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The settlement procedure in the European Commission's cartel cases: an early evaluation

Kai Hüschelrath* and Ulrich Laitenberger†

ABSTRACT

The introduction of the European Union (EU) Settlement Procedure in 2008 aimed at promoting the speed and efficiency of cartel investigations by the European Commission (EC). We use a data set consisting of 84 cartels decided by the EC from 2000 to 2014 to estimate the impact of the EU Settlement Procedure on the duration of EC cartel investigations. We find a statistically significant reduction in the duration of settled cases of about 8.7 months, suggesting that the settlement procedure has reached its primary aim. However, based on the identification and discussion of possible further impacts of the settlement procedure—particularly on the determination of fines, the operability of the leniency programme, the probability and success of appeals, follow-on private enforcement as well as overall deterrence—we conclude that further empirical analyses are necessary for a comprehensive evaluation of the overall welfare implications of the introduction of the settlement procedure in cartel cases in the EU.

KEYWORDS: competition policy, cartels, settlements, ex-post evaluation, European Union

JEL CLASSIFICATIONS: K21, L41

I. 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

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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 1995–1999 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 30-fold 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 programme, the substantial broadening of 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 [eg as part of the European Competition Network (ECN)], the most recent substantial reform of (public) cartel enforcement in the EU 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 per cent 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.

In this context, we use a data set consisting of 84 cartels decided by the EC from 2000 to 2014 to estimate the impact of the EU Settlement Procedure on the duration of EC cartel investigations. We find a statistically significant reduction in the duration of settled cases of about 8.7 months suggesting that the settlement procedure has reached its primary aim. However, based on the identification and discussion of possible further impacts of the settlement procedure—particularly on the determination of fines, the operability of the leniency programme, the probability and success of appeals, follow-on private enforcement as well as overall deterrence—we conclude that further empirical analyses are necessary for a comprehensive evaluation of the overall welfare implications of the introduction of the settlement procedure in the EU.

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

1 The respective data (not adjusted for court judgements) is published (and frequently updated) by the EC's Competition Directorate-General. See European Commission, 'Cartel Statistics' <<http://ec.europa.eu/competition/cartels/statistics/statistics.pdf>> accessed 20 November 2016.

enforcement in the EU 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.

II. 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 EC cartel cases. Following an initial brief general discussion of the law and economics of settlement procedures in Section II.i., we subsequently provide a more detailed characterization of the main steps of the EU Settlement Procedure in Section II.ii. 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.

II.i. 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’² 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.³

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 settle⁴ as well as their social implications in general⁵ and their (negative) impact on deterrence in particular.⁶ 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 litigation⁷ and the respective literature mentioned there or (more generally)

2 R Cooter and T Ulen, *Law and Economics* (6th edn, Pearson 2014) 393.

3 See W Landes, ‘An Economic Analysis of the Courts’ (1971) 14 *J Law Econ* 61 and R Adelstein, ‘The Plea Bargain in Theory: A Behavioral Model of the Negotiated Guilty Plea’ (1978) 44 *Southern Econ J* 488.

4 See, eg, Landes (n 3), R Posner, ‘An Economic Approach to Legal Procedure and Judicial Administration’ (1973) 2 *J Legal Stud* 399, W Baxter, ‘The Political Economy of Antitrust’ in R Tollison (ed), *The Political Economy of Antitrust* (Rowman & Littlefield 1980) 3 and E Bueren, *Verständigungen - Settlements in Kartellbußgeldverfahren: Eine Untersuchung des Vergleichsverfahrens der Kommission mit einer rechtsvergleichen- und rechtsökonomischen Analyse* (Nomos 2011).

5 See S Shavell, ‘The Social Versus Private Incentive to Bring Suit in a Costly Legal System’ (1982) 11 *J Legal Stud* 222 and R Cooter and D Rubinfeld, ‘Economic Analysis of Legal Disputes and Their Resolution’ (1989) 27 *J Econ Lit* 1067.

6 See, eg, T Miceli, ‘Plea Bargaining and Deterrence: An Institutional Approach’ (1996) 3 *Eur J L Econ* 249 or C La Casse and A Payne, ‘Federal Sentencing Guidelines and Mandatory Minimum Sentences: Do Defendants Bargain in the Shadow of the Judge?’ (1999) 42 *J L Econ* 245.

7 See, eg, K Cremers and P Schliessler, ‘Patent Litigation Settlement in Germany - Why Parties Settle during Trial’ (2015) 40 *Eur J L Econ* 185.

plea bargaining⁸—a settlement procedure frequently applied in criminal cases in the USA.⁹

With respect to settlements in antitrust cases, Rubinfeld¹⁰ provides an excellent overview of the theoretical and empirical literature. Differentiating between settlements in private litigation and as part of public enforcement, he leaves no doubt that the large majority of existing papers concentrates on the former with a particular focus on the USA.

From a theoretical perspective, the general settlement-trial decision literature suggests that settlement decisions depend on a multitude of factors including the available savings in litigation costs, the risk aversion of the involved parties, the perceived likelihood of success, or reputational effects of external benefits flowing from the case.¹¹ Furthermore, as shown by Perloff and Rubinfeld,¹² the incentives to settle can be influenced by the existing legal rules—and may gain further in complexity in cases that follow-on government suits.¹³

From an empirical perspective, several contributions assessing settlement probabilities by applying stochastic models of settlement behaviour in private litigation are particularly worth mentioning.¹⁴ In the context of antitrust litigation, Perloff, Rubinfeld, and Ruud¹⁵ use a jointly estimated model of settlement and trial outcome to investigate the role of risk aversion in explaining the settlement-trial decision. They find that the likelihood of a plaintiff's success especially depends on the jurisdiction, the antitrust allegation, firm size, the industry and whether or not a jury trial occurs. Furthermore, while reputation effects do not play an important role in the decision to settle, risk aversion is found to have such a decisive influence.

