter alia, different concentration levels as measured by the HHI or market shares, respectively. The dataset consists of 1670 distinct cases between September 1990 and December 2013, where 791 of them are after the reform. Results suggest that after the reform, the EC challenged less cases with unilateral concerns, for mergers where the HHI post merger was intermediate, that is, not very high or very low. In summary, Mini (2018) also concludes that the reform 2004 lead to a less strict enforcement as the probability of a challenges decreases, depended on the HHI levels.

To the best of our knowledge, there exists no comprehensive textual analysis of the EC’s merger decisions so far. We build upon previous literature by selecting our relevant terms for

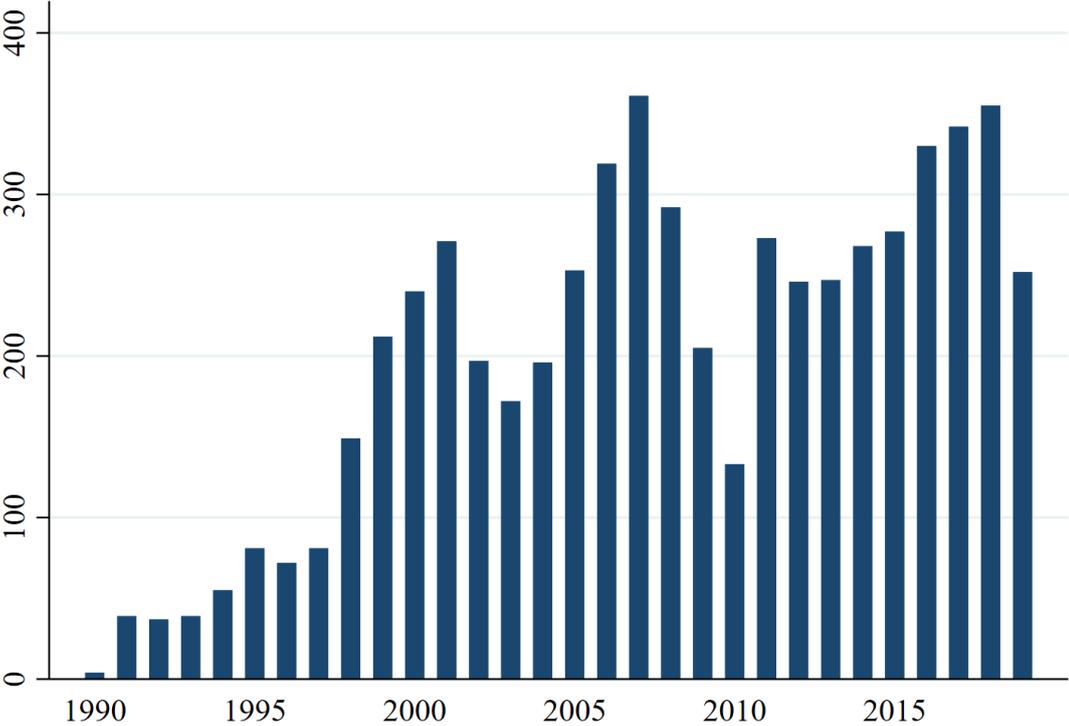
dictionaries (e.g. from Lyons (2004), Christiansen and Kerber (2006), Budzinski (2007) or Heim, Hüschelrath, and Laitenberger (2015)) and use similar estimation models for predicting the probability of non-clearance (see, e.g., Bergman, Jakobsson, and Razo (2005)). We do, however, extend the current knowledge by analysing 29 years of merger control, additionally applying automated text analysis and dictionary approaches on all available case decision documents. In contrast to the previously mentioned seminal study by Affeldt et al. (2021), we do not distinguish between different product markets and instead focus on different dictionaries for arguments relating to structural market parameters and the More Economic Approach.

3. Data and Methods

Our dataset consists of all merger decision documents prepared by the EU's Directorate General for Competition (DG Comp) from 1990 up to the end of 2019. In particular, we collect all final decisions which are available in English. Our focus lies on the English-language cases as the English language is one of the three official working languages of the Commission, besides German and French. The automation of language processing is simplified when the corpus of documents, the structured set of texts, consists of only one language. For setting up our dataset, we retrieve all files from the official website of DG Comp for the given time period (European Commission, 2020). In total, we end up with a collection of 6245 English decision documents (for an overview, see Figure 3) and extract the following basic information about every case: case number, parties involved, notification date of the merger, final decision date by the DG, word lengths in every document, associated economic sector and the type of decision. The latter is used for identifying whether a merger was approved directly, cleared only under certain conditions or prohibited.

Figure 1 shows the number of cases per year in our sample, ranging from 1990 up to the end of 2019. There seems to be both an overall positive trend in the number of cases over time and also a cyclical development of case numbers, as the number of words in every decision varies substantially over time.

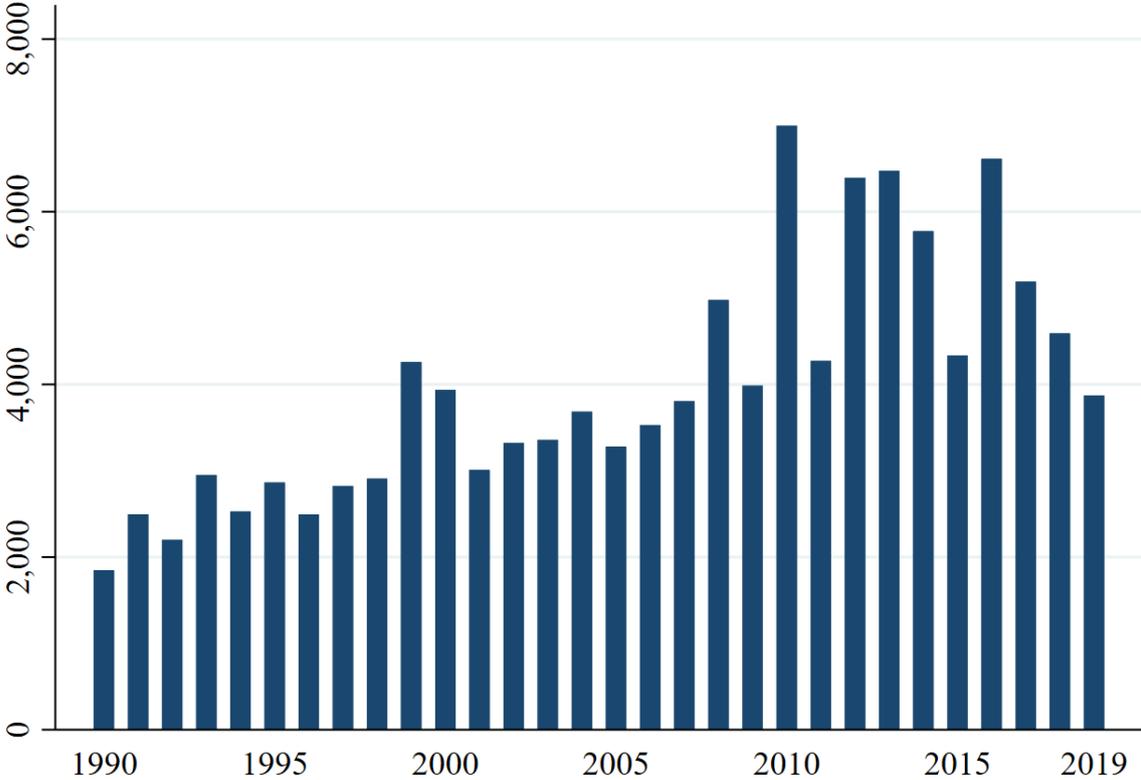
Figure 1. Number of cases per year.



