



UvA-DARE (Digital Academic Repository)

Dissecting cartels

From discovery to damages

Rosenboom, N.S.R.

Publication date

2020

Document Version

Final published version

License

Other

[Link to publication](#)

Citation for published version (APA):

Rosenboom, N. S. R. (2020). *Dissecting cartels: From discovery to damages*. [Thesis, fully internal, Universiteit van Amsterdam].

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.



Dissecting cartels

From Discovery to Damages

Nicole Rosenboom

Dissecting cartels
From Discovery to Damages

Nicole Rosenboom

Dissecting cartels

From Discovery to Damages

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor

aan de Universiteit van Amsterdam

op gezag van de Rector Magnificus

prof. dr. ir. K.I.J. Maex

ten overstaan van een door het College voor Promoties ingestelde

commissie, in het openbaar te verdedigen in de Agnietenkapel

op dinsdag 21 april 2020, te 14:00 uur

door Nicole Sylvette Renée Rosenboom

geboren te Rotterdam

Promotiecommissie:

Promotor:

Prof. dr. B.E. Baarsma

Universiteit van Amsterdam

Prof. dr. B.J. ter Weel

Universiteit van Amsterdam

Overige leden:

Prof. dr. M.P. Schinkel

Universiteit van Amsterdam

Prof. dr. J. Hinloopen

Universiteit van Amsterdam

Prof. dr. mr. R. Wesseling

Universiteit van Amsterdam

Prof. dr. E. Brouwer

Tilburg University

Prof. mr. dr. A. Gerbrandy

Universiteit Utrecht

Faculteit:

Universiteit van Amsterdam,
Economie en Bedrijfskunde

This PhD book is dedicated to
James and Kevin Rosenboom

Table of content

TABLE OF CONTENT	7
1. PREFACE	9
2. INTRODUCTION	11
2.1 KEEPING PACE WITH DEVELOPMENTS IN COMPETITION POLICY	11
2.2 HOW THE ARTICLES RELATE TO THE DIFFERENT PHASES OF CARTEL ENFORCEMENT	13
3. SUMMARY—DISSECTING CARTEL: FROM DISCOVERY TO DAMAGES	14
4. INVOLVED IN A DUTCH CARTEL: WHO BLOWS THE WHISTLE?	27
4.1 INTRODUCTION	27
4.2 LITERATURE AND HYPOTHESIS	31
4.3 DESCRIPTION OF DATA	39
4.4 RESULTS.....	47
4.5 CONCLUSION AND DISCUSSION.....	54
4.6 APPENDIX—OVERVIEW OF ALL SANCTION DECISIONS.....	58
5. THE INTERACTION OF PUBLIC AND PRIVATE CARTEL ENFORCEMENT	65
5.1 INTRODUCTION	65
5.2 THEORY AND METHOD	69
5.3 METHOD.....	73
5.4 MODEL.....	73
5.5 CONJOINT ANALYSIS	80
5.6 DIRECT QUESTIONS – OTHER RESULTS	93
5.7 CONCLUSION AND DISCUSSION.....	100
5.8 APPENDIX A—DESCRIPTION OF THE RESPONDENTS.....	103
5.9 APPENDIX B—QUESTIONNAIRE FIRMS.....	105
5.10 APPENDIX C—ROBUSTNESS CHECKS.....	111
6. A VERITABLE TOWER OF BABEL ON THE CONFUSION BETWEEN THE LEGAL AND ECONOMIC INTERPRETATIONS OF ARTICLE 101(3) OF