Discussion Paper No. 15-064

The Settlement Procedure in EC Cartel Cases: An Empirical Assesment

Kai Hüschelrath and Ulrich Laitenberger

ZEW

Zentrum für Europäische
Wirtschaftsforschung GmbH

Centre for European
Economic Research

Discussion Paper No. 15-064

The Settlement Procedure in EC Cartel Cases: An Empirical Assesment

Kai Hüschelrath and Ulrich Laitenberger

Download this ZEW Discussion Paper from our ftp server:

http://ftp.zew.de/pub/zew-docs/dp/dp15064.pdf

Die Discussion Papers dienen einer möglichst schnellen Verbreitung von neueren Forschungsarbeiten des ZEW. Die Beiträge liegen in alleiniger Verantwortung der Autoren und stellen nicht notwendigerweise die Meinung des ZEW dar.

Discussion Papers are intended to make results of ZEW research promptly available to other economists in order to encourage discussion and suggestions for revisions. The authors are solely responsible for the contents which do not necessarily represent the opinion of the ZEW.

THE SETTLEMENT PROCEDURE IN EC CARTEL CASES: AN EMPIRICAL ASSESSMENT

Kai Hüschelrath[♣] and Ulrich Laitenberger[°]

August 2015

Abstract
In June 2008, the European Commission (EC) was enabled to introduce a settlement procedure that aims at promoting the procedural efficiency of cartel enforcement in the European Union (EU). We use a data set consisting of 84 cartels decided by the EC from 2000 to 2014 to empirically investigate the impact of the EU settlement procedure on the duration of cartel investigations. Separating the enforcement process into two consecutive stages, we find that the introduction of the settlement procedure is followed by a substantial shortening of the second stage – reaching from the statement of objections (SO) to the decision – while it leaves the duration of the first stage from the beginning of the case to the SO unaffected. Subsequent to a discussion of further evaluation approaches we conclude that the EU Settlement Procedure has increased procedural efficiency of cartel enforcement in the European Union substantially.

Keywords Competition policy, cartels, settlements, ex-post evaluation, European Union

JEL Class K21, L41

[♣] ZEW Centre for European Economic Research, Competition and Regulation Research Group and MaCCI Mannheim Centre for Competition and Innovation, Address: P.O. Box 10 34 43, D-68034 Mannheim, Germany, E-Mail: hueschelrath@zew.de; University of Mannheim, L7, 3-5, 68131 Mannheim, Germany; *Corresponding author*. We are indebted to Cung Truong Hoang for excellent research assistance. The usual disclaimer applies.

[°] ZEW Centre for European Economic Research, Competition and Regulation Research Group and MaCCI Mannheim Centre for Competition and Innovation, Address: P.O. Box 10 34 43, D-68034 Mannheim, Germany, E-Mail: laitenberger@zew.de.

1 Introduction

Fighting cartels is a major priority of competition policy in the European Union (EU). Acting in concert with national competition authorities, the European Commission (EC) has made considerable efforts to promote competitiveness by detecting and punishing cartels. These efforts are visible not only in the large number of cartel cases handled by the Commission every year, but also in the substantial rise in the fines imposed on the cartel members. For example, while the Commission decided 10 cartel cases in the 1995 to 1999 period imposing fines of in sum about €0.3 billion, the most recent five year period from 2010 to 2014 experienced 30 decided cases with total fines of about €8.9 billion imposed by the Commission.[1] In other words, a tripling of the number of cases is accompanied by a roughly thirtyfold increase in fines.

While the clearly documented successes in fighting cartels are likely to be influenced by the introduction (or reform) of several policy instruments over the last two decades such as the corporate leniency program, the substantial increase in the fine spectrum for cartel infringements – accompanied by the publication of detailed guidelines for setting fines – or a general increase in international cooperation between competition authorities (e.g., as part of the European Competition Network (ECN)), the most recent substantial reform of (public) cartel enforcement in the European Union was the introduction of a settlement procedure in June 2008.

Generally, the EU settlement procedure in cartel cases enables the EC to close investigations faster by eliminating or reducing several procedural steps – such as full access to file, drafting and translations or oral hearings and interpretation – required under the standard procedure. Parties who admit liability and waive these procedural rights receive a discount of 10 percent on the final fine imposed. Through the introduction of the settlement notice, the EU aims at handling the respective cartel cases faster and more efficiently thus freeing up resources for additional cases and strengthening the deterrence effect of cartel enforcement.

Against this background, we use a data set consisting of 84 cartels decided by the EC from 2000 to 2014 to empirically investigate the impact of the EU settlement procedure on the duration of cartel investigations. Separating the enforcement process into two consecutive stages, we find that the introduction of the settlement procedure is followed by a substantial shortening of the second stage – reaching from the statement of objections (SO) to the

[1] The respective data (not adjusted for court judgements) is published (and frequently updated) by the European Commission's Competition Directorate-General on the following website: http://ec.europa.eu/competition/cartels/statistics/statistics.pdf (last accessed on 12 August 2015).

decision – while it leaves the duration of the first stage from the beginning of the case to the SO unaffected. Subsequent to a discussion of further evaluation approaches we conclude that the EU Settlement Procedure has increased procedural efficiency of cartel enforcement in the European Union substantially.

The remainder of the article is structured as follows. In the subsequent second section, we introduce into the law and economics of settlement procedures in general and the design of the EU Settlement Procedure in cartel cases in particular. The third section then continues with the presentation of our empirical analysis and results for our key research question whether the introduction of the EU Settlement Procedure had a measurable impact on the duration of EC cartel investigations. Following a discussion of further possible impacts of the procedure on cartel enforcement in the European Union in the fourth section, the final fifth section concludes the article by reviewing its key results and discussing its implications for the EC, the involved companies as well as overall welfare.

2 The Settlement Procedure and its Implementation in EC Cartel Cases

In this section, we provide an introduction to the settlement procedure and its implementation in European Commission (EC) cartel cases. Following an initial brief general discussion of the law and economics of settlement procedures in Section 2.1, we subsequently provide a more detailed characterization of the main steps of the EU Settlement Procedure in Section 2.2. The second section is closed by the provision of some qualitative evidence on the EU Settlement Procedure with respect to both average number and duration of cases on a yearly basis as well as the individual duration of all cartel cases from 2000 to 2014.

2.1 The Law and Economics of Settlement Procedures

In many jurisdictions, a significant share of legal disputes are not investigated and decided in court but solved "in the shadow of the law" (Cooter and Ulen (2000), p. 398) through bargaining as part of settlement procedures. Although the expectations of a possible trial outcome are certainly affecting the process (and outcome) of a settlement, all parties can often benefit through various cost savings such as legal fees, trial costs or the opportunity costs of time associated with a trial (see, e.g., Landes (1971) or Adelstein (1978)).

The high relevance of settlement procedures in modern law systems led, on the one hand, to a substantial amount of general law and economics research with a particular focus on the determinants of private decision whether or not (and when) to settle[2] (see, e.g., Landes (1971),

[2] Two important drivers of the decision to settle are, first, the ex-ante degree of divergence of the parties' expectations – in combination with the effectivity of the respective settlement process in facilitating a

Posner (1973), Baxter (1980) or Bueren (2011)) as well as their social implications in general (see, e.g. Shavell (1982) or Cooter and Rubinfeld (1989)) and their (negative) impact on deterrence in particular (see, e.g., Miceli (1996) and La Casse and Payne (1999)). On the other hand, the implementation of specific settlement procedures in particular fields of law and/or particular jurisdictions led to significant theoretical and empirical research. Examples include settlements as part of patent litigation (see, e.g., Cremers and Schliessler (2012) and the respective literature mentioned there) or (more generally) plea bargaining[3] – a settlement procedure frequently applied in criminal cases in the United States (see, e.g., Adelstein (2007) or Givati (2014)).

Although the main insights of the general literature on the settlement procedure – especially the identified general costs and benefits mentioned above – stay relevant when the perspective is narrowed down to settlements in EC cartel cases, Ascione and Motta (2008) correctly point to the following three important legal differences.[4] First, while the general literature typically refers to private contracts used to avoid going to court, settlements in cartel cases are used during the EC cartel enforcement process (and are not an instrument to avoid an official investigation and decision). Second, while standard settlements typically take place between private actors, in EC cartel cases, they refer to the relationship of the EC and the respective companies. Third, standard settlements cases are typically characterized by a large amount of uncertainty (e.g., with respect to the guilt of the defendant) while the only uncertainty in EC cartel cases is related to the amount of the fine (as the infringement has already been established). A more detailed overview of the EU Settlement Procedure in cartel cases is provided in the following sub-section.

2.2 Characterization of the EU Settlement Procedure

The EU Settlement Procedure was introduced in late June 2008 with Regulation 622/2008[5] and a Commission Notice[6] on the conduct of settlement procedures. It enables the European

---

necessary convergence of positions over time – and, second, the division of the surplus generated by the settlement among the parties. See, for example, Ascione and Motta (2008) and the additional literature mentioned there.

[3] Adelstein (2007, p. 2) defines a plea bargain as "… a voluntary exchange of concessions in which a defendant waives his right to a full criminal trial in return for the prosecutor's guarantee of a lesser sentence than would be expected after a conviction at trial".

[4] Although it is beyond the scope of this article to develop and discuss a complete taxonomy of cartel enforcement and settlement regimes, the International Competition Network (2008) provides a detailed overview with particular discussions on (1) different types of settlement systems, (2) the interplay of leniency and cartel settlements, (3) key principles to introducing cartel settlements, (4) benefits of cartel settlements, (5) key issues commonly addressed during settlement discussions, (6) key elements of cartel settlements as well as (7) other contemplated cartel settlement systems. See also Aygün (2013) for a detailed discussion.

[5] Commission Regulation (EC) No 622/2008 of 30 June 2008 amending Regulation (EC) No 773/2004, as regards the conduct of settlement procedures in cartel cases, OJ L 171/3, 1.7.2008. Commission Regulation

Commission to close investigations faster by eliminating or reducing several procedural steps – such as full access to file, drafting and translations or oral hearings and interpretation – required under the standard procedure.[7] Parties who admit liability and waive these procedural rights receive a discount of 10 percent on the final fine imposed. Through the introduction of the settlement notice, the EU aims at enabling "… the Commission to handle faster and more efficiently cartel cases …"[8] thus freeing up resources for additional cases and strengthening the deterrence effect of cartel enforcement.