The average length of the decision documents increases intensely, as shown in Figure 2. Before 1998, the cases have on average a total of 2'777 words per document. During this period, the most extensive case has 25'030 words: The merger between the two US companies Kimberly-Clark Corporation of Dallas and Scott Paper Company of Philadelphia of 16 January 1996 (European Commission, 1995). In the years between 1999 and 2010, the average number of words varies around 4'000. One extreme outlier here is the merger between the airlines Ryanair / Aer Lingus which was prohibited under article 8(3) of the Merger Regulation (European Commission, 2007). This decision took almost a year until it was finalised in 2007, resulting in a very detailed and extensive decision document with more than 20'000 words. After 2010, the figures fluctuate sharply around 6'000 words with a high variance. This is due to some

extraordinarily large and complex cases in recent years. The longest case overall is the merger between the chemical companies Dow and DuPont, cleared in March 2017. Its final decision document spans 915 pages and contains nearly 405'000 words (European Commission, 2017).

Figure 2. Average number of words in the decision documents per year.



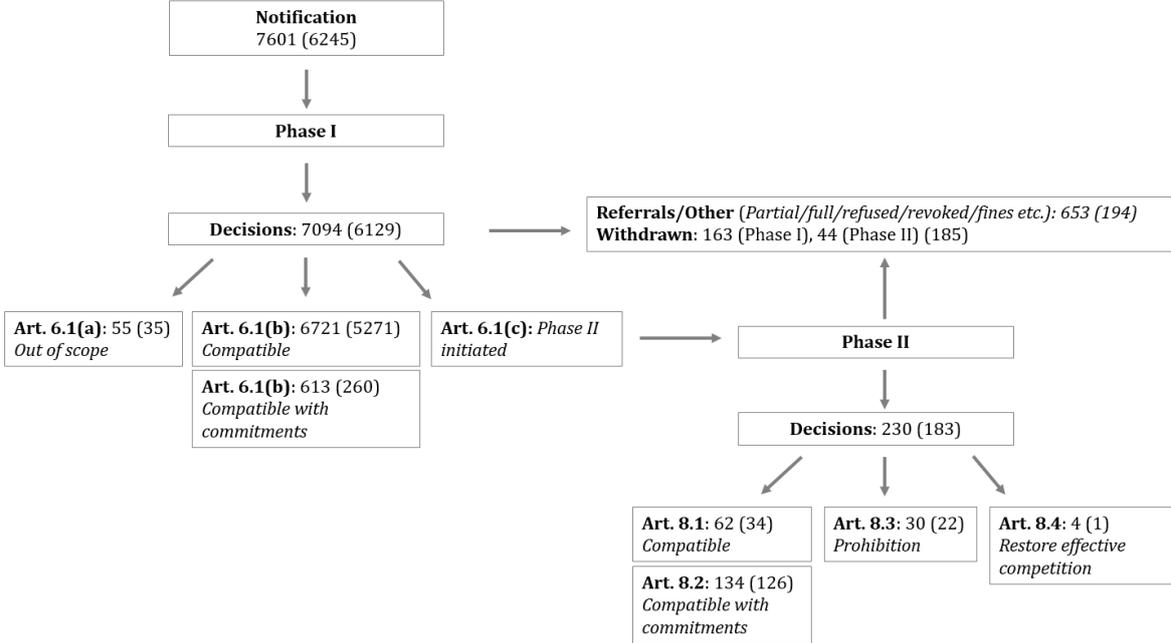
3.1 Decision

We identify the most relevant articles for merger decisions according to the EU Competition Law Rules (European Union, 2010). These include articles 6(1)a, 6(1)b and 6(1)c for Phase I and 8(1), 8(2) and 8(3) for Phase II decision, respectively. Figure 3 provides an overview of all cases notified at the EC, according to the official merger statistic.¹ In total, 7601 cases have been registered at the EC in the time period of 21 September 1990 until the end of 2019. Since

¹ https://ec.europa.eu/competition-policy/document/download/4b083559-e36c-44c2-a604-f581abd6b42c_en?filename=Merger_cases_statistics.pdf (21/07/2022).

our sample only contains mergers which are accompanied by a final decision document in English, we obtain 6245 cases for our analysis (see Figure 3, numbers in brackets).

Figure 3. Statistic of all cases officially notified at the EC and in our sample (in brackets).



Note: For referrals, the number of cases in our sample is relatively low due to the lack of final decision documents. Requests for referrals are not included in the figures as they appear again in the decision of the referral. For Art. 6.1(c), numbers are included in Phase II decisions or withdrawals/other, respectively.

In cases where commitments are not fulfilled or agreements cannot be reached, a merger can eventually be prohibited or withdrawn by the notifying parties. Article 8(3) refers to a prohibition in Phase II, as shown in Figure 3. In total, we have only 30 prohibitions over the whole time period which refers to 0,4% of all notified cases. This, however, should be interpreted carefully as the number of withdrawals and cases with commitments is not reflected in this definition. The overall majority of cases in our sample is cleared in Phase I under article 6.1(b). Cases under Art. 4(4) are fully referred from the Commission back to the competent authorities of the member states, for example in Case M. 3534, where the geographic focus of the merger was entirely on the United Kingdom and therefore, the case was not to be decided by the EC (*Cargill / ABF / Allied Grain JV*, 2011). Similar to Art. 4(4), a case can also be referred back to the member states under Art. 9(3), either partially or fully, also on request by the member state, after investigation by the EC (see for example M.1827 *Hanson/Pioneer*,

2000).

Another interesting aspect is the rather low number of mergers outside of the scope of the merger regulation, indicated by Art. 6.1(a). In total, only 55 cases have been recorded as out of scope which refers to 0.7% of all notified cases. Moreover, these 55 cases are unevenly distributed over time: Most of them appear in the early years of the European merger reviews. After 2004, there are only 3 cases classified as of type Art. 6.1(a). This could indicate that firms are better able to assess jurisdiction in merger control.

3.2 Sector

The official “Statistical Classification of Economic Activities in the European Community” provides the framework for our analysis of the distribution of economic sectors in our dataset (European Commission, 2020b). An overview of the classification and notation of the codes is given in Table 1. In our sample of all merger cases, sector C, the manufacturing sector, incorporates the most cases (39%). Sector G (Wholesale and retail trade) includes 11% of all cases, and sector K (Financial and insurance activities) includes 9,8%. Table 1 shows the distribution of the economic sectors.²

² For some cases, no economic sectors could be identified. Thus, we only report 6002 cases with a given economic sector. Many of the cases without a given sector are decided under Art. 4(4), Art. 14 or withdrawn.

Table 1. Distribution of economic sectors, sorted descending.

Sector	Freq.	Percent	Cum.
C - Manufacturing	2,337	38.94	38.94
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	676	11.26	50.2
K - Financial and insurance activities	589	9.81	60.01
J - Information and communication	563	9.38	69.39
H - Transporting and storage	426	7.1	76.49
D - Electricity, gas, steam and air conditioning supply	302	5.03	81.52
N - Administrative and support service activities	211	3.52	85.04
L - Real estate activities	207	3.45	88.49
M - Professional, scientific and technical activities	125	2.08	90.57
I - Accommodation and food service activities	103	1.72	92.29
B - Mining and quarrying	91	1.52	93.8
F - Construction	91	1.52	95.32
E - Water supply; sewerage; waste management and remediation activities	73	1.22	96.53
Q - Human health and social work activities	73	1.22	97.75
R - Arts, entertainment and recreation	58	0.97	98.72
O - Public administration and defence; compulsory social security	28	0.47	99.18
S - Other services activities	24	0.4	99.58
A - Agriculture, forestry and fishing	14	0.23	99.82
P - Education	6	0.1	99.92
T - Activities of households as employers	5	0.08	100