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 Motta¹⁶ correctly point to the following three important legal

8 Adelstein 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'. See R Adelstein, 'Economics of Plea Bargaining' (2007) Division II Faculty Publications, Paper 94, 2 <<http://wescholar.wesleyan.edu/div2facpubs/94>> accessed 20 November 2016.

9 See, eg, Adelstein (n 8) or Y Givati, 'Legal Institutions and Social Values: Theory and Evidence from Plea Bargaining Regimes' (2014) 11 J Empirical Legal Stud 867.

10 D Rubinfeld, 'Antitrust Settlements' in R Blair and D Sokol (eds), *The Oxford Handbook of International Antitrust Economics* (OUP 2015) 172.

11 *ibid.*

12 J Perloff and D Rubinfeld, 'Settlements in Private Antitrust Litigation' in L White (ed), *Private Antitrust Litigation: New Evidence, New Learning* (MIT Press 1988) 149.

13 See also H Briggs, K Huryn and M McBride, 'Treble Damages and the Incentive to Sue and Settle' (1996) 27 RAND J Econ 770.

14 See, eg, G Fournier and T Zuehlke, 'Litigation and Settlement: An Empirical Approach' (1989) 71 Rev Econ Stat 189 or J Perloff, D Rubinfeld and P Ruud, 'Antitrust Settlements and Trial Outcomes' (1996) 78 Rev Econ Stat 401.

15 Perloff and others (n 14).

16 A Ascione and M Motta, 'Settlements in Cartel Cases' (2008) EU Competition Law and Policy Workshop Proceedings <http://www.barcelonagse.eu/tmp/pdf/motta_settlementscartels.pdf> accessed 20 November 2016.

differences.¹⁷ First, while the general literature typically refers to private contracts used to avoid going to court, settlements in cartel cases are applied 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 settlement cases are typically characterized by a large amount of uncertainty (eg with respect to the liability or guilt of the defendant) while—in comparison—the uncertainty in EC cartel cases is limited to the basic amount of the fine as well as the final fine (received after taking into account additional determinants such as aggravating or mitigating factors or participation in the leniency programme). A more detailed overview of the EU Settlement Procedure in cartel cases is provided in the following subsection.

II.ii. Characterization of the EU Settlement Procedure

The EU Settlement Procedure was introduced in late June 2008 with Regulation 622/2008¹⁸ and a Commission Notice¹⁹ on the conduct of settlement procedures. It 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.²⁰ Parties who admit liability and waive these procedural rights receive a discount of 10 per cent 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 ...”²¹ 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,²² it is important for our subsequent empirical analysis to

17 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 provides a detailed overview with particular discussions on (i) different types of settlement systems, (ii) the interplay of leniency and cartel settlements, (iii) key principles to introducing cartel settlements, (iv) benefits of cartel settlements, (v) key issues commonly addressed during settlement discussions, (vi) key elements of cartel settlements as well as (vii) other contemplated cartel settlement systems. See International Competition Network, ‘Cartel Settlements’ (2008) Cartel Working Group, Subgroup 1—General Legal Framework, Report to the ICN Annual Conference <<http://www.internationalcompetitionnetwork.org/uploads/library/doc347.pdf>> accessed 20 November 2016. For a detailed discussion, see also E Aygün, ‘Cartel Settlements: General Features, Recent Developments in the European Commission’s Practices and Implications for Turkey’ (2013) 14 *Rekabet Dergisi* 3.

18 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 [2008] OJ L171/3. Commission Regulation (EC) No 773/2004 of 7 April 2004 relating to the conduct of proceedings by the Commission pursuant to arts 81 and 82 of the EC Treaty [2004] OJ L123/18 lays down rules concerning the participation of the parties concerned in such proceedings.

19 Commission Notice on the conduct of settlement procedures in view of the adoption of decisions pursuant to art 7 and art 23 of Council Regulation (EC) No 1/2003 in cartel cases [2008] OJ C167/1.

20 Commission Regulation (EC) No 773/2004 [2004] OJ L123/18.

21 Commission Regulation (EC) No 622/2008 [2008] OJ L171/3, 1.

22 For practitioner’s perspectives on the functioning of the EU Settlement Procedure, see J-F Bellis, ‘General Overview of the EU Cartel Settlement Procedure’ (2014a) *Competition Policy International* 1,

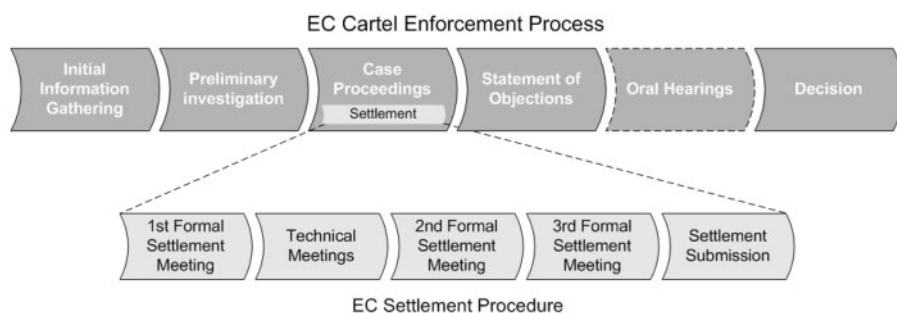


Figure 1. The EC cartel enforcement process and the settlement procedure.²³

briefly characterize the respective main steps of the procedures as sketched in Figure 1.