Although it is beyond the scope of this article to present a detailed characterization of the EC cartel enforcement process in general and the EU Settlement Procedure in particular,[9] it is important for our subsequent empirical analysis to briefly characterize the respective main steps of the procedures as sketched in Figure 1.

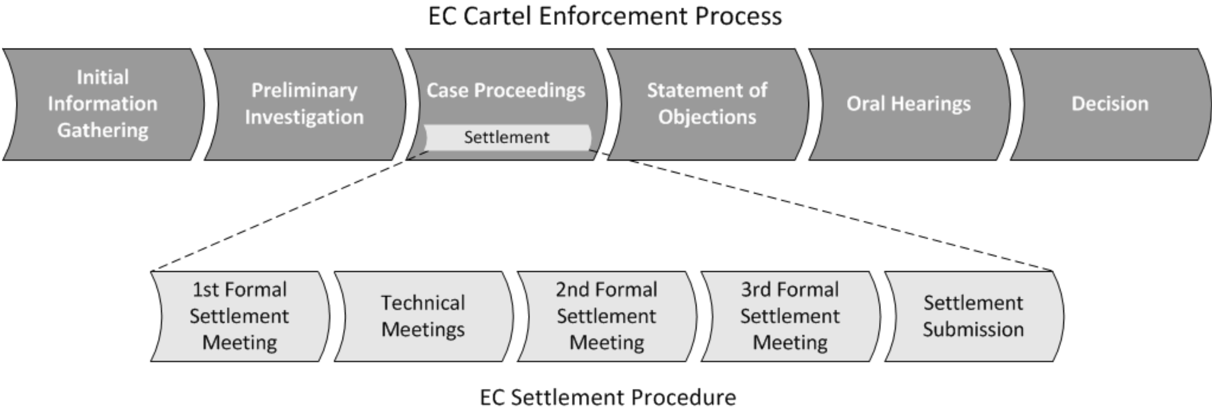

Figure 1: The EC Cartel Enforcement Process and the Settlement Procedure[10]

Figure 1 subdivides the EC cartel enforcement process into six subsequent stages: initial information gathering, preliminary investigations, case proceedings, statement of objections, oral hearings and decision. The first two stages are largely unaffected by the settlement procedure as the Commission first has to gather information on a possible infringement (e.g., through a leniency program, an informant etc.) and has to conduct a preliminary investigation to assess whether the collected material appears sufficient to initiate case proceedings.

(EC) No 773/2004 of 7 April 2004 relating to the conduct of proceedings by the Commission pursuant to Articles 81 and 82 of the EC Treaty (OJ L 123/18, 27.4.2004) lays down rules concerning the participation of the parties concerned in such proceedings.

6 Commission Notice on the conduct of settlement procedures in view of the adoption of decisions pursuant to Article 7 and Article 23 of Council Regulation (EC) No 1/2003 in cartel cases (2008/C 167/01), OJ C 167/1, 2.7.2008.

7 See Commission Regulation (EC) No 773/2004, OJ L 123/18.

8 Commission Regulation (EC) No 622/2008, OJ L 171/3, p. 1.

9 See Bay (2010), Bellis (2014a, 2014b), Olsen and Jephcott (2010) or Vascott (2013) for practitioner's perspectives on the functioning of the EU Settlement Procedure.

10 Inspired by two separate figures in Bellis (2014b).

If case proceedings are commenced, the settlement procedure comes into play. The procedure as such can broadly be subdivided further into the five steps[11] shown in Figure 1. Although the parties may express their interest in a hypothetical settlement, the EC decides whether to send letters to the involved companies informing of the decision to initiate proceedings in view of settlement and requesting them to express their interest in settlement. Although legally such a decision can take place at any point in time before the Commission issues a statement of objections (i.e., a written document in which it informs the parties concerned of the objections raised against them) rather the beginning of the case proceedings appear to be the most likely point in time (see Bellis (2014b)). In this respect, it is important to mention that the EU Settlement Procedure is a 'case closure mechanism' (not an investigative tool such as plea bargaining in the United States) and therefore only considered after the EC has finalized its investigation (see, e.g., O'Brien (2008), Hansen and Yoshida (2012) and especially Stephan (2009) and for assessments of similarities and differences between the two settlement procedures).

As part of the initial formal settlement meeting, the EC presents its assessment to the parties – in bilateral meetings with EC senior staff, case team and a settlement unit's representative – and discloses its evidence used to establish potential objections, liability and fines. In subsequent technical meetings with the case team, the parties present their views and arguments to the EC and especially discuss the scope of the infringement (i.e., duration and gravity) as well as the value of affected sales (both key drivers of the level of the fine). Although the EC does not enter any form of bargaining, in practice, these meetings provide possibilities for the companies to influence the EC's views (see, e.g., Hansen and Yoshida (2012) or Bay (2010)).

The second formal settlement meeting is then used to receive verification that an (informal) agreement between the EC and the respective companies exist regarding both the scope of infringement and the value of affected sales. Only in the subsequent third formal settlement meeting, the EC discloses the maximum amount of the fine and confirms the form and timing of the 'streamlined' (i.e., much shorter[12]) settlement submission and eventually the final decision on the settled case (see generally Bellis (2014a, 2014b) for further information).

[11] See generally Dekeyser (2012), Laina and Laurinen (2013), Laina and Bogdanov (2014) and Van Ginderachter (2014) for more detailed information on the EU Settlement Procedure from inside the Commission.

[12] According to Laina and Laurinen (2013), the amount of pages to be written is reduced from 'several hundreds of pages' under the standard procedure to 'on average 20 to 40 pages' under the settlement procedure.

Comparing the standard cartel enforcement process with the settled enforcement process reveals that there are no apparent differences in the beginning thereby assuming no impact on procedural efficiency. However, as soon as the case proceedings are commenced, the usual enforcement process is partly replaced and partly complemented by the settlement process, ceteris paribus, suggesting an increase in EC workload and no apparent increase in procedural efficiency. However, as already indicated above, the respective procedural efficiencies are expected to be realized especially by eliminating or reducing procedural steps required under the standard procedure such as full access to file[13], drafting and translations as well as oral hearing and interpretation. Although parts of these procedures already take place before finalizing the statement of objections, the lion part is scheduled to take place after the SO under the standard procedure.

Given this structure of the EU Settlement Procedure, in our empirical analysis below, we will subdivide the entire process into two stages: a first period from the beginning of the case (through initial information gathering) up to the statement of objections and a second period from the statement of objections to the decision.[14] Ceteris paribus, we expect that especially the second stage is shortened substantially by the introduction of the settlement procedure while the effect on the first stage remains unclear as, first, possible advantages in the form of procedural efficiencies might be overcompensated by the additional time needed to complete the settlement process (see, e.g., Bay (2010) for a description of the early challenges in organizing the respective processes) and, second, a significant share of the first stage – namely information gathering and the preliminary investigation of the case – is not (directly) affected by the settlement procedure thereby constraining the overall possibilities for procedural efficiency increases at this stage (see, e.g., Laina and Laurinen (2013)).

2.3 Qualitative evidence on the EU Settlement Procedure

Before we turn to our empirical assessment of the impact of the EU Settlement Procedure on the duration of cartel investigations, it adds value to present and discuss selected qualitative evidence on the number of cases as well as the average total duration of EC cartel investigations. Figure 2 therefore plots the development of the number of cases decided by the European Commission from 2000 to 2014 (excluding three readopted cases[15]).

---

[13] Granting full access to file usually demands resource intensive preparation efforts in the form of screening 'tens of thousands of pages of documents' for confidentiality (see Kroes (2008)).

[14] Although it would be desirable to include further investigation-related dates into our empirical analysis below, the date of statement of objections and the date of decision are the only two points in time that are stated explicitly in the respective decisions on a regular basis.

[15] The cases are Gas Insulated Switchgear (Case COMP/39.966), Steel Beams (Case COMP/38.907) and Manufacture of other Organic Basic Chemicals (Case COMP/39.003).

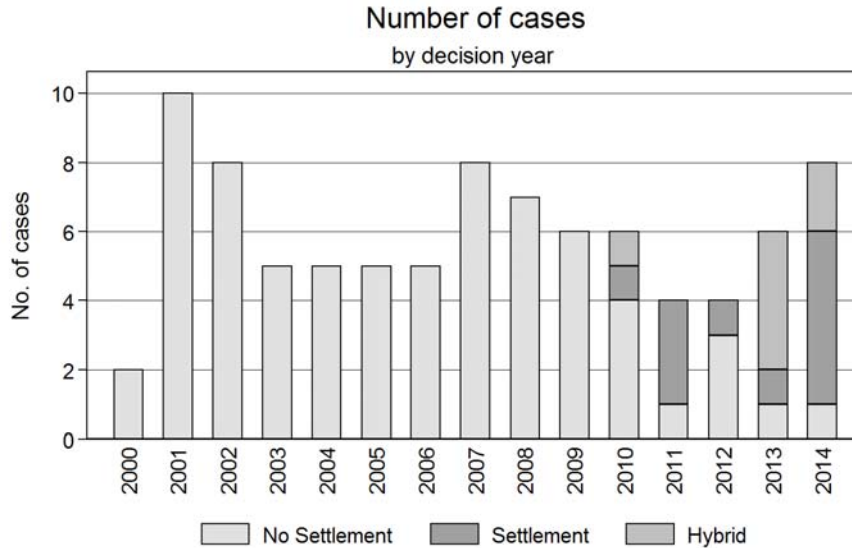

Figure 2: Number of Decided EC Cartel Cases (2000-2014)

As generally shown in Figure 2, the number of decided cases vary quite substantially between the years with the year 2000 (2 cases) and the year 2001 (10 cases) delineating the spectrum. With respect to settlements, Figure 2 shows that between 2010 and 2014, we observe in sum 16 settled cases out of which 5 cases[16] were hybrid settlements in which typically one of the companies decided to opt out of the settlement procedure (see generally Laina and Bogdanov (2014) for further information). Furthermore, the first two cases – settled in 2010[17] – were special in the sense that they were converted into settlement cases relatively late in the investigation process (see Vascott (2013)) thus questioning them as suitable cases for particularly an investigation of the effect of the settlement notice on the duration of EC cartel investigations. We therefore exclude the respective two cases from our empirical investigation in Section 4 below.

In addition to the number of cases settled by the EC since 2008, our aim to study the impact of the settlement procedure on the duration of the respective EC investigations suggest an initial look at the development of the average duration of EC cartel investigations between 2000 and 2014. Figure 3 below provides the respective aggregated information.