3.4 Text Analysis

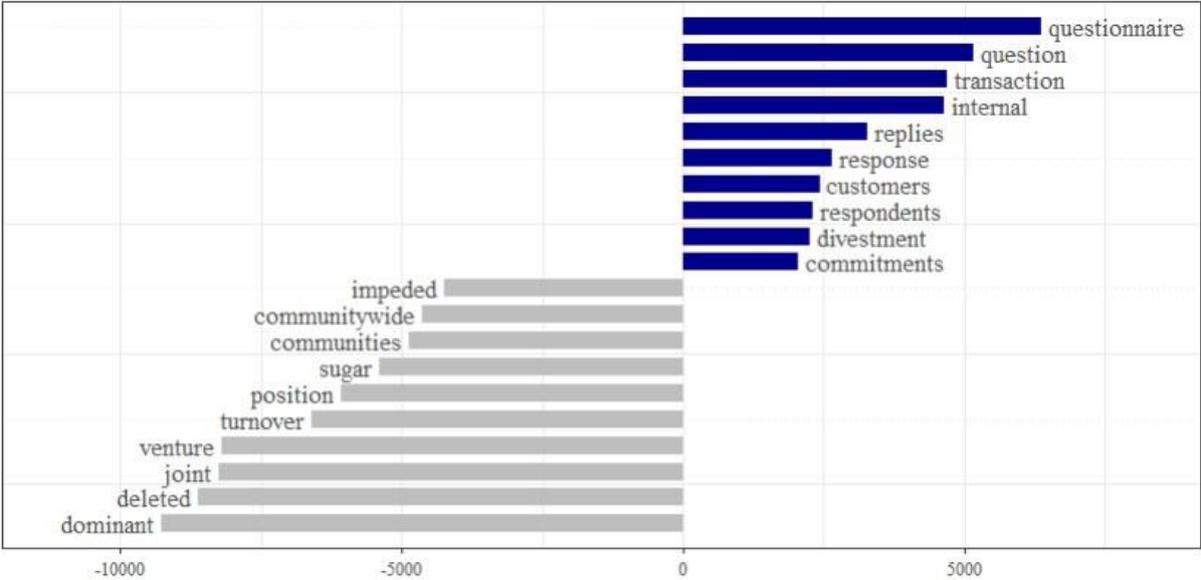
In this section, we analyse the final decision documents of all merger cases in our sample, using text analysis.

Keyness Analysis

First, we identify differences in the wording before and after the 2004 merger reform. We implement a keyness analysis by splitting the corpus into a target and a reference group (Benoit et al., 2018). The keyness of a given term or feature in general refers to a score of occurrence across different categories. In our case, the categories are the mergers before and after the 2004 reform, that is a merger is either decided before or after 2004. These two categories then build the basis for the two groups, the reference and the target group of documents. In Figure 4, the most frequent terms before the 2004 reform are given in grey bars and the ones after the reform

in blue bars, respectively. General stop-words and terms referring to individual companies or common abbreviations (such as “eea” for European Economic Area) are removed in advance. After the reform 2004, we observe a higher probability for the terms “questionnaire” and “question” which indicate a greater emphasis on feedback from the merging parties, competitors, customers or other third parties. Interestingly, before the reform, the term “dominant” was used more often than after the reform. This hints at less influence of the concept of dominance in the merger review, a result that is in line with the findings of Affeldt et al. (2021) who show that arguments related to dominance significantly decrease after 2004.

Figure 4. Keyness analysis for comparing the relative frequency of terms before/after the MEA.



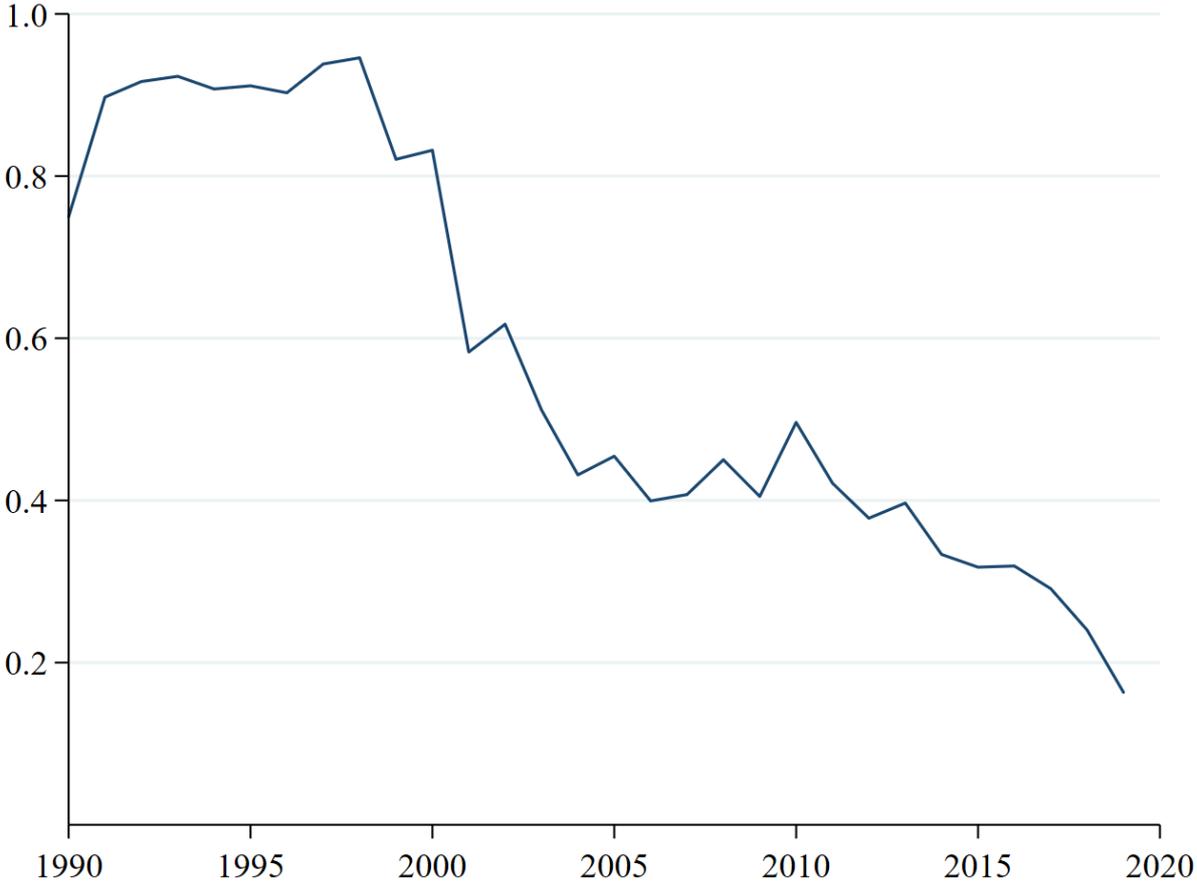
Dictionary Approach

Second, we analyse individual terms or groups of terms which represent specific economic or theoretical concepts, such as terms relating to structural market parameters like dominance or entry barriers.³ We assume that the focus on topics regarding such structural indicators is decreasing over time and should decline especially after 2004. As seen in Figure 5, there is a

³ These terms are: dominance, dominant, market share, market shares, entry barrier, entry barrier, barriers, market entry, entries, foreclosure, foreclose.

substantial decrease in the proportions of cases which refer to these structural market parameters but the decline did not start in 2004. Instead, the negative trend can be traced back to the beginning of the 2000s. Time series for all individual terms can be found in the appendix (Figure 12).

Figure 5. Proportion of cases that contain at least one term relating to structural market parameters (dominance, foreclosure, market share, entry barrier), aggregated per year.