Figure 1 subdivides the EC cartel enforcement process into six subsequent stages: initial information gathering, preliminary investigations, case proceedings, statement of objections (SO), 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 (eg through a leniency programme, an informant, etc) and has to conduct a preliminary investigation to assess whether the collected material appears sufficient to initiate case proceedings.

If case proceedings are commenced, the settlement procedure comes into play. The procedure as such can broadly be subdivided further into the five steps²⁴ 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 SO (ie 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.²⁵ In this respect, it is important to mention that the EU Settlement Procedure is more of a ‘case closure mechanism’ (and only partly an investigative tool such as plea

J-F Bellis, ‘Cartel Settlements’ (Conference on the Fight against Hard Core Cartels in Europe, Madrid, November 2014b), G Olsen and M Jephcott, ‘The European Commission’s Settlement Procedure’ (2010) 25 *Antitrust* 76 and D Vascott, ‘EU Cartel Settlements: Are They Working?’ (2013) *Global Compet Rev* <<https://www.lw.com/mediaCoverage/are-eu-cartel-settlements-working>> accessed 20 November 2016.

23 Inspired by two separate figures in Bellis (2014b, n 22). The standard EC cartel enforcement process includes all six stages represented in the top of the figure by the dark-shaded tetragons. In settled cases, the oral hearings stage (tetragon with dashed lines) is omitted.

24 For more detailed information on the EU Settlement Procedure from inside the Commission, see K Dekeyser, ‘Alternative Procedures in the European Antitrust Legal Framework—Cartel Settlements and Commitment Decisions’ (EU-China Competition Policy Conference, Wuxi, 2012); F Laina and A Bogdanov, ‘The EU Cartel Settlement Procedure: Latest Developments’ (2014) 5 *J Eur Compet L & Pract* 717; F Laina and E Laurinen, ‘The EU Cartel Settlement Procedure: Current Status and Challenges’ (2013) 4 *J Eur Compet L & Pract* 302.

25 See Bellis (2014b, n 22).

bargaining in the USA) and therefore only considered after the EC has finalized its investigation.²⁶

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 (ie 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.²⁷

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' (ie much shorter²⁸) settlement submission and eventually the final decision on the settled case.²⁹

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 either speed or 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 efficiency. However, as already indicated above, the respective increase in speed and efficiency are expected to be realized especially by eliminating or reducing procedural steps required under the standard procedure such as full access to file,³⁰ drafting and translations as well as oral hearing and interpretation. Although parts of these procedures already take place before finalizing the SO, the lion part is scheduled to take place after the SO under the standard procedure.

Guided by the structure of the EU Settlement Procedure just discussed, in our empirical analysis below, we will subdivide the entire process into two stages: a first

26 For assessments of similarities and differences between the two settlement procedures, see A O'Brien, 'Cartel Settlements in the U.S. and EU: Similarities, Differences & Remaining Questions' (13th Annual EU Competition Law and Policy Workshop, Florence, June 2008); M Hansen and D Yoshida, 'Cartel Settlements & Leniency in the United States and the European Union' (Presentation, Tokyo, November 2012); A Stephan, 'The Direct Settlement of EC Cartel Cases' (2009) 58 *Int Comp L Quart* 627.

27 For a detailed economic analysis, see MP Schinkel, 'Bargaining in the Shadow of the European Settlement Procedure for Cartels' (2011) 56 *Antitrust Bull* 461. For more detailed law perspectives, see, eg, Hansen and Yoshida (n 26) and M Bay, 'EU Cartel Settlements: Theory and (first) Practice' (IBRAC Seminar, Guarujá, November 2010).

28 According to Laina and Laurinen (n 24), 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.

29 See generally Bellis (2014a/b, n 22) for further information.

30 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 N Kroes, 'Settlements in Cartel Cases' (12th Annual Competition Conference, Fiesole, September 2008).

period from the beginning of the case (through initial information gathering³¹) up to the SO and a second period from the SO to the decision. Although the choice of this cut-off date was also guided by the availability of the respective information for all cartel cases,³² its main motivation was to be able to investigate two separate effects: first, whether the settlement procedure has been implemented correctly. If this is the case, we would expect the duration of the second period to be shortened substantially.

Second, and even more important, we are able to investigate whether the introduction of the settlement procedure actually reached its main aim of speeding up the entire EC cartel enforcement process. *Ex ante*, the existence of such a positive net effect is not clear as—although some of the post-SO enforcement steps cease to apply under the settlement procedure—the first period now contains the settlement procedure with *ex-ante* open effects on the duration of that process. In the worst case, if agreeing on a settlement takes longer than going through the standard procedure, the benefits of the settlement procedure would be questionable or even non-existent. However, if we find that the expected reduction in the duration of the second period is accompanied by either no or only a small increase in the duration of the first period, we can conclude that the introduction of the settlement procedure reached its primary aim of shortening the duration of EC cartel investigations.

II.iii. 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 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 EC from 2000 to 2014 (excluding three readopted cases³³).