---

[16] The cases are Animal Feed Phosphates (Case COMP/38.866), Yen Interest Rate Derivatives (Case COMP/39.861), Euro Interest Rate Derivatives (Case COMP/39.914), Steel Abrasives (Case COMP/39.792) and Mushrooms (Case COMP/39.965).

[17] The cases are DRAMs (Case COMP/38.511) and Animal Feed Phosphates (Case COMP/38.866).

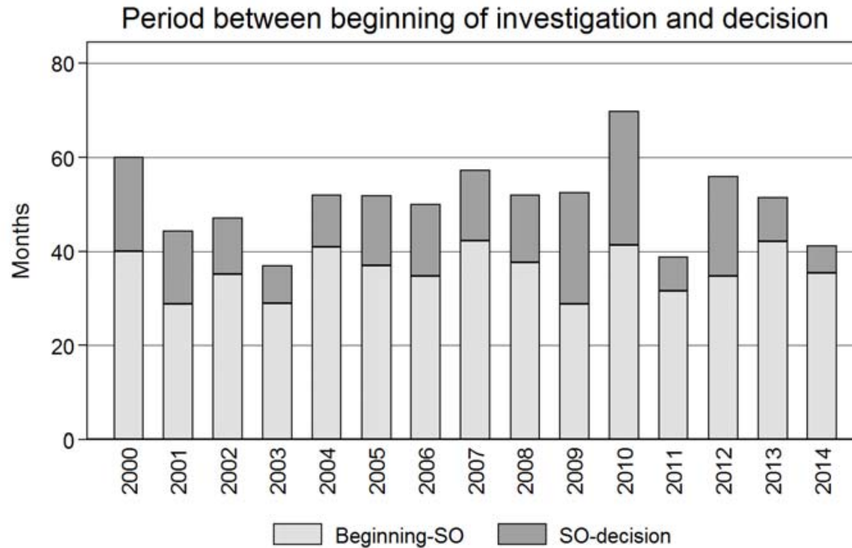

Figure 3: Total Duration of EC Cartel Investigations (2000-2014)

Figure 3 subdivides the total duration of EC cartel investigations into the two stages from the beginning of the investigation to the statement of objections (SO) and from the SO to the decision on the case. In terms of overall duration, Figure 3 shows a significant reduction especially in the years 2011 and 2014. However, both values are still above the 2003 value (that was reached without a settlement procedure). Furthermore, a differentiation into the two stages of the enforcement process already provides an indication that the overall reduction in the duration of the investigation is largely driven by the second stage (from the SO to the decision) rather than the first stage.

Although Figure 3 certainly provides valuable insights on the duration of the EC cartel enforcement process, plotting yearly averages over a relatively small number of cases (with a rather high individual variation in duration) is likely to hide important information. In Figure 4 below, we therefore plot the length of the respective two stages for every EC cartel case between 2000 and 2014. The horizontal axis orders the case numbers according to their decision dates, i.e., the last case decided by the EC in 2014 is located at the very right of the figure. The vertical axis plots the months before and after the statement of objections (SO) the EC was working on the respective case. The negative values in the vertical axis show the respective duration of the first stage from the beginning of the case to the SO while the positive values show the length of the second stage from the SO to the decision for every case in our data set.[18] Adding up the respective two bars of the stages therefore result in the total

[18] For hybrid cases, the durations reported for the second stage refer to the companies that decided to settle (i.e., they exclude the companies that decided to opt-out of the settlement procedure and face the (longer) standard procedure).

duration of the investigation on a case-by-case basis. As our primary aim is to identify possible differences between settled and non-settled cases, Figure 4 further introduces separate colors for both stages of the settled cases.

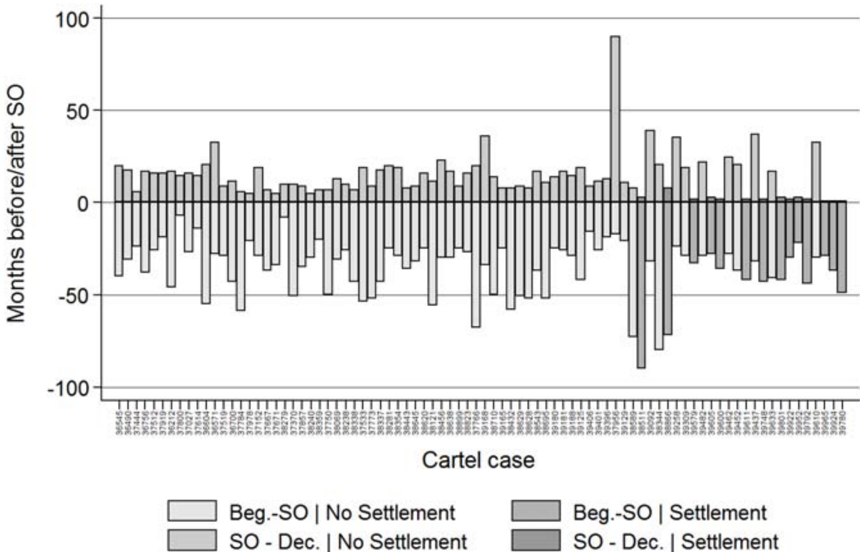

Figure 4: Individual Duration of Case Investigations before and after the EC's Statement of Objections (2000-2014)

Abstracting from the few outliers with unusually long first or second stages (justifying their exclusion from our empirical analysis below), the probably most apparent finding of Figure 4 is the substantial reduction in the duration of the second stage for settled cases.[19] It is further shown that the first stage of the respective settled cases does not show an obvious shift compared to their non-settled counterparts. An interesting further observation has to do with the duration of non-settled cases since the EU Settlement Procedure was implemented. Here we see a clear increase in the duration of particularly the second stage (compared to the pre-settlement era) suggesting that the EC might prioritize settled cases over non-settled cases in their everyday work leading to a substantial increase in the duration of non-settled cases.

Generally, we can conclude from our review of qualitative evidence that a reduction in the duration of particularly the second stage after the introduction of the settlement procedure has taken place (for the settled cases only). However, as it cannot be ruled out that the respective effect is driven by factors other than the settlement notice, our empirical analysis in the following section aims at isolating and quantifying the effect of the EU Settlement Procedure

[19] It is important to remark that we treat hybrid cases as settled cases as the majority of companies in those cases still settled and typically only one company in each case decided to opt out during the procedure. The only exception is Euro Interest Rate Derivatives (Case COMP/39.914) were 3 out of 7 companies decided not to settle (see Laina and Bogdanov (2014), p. 723 for detailed information).

by controlling for other factors that might have an impact on the duration of an EC cartel investigation.

3 Empirical Analysis of the Impact of the EU Settlement Procedure on the Duration of Cartel Investigations

In this section, we present our empirical analysis of the EU Settlement Procedure in cartel cases. As the key aim of the implementation of the procedure was an increase in administrative and procedural efficiency, a straightforward ex-post evaluation research question asks whether the introduction of the settlement procedure has led to a significant reduction in the duration of the investigations. In Section 3.1 we therefore develop several hypotheses on the determinants of the duration of EC cartel investigations. Section 3.2 continues with a description of our data set and a discussion of the respective descriptive statistics, followed by the presentation and interpretation of our empirical results in Section 3.3.

3.1 Hypothesis Development

In this section, we develop hypotheses on possible determinants of the duration of EC cartel investigations.[20] We differentiate between four sets of explanatory variables: cartel-related, investigation-related, fine-related and legal environment-related.

Cartel-related determinants

A first set of variables relate to characteristics of the cartel handled by the European Commission. In this respect, we hypothesize that, first, the number of countries represented in one cartel may have an impact on the duration of the cartel investigation, basically because the larger the number of countries, the more difficult it becomes for the EC to collect the respective evidence necessary to decide on a certain case. This is especially true when evidence (and the respective documentation such as, for example, the statement of objections later on in the process) needs to be translated from and into several languages. Second, we assume, for comparable reasons, that the number of firm groups[21] within one cartel may have an impact on the duration of the investigation. Ceteris paribus, it appears easier for the EC to investigate a case (including consultations etc.) consisting of three firm groups than a similar case with ten firm groups.

[20] Compared to Hüschelrath et al. (2013), we have extended the data set substantially – not only time-wise but especially with respect to the inclusion of further variables allowing us to develop a larger set of hypotheses and therefore richer specification of our empirical model below.

[21] Firms within one group are linked through ownership and are jointly liable for cartel fines. To increase the readability of the article, we mostly use the term ‘company’ as synonym.

Third, we hypothesize that the type of infringement has an impact on the duration of an EC cartel investigation, basically because different types of agreement typically create different types of documentation that can later be used by the EC as evidence to prove the respective infringement. In this respect, we assume that market division and quantity-fixing agreements are quicker to decide on as these types of agreement require detailed documentation (and monitoring efforts) by the cartel members (and a case is probably only brought if this material is available). Last but not least, we expect that a global presence of the cartel increases the duration of the investigation because, first, the respective investigation generally increases in complexity (and size) and, second, because the EC might have to communicate more with foreign competition authorities to coordinate on the respective case.

Investigation-related determinants

A second group of variables relate to characteristics of the cartel investigation handled by the EC. In this respect, our first explanatory variable refers to the time span between the cartel breakdown and the beginning of the investigation by the EC. Here, it is straightforward to assume that the longer the respective time span, the more difficult it becomes for the EC to gather and/or interpret the respective proof on both the existence and the scope of the cartel agreement thus increasing the duration of the investigation. Second, for similar reasons, we expect that the time span between the end of the cartel and its detection by the EC might have an impact on investigation speed. Ceteris paribus, a cartel which was detected while still operating makes it much easier for the EC to collect the respective evidence than an otherwise similar cartel that was terminated five years ago.

Third, the fact that many detected cartels were of international scope – leading to either simultaneous or successive investigations in multiple jurisdictions – suggests that the duration of investigations is reduced if the EC is able to build on this information. In particular, given the tradition and high degree of professionalism in US antitrust policy, it appears reasonable to assume that the speed of EC cartel investigations increases if the case is or was investigated by the corresponding US antitrust authorities as well. However, adding an international dimension (especially involving the United States) might also increase the duration of the investigation as cartel companies try not to disclose too much information as they fear disadvantages in parallel investigations or subsequent private enforcement activities. Last but not least, the share of leniency applicants could be an investigation-related determinant of the speed of the investigation. The larger the share of cartel members that are willing to cooperate with the Commission, the better the information situation on the side of the EC making it

possible to close the respective case earlier than in otherwise similar cases. However, it is important to remark here that the share of leniency applicants is only a measure of the potential gains from cooperation, not the actual gains (as measured by the average percentage leniency reduction below).