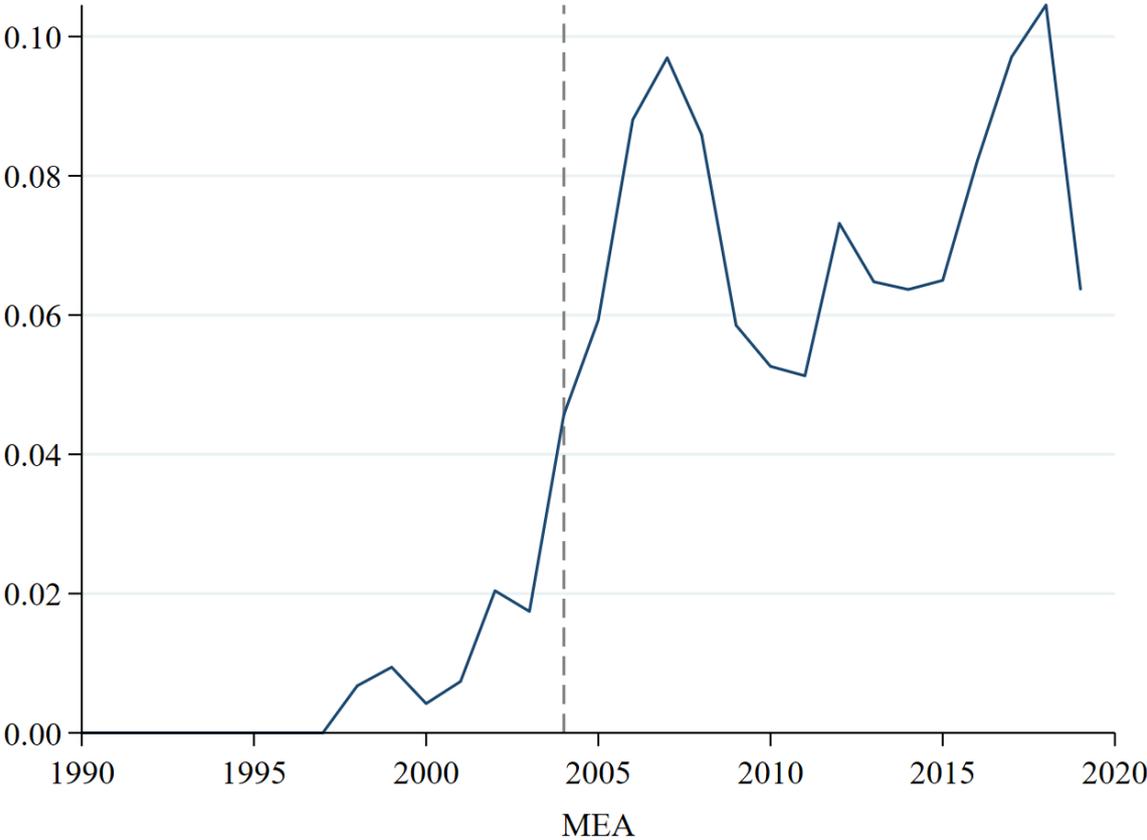


Since the terms relating to structural market parameters are declining over time, as expected, we also use a separate dictionary of terms related to the More Economic Approach.⁴ Terms include coordinated effects, efficiency defence or different elasticities which are sometimes

⁴ The terms used are: Welfare, consumer welfare, Significant Impediment to effective Competition, SIEC, coordinated effect, uncoordinated effect, coordinated effects, uncoordinated effects, non-coordinated effects, unilateral effect, efficiency defence, efficiency defence, SSNIP, Small but significant and non-transitory increase in price.

analysed during the merger review process due to the More Economic Approach. The result is plotted in Figure 6. During the 1990s, we see relatively high values which seems counterintuitive. After 1997, we observe a steady increase and a clear trend in the mentioning of the MEA related terms over time.⁵

Figure 6. Proportion of cases that contain at least one term relating to terms in the MEA dictionary, aggregated per year.

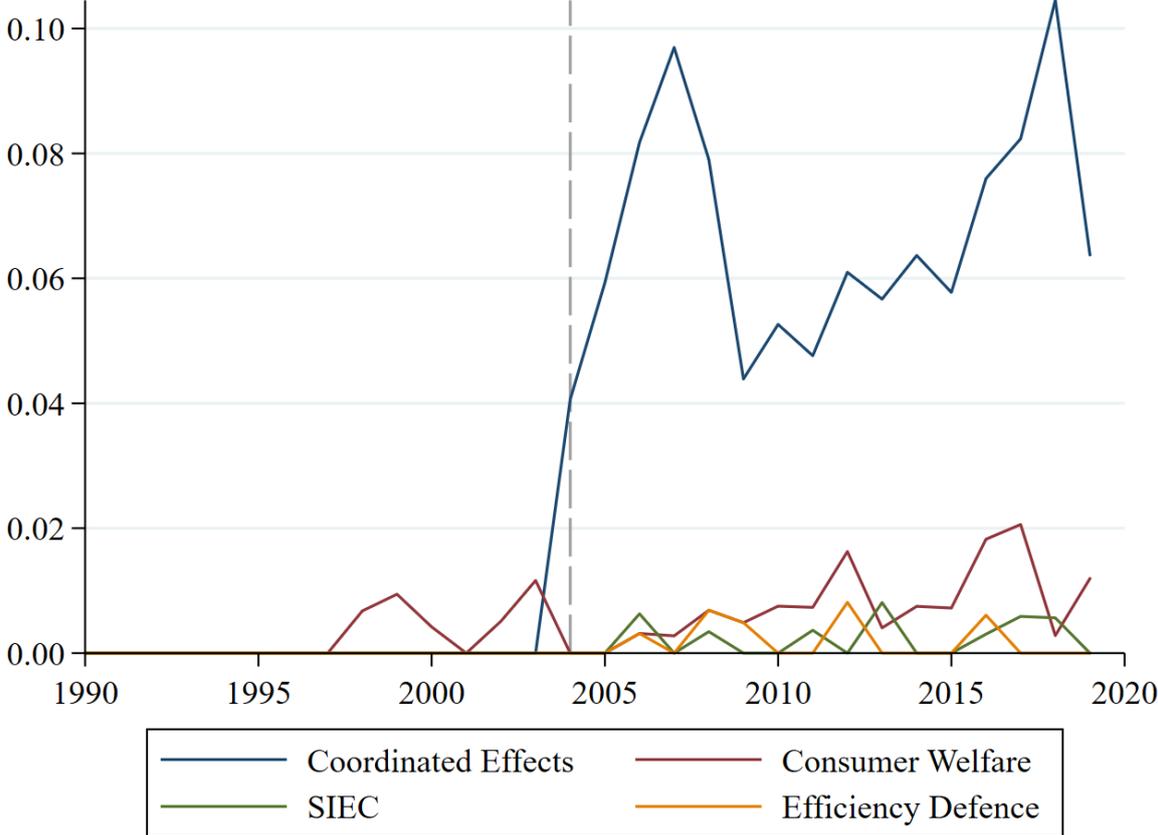


A closer look into specific terms reveals interesting differences. Terms regarding coordinated or uncoordinated effects are, as expected, only relevant since 2004 (Figure 7) and have been used in the decisions every year from 2004 onwards. Similarly, the introduced concept of efficiency defences or the SIEC test (Significant Impediment to Effective Competition) in the

⁵ While on 30 June 1997 the Council Regulation (EC) No 1310/97 was adopted, it is not clear in what way this regulation could have influenced the wording of the merger decisions.

merger review can be clearly detected in the decision documents. Interestingly, other terms, relating to efficiency are used constantly over time, without any substantial trend in the data (see Figure 11 in the appendix).

Figure 7. Proportion of cases regarding coordinated effects, consumer welfare, SIEC, efficiency defence, aggregated per year.