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 18 settled cases out of which 7 cases³⁴ were hybrid settlements in which typically one of the companies decided to opt out of the

31 The choice of the start date of the investigation is a non-trivial exercise due to the existence of several alternative dates such as, eg, the date of a dawn raid, the allocation of a case number, or the opening of official proceedings. In this article, we consistently use the earliest event explicitly mentioned in the decision documents (eg, the date of the first leniency application) as start date of the investigation.

32 Although it would be desirable to include further investigation-related dates into our empirical analysis below—such as, eg, the initiation of proceedings—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. However, it is important to note that the entire duration of EC cartel investigations—from the beginning of the investigation to the decision—is unaffected by the choice of the cut-off date. As our main analysis refers to this total duration of the EC cartel enforcement process, the respective main conclusions hold independent of the chosen cut-off date.

33 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).

34 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).

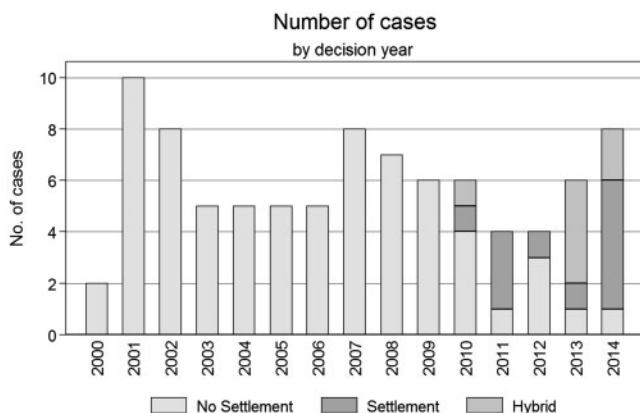


Figure 2. Number of decided EC cartel cases (2000–14).

settlement procedure.³⁵ Furthermore, the first two cases—settled in 2010³⁶—were special in the sense that they were converted into settlement cases relatively late in the investigation process³⁷ 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 IV.

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.

Figure 3 subdivides the total duration of EC cartel investigations into the two stages from the beginning of the investigation to the 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 (settled and non-settled) cases—with a rather high individual variation in duration—is likely to hide important information. In Figure 4, 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, ie, 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 SO the EC was working on the respective case. The negative values on the vertical axis show the respective duration of

35 See generally Laina and Bogdanov (n 24) for further information.

36 The cases are *DRAMs* (Case COMP/38.511) and *Animal Feed Phosphates* (Case COMP/38.866).

37 See Vascott (n 22).

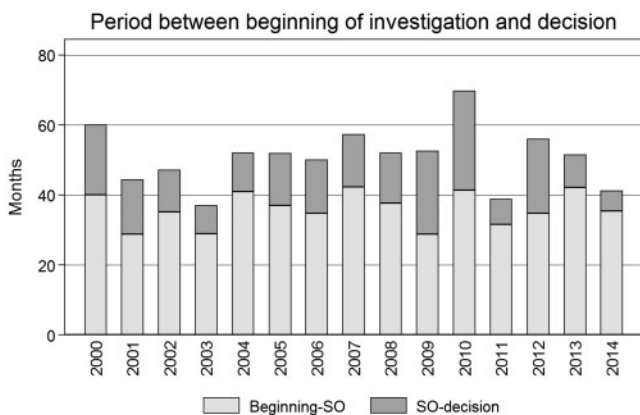


Figure 3. Total duration of EC cartel investigations (2000–14).

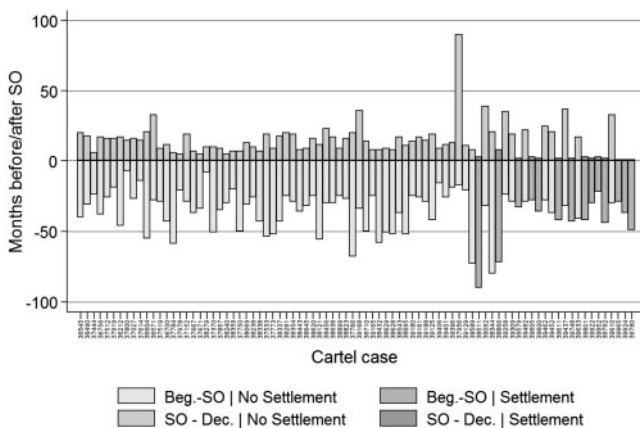


Figure 4. Individual duration of case investigations before and after the EC's SO (2000–14).

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.³⁸ Adding up the respective two bars of the stages therefore result in the total 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 colours for both stages of the settled cases.

Abstracting from the few outliers with unusually long first or second stages (justifying their exclusion from our empirical analysis below), the probably most

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

apparent finding of Figure 4 is the substantial reduction in the duration of the second stage for settled cases.³⁹ This finding supports the conclusion that the settlement procedure was implemented correctly. It is further revealed that the first stage of the respective settled cases does not show an obvious upward shift compared to their non-settled counterparts, suggesting that the settlement procedure leads to a net reduction in the total duration of EC cartel investigations.

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—possibly aiming at showing that the settlement procedure actually works—however, apparently at the expense of a substantial increase in the duration of non-settled cases.⁴⁰

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

III. 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 the speed and efficiency of EC cartel investigations, 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 III.i. we therefore develop several hypotheses on the determinants of the duration of EC cartel investigations. Section III.ii. 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 III.iii.

III.i. Hypothesis development

In this section, we develop hypotheses on possible determinants of the duration of EC cartel investigations.⁴¹ We differentiate between four sets of explanatory variables: cartel-related, investigation-related, fine-related, and legal environment-related.

39 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) where 3 out of 7 companies decided not to settle. See Laina and Bogdanov (n 24) 723 for detailed information.