Fine-related determinants

A third group of variables influencing the duration of EC cartel investigations relate to fine-setting as key output of an EC cartel investigation. In this respect, the 2006 Guidelines for Setting Fines clearly state that the determination of the fine especially depends on factors such as the duration of the infringement, aggravating or mitigating factors or the degree of cooperation as part of the leniency program. Ceteris paribus, we therefore hypothesize that the time needed to fix the fine is increasing with the duration of the cartel, basically because the investigation activities of the EC take more time (e.g., to find sufficient proof for the start date of the cartel). The same general argumentation applies to the presence of aggravating and mitigating factors (i.e., the cartel includes a repeat offender or a company's involvement was limited, respectively). Last but not least, we expect that the actual degree of cooperation of the separate cartel members with the Commission – reflected in fine reductions between 10 and 100 percent – is a key driver of the speed of investigation. Ceteris paribus, a cartel case in which all members cooperate fully with the EC and provide the respective evidence is expected to be finished sooner than a case in which no cartel member agreed to cooperate. We therefore expect that the duration of an EC investigation decrease with an increasing average percentage leniency reduction (as measure of the degree of cooperation). The same general argumentation applies for the indicator whether or not the cartel case included a key witness.

Legal environment-related determinants

A fourth and last group of variables refer to the legal environment under which the respective cases were decided. Generally, changes in the legal environment on the one hand can lead to decreases in the duration of the investigations (as the reformed process turned out to be efficiency-increasing), however, a significant learning period or an increase in complexity could also cause the opposite result. With respect to EC cartel enforcement in our period of investigation, three major reforms have been implemented (and are therefore included into our analysis): the substantial reforms of the 1996 leniency program in 2002 and 2006, the reform of the guidelines for setting fines in 2006 and the settlement notice in 2008. For all three reforms, we ex-ante expect to observe decreases in the duration of the investigation process.

While the leniency program improved the information situation at the Commission, the reform of the fine guidelines increased transparency (and therefore the speed) of the fine-setting process. The key aim of the introduction of the settlement procedure explicitly was (as explained above) an increase in procedural efficiency through shorter investigation periods.

3.2 Data Set and Descriptive Statistics

The raw data set used in this article contains detailed information on all cartel cases decided by the European Commission between 2000 and 2014. The data were collected from decisions and press releases published by the EC in the course of its investigations and combine case-specific as well as company-specific information. For our study of the effect of the settlement procedure, we remain on the case level – due to the absence of variation on the company level with respect to duration in most cases – and include in sum 82 cartel cases into our analysis. Table 1 shows the descriptive statistics of the variables included into our empirical analysis. A description of the construction of the variables is provided in Table 3 in the Appendix.

As shown in Table 1, in addition to the mean and standard deviation values for all cases presented in column (1), we also present a split into 'non-settled cases' (column (2)) and 'settled cases' (column (3)) to be able to identify possible structural differences in the respective sub-groups. As already mentioned in Section 2.3 above, we excluded the first two settlement cases[22] (decided in 2010) as they were converted into settled cases relatively late in the investigation process as well as three re-adoptions of cases[23] as these cases have by definition an unusually long duration. Furthermore, for our empirical analysis, we excluded one extraordinary long case[24] as well as two cases[25] for which the respective decisions were unavailable at the time of our analysis. We therefore end up with 12 settled cases and 70 non-settled cases in the data set used for our empirical analysis.

[22] The cases are DRAMs (Case COMP/38.511) and Animal Feed Phosphates (Case COMP/38.866).

[23] The cases are Gas Insulated Switchgear (Case COMP/39.966), Steel Beams (Case COMP/38.907) and Manufacture of other Organic Basic Chemicals (Case COMP/39.003).

[24] The case is Far East Trade Tariff and Surcharges Agreement (Case COMP/34.018).

[25] The cases are Yen Interest Rate Derivatives (Case COMP/39.861) and Euro Interest Rate Derivatives (Case COMP/39.914).

Table 1: Descriptive Statistics

	(1) All cases		(2) Non-settled cases		(3) Settled cases	
Cartel-related variables						
Number of firm groups	5.59	(3.24)	5.93	(3.37)	3.63	(1.18)
Number of countries	4.80	(2.75)	4.79	(2.70)	4.84	(3.14)
Infringement: Market division	0.54	(0.50)	0.56	(0.50)	0.42	(0.51)
Infringement: Quantity Fixing	0.29	(0.46)	0.30	(0.46)	0.25	(0.45)
Global cartel presence	0.10	(0.30)	0.10	(0.30)	0.08	(0.29)
Investigation-related variables						
Total duration	49.52	(16.88)	51.46	(17.29)	38.25	(7.79)
Duration Investigation-SO	35.16	(13.74)	34.97	(14.53)	36.25	(8.02)
Duration SO-Decision	14.37	(12.20)	16.49	(11.98)	2.00	(0.74)
Detection before cartel ended	0.51	(0.50)	0.52	(0.50)	0.43	(0.50)
Time span cartel end to detection	9.00	(13.68)	7.85	(12.52)	15.68	(18.39)
Investigation in the US	0.09	(0.28)	0.11	(0.31)	0.00	(0.00)
Share of leniency applicants	0.67	(0.31)	0.67	(0.31)	0.66	(0.33)
Fine-related variables						
Duration of cartel	92.14	(69.83)	100.54	(71.47)	43.12	(28.23)
Aggravating circumstances	0.51	(0.50)	0.59	(0.49)	0.00	(0.00)
Mitigating circumstances	0.43	(0.49)	0.43	(0.49)	0.42	(0.51)
Key witness	0.65	(0.48)	0.61	(0.48)	0.83	(0.39)
Leniency reduction	0.31	(0.21)	0.31	(0.21)	0.32	(0.19)
Repeat offender	0.34	(0.48)	0.40	(0.49)	0.00	(0.00)
Legal environment-related variables						
Settlement notice applied	0.15	(0.36)	0.00	(0.00)	1.00	(0.00)
Leniency program applied	0.58	(0.49)	0.51	(0.50)	1.00	(0.00)
2006 Fine guidelines applied	0.45	(0.50)	0.36	(0.48)	1.00	(0.00)
Observations	*82*		*70*		*12*	

Starting off our discussion of the descriptive statistics with the *cartel-related variables*, Table 1 shows that the average cartel case included about 5.6 cartel groups stemming from about 4.8 countries with the settled cases showing substantial divergence in the average number of firm groups (3.6). Roughly half of all cartel cases involved a market division agreement while roughly a third showed a quantity fixing agreement (leaving the remaining about 25 percent for other types of agreement). Last but not least, we find that about 10 percent of the cases have a global cartel presence with again the settled cases showing no structural difference.

Turning to *investigation-related variables*, we find that the total duration of the investigation[26] by the EC over the entire data set was about 50 months. However, the difference between non-settled and settled cases is found to be substantial showing values of about 52 months and 38 months, respectively. In percentage terms, our descriptive analysis

[26] If there were several cartels dealt with in one case, we took the mean value of all cartel observations. As for most cases an exact start date of the EC investigation is not reported, we use the first event mentioned in the decision documents as beginning of the investigation. This is mostly the application of the leniency program; however, in a handful of cases also prior investigations in the US, complaints, filings of insiders or investigations ex-officio.

shows that the introduction of the settlement procedure led to an overall reduction of the investigation duration of about 27 percent. Furthermore, the breakdown of the total duration into two stages provide first confirming descriptive evidence for our hypothesis above, namely that the reduction in the duration of the investigation is driven by the second stage from the statement of objections to the decision. While the duration of the first stage even increases slightly by about one month, the duration of the second stage is found to be reduced by about 14.5 months leading to net savings of about 13.5 months.

Furthermore, Table 1 shows further that while settled and no-settled cases do not differ much with respect to the 'detection before cartel ended' and 'share of leniency applicants' variables, we find considerable differences for the 'time span cartel end to detection'[27] and 'investigation in US' variables. While the length of the former increases substantially for the settled cases (suggesting an increased presence of more complex older cases), none of the settled cases was also investigated in the US (either prior or in parallel). This is consistent with the EC's view that cases dealt with in parallel in other jurisdictions are no particularly good candidates for settlement (see Laina and Bogdanov (2014)).

Turning to the *fine-related variables*, we again see partly similar but partly also different results for settled and non-settled cases. While the former state applies to mitigating circumstances (playing a role in about 42 percent of all cases) and the leniency reduction (found at an average of about 31 percent), the most substantial differences are found for the duration of the cartel. While the settled cases show an average duration of about 100 months, this value shrinks to 43 months for the settled cases. Furthermore, we also find that both aggravating circumstances as well as repeat offenders are non-existent in the settled cases, although both criteria played substantial roles in the non-settled cases reaching values of 59 percent and 40 percent, respectively. In other words, settled cases so far can be characterized as less serious, shorter (and as shown above also older) infringements than the majority of non-settled cases.

Last but not least, we turn to our three *legal environment-related variables*. It is shown here that about 15 percent of all cases in the data set were eventually settled. Furthermore, the leniency program is applied in 58 percent of all cases; because of its chronological order, all

[27] The time-span between the cartel end and the beginning of the investigation is set to zero when the cartel was detected while it was active. For the cases Bathroom Fittings and Fixtures (Case COMP/39.092), Specialist Medical Practice Activities (Case COMP/39.510) and Manufacture of Paper and Paper Products (Case COMP/39.780), the average reduction due to leniency was approximated as the decision document did not include sufficiently detailed information. For the case Manufacture of Beer/Wholesale of Beverages (Case COMP/37.750), the cartel beginning was also taken as cartel end date (as the cartel actually never operated).

settled cases were dealt under the 2002 or 2006 versions of the leniency program and the 2006 fine guidelines.

3.3 Empirical Model and Regression Results

In order to investigate the determinants of the duration of the appeals process, we estimate the following OLS model:

$$Duration = \beta_0 + \beta_1' Cartel + \beta_2' Invest + \beta_3' Fine + \beta_4' Legal_environ + u$$

The dependent variable *Duration* equals the overall duration (in months) needed by the European Commission to decide the respective case. The independent variables included into our model refer to the four sets of variables identified in Section 3 above as potential drivers of the duration of the investigation process: cartel-related (*Cartel*), investigation-related (*Invest*), fine-related (*Fine*) and legal environment-related (*Legal_environ*). The error term is denoted by u.