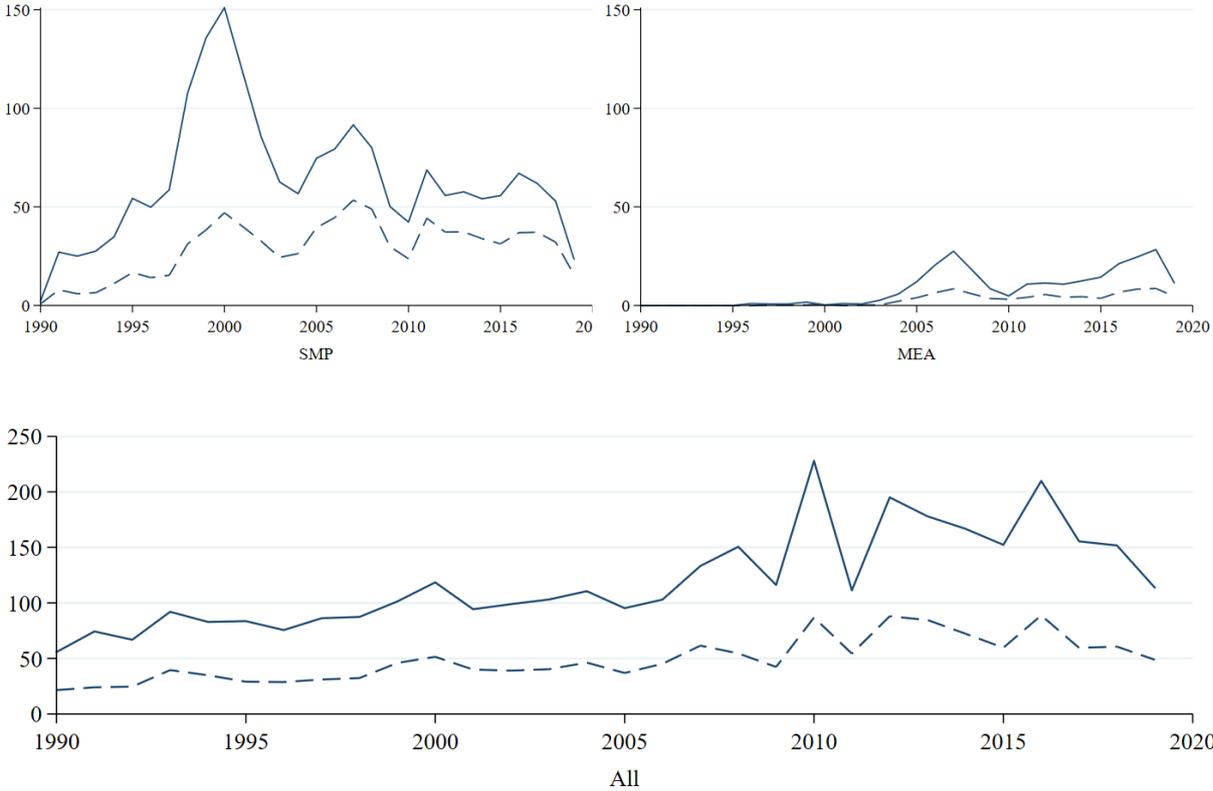


Tonality

Third, we analyse the tonality of the decision documents in the context of competition concerns. Since the length of the documents varies substantially (see Figure 2 for comparison), we obtain the relative term frequencies of positive and negative terms within the Lexicoder Sentiment Dictionary (Young, L. & Soroka, S., 2012), implemented in quanteda (Benoit et al., 2018). The results are plotted in Figure 8. As shown, the tonality of the decisions is always more positive than negative throughout our observation period. As the tonality of cleared cases is more positive than the one of non-cleared cases (Bernhardt, 2021) and most cases are finally cleared,

this result is very plausible. Furthermore, we take a closer look into the tonality of terms around specific keywords and phrases, in a given window of +/- 10 terms.⁶ First, we select the same keywords relating to structural market parameters (SMP) as before, such as dominance or entry barriers. Second, we use the keywords relating to the 2004 reform and the More Economic Approach, such as efficiency defence or the SIEC test. The tonality of terms relating to SMP reaches its maximum for positivity around 2000 and decreases afterwards. Interestingly, there is no continuous decline in positively classified terms around SMP as there are small peaks around 2007, 2011 and 2016. For terms around MEA keywords, there is a clear peak in positive tonality after 2004 but we cannot observe a clear tendency towards a positive trend.

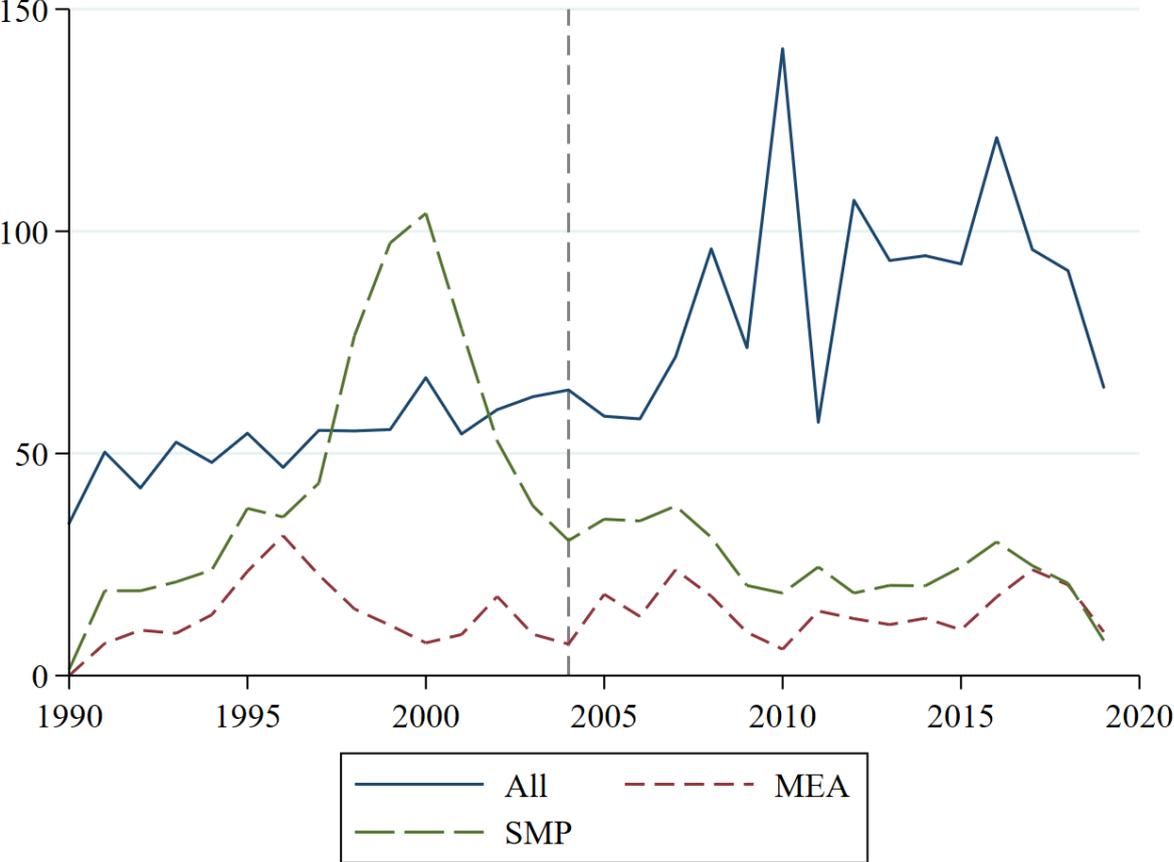
Figure 8. Relative frequency of positive (solid) and negative (dashed) terms per year. In the two graphs in the top, the tonalities of terms related to keywords of structural market parameters (left) and the More Economic Approach (right) are depicted. The graph below shows the tonality of all terms, regardless of specific keywords.



⁶ We have tested to vary the window of terms to +/- 5 and +/- 10 around the keyword but the results did not change considerably.

As a next step, we also calculate the sentiment by subtracting the negative values from the positive ones (Figure 9). Again, we observe a peak of positively toned decisions around 2007/2008, followed by a steep decline in sentiment which seems surprising since the number of prohibitions or withdrawals has declined substantially after 2002: Before 2002, around 7% of cases were withdrawn or prohibited, whereas after 2002, only 2.8% of cases were not cleared (Bernhardt, 2021). Thus, we would not expect such a decrease in sentiment. After a dip in 2010, the sentiment increases again and reaches its maximum near the end of our observation period.

Figure 9. Sentiment of merger decisions (positive minus negative) per year.



4. Regression Analysis

In this chapter, we conduct a regression analyses of merger reviews. First, we analyse the impact of merger regulation on the duration of merger reviews as well as on the probability of a merger being prohibited. Second, we turn to our semantic analysis, determining any changes on wording and tonality.