40 We are grateful to an anonymous reviewer for bringing this argument to our attention.

41 Compared to K Hüscherlath, U Laitenberger and F Smuda, 'Cartel Enforcement in the European Union: Determinants of the Duration of Investigations' (2013) 34 *Eur Compet L Rev* 33, we have extended the data set substantially—not only timewise but especially with respect to the inclusion of further variables

III.i.i. Cartel-related determinants

A first set of variables relate to characteristics of the cartel handled by the EC. 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 SO 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 groups⁴² 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 an otherwise similar case with ten firm groups.

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 proof is available). Finally yet importantly, 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.

III.i.ii. 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 the 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 5 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

allowing us to develop a larger set of hypotheses and therefore richer specification of our empirical model below.

42 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.

authorities as well. However, adding an international dimension (especially involving the USA) 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.

Finally yet importantly, 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).

III.i.iii. 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 programme. *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 (eg to find sufficient proof for the start date of the cartel). The same general argumentation applies to the presence of aggravating and mitigating factors (ie the cartel includes a repeat offender or a company's involvement was limited, respectively). Finally yet importantly, we expect that the actual degree of cooperation of the separate cartel members with the Commission—reflected in fine reductions between 10 per cent and 100 per cent—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 decreases 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.

III.i.iv. 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 notice in 2002 and 2006, the reform of the 1998 guidelines for setting fines in 2006, and the settlement notice in 2008. For all three reforms, we expect to observe decreases in the duration of the investigation process. While

the leniency programme 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 the speed and efficiency of EC cartel investigations.

III.ii. Data set and descriptive statistics

The raw data set used in this article contains detailed information on all cartel cases decided by the EC 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 A1 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 subgroups. As already mentioned in Section II.iii above, we excluded the first two settlement cases⁴³ (decided in 2010) as they were converted into settled cases relatively late in the investigation process as well as three readoptions of cases⁴⁴ as these cases have by definition an unusually long duration. Furthermore, for our empirical analysis, we excluded one extraordinary long case⁴⁵ as well as two cases⁴⁶ 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.

Starting 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 per cent for other types of agreement). Finally yet importantly, we find that about 10 per cent 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 investigation⁴⁷ by the EC over the entire data set was about 50 months. However,

43 The cases are *DRAMs* (Case COMP/38.511) and *Animal Feed Phosphates* (Case COMP/38.866).

44 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).

45 The case is *Far East Trade Tariff and Surcharges Agreement* (Case COMP/34.018).

46 The cases are *Yen Interest Rate Derivatives* (Case COMP/39.861) and *Euro Interest Rate Derivatives* (Case COMP/39.914).

47 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. In the majority of cases, this date is the first

Table 1. Descriptive statistics

	(1)		(2)		(3)	
	All cases		Non-settled cases		Settled cases	
<i>Cartel-related variables</i>						
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)
<i>Investigation-related variables</i>						
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 USA	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)
<i>Fine-related variables</i>						
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)
<i>Legal environment-related variables</i>						
Settlement notice applied	0.15	(0.36)	0.00	(0.00)	1.00	(0.00)
Leniency programme 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)
<i>Observations</i>	82		70		12	

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 shows that the introduction of the settlement procedure led to an overall reduction of the investigation duration of about 27 per cent.

Furthermore, the breakdown of the total duration into the two stages first provides clear descriptive evidence that the settlement procedure was implemented correctly—as the duration of the second stage from the SO to the decision is reduced substantially by about 14.5 months. Second, although the duration of the first stage from the beginning of the investigation to the SO shows a slight increase of about

leniency application handed in to the EC. However, in a handful of cases, alternative dates such as prior investigations in the USA, complaints, filings of insiders or investigations ex-officio were used as start date of the EC investigation.

one month, the savings in the second stage are substantially larger leading to net savings of about 13.5 months.

Furthermore, Table 1 shows further that while settled and not-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'⁴⁸ 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 USA (either prior or in parallel). This is consistent with the personal views of Commission officials stating 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 per cent of all cases) and the leniency reduction (found at an average of about 31 per cent), the most substantial differences are found for the duration of the cartel. While the non-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 per cent and 40 per cent, 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.

Finally yet importantly, we turn to our three 'legal environment-related variables'. It is shown here that about 15 per cent of all cases in the data set were eventually settled. Furthermore, the leniency programme is applied in 58 per cent of all cases; because of its chronological order, all settled cases were dealt under the 2002 or 2006 versions of the leniency programme and the 2006 fine guidelines.

III.iii. 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 EC to decide the respective case. The independent variables included into our model refer to the four sets of variables identified in Section III above as potential

48 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 documents 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).

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.

Starting a more detailed discussion of the respective coefficients with our *cartel-related variables*, the number of firm groups has a significantly positive effect on the total duration and the second stage thereby largely confirming our hypothesis derived in Section III.i. 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. Finally yet importantly, 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 (eg 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 USA 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 per cent 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 programme. Furthermore, we

Table 2. Regression results

	(1)		(2)		(3)	
	Total Duration Beginning-Decision		Duration Beginning-SO		Duration SO-Decision	
<i>Cartel-related variables</i>						
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)
<i>Investigation-related variables</i>						
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 USA	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)
<i>Fine-related variables</i>						
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)
<i>Legal environment-related variables</i>						
Settlement notice applied	-8.67*	(-1.71)	1.41	(0.36)	-10.09**	(-2.16)
Leniency programme 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: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

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.