Applying this model to our data set described above leads to the results shown in Table 2. While column (1) presents the estimation results for the total duration of the investigation as dependent variable, columns (2) and (3) estimate the same model separately for the two stages 'beginning of investigation to statement of objections (SO)' and 'SO to decision'. The first apparent finding of Table 2 is the differences between the two stages showing only one determinant (global cartel presence) having a significant influence on both the first and the second stage, although in an opposed direction. This finding alone shows the importance of our separation into two stages.

Table 2: Regression Results

	(1) Total Duration Beginning-Decision		(2) Duration Beginning-SO		(3) Duration SO-Decision	
Cartel-related variables						
Number of firm groups	1.71**	(2.23)	-0.13	(-0.19)	1.85***	(3.58)
Number of countries	0.42	(0.49)	1.02	(1.60)	-0.61	(-0.75)
Infringement: Market division	0.59	(0.15)	5.31	(1.49)	-4.72	(-1.59)
Infringement: Quantity Fixing	-4.21	(-0.95)	-2.33	(-0.59)	-1.88	(-1.01)
Global cartel presence	-3.94	(-0.71)	-12.01***	(-2.76)	8.07**	(2.10)
Investigation-related variables						
Detection before cartel ended	-17.61***	(-3.11)	-13.31***	(-2.74)	-4.30	(-1.06)
Time span cartel end to detection	-0.36**	(-2.12)	-0.26	(-1.53)	-0.10	(-1.05)
Investigation in the US	18.11**	(2.08)	15.90*	(1.95)	2.22	(0.69)
Share of leniency applicants	-0.79	(-0.12)	0.50	(0.08)	-1.30	(-0.33)
Fine-related variables						
Duration of cartel	-0.00	(-0.08)	-0.01	(-0.31)	0.01	(0.38)
Aggravating circumstances	-3.82	(-0.48)	3.40	(0.48)	-7.21**	(-2.35)
Mitigating circumstances	-0.42	(-0.11)	1.13	(0.31)	-1.55	(-0.68)
Key witness	-1.14	(-0.23)	4.42	(1.03)	-5.56*	(-1.91)
Leniency reduction	-22.49**	(-2.22)	-19.34**	(-2.12)	-3.14	(-0.53)
Repeat offender	4.65	(0.55)	-3.48	(-0.50)	8.13*	(1.83)
Legal environment-related variables						
Settlement notice applied	-8.67*	(-1.71)	1.41	(0.36)	-10.09**	(-2.16)
Leniency program applied	0.46	(0.07)	-1.92	(-0.41)	2.38	(0.66)
2006 Fine guidelines applied	3.40	(0.53)	4.47	(0.80)	-1.07	(-0.30)
Constant	58.24***	(5.26)	39.21***	(4.18)	19.03**	(2.31)
Observations	*82*		*82*		*82*	
R^2	*0.358*		*0.232*		*0.468*	
Adjusted R^2	*0.174*		*0.013*		*0.317*	

t statistics in parentheses; significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Starting off a more detailed discussion of the respective coefficients with our *cartel-related variables*, the number of firm groups has a significantly positive effect on total duration and the second stage thereby largely confirming our hypothesis derived in Section 3.1 above. The number of countries is found to have no significant effect in any of the three periods; the same finding also applies to both infringement types. Last but not least, a global cartel presence is found to speed up the first stage, however, slows down the second stage (leading to an insignificant effect on total duration). A possible explanation for this result could be that the information gathering process is eased through international cooperation while the respective workload later on in the case increase substantially (e.g., due to translations into different languages etc.).

Turning to our *investigation-related variables*, we find that cases in which the infringement was detected by the Commission before the cartel ended led to a rather large reduction in the duration of the first stage of the investigation of about 13 months, however, has no further significant effect on the second stage. While the time span from cartel end to

detection is only found to have a small (and weak) overall negative effect of about 0.36 months on the total duration of the investigation, a (prior or parallel) investigation in the US has a substantial duration-increasing effect of about 16 months in the first stage. One explanation for this finding could be a time-consuming coordination between the respective authorities, possibly in combination with a significant amount of waiting time for a decision from the responsible US authority (or attempts by the respective companies to delay the investigation for strategic reasons).

With respect to the *fine-related variables*, we find insignificant results for 'duration of cartel' and 'mitigating circumstances'. Although cartel duration is a key factor in the determination of the fine, its mechanical calculation apparently has no significant influence on the duration of the investigation. The same conclusion applies for mitigating circumstances. We further find that the presence of a key witness reduces duration in the second phase only while a large and significant duration-decreasing effect (of in total about 22 months) is found for the percentage leniency reduction variable (which includes the 100 percent fine reduction usually received by the key witnesses) in the first phase. Both findings suggest that the duration of investigation is decreasing with an increasing degree of cooperation of the respective former cartel members with the Commission through its leniency program. Last but not least, we find a negative effect (of about 7 months) for aggravating circumstances and a positive effect of about 8 months if a repeat offender exists on the duration of the second stage only.

Last but not least, our results for the *legal environment-related variables* show that neither the leniency program as such nor the introduction of the new guidelines for setting fines had a measurable impact on the duration of EC cartel investigations. However, for the introduction of the settlement notice, we find a substantial reduction of the duration of settled cases compared to non-settled cases. On average, settled cases are found to be closed about 8.7 months earlier than non-settled cases. Furthermore, our descriptive finding from Section 3.2 above – suggesting that the time savings largely come from the second stage lasting from the statement of objection to the decision – is confirmed. While the duration of the first stage increases slightly (but is statistically insignificant), the duration of the second stage is reduced substantially by more than 10 months.

In a nutshell, we can therefore conclude that our empirical analysis of key determinants of the duration of EC's cartel investigations found clear evidence for a large and significant

duration-decreasing impact of the introduction of the EU Settlement Procedure.[28] More generally, we further find that – according to the respective R^2-values – our determinants of investigation duration are better in explaining the second stage than the first. Overall, in addition to the settlement notice, the total duration of an EC cartel investigation is found to be positively affected by the number of firm groups and an US investigation and negatively affected by detection before the cartel ended, an increasing time span between the cartel end and detection as well as the average percentage leniency reduction.

4 Further Possible Impacts of the EU Settlement Procedure on Cartel Enforcement

In addition to an analysis of determinants of the duration of investigations, the introduction of the EU Settlement Procedure suggests an implementation of further evaluation approaches. In this section, we therefore discuss the following six further possible impacts of the settlement procedure on the cartel enforcement process (including options for future empirical assessments): (1) Determinants of the decision to settle, (2) Impact on the determination of fines, (3) Impact on the operability of the leniency program (4) Impact on the probability and success of appeals, (5) Impact on follow-on private enforcement and (6) Impact on deterrence.

4.1 Determinants of the Decision to Settle

As participation in the EU Settlement Procedure is the free decision of the respective companies (after being invited by the Commission), a policy-relevant question is whether and how the characteristics of companies who decided to settle differ from characteristics of companies who decided to stick to the standard procedure. In this respect, staff members of the EC have frequently stated that it is not considered a desirable aim to apply the settlement procedure to all future cartel cases. It is up to the Commission to decide whether the characteristics of the case at hand make it sufficiently likely that a settlement (including all companies that participated in the infringement) will eventually be successful (i.e., the expected procedural efficiencies are in fact realized). In this respect, several contributions mention a selection of screening criteria that are likely to increase the probability that the EC proposes to settle (see, e.g., Laina and Laurinen (2013) and Laina and Bogdanov (2014)). For example, Van Ginderachter (2014, p. 6) identifies the following nine criteria that influence the suitability of a case for settlement from the perspective of the EC: (1) parties' interest to

[28] However, due to the fact that, for the hybrid cases, we only included the respective durations for the settled firm groups – which appears to be a rather strong simplification given the fact that the Commission has to apply the lengthy and resource-intensive standard procedure for the opt-out companies – it is reasonable to argue that our results over- rather than underestimate the true impact of the settlement notice on the duration of EC cartel investigations. However, as typically the vast majority of firm groups in hybrid cases settle, a potential bias is expected to be small (see Footnote 19 above for further information).

settle, (2) number of parties, (3) number of successful leniency applicants, (4) expected degree of contestation, (5) parties' foreseeable conflicting positions on liability, (6) impact on aggravating circumstances, (7) procedural efficiencies (including lack of appeals), (8) EU/EEA cases or cases already decided/pending in other jurisdictions and (9) novel legal issues.

Based on this set of screening criteria – probably complemented by additional criteria – it would be a highly policy-relevant research question to investigate whether and how companies that decided to settle differ from companies that decided not to do so. For example, Hoang el al. (2014) apply discrete choice models to assess a very similar question to the case of the EC leniency program and are able to identify partly different sets of drivers for firm groups that participated in the leniency program compared to the remaining firm groups allowing important conclusions on the workability of the leniency program and potentials for its further improvement.

Although it would therefore be highly desirable to provide such an analysis for the case of the settlement procedure, the (so far) rather low number of either settled or hybrid cases does not provide a sufficient basis for a meaningful application of the respective discrete choice models. Furthermore, the general applicability of such empirical analyses in the future will certainly depend on the success of the settlement procedure. Earlier contributions such as Nay (2010), Brankin (2008) or Kelley (2010) argue that it appears unlikely that the settlement procedure will become the default case closure mechanism – on the one hand, because the incentives for companies to participate are too low and on the other hand, as the benefits for the EC are limited to the presumably large share of cases in which at least one cartel member decides not to settle (hybrid case). Later contributions (in light of the first successfully settled cases) are more optimistic with respect to the workability of the EU Settlement Notice expecting about 50 percent of all cases being settled (see, e.g., Vascott (2013)). While the former scenario will make an application of suitable empirical methods difficult, the latter is likely to generate a sufficient amount of heterogeneous cases thus providing an almost ideal environment for conducting empirical ex-post evaluation exercises.