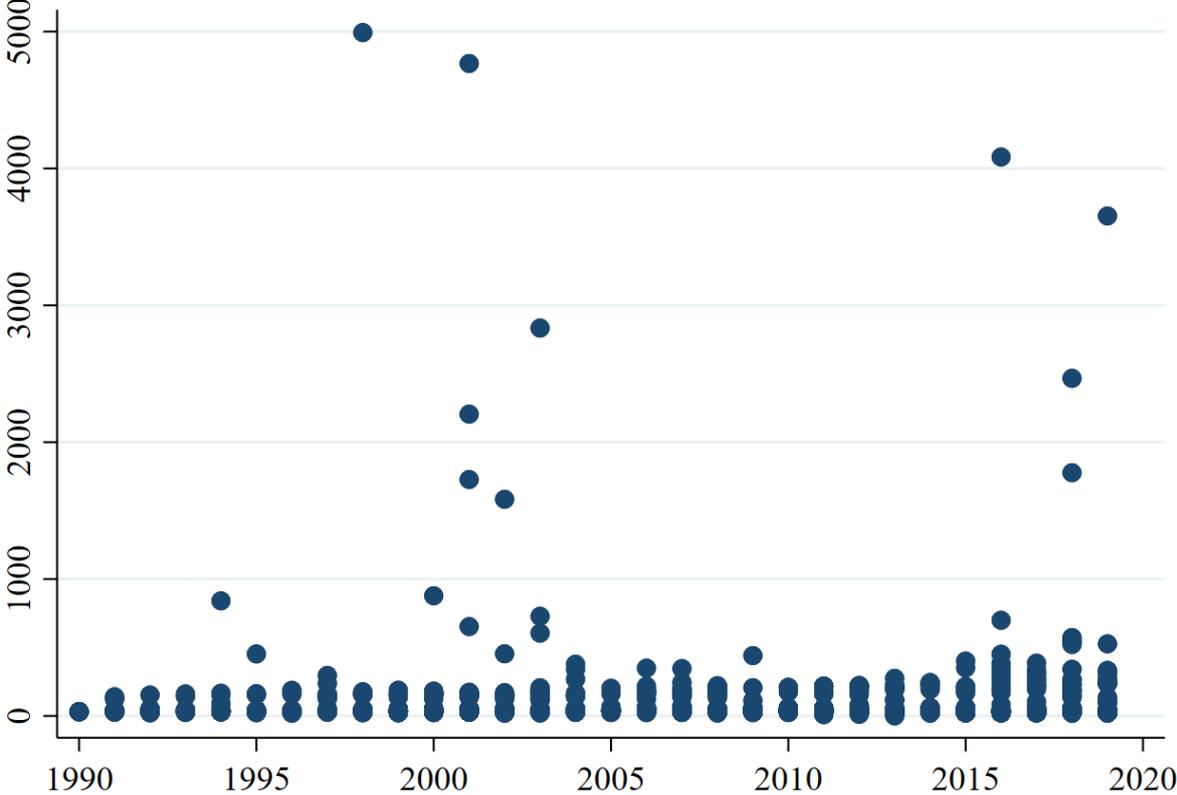
4.1 Duration of merger reviews

The duration of a case analysis depends on various factors such as the complexity, the competitiveness of the affected markets and possible efficiencies. A decisive factor in determining the duration of the investigation is whether the merger is resolved Phase I or phase 2. When entering Phase I of the merger control procedure, the European Commission has 25 working days to analyse the case. Most of the cases are resolved in Phase I, in general without any remedies (European Commission, 2013). At the end of Phase I there are two possible outcomes of the procedure: first, the merger is cleared (unconditionally or with respect to remedies). Second, the Commission still has competition concerns and opens a phase II investigation. Phase II is an in-depth analysis of the case. In general, the Commission has 90 working days to come to a decision. The period can be extended to some degree (by additional 15 and 20 working days) under certain circumstances. However, it is not uncommon for the investigation period to be even longer. Given all merger cases from 1990 to 2019 the analysis of 11 cases took more than 1000 days and 28 cases took more than 400 days. 3.68% or more than 200 cases took more than 150 days. However, the vast majority of all merger (more than 91%) is resolved within 45 days (see Figure 10).

Factors that seem to be suited to reflect the complexity and therefore the duration of merger reviews are typically connected with companies involved in the merger or with the respective markets. However, firm- and market-specific factors such as market shares, concentration rates,

entry barriers, mark-ups, profits or costs are either not included in the decisions, blackened out or cannot easily be extracted from the documents, especially not through automated techniques.

Figure 10. Duration of the merger reviews per year, measured in days.



For this reason, we chose covariates that we assume will affect the duration of merger analyses and that are easier to extract from the documents. As economic sectors are characterised by different competition intensities we use dummy variables accounting for the primary economic sector that is affected by the merger (see Table 4 in the appendix for an overview). Since the article after which a merger is decided provides exact information on whether this case is cleared, withdrawn, approved etc. (see Table 1), this information should be highly correlated with duration. We therefore generated dummy variables to account for the respective article used. Finally, as an alternative to article dummies, we also used a dummy variables indicating if a merger is a phase I or phase II merger.

As we are aware that omitting market- and firm-specific factors can result in severe misspecification, we address this problem with a semantic approach. Instead of gathering information on, e.g., the concentration rates, number of competitors, barriers to entry and other factors, we count the number of structural and competition-relevant terms within a document. As can be seen from Table 8 in the appendix, we use 22 categories of terms, which are connected to the intensity, and restrictions of competition. The idea behind this approach is that – albeit the occurrence of a specific term cannot prove any pro- or anti-competitive effects – the occurrence of a higher number of terms is assumed to be a proxy for concerns over these terms of the European Commission.⁷ We therefore built dummy variables indicating if these terms occur in the decisions

To account for the 2004 regulation, we created a dummy variable which is equal to one since the time the regulation came into force and zero otherwise. As the 2004 merger regulation is not the only regulation which could have an impact on the duration of merger reviews, we also included two additional dummy variables (Reg2007 and Reg2013) in order to account for respective regulations:

At the end of November 2007, the European Commission adopted the so-called non-horizontal merger guidelines to simplify the application and interpretation of the EC Merger Regulation on non-horizontal mergers.⁸ Reg2007 indicates the time when this guidelines were adopted.⁹ On 5th of December 2013, the European Commission adopted a merger simplification package

⁷ An improvement and of this approach a task for future research would be to analyse the tonality of the terms within a specific document.

⁸ EU 2008/C 265/07.

⁹ European Commission (2007), Mergers: Commission Adopts Guidelines for Merging Companies with Vertical or Conglomerate Relationship (Press release, 28 Nov. 2007).

“in order to simplify and expedite the examination of concentrations that are unlikely to raise competition concerns [...]” (European Commission, 2013). The regulation became applicable as of 1st January 2014 and included a number of measures as, e.g., an relaxing of market share thresholds and an adaption of information requirements.¹⁰

Table 2. Survival analysis.

Duration	(1) Cox Full sample	(2) Cox < 1000	(3) Cox < 300	(4) Cox Full Sample	(5) Cox Full Sample
Reg2004	.7171 (0.00)	.6992 (0.00)	.6918 (0.00)	.7221 (0.00)	.7192 (0.00)
Reg2007	1.21 (0.00)	1.21 (0.00)	1.21 (0.00)	1.30 (0.00)	1.29 (0.00)
Reg2013	1.45 (0.00)	1.47 (0.00)	1.54 (0.00)	1.71 (0.00)	1.68 (0.00)
Phase	-	-	-	2.34 (0.00)	-
Sector dummies	YES	YES	YES	YES	YES
Article dummies	YES	YES	YES	NO	YES
Competition terms	NO	NO	NO	YES	YES
Observations	5,989	5,979	5,942	5,989	5,989
Log Likelihood	-45863	-45740	-45394	-45283	-45243
Wald Chi	7430843 (0.00)	8449479 (0.00)	1.20e+07 (0.00)	1211337 (0.00)	512892 (0.00)

Note: Robust and clustered standard errors (on sector level) in parentheses.