Finally yet importantly, our results for the ‘legal environment-related variables’ show that neither the leniency programme 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 closed about 8.7 months earlier than non-settled cases. Confirming our descriptive findings from Section III.ii. above, these time savings are realized in the second stage lasting from the statement of objection to the decision—thus confirming the correct implementation of the settlement procedure. Although the duration of the first stage shows a slight (but statistically insignificant) increase, the shortening of the second stage by more than 10 months is substantially larger leading to the net decrease in the overall duration of 8.7 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. 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.⁴⁹

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.

IV. 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): (i) determinants of the decision to settle, (ii) impact on the determination of fines, (iii) impact on the operability of the leniency programme, (iv) impact on the probability and success of appeals, (v) impact on follow-on private enforcement, and (vi) impact on deterrence.

49 However, as typically the vast majority of firm groups in hybrid cases settle, a potential bias is expected to be small (see Footnote 39 above for further information).

IV.i. 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 (ie the expected reduction in the duration of the investigation is 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.⁵⁰ For example, Van Ginderachter⁵¹ identifies the following nine criteria that influence the suitability of a case for settlement from the perspective of the EC: (i) parties' interest to settle, (ii) number of parties, (iii) number of successful leniency applicants, (iv) expected degree of contestation, (v) parties' foreseeable conflicting positions on liability, (vi) impact on aggravating circumstances, (vii) procedural efficiencies (including lack of appeals), (viii) EU/EEA cases or cases already decided/pending in other jurisdictions, and (ix) 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 *et al.*⁵² apply discrete choice models to assess a very similar question to the case of the EC leniency programme and are able to identify partly different sets of drivers for firm groups that participated in the leniency programme compared to the remaining firm groups allowing important conclusions on the workability of the leniency programme 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 Brankin⁵³ or Kelley⁵⁴ 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

50 See, eg, Laina and Laurinen (n 24) and Laina and Bogdanov (n 24).

51 E Van Ginderachter, 'European Commission's Settlement Procedure—A Success Story' (Conference on the Fight against Hard Core Cartels in Europe, Madrid, November 2014) 6.

52 CT Hoang and others, 'Determinants of Self-Reporting under the European Corporate Leniency Program' (2014) 40 *Int Rev L Econ* 15.

53 S-P Brankin, 'All Settled: Where are the European Commission's Settlement Proposals Post Consultation?' (2008) 7 *Compet L J* 170.

54 M Kelley, 'Settling for Settlement: The European Commission's New Cartel Settlement Procedure' (2010) 9 *Washington Univ Global Stud L Rev* 699.

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).

However, 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 per cent of all cases being settled.⁵⁵ 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.

IV.ii. Impact on the determination of fines

A further potential impact of the settlement procedure is on the determination of fines. In this respect, Bellis⁵⁶ argues that, in principle, the total reduction of the fine could be either higher or lower than the 10 per cent discount of the final fine set out in the EU Settlement Notice. A decrease of more than 10 per cent 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. Furthermore, despite the existence of detailed fine guidelines, it cannot be ruled out entirely 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.

55 See, eg, Vascott (n 22). In fact, as already revealed by Figure 2 above, between 2011 and 2014, 18 out of 28 cases (ie, about 64 per cent) were (at least partly) settled. Even if we exclude hybrid cases, we still find that 11 out of 28 cases, ie, about 39 per cent, were settled.

56 Bellis (2014b, n 22).

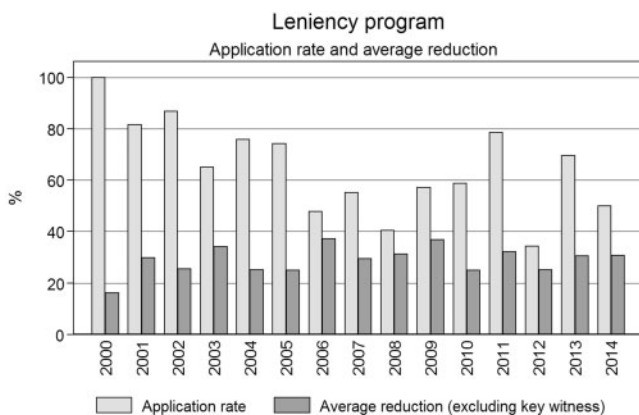


Figure 5. Average leniency application rates and average percentage fine reductions excluding key witnesses (2000–14).

IV.iii. Impact on the operability of the leniency programme

Although the leniency programme 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 programme negatively.⁵⁷ 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 programme where the runner-up leniency applicants receive smaller discounts of up to 20 per cent.

Although few commentators would probably consider the eventually introduced settlement discount of 10 per cent of the final fine as too high, the argument can be investigated empirically by analysing whether the introduction of the settlement procedure led to a significant reduction in the application of the leniency programme 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 programme 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 programme 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).

As revealed by Figure 5, the application rates fluctuate substantially between the years reaching its maximum value of 100 per cent already in 2000 and its minimum

57 See Ascione and Motta (n 16), Laina and Laurinen (n 24) as well as OECD, ‘Plea Bargaining/Settlement of Cartel Cases’ DAF/COMP(2007)38 (Paris 2008).

value of 34 per cent 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 per cent 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 per cent to 37 per cent with an average value of about 28 per cent. 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 (preliminary) conclusion that currently no evidence on a possible negative impact of the settlement procedure on the leniency programme can be found.

IV.iv. 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 the admission of liability for an illegal agreement of a certain scope and value of affected sales—substantially reduce the probability that the appeal will generally be successful. Furthermore, even if such an appeal against a settled case turns out to have some merit, it can be expected that the reduction of the final fine on appeal is lower than for cases decided under the standard procedure (thus reducing the incentives to file an appeal against a settled case in the first place).