4.2 Impact on the Determination of Fines

A further potential impact of the settlement procedure is on the determination of fines. In this respect, Bellis (2014b) argues that, in principle, the total reduction of the fine could be either higher or lower than the 10 percent discount of the final fine set out in the EU Settlement Notice. A decrease of more than 10 percent would be possible if, first, the fine multiplier

would have exceeded the factor two in the absence of a settlement and, second, more generally, the companies would have been able to use the settlement discussions to convince the EC that either the scope of the infringement or the value of affected sales is smaller/lower than initially estimated by the EC. However, it also cannot be ruled out completely that the EC tries to compensate the 'lost 10 percent of fines' by finding ways to increase the final fine accordingly. In fact, the EC could set the fine such that a plaintiff would become indifferent between either agreeing to settle or filing an appeal afterwards. However, this is only expected under the presumption that the EC aims at maximizing fines to increase deterrence.

Although data availability issues currently prevent an empirical investigation of especially the second issue, future work might apply simple OLS regressions to investigate the determinants of EC fine calculations and would therefore be able to identify any significant changes in EC fine-setting after the introduction of the settlement procedure. However, such an exercise would require good predictors that are unrelated to the EC's assessment; gathering these is becoming more and more unlikely in the settlement era due to the reduced amount of information included into 'settled' decisions.

More generally, as the fine-setting process is rather transparent and a factual increase of the final fine would reduce the incentives to participate in the settlement procedure for the companies, it appears rather unlikely that an empirical analysis will be able to identify such a fine-increasing effect for non-settled or hybrid cases.

4.3 Impact on the Operability of the Leniency Program

Although the leniency program as investigative tool and the settlement procedure as case closure tool appear to be perfect complements, some commentators discuss certain fears that the introduction of a settlement procedure might affect the operability of the leniency program negatively (see OECD (2006), Ascione and Motta (2008) or Laina and Laurinen (2013)). In particular, it is argued that if the settlement discount of the final fine is too generous, the incentives to apply for leniency could be reduced. This might particularly be the case in the lower bands of the leniency program were the runner-up leniency applicants receive smaller discounts of up to 30 percent.

Although few commentators would probably consider the eventually introduced settlement discount of 10 percent of the final fine as too high, the argument can be investigated empirically by analyzing whether the introduction of the settlement procedure led to a significant reduction in the application of the leniency program particularly among the runner-up companies. In this respect, a first look at our descriptive evidence in Table 1 above shows

no indication of a reduced application rate in the EC leniency program as for both the 'share of leniency applicants' and the 'average leniency reduction' we find no mentionable differences between settled and non-settled cases. However, the fact that the time span of the non-settled cases is much longer – including older cases with presumably diverging shares of leniency applicants – suggests taking a look at the yearly developments of both the application rate for the leniency program in general and the percentage leniency fine reduction granted by the Commission in particular. Figure 5 plots the respective values from 2000 to 2014 for all leniency applicants excluding the respective key witnesses (who typically receive a fine waiver).

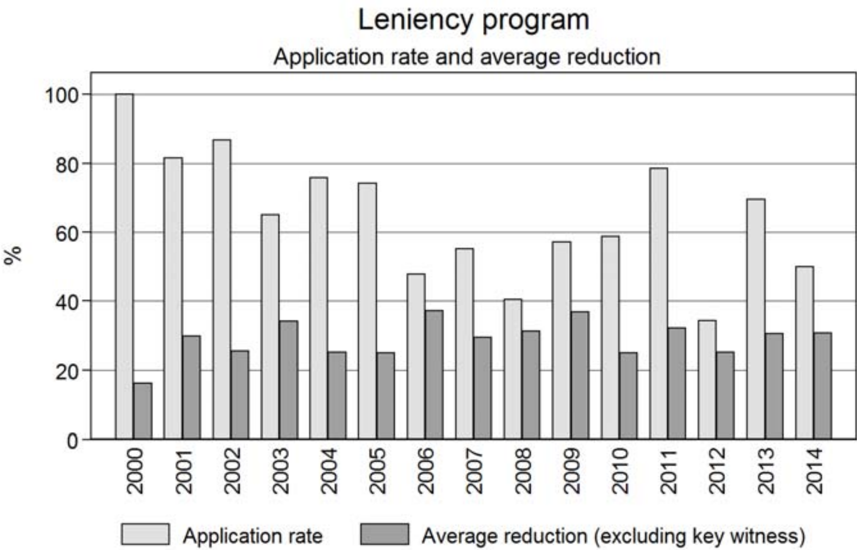

Figure 5: Average Leniency Application Rates and Average Percentage Fine Reductions Excluding Key Witnesses (2000-2014)

As revealed by Figure 5, the application rates fluctuate substantially between the years reaching its maximum value of 100 percent already in 2000 and its minimum value of 34 percent in 2012. However, although the minimum value falls into the settlement era, the respective other application rates since 2010 fluctuate around the overall average rate of 63 percent thus suggesting no structural changes induced by the settlement procedure.

For the average percentage fine reduction due to leniency – a measure for the degree of firm cooperation with the Commission – we generally find that the values are located in a rather small range from 16 percent to 37 percent with an average value of about 28 percent. The years since the first settled cases appear (in 2010) show no remarkable change in the percentage fine reduction for the runner-up cartel members thus allowing the conclusion that

no evidence on a possible negative impact of the settlement procedure on the leniency program can be found.

4.4 Impact on the Probability and Success of Appeals

Although not officially stated as aim of the implementation of the EU Settlement Procedure, the Commission (at least implicitly) expects a reduced probability and success of appeals against its decisions. Although technically EC settlement decisions can still be appealed by the companies with either the General Court (GC, as first-stage EU appellate court) or the European Court of Justice (ECJ, as second-stage and highest EU appellate court), various requirements for a successful settlement – in particular admitting liability for an illegal agreement of a certain scope and value of affected sales – reduce the probability that the appeal will generally be successful and, if this is nevertheless found to be the case, that the reduction of the final fine imposed by the EC will be lower than for cases decided under the standard procedure. The expected reduction in the number of appeals is expected to lead to a corresponding reduction of the occasions at which the Commission is forced to defend the legality of its decisions in court thus freeing up additional resources for other enforcement activities.

From an economic perspective, the decision of companies to either settle or appeal depends on the expected returns generated by the two options. In this respect, the outcome of a settlement is fixed at 10 percent of the final fine with only the exact level of the final fine being uncertain at the beginning of the settlement process. The outcome of an appeals process, however, faces a substantially higher amount of uncertainty. Assuming that companies file appeals merely for substantive and not for strategic reasons (such as achieving delays in fine payments or follow-on private enforcement etc.), consulting the statistics of past appeals cases can provide important insights. In this respect, Hüschelrath and Smuda (2014) recently find that, in the period from 2000 to 2012, about 50 percent of 467 firm groups fined by the EC decided to hand in an appeal with the GC. Out of this sub-sample of 234 firm groups, roughly 47 percent were eventually successful in the sense of receiving a reduction of the fine originally imposed by the EC. With an average fine imposed by the EC of about €31 million and an average fine reduction on appeal of about €8.4 million, the expected percentage fine reduction on appeal in the past lied at about 27 percent[29] of the final fine

[29] Interestingly, referring to a smaller set of (older) EC cartel cases, Ascione and Motta (2008) propose to use the expected fine reduction on appeal as benchmark for the fixing of the percentage discount on the final fine as part of the settlement procedure. They find an average expected reduction of an EC fine on appeal of about 26 percent.

imposed by the EC (and therefore substantially higher than the 10 percent discount offered for settling).[30]

In essence, these findings suggest that the promising appeals cases are still brought (and not settled) as the expected percentage fine reductions on appeal are much higher than for settling the case. Cases with a low appeals success probability, however, can be expected to have a higher probability to be settled simply because the respective companies are better off with the 10 percent fine discount for settling. As a consequence, the existence and size of an effect of the introduction of the settlement procedure on the number of appeals will depend, first, on the shares of higher and highest risk appeals cases before and after its introduction and second, more obviously, on the future development of the relative shares of settled cases versus non-settled (or hybrid) cases.

Although an econometric investigation of these issues must be left for future research, simple qualitative evidence already provides several interesting insights. Figure 6 plots the percentage shares of firm groups that decided to (1) neither appeal nor settle, (2) only settle, (3) only appeal, and (4) settle and appeal for the respective case decision year[31] from 2000 to 2014.

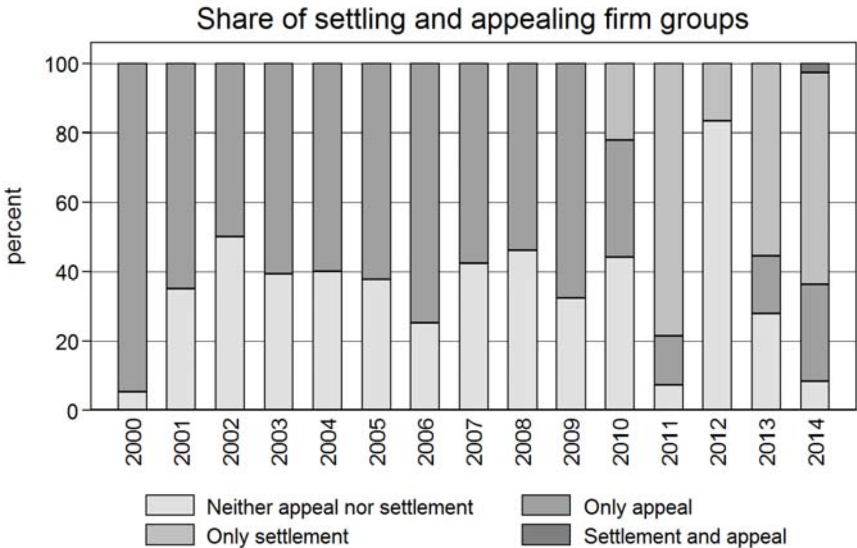

Figure 6: Shares of Settling and Appealing Firm Groups (2000-2014)

[30] However, it has to be added that the companies on average waited about 57 months from the beginning of the appeals process to the final decision (either by the GC or the ECJ). See Hüschelrath and Smuda (2014) for further information. As this waiting period generates a substantial amount of additional costs, the benefit of an appeals process is reduced.

[31] Please note that the respective settlement and appeal values correspond to the year in which the original EC decision on the cartel was made, i.e., a case decided by the EC in 2001 and finally ruled by a European appellate court in 2004 is counted as appeal in the year 2001.

As shown in Figure 6, before the introduction of the EU Settlement Procedure in 2010, the share of firm groups that decided to appeal an EC fining decision was quite significant mostly exceeding the 50 percent threshold and reaching an average of 63 percent. However, the picture changes substantially after 2010. With the exception of 2012, the share of settling (but not appealing) firm groups was much larger than the share of firm groups (fined under the standard procedure) that either decided to appeal or not to do so. Most interestingly, however, we find that – since the introduction of the EU Settlement Procedure – only one firm group that decided to settle later appealed the respective EC decision.[32] In this respect, we find clear evidence for a substantial reduction of the number of appeals for the sub-group of firm groups that decided to settle.