To estimate the impact of the merger regulations on the duration of merger investigations we use semi-parametric proportional-hazard Cox models (see Table 2). Starting with the full sample, we find that all three regulations (Reg2004 and Reg2007, Reg2013) have an impact on

¹⁰ See Commission Implementing Regulation, (EU) No 1269/2013.

investigation time. Both Reg2007 as well as Reg2013 have a negative effect on the duration of the merger reviews. The hazard ratio lies between 1.21 to 1.30 and 1.45 to 1.71, respectively.

Adding dummy variables for our 20 categories of competition terms (see column 5 in Table 2), we now account for the use of the terminology within the reports. By these means we indicate the relevance of terms such as concentration, markets share, innovation, coordinated effects and others to control for case-specific factors. Again, the results remain more or less stable. Given equation (5) both regulations increase the hazard of merger investigations being terminated by 1.29 and 1.68 times. However, the 2004 regulation reduces the risk that an investigation will be terminated by about .72 times.

As some investigations last considerably longer our dataset has some outliers, which may lead to biased result. For this reason, we ran two additional regressions restricting duration to 1000 and 300 days, respectively. However, the results do not change qualitatively and only mildly quantitatively, when restricting the sample. Even if we restrict duration to a maximum investigation period of 300 days, the results do not change dramatically.

Overall, it appears that that both the 2007 and the 2013 reforms have decreased the duration of merger analysis, while the 2004 regulation has led to a significant increase in the investigation time.

4.2 Determinants of merger prohibition

Next, we analyse the impact of regulatory regimes on the probability of merger prohibition. Table 3 contains the results of least squares and logit regressions, regressing a dummy variable indicating when a merger is not cleared, i.e. if it is prohibited or withdrawn, on regulations regimes dummies, sector dummies and term dummies.

Table 3. Probability of prohibitions.

	(1)	(2)	(4)	(5)
Non-cleared	OLS	OLS	Logit	Logit
Reg2004	-.0821 (0.00)	-.0135 (0.02)	-6.05 (0.00)	-2.66 (0.00)
Reg2007	.0475 (0.00)	.0111 (0.02)	4.84 (0.00)	1.98 (0.07)
Reg2013	.0778 (0.00)	.0247 (0.03)	2.83 (0.00)	1.96 (0.00)
Sector dummies	YES	YES	YES	YES
Term dummies	NO	YES	NO	YES
Constant	.0622 (0.00)	.5953 (0.00)	-5.09 (0.15)	-2.2527 (0.97)
Observations	6,113	6,113	5,911	5,911
(Pseudo) R ²	0.08	0.56	0.34	0.72
F/Wald Chi ²	22.96 (0.00)	175.38 (0.00)	572.24 (0.00)	1388.32 (0.00)
Log Likelihood			-550.51	-66.03
<i>Marginal Effects</i>				
Reg2004			-.2968 (0.00)	-.0092 (0.03)
Reg2007			.0446 (0.00)	.0030 (0.02)
Reg2013			.0330 (0.00)	.0047 (0.09)

Note: Robust and clustered standard errors (on sector level) in parentheses.

Starting with simple linear probability models, regression (1) that includes sector dummies but no term dummies indicates that 2004 merger regulation led to a decrease of the probability of a merger being prohibited by about 8 percentage points. However, 2007 and 2013 regulation seem to have a positive impact on the probability of prohibition. Given that regulation regime dummies equal one since the date when a regulation started until the end of our sample (i.e. 2019), an overall average effect by about 4,32 percentage points can be stated from 2013 to 2019. However, when including competition-relevant terms in our regression (2), the effects of merger regulation on probability of prohibition decline such that an overall effect of 2,23

percentage points result. At the same time, the explanatory power increases significantly when competition-relevant terms are included.

When using logit instead of linear probability models, a similar picture emerges. Using sector and regulation regime dummies yields significant effects of merger regulation on the probability of prohibition. However, when accounting for competition terms these effects are considerably smaller. Again, the explanatory power is much bigger when considering competition terms as a proxy for possible competition concerns. While the 2004 merger regulation leads to a decrease of the probability of prohibition by about 0.9 percentage points the overall effect is about 0.84 percentage points.

Overall, effects of merger regulation on the probability of prohibition are quite low. While the explanatory power of the models based on sector dummies is rather low a significant increase can be observed when including competition-relevant terms. However, models using competition terms do no longer support former results. Still a statistically significant overall reduction in prohibition probability can be measured, which is however economically less significant. As the total number of prohibitions is very small compared to the majority of cleared cases the results have to be interpreted rather carefully (see Bernhardt, 2021, for an overview of non-cleared cases in the EU).

As the number of prohibited mergers is low one could argue that this measure is inadequate. To address this criticism, we also use interventions instead prohibitions. We therefore create a dummy variable, interventions, that is equal to one when a merger is not cleared directly on Phase I which is defined by the article of the decision (see Figure 3 for an overview). Using interventions as the left hand side variable we repeat regressions from Table 4 (see Table 5). Overall, the regression results support the results from the regressions analysing the impact of

the regulations on prohibitions. The results now become economically and statistically insignificant when accounting for competition-related terms.

Table 5. Probability of interventions.

Interventions	(1) OLS	(2) OLS	(4) Logit	(5) Logit
Reg2004	-.0977 (0.00)	-.0170 (0.08)	-1.71 (0.00)	-.3972 (0.24)
Reg2007	.0503 (0.00)	-.0007 (0.89)	1.07 (0.00)	.1439 (0.47)
Reg2013	.07562 (0.00)	.0186 (0.01)	1.02 (0.00)	.5704 (0.02)
Sector dummies	YES	YES	YES	YES
Term dummies	NO	YES	NO	YES
Constant	.3478 (0.00)	.9722 (0.00)	-3.12 (0.00)	1.11 (0.00)
Observations	6,113	6,113	6,051	6,051
(Pseudo) R ²	0.08	0.50	0.11	0.50
F/Wald Chi ²	22.58 (0.00)	141.34 (0.00)	406.02 (0.00)	1388.32 (0.00)
Log Likelihood			-1517.60	-844.77
<i>Marginal Effects</i>				
Reg2004			-.1395 (0.00)	-.0114 (0.26)
Reg2007			.0577 (0.00)	-.0038 (0.48)
Reg2013			.0673 (0.00)	.0167 (0.02)

Note: Robust and clustered standard errors (on sector level) in parentheses.

5. Conclusion

The implementation of the 2004 merger regulation has been a massive change of the merger control procedure in the European Union and has also been a radical change of the underlying idea of how competitive effects of mergers should be assessed. The so-called More Economic Approach aims at both a more theory-based analysis as well as a much greater use of sometimes complex empirical methods.

Some 18 years after the introduction of the MEA, this paper analyses the effects of the reform on not only the procedure but also on the outcomes of the merger decisions of the European Commission. After providing some simple facts about the reform, we turn to the analysis of the duration of merger reviews.

Our results of a survival analysis show that the duration of the merger reviews has substantially increased due to the 2004 reform. Controlling for various factors such as differences in industrial sectors, we also find that the 2007 introduction of the merger guidelines for non-horizontal mergers as well as the merger simplification package adopted at the end of 2013 led to a decrease in merger review duration. As we are not able to control for firm- and market-specific factors given such a large set of data, we use text analysis tools to determine competition-relevant terms within the decision documents. Generating dummy variables accounting for the occurrence of such terms are supposed to proxy the Commission's concerns, which are related to those terms. However, introducing the dummy variables in our survival analysis did not change the results significantly.

Analysing the impact of merger regulations, the probability of mergers being prohibited results in a negative effect of MEA and positive effects of the 2007 and 2013 regulations. If, however, the competition-relevant terms are used as covariates, these effects remain statistically significant but fall to econometrically insignificant values.