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 per cent 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, Hüscherlath and Smuda⁵⁸ recently find that, in the period from 2000 to 2012, about 50 per cent of 467 firm groups fined by the EC decided to hand in an appeal with the GC. Out of this subsample of 234 firm groups, roughly 47 per cent 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 per cent of the final fine imposed by the EC (and therefore substantially higher than the 10 per cent

58 K Hüscherlath and F Smuda, 'The Appeals Process in the European Commission's Cartel Cases: An Empirical Assessment' (2016) 13 *J Empirical Legal Stud* 330.

discount offered for settling).⁵⁹ However, taking the probability of winning an appeal into account reduces the unconditional expected reduction to about 12.7 per cent.

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—or cases whose continuation are likely to create substantial reputational damage—can be expected to have a higher probability to be settled simply because the respective companies are better off with the 10 per cent 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 is left for future research, simple qualitative evidence already provides several interesting insights. Figure 6 plots the percentage shares of firm groups that decided to (i) neither appeal nor settle, (ii) only settle, (iii) only appeal, and (iv) settle and appeal for the respective case decision year⁶⁰ from 2000 to 2014.

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 per cent threshold and reaching an average of 63 per cent. 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.⁶¹ In this respect, we find clear evidence for a substantial reduction of the number of appeals for the subgroup of firm groups that decided to settle.⁶²

59 However, it has to be added that the companies on average waited about 49 months from the beginning of the appeals process to the final decision (either by the GC or the ECJ). See Hüscherlath and Smuda (n 57) for further information. As this waiting period generates a substantial amount of additional costs, the benefit of an appeals process is reduced.

60 Please note that the respective settlement and appeal values correspond to the year in which the original EC decision on the cartel was made, ie, 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.

61 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, n 22) provides further information on the case that ended with the withdrawal of the appeal by Société Générale. 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, n 22))] describing the case of Timab, a company that decided to opt out of the settlement procedure in *Animal Feed Phosphates* (Case COMP/38.866)].

62 For empirical evidence, see M Hellwig, K Hüscherlath and U Laitenberger, 'Settlements and Appeals in the European Commission's Cartel Cases: An Empirical Assessment' (2016) ZEW Discussion Paper No 16-010 <<http://ftp.zew.de/pub/zew-docs/dp/dp16010.pdf>> accessed 20 November 2016.

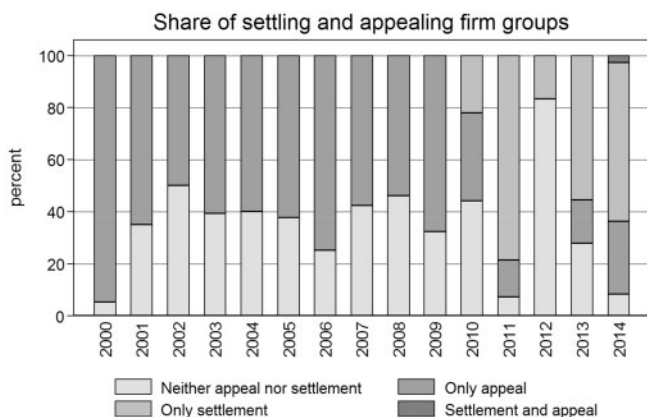


Figure 6. Shares of settling and appealing firm groups (2000–14)

IV.v. 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 Actions⁶³ was signed into law in late 2014, these cases are expected to gain in importance in the EU'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.

In principle, the settlement procedure is expected to generate particularly three positive effects on private enforcement: first, it is inseparably linked to a clear admission of liability by the respective settling cartel members thus creating a promising basis for subsequent private damage claims. Second, the settlement decision is expected to be finalized earlier than the standard decision—and is also likely to reduce the probability of subsequent appeals substantially—thus allowing private parties to commence their respective actions earlier.⁶⁴ Finally yet importantly, from a more general perspective, the expected freeing up of resources at the Commission—because of the settlement procedure—is expected to lead to more cartel case decisions

63 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 2 years to implement it into their national legal systems.

64 Interestingly, as reported by Bellis (2014b, n 22), 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, n 22, 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). For further information, see E Bueren, K Hüschelrath and T Veith, "Time is Money—How Much Money is Time? Interest and Inflation in Competition Law Actions for Damages" (2014) ZEW Discussion Paper No 14-008 <<http://ftp.zew.de/pub/zew-docs/dp/dp14008.pdf>> accessed 20 November 2016.

in a certain period thus increasing the general possibilities for follow-on private damages actions.

Despite these possible positive implications of the settlement procedure on follow-on private enforcement, there is especially one important aspect that might seriously hamper the further development of private enforcement in the EU: the substantially less informative EC 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 case⁶⁵ [that needs to present convincing evidence on, for example, the scope of the infringement (ie duration and gravity) as well as the value of affected sales].⁶⁶

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 endeavour 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 broad absence of private enforcement cases before the introduction of the settlement procedure will make any statistical isolation of a respective effect a difficult endeavour.

IV.vi. Impact on deterrence

Although there is little doubt that the number of detected and fined 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 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,⁶⁷ the (10 per cent) reduction in fines offered as benefit to settle reduces the expected fine for every cartel member and thus affects the level of deterrence negatively. *Ceteris paribus*, such a factual fine reduction would

65 Additionally, the public enforcement of anti-cartel laws is also likely to suffer from an increasing use of the settlement procedure as such cases hardly generate additional case law leading to a loss of learning. We are grateful to an anonymous reviewer for bringing this argument to our attention.