4.5 Impact on Follow-on Private Enforcement

A further potential impact of the settlement procedure refers to the private enforcement of cartel cases. At the latest since the Directive on Antitrust Damages Actions[33] was signed into law in late 2014, these cases are expected to gain in importance in the European Union's Member States and the question is therefore raised whether and how the settlement procedure influences the number and probability of success of such private enforcement activities.

At first sight, one important aspect that might hamper the further development of private enforcement has to do with the substantially less informative decisions published for settled cases. While a normal decision must contain detailed information on the infringement, the decision following a successful settlement is much shorter making it more complicated to successfully bring a follow-up private enforcement case (that needs to present convincing evidence on, for example, the scope of the infringement (i.e., duration and gravity) as well as the value of affected sales).[34] However, an opposing effect can be seen in the clear admittance of liability of cartel members demanded by the Commission as part of the settlement

[32] In the Euro Interest Rate Derivatives (Case COMP/39.914), Société Générale became the first settling party to appeal an EC settlement decision alleging an error in the assessment of the fine (Case T-98/14, Société Générale versus Commission, case brought on 14 February 2014). Bellis (2014a) provides further information on the case. More generally, companies that decided to opt out of the settlement procedure might have an increased probability to appeal (as they might be left with the impression that the Commission eventually punished them with higher fines for refusing to settle (see Bellis (2014a) describing the case of Timab, a company that decided to opt out of the settlement procedure in Animal Feed Phosphates (Case COMP/38.866)).

[33] Directive of the European Parliament and the Council on Certain Rules Governing Actions for Damages under National Law for Infringements of the Competition Law Provisions of the Member States and of the European Union (PE-CONS 80/14). The Directive was signed into law on 26 November 2014 leaving the Member States two years to implement it in their national legal systems.

[34] It should be noted that both the EU Settlement Notice and the Directive on Antitrust Damages Actions protect settlement submissions from discovery in private damages litigations – in basically the same way as guaranteed for information disclosed as part of the leniency program – in order to retain the incentives of companies to engage in settlements.

procedure. Additionally, the settlement decision is expected to be finalized earlier than the standard decision allowing private parties to commence their respective actions earlier.[35] Last but not least, from a more general perspective, the expected freeing up of resources at the Commission as a consequence of the settlement procedure allows it to decide on more cases in a certain period of time thus increasing the general possibilities of follow-on private damages actions.

Although it would be technically possible to investigate the impact of the settlement notice on the probability and success of follow-on private enforcement activities, the fact that most EU Member States are still in its infancy with respect to private cartel enforcement complicates such an endeavor in the years to come. Even if a sufficiently large number of cases will be generated at some point – which appears to be unclear given the expected high rate of settled private damage claims – the largely absence of private enforcement cases before the introduction of the settlement procedure will make any statistical isolation of a respective effect a difficult endeavor.

4.6 Impact on Deterrence

Although there is little doubt that the number of detected and punished cartels can be used as one indication for the success of a certain cartel policy, there is also little doubt that the eventual aim of cartel policy actions lies in the deterrence of future infringements (or the self-reporting of existing infringements, respectively). A comprehensive discussion of possible impacts of the EU Settlement Procedure on cartel enforcement must therefore close with a perspective on the impact on deterrence.

From a theoretical perspective, the sign of the net effect of the introduction of the settlement procedure on deterrence appears undetermined. On the one hand, the settlement procedure frees resources thereby allowing the EC to investigate and decide on more cases in a given time period (possibly even to increase its activities to detect further cases ex-officio) thus leading to an increase in deterrence. On the other hand, referring to the general law and economics literature together with the cartel-related discussion in Ascione and Motta (2008), the (10 percent) reduction in fines offered as benefit to settle reduces the expected fine for

[35] Interestingly, as reported by Bellis (2014b), a UK Supreme Court decision in Deutsche Bahn (Deutsche Bahn AG and others v. Morgan Advanced Materials Plc (formerly Morgan Crucible Plc) [2014] UKSC 24) finds that a party that is subject to an infringement decision and does not appeal becomes immediately subject to follow-on claims (even if other liable parties have appealed the decision). As argued by Bellis ((2014b), p. 42) this means that "… settling parties in a hybrid case will face follow-on damage claims sooner than any non-settling parties". Ceteris paribus, this constellation can lead to a reduction in the incentives for companies to settle (partly depending on the regime of interest on damages implemented in the respective jurisdiction (see Bueren et al. (2014) for further information)).

every cartel member and thus affects the level of deterrence negatively. Ceteris paribus, such a factual fine reduction would turn marginal cartels[36] profitable thus expecting an increase in the number of newly formed cartels.

Discussing the plausibility and significance of the two opposing effects a little further, a natural way to investigate the first effect lies in an analysis of the number and types of decided cartel cases over time. In this respect, the substantial increase in the number of decided cases especially in 2014 (shown in Figure 2 above) could be seen as first indication for the existence of such an effect. However, as also shown in Figure 2, comparable or even larger numbers of decided cases were observed in earlier years (without an impact of the settlement procedure). An application of empirical techniques – for example, aiming at identifying a structural break in the number of decided cases after the introduction of the settlement procedure – must therefore be put on hold for a few more years. However, the general value of such an analysis appears limited anyway as it ignores the (changes in the) presumably large population of undetected cartels.[37]

With respect to the second effect – the reduced deterrence due to the factual fine reduction granted for settling companies – much depends on the answer to the more general question whether the current level of fines in the EU is classified as too high, too low or just right. In this respect, on the one hand, (probably) the majority of researchers argue that current fine levels are too low to reach the deterrence-optimal level.[38] As a consequence, the introduction of the settlement procedure would therefore worsen the situation further. On the other hand, the introduction to this article gave an impression on the dimension of recent fine increases finding a thirtyfold increase in average fines per cartel when comparing the 1995 to 1999 period with the 2010 to 2014 period – not to mention the expected factual fine increases in the form of private damage claims. Without aiming at assessing this important question of the levels of current and optimal deterrence in the EU any further in this article, on a higher level, the OECD (2006, p. 14) is certainly right in asking competition authorities to "… seek

[36] 'Marginal cartels' are cartels whose implementation was just deterred before a certain change occurred (as the expected costs marginally exceeded the expected benefits), however, turned profitable after that change due to a (as in our case here) reduction in the expected costs (i.e., fine).

[37] For the European Union, Combe et al. (2008) apply a general stochastic detection model to estimate the annual probability of detection for a sample consisting of all cartels convicted by the European Commission from 1969 to 2007. The authors find an annual probability of detection that falls between 12.9% and 13.3%. Most recently, Ormosi (2014) develops a statistical method to estimate time-dependent cartel discovery rates and subsequently applies it to a data set of cartels convicted by the EC from 1984 to 2009. He finds evidence that less than a fifth of cartelizing firms are discovered.

[38] Examples of papers that find a significant under-deterrence of cartelization in the European Union are Combe and Monnier (2011), Mariniello (2013), Schinkel (2007), Smuda (2014) or Veljanovski (2007). Contributions identifying a significant risk of over-deterrence include Van Cayseele et al. (2008) and Allain et al. (2015).

settlements that maximize overall deterrence resulting from public and private enforcement, rather than focus exclusively on the sanction they can obtain".

5 Conclusion

While most Member States of the European Union (EU) were historically a hospitable environment for cartels, the landscape has radically changed and is well-stated in a pronouncement of a former European Commissioner for Competition, Mario Monti. Back in the year 2000, he referred to cartels as "cancers on the open market economy" (Monti (2000, p. 2) and concluded that "[t]he fight against cartels is essential to the welfare of our economies and should be a priority for all enforcement authorities" (Monti (2000), p. 9). Since then, the European Commission (EC) together with the national competition authorities in the EU Member States has made considerable efforts to improve the competitiveness of the European Union by fighting cartels.

Although it is undisputed that these activities born fruit in the form of substantial increases in the number of detected and punished cartels – and strengthened the deterrent effect of cartel enforcement associated therewith – it is equally undisputed that these successes do not come free of charge but where only possible through substantial investments of time (and other resources) by the EC and the other parties involved in the enforcement process. For example, in the period from 2000 to 2014, the average cartel investigation – consisting of activities such as initial information gathering, preliminary investigation, case proceedings or the writing of the statement of objections and decision – lasted more than four years. Aiming at reducing the duration of cartel investigations, in 2008, the EU enabled the EC to introduce a settlement procedure to streamline the cartel enforcement process.

Against this background, we use a data set consisting of 84 cartels decided by the EC from 2000 to 2014 to empirically investigate the impact of the EU settlement procedure on the duration of cartel investigations. Separating the enforcement process into two consecutive stages, we find that the introduction of the settlement procedure is followed by a substantial shortening of the second stage – reaching from the statement of objections (SO) to the decision – by more than 12 months while it leaves the duration of the first stage from the beginning of the case to the SO unaffected.

From an *authority's perspective*, our empirical results have shown that the EU Settlement Procedure – six and a half years after its implementation – has led to quicker decisions particularly for settled cases and are therefore likely to have realized substantial resource savings. If these resources were reinvested in the investigation of new cases, a positive knock-on effect on the strengthening of the deterrent effect of cartel enforcement can be expected as

well. Furthermore, due to the still rather short history of the settlement procedure (along with its rather slow start), it can be expected that the realization of further efficiencies will cause additional savings, especially if the settlement negotiations in the first stage profit from further learning economies on both sides of the table and the Commission is successful in selecting the right cases for settlements – i.e., cases which are sufficiently likely to allow the realization of the respective procedural efficiencies – and avoids hybrid cases as well as discontinued settlements.

From a *company's perspective*, the decision to settle is rather complex and multifaceted. In addition to the obvious benefit of the 10 percent fine discount, further benefits include savings in litigation costs or less reputational damage (due to the shorter investigation duration) or the possibility to influence the EC's assessment of the case during the settlement proceedings. However, the settlement procedure also imposes substantial costs on the companies, first and foremost by the compulsory admission of liability and the therefore substantially reduced possibilities to receive a (possibly larger) fine reduction (or even annulment) in a subsequent appeals process. A further potential disadvantage of the quicker resolution of the case must be seen in a corresponding earlier exposure to either further public enforcement actions in other jurisdictions or follow-on private litigation of customers being harmed by the respective cartel agreement.