Finally, we conducted a semantic analysis on the impact for the MEA on the wording of the merger decisions. Overall, and not surprisingly, there is decline in terms regarding structural market parameters and an increase in terms that are related with the 2004 merger regulation. However, part of the development of wordings does not seem to be explained by the reforms. The tonality of the decisions is always more positive than negative which seems plausible since the overall majority of cases are cleared without any obligations based on competitive concerns.

To sum up, the impact of the 2004 merger regulation but also of the 2007 merger guidelines on non-horizontal mergers as well as of the 2013 merger simplification package seem to be evident. While the MEA has led to an increase in the duration of investigations, the other reforms seem to have more than offset this effect. A change in the probability of prohibition is more likely to be in the range of less than one percentage point. However, as expected, the wording of the Commission's decisions has changed significantly.

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Appendix

Tables

Table 4. Duration statistics by sector.

Sector	Observations	Mean	Std. Dev.	Min	Max
1	204	39.21	43.70	2	454
2	13	65.84	81.01	22	311
3	91	34.68	19.26	9	157
4	2,329	49.46	126.27	0	4993
5	299	45.49	130.37	0	2205
6	71	31.28	6.20	8	240
7	90	37.26	35.32	18	341
8	653	35.55	22.14	8	240
9	421	69.29	305.30	1	4048
10	556	54.76	148.53	1	2834
11	588	41.75	196.54	19	4767
12	206	29.73301	17.39	7	265
13	125	38.65	27.43	22	182
14	211	34.76	21.61	6	223
15	28	34.17	5.12	22	46
16	6	29	3.03	24	33
17	63	31.23	7.08	22	54
18	58	40.91	38.78	22	245
19	24	33.33	5.23	25	45
20	4	32.5	2.64	29	35

Table 8. Structural and competition-related terms.

ID	Group	Terms
1	Coordination	coordinated effect(s), collusion, tacit collusion, cartel
2	Non coordination	uncoordinated effect(s), unilateral effect, non-coordinated effect
3	Entry	Market entry, entry barrier, barrier to entry, market exit
4	Market power	Market power, market dominance, joint dominance, dominance
5	Price effect	Price effect
6	Efficiency	Efficiency gain, efficiencies, efficiency defence
7	Price competition	Price competition
8	Quantity competition	Quantity competition
9	Bidding market	Bidding market
10	Potential competition	Potential competition
11	Concentration	Concentration, concentration rate, Herfindahl index, HHI, Herfindahl-Hirschman
12	Product differentiation	Product differentiation
13	Innovation	Innovation, invention, research and development
14	Investment	Investment
15	Capacity	Capacity, capacity constraints
16	Cost	Cost, cost asymmetries, fixed costs
17	Multi market contacts	Multi market contacts
18	Buyer Power	Buyer Power
19	<i>skipped</i>	
19	Market transparency	Market transparency
20	Demand elasticity	Demand elasticity
21	Platform	Platform, network effect
22	Regression	Regression, correlation

Figure 11. Proportion of cases that contain at least one term from the dictionary regarding **efficiency**.

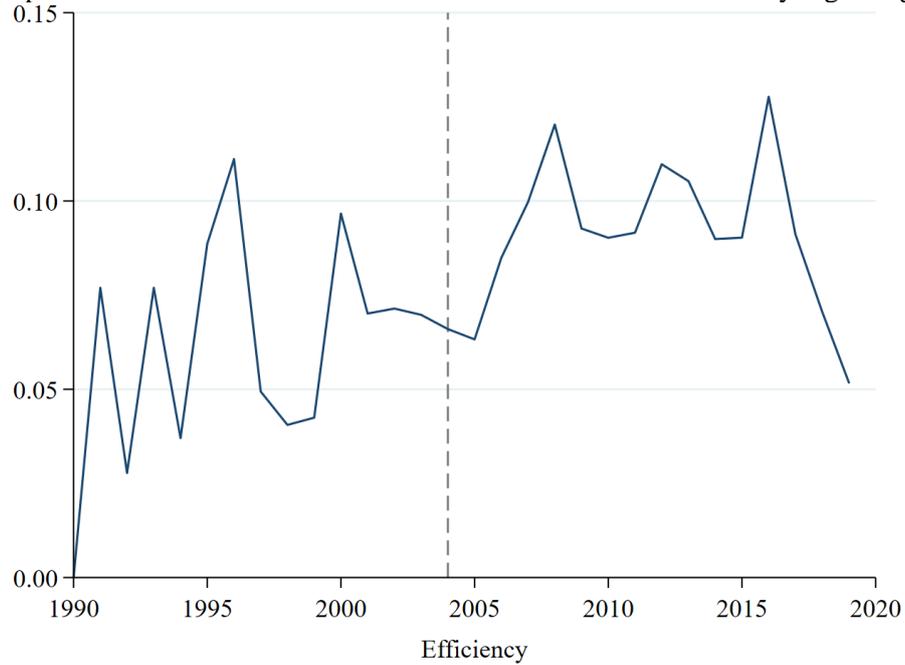
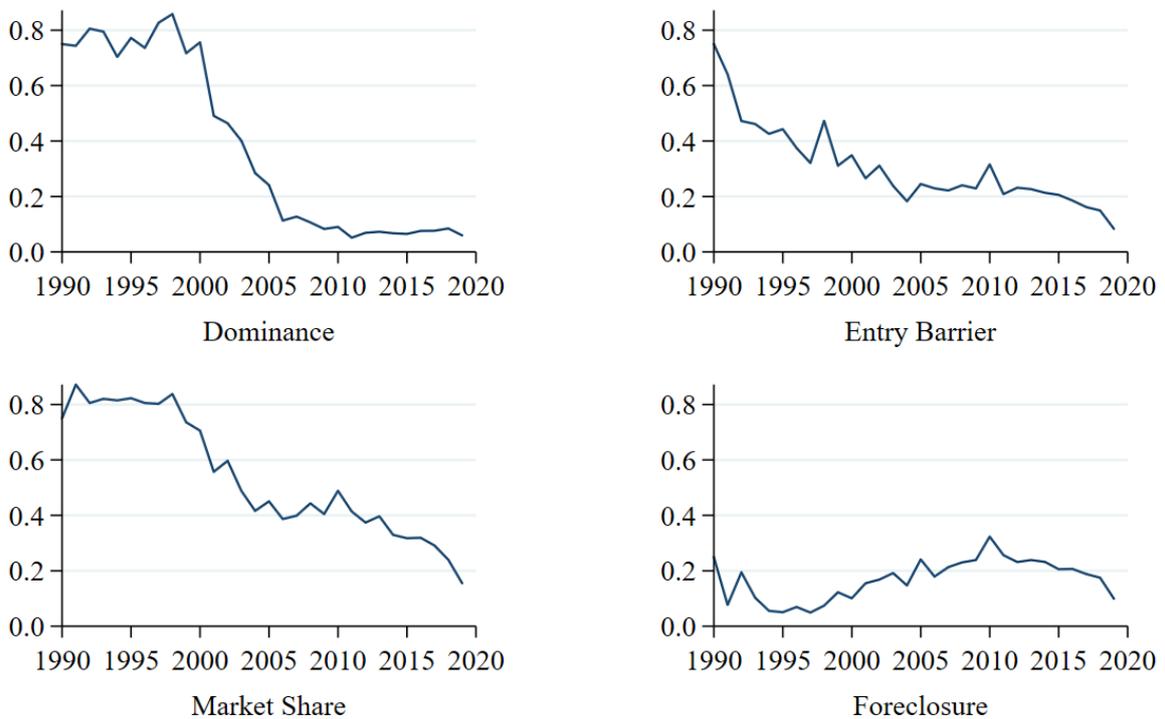


Figure 12. Proportion of cases that contain at least one term from the dictionary regarding **dominance, market shares, foreclosure and entry barriers**.¹¹



¹¹ Dominance, dominant, market share, market shares, entry barrier, entry barrier, barriers, market entry, entries, foreclosure, foreclose.

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