66 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 programme—in order to retain the incentives of companies to engage in settlements.

67 Ascione and Motta (n 16).

turn marginal cartels⁶⁸ 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.⁶⁹

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.⁷⁰ 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 of the dimension of recent fine increases finding a 30-fold increase in average fines per cartel when comparing the 1995–1999 period with the 2010–2014 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

68 '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 (ie, fine).

69 For the European Union, Combe Monnier and Legal 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%. See E Combe, C Monnier and R Legal, 'Cartels: The Probability of Getting Caught in the European Union' (2008) Bruges European Economic Research Paper No 12 <https://www.coleurope.eu/system/files_force/research-paper/beer12.pdf?download=1> accessed 20 November 2016. Most recently, Ormosi 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. See P Ormosi, 'A Tip of the Iceberg? The Probability of Catching Cartels' (2014) 29 *J Appl Econ* 549.

70 Examples of papers that find a significant under-deterrence of cartelization in the European Union are E Combe and C Monnier, 'Fines Against Hard-core Cartels in Europe: The Myth of Overenforcement' (2011) 56 *Antitrust Bull* 56, 235; M Mariniello, 'Do European Union Fines Deter Price Fixing?' (2013) *Bruegel Policy Brief* No 4; MP Schinkel, 'Effective Cartel Enforcement in Europe' (2007) 30 *World Compet L Econ Rev* 539; F Smuda, 'Cartel Overcharges and the Deterrent Effect of EU Competition Law' (2014) 10 *J Compet L & Econ* 63 and C Veljanovski, 'Cartel Fines in Europe: Law, Practice and Deterrence' (2007) 30 *World Compet L Econ Rev* 65. Contributions identifying a significant risk of over-deterrence include P Van Cayseele, P Camesasca and K Hugmark, 'The EC Commission's 2006 Fine Guidelines Reviewed from an Economic Perspective: Risking Overdeterrence' (2008) 53 *Antitrust Bull* 1083 and ML Allain and others, 'Are Cartel Fines Optimal? Theory and Evidence from the European Union' (2015) 42 *Int Rev L Econ* 38.

levels of current and optimal deterrence in the EU any further in this article, on a higher level, the OECD⁷¹ is certainly right in asking competition authorities to '... seek settlements that maximize overall deterrence resulting from public and private enforcement, rather than focus exclusively on the sanction they can obtain'.

V. CONCLUSION

While most Member States of the 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'⁷² 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'.⁷³ Since then, the EC together with the national competition authorities in the EU Member States has made considerable efforts to improve the competitiveness of the EU 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 were 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 EC cartel investigation—consisting of activities such as initial information gathering, preliminary investigation, case proceedings, or the writing of the SO and decision—lasted more than 4 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 have used a data set consisting of 84 cartels decided by the EC from 2000 to 2014 to estimate the impact of the EU Settlement Procedure on the duration of EC cartel investigations. We find a statistically significant reduction in the duration of settled cases of about 8.7 months, suggesting that the settlement procedure has reached its primary aim of increasing the speed of EC case investigations. Although the first stage of the enforcement process from the beginning of the investigation to the SO shows a slight—but statistically insignificant—increase of about 1.4 months, the duration of the second stage reaching from the SO to the decision shows the expected (significant) decrease in the duration by about 10.1 months.

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

71 OECD (n 57) 14.

72 M Monti, 'Fighting Cartels—Why and How?' (3rd Nordic Competition Policy Conference, Stockholm, September 2000) 2.

73 *ibid* 9.

can be expected that the realization of further learning economies on both sides of the (bargaining) table will allow the realization of additional savings in the years to come. On the side of the Commission, a substantial fraction of such additional savings are likely related to its approach in selecting only suitable cases for the settlement procedure—ie to avoid 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 per cent 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 by customers being harmed by the respective cartel agreement.

From a ‘welfare perspective’, faster EC decision-making processes are welcomed 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 per cent 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 (and thus the further generation of case law). 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—possibly triggered by the EC’s anticipation that a subsequent (error-correcting) appeals process is much less likely. 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 parties involved in the settlement process to avoid the inconsistencies or misunderstandings that possibly caused a significant fraction of appeals cases in the pre-settlement era.

Finally yet importantly, from the perspective of private cartel enforcement, on the surface, the settlement procedure could be welcomed (as the avoidance of lengthy appeals proceedings allows a sooner start of private follow-on litigation). However, the size of such an additional deterrence effect will not only depend on the general success of the implementation of the 2014 Directive on Antitrust Damages Actions but also on the availability of detailed case information needed to substantiate (promising) private damage claims. In this respect, the streamlined EC decisions published in settled cases are certainly counterproductive and are thus likely to hamper the rise of private cartel enforcement in the Member States of the EU and the additional deterrence effect attached to it.

Appendix

Table A1. Variables in the data set

Variables	Description
<i>Cartel-related variables</i>	
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
<i>Investigation-related variables</i>	
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 SO, in months
Duration SO-Decision	Time span from EC SO 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 USA	=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
<i>Fine-related variables</i>	
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 programme 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
<i>Legal environment-related variables</i>	
Settlement notice applied	=1 if settlement notice was applied (full or hybrid cases)
Leniency programme applied	=1 if leniency programme (2002 or 2006 version) applied
2006 Fine guidelines applied	=1 if 2006 fine guidelines applied