From a *welfare perspective,* productive efficiency increases in the procedures of the EC are always positive as long as, first, the deterrence effect is not significantly weakened and, second, the quality of the respective decisions remains largely unaffected. Although the net effect of the settlement procedure on deterrence appears undecided – with the 10 percent fine discount weakening it but the increased enforcement activities due to freed authority resources generating a positive shift – it appears likely that its overall size is rather small (and could be easily compensated by adjustment in either fine levels or the probability of cartel detection and punishment). In terms of the quality of EC decisions, a potentially negative future impact could result from the expectation that an increasing share of settled cases leads to a corresponding reduction in the share of appeals cases. As the appeals process generally has important control and error-correction functions in legal systems, a decreasing relevance in the settlement era might eventually cause negative effects on the quality of EC cartel decisions. Although future research will have to investigate whether such an effect can be identified, a potential countervailing argument refers to the expected increased efforts of all involved parties in the first stage of the cartel enforcement process to avoid the

inconsistencies or misunderstandings that possibly caused a significant fraction of appeals cases in the pre-settlement era.

References

Adelstein, R. (2007), Economics of Plea Bargaining, Division II Faculty Publications. Paper 94, available at http://wesscholar.wesleyan.edu/div2facpubs/94.

Adelstein, R. (1978), The Plea Bargain in Theory: A Behavioral Model of the Negotiated Guilty Plea, Southern Economic Journal 44, 488-503.

Allain, M.-L., M. Boyer, R. Kotchoni, J.-P. Ponssard (2015), Are Cartel Fines Optimal? Theory and Evidence from the European Union, International Review of Law and Economics 42, 38-47.

Ascione, A. and M. Motta (2008), Settlements in Cartel Cases, EU Competition Law and Policy Workshop/Proceedings, Florence.

Aygün, E. (2013), Cartel Settlements: General Features, Recent Developments in the European Commission's Practices and Implications for Turkey, Rekabet Dergisi 14 (2), 3-42.

Baxter, W. (1980), The Political Economy of Antitrust, in: R. Tollison, The Political Economy of Antitrust, Lexington, 3-49.

Bay, M. (2010), EU Cartel Settlements: Theory and (first) Practice, Presentation, IBRAC Seminar, 26 November 2010, Guarujá.

Bellis, J.-F. (2014a), General Overview of the EU Cartel Settlement Procedure, Competition Policy International, 1-6.

Bellis, J.-F. (2014b), Cartel Settlements, Van Bael & Bellis, Presentation, 28 November 2014, Madrid.

Brankin, S.-P. (2008), All Settled: Where are the European Commission's Settlement Proposals Post Consultation?, Competition Law Journal 7, 170-181.

Bueren, E. (2011), Verständigungen - Settlements in Kartellbußgeldverfahren: Eine Untersuchung des Vergleichsverfahrens der Kommission mit einer rechtsvergleichenden und rechtsökonomischen Analyse, Baden-Baden.

Bueren, E., K. Hüschelrath and T. Veith (2014), Time is Money – How Much Money is Time? Interest and Inflation in Competition Law Actions for Damages, ZEW Discussion Paper No. 14-008, Mannheim.

Combe, E. and C. Monnier (2011), Fines Against Hard-core Cartels in Europe: The Myth of Overenforcement, Antitrust Bulletin 56, 235-276.

Combe, E., C. Monnier and R. Legal (2008), Cartels: The Probability of Getting Caught in the European Union, Working Paper PRISM-Sorbonne, Paris.

Cooter, R. and D. Rubinfeld (1989), Economic Analysis of Legal Disputes and Their Resolution, Journal of Economic Literature, 1067-1097.

Cooter, R. and T. Ulen (2000), Law & Economics, Third Edition, Reading.

Cremers, K. and P. Schliessler (2012), Patent Litigation Settlement in Germany - Why Parties Settle during Trial, ZEW Discussion Paper No. 12-084, Mannheim.

Dekeyser, K. (2012), Alternative Procedures in the European Antitrust Legal Framework – Cartel Settlements and Commitment Decisions, Presentation, EU-China Competition Policy (Competition Week 3), Wuxi.

Givati, Y. (2014), Legal Institutions and Social Values: Theory and Evidence from Plea Bargaining Regimes, Journal of Empirical Legal Studies 11, 867-893.

Hansen, M. and D. Yoshida (2012), Cartel Settlements & Leniency in the United States and the European Union, Presentation, 21 November 2012, Tokyo.

Hoang, C.T., K. Hüschelrath, U. Laitenberger and F. Smuda (2014), Determinants of Self-Reporting under the European Corporate Leniency Program, International Review of Law and Economics 40, 15-23.

Hüschelrath, K. and F. Smuda (2014), The Appeals Process: An Empirical Assessment, ZEW Discussion Paper No. 14-063, Mannheim.

Hüschelrath, K., U. Laitenberger and F. Smuda (2013), Cartel Enforcement in the European Union: Determinants of the Duration of Investigations, European Competition Law Review 34 (1), 33-39.

International Competition Network (2008), Cartel Settlements, Cartel Working Group, Subgroup 1 – General Legal Framework, Report to the ICN Annual Conference, Kyoto.

Kelley, M. (2010), Settling for Settlement: The European Commission’s New Cartel Settlement Procedure, Washington University Global Studies Law Review 9, 699-720.

Kroes, N. (2008), Settlements in Cartel Cases, Speech Manuscript, 12th Annual Competition Conference, 19 September 2008, Fiesole.

La Casse, C. and A. Payne (1999), Federal Sentencing Guidelines and Mandatory Minimum Sentences: Do Defendants Bargain in the Shadow of the Judge?, Journal of Law and Economics 42, 245-269.

Laina, F. and A. Bogdanov (2014), The EU Cartel Settlement Procedure: Latest Developments, Journal of European Competition Law & Practice 5 (10), 717-727.

Laina, F. and E. Laurinen (2013), The EU Cartel Settlement Procedure: Current Status and Challenges, Journal of European Competition Law & Practice 4 (4), 302-311.

Landes, W. (1971), An Economic Analysis of the Courts, Journal of Law and Economics 14, 61-108.

Mariniello, M. (2013), Do European Union Fines Deter Price Fixing?, Bruegel Policy Brief No. 4, Brussels.

Miceli, T. (1996), Plea Bargaining and Deterrence: An Institutional Approach, European Journal of Law and Economics 3, 249-264.

Monti, M. (2000), Fighting Cartels – Why and How?, European Commission SPEECH/00/295, 11 September 2000, Stockholm.

O'Brien, A. (2008), Cartel Settlements in the U.S. and EU: Similarities, Differences & Remaining Questions, Speech Manuscript, 13th Annual EU Competition Law and Policy Workshop, 6 June 2008, Florence.

OECD (2006), Plea Bargaining/Settlement of Cartel Cases, DAF/COMP(2007)38, Paris.

Olsen, G. and M. Jephcott (2010), The European Commission's Settlement Procedure, Antitrust 25 (1), 76-80.

Ormosi, P. (2014), A Tip of the Iceberg? The Probability of Catching Cartels, Journal of Applied Econometrics 29, 549-566.

Posner, R. (1973), An Economic Approach to Legal Procedure and Judicial Administration, Journal of Legal Studies 2, 399-458.

Schinkel, M.P. (2007), Effective Cartel Enforcement in Europe, World Competition Law and Economics Review, 30(4), 539-572.

Shavell, S. (1982), The Social Versus Private Incentive to Bring Suit in a Costly Legal System, Journal of Legal Studies 11(2), 222-339.

Smuda, F. (2014), Cartel Overcharges and the Deterrent Effect of EU Competition Law, Journal of Competition Law & Economics 10(1), 63-86.

Smuda, F., P. Bougette and K. Hüschelrath (forthcoming), Determinants of the Duration of European Appellate Court Proceedings in Cartel Cases, Journal of Common Market Studies.

Stephan, A. (2009), The Direct Settlement of EC Cartel Cases, International and Comparative Law Quarterly 58 (3), 627-654.

Van Cayseele, P., P. Camesasca and K. Hugmark (2008), The EC Commission's 2006 Fine Guidelines Reviewed from an Economic Perspective: Risking Overdeterrence, Antitrust Bulletin 53, 1083-1126.

Van Ginderachter, E. (2014), European Commission's Settlement Procedure – A Success Story, Presentation, 28 November 2014, Madrid.

Vascott, D. (2013), EU Cartel Settlements: Are They Working?, Global Competition Review, published on website on 8 April 2013.

Veljanovski, C. (2007), Cartel Fines in Europe: Law, Practice and Deterrence, World Competition Law and Economics Review 30(1), 65-86.

Appendix

Table 3: Variables in the Data Set

Variables	Description
Cartel-related variables	
Number of firm groups	Number of firm groups within cartel
Number of countries	Number of different countries within cartel
Infringement: Market division	=1 if cartel infringement was market division
Infringement: Quantity Fixing	=1 if cartel infringement was quantity fixing
Global cartel presence	=1 if cartel market was worldwide
Investigation-related variables	
Total duration	Time span from beginning of EC investigation to EC decision, in months
Duration Investigation-SO	Time span from beginning of EC investigation until EC statement of objections, in months
Duration SO-Decision	Time span from EC statement of objections to decision by EC, in months
Detection before cartel ended	=1 if cartel was detected before its end
Time span cartel end to detection	Time span from cartel breakdown to beginning of EC investigation, in months (zero if detection during cartel lifetime)
Investigation in the US	=1 if the cartel case was also investigated by an US antitrust authority (prior or in parallel to EC)
Share of leniency applicants	Share of cartel members that applied for leniency
Fine-related variables	
Duration of cartel	Duration of cartel, in months
Aggravating circumstances	=1 if aggravating circumstances were taken into account in EC decision
Mitigating circumstances	=1 if mitigating circumstances were taken into account in EC decision
Key witness	=1 if key witness as part of the leniency program existed in case
Leniency reduction	Leniency reduction granted for cartel, in percent of final fine
Repeat offender	=1 if repeat offender was present in case
Legal environment-related variables	
Settlement notice applied	=1 if settlement notice was applied (full or hybrid cases)
Leniency program applied	=1 if leniency program (2002 or 2006 version) applied
2006 Fine guidelines applied	=1 if 2006 fine guidelines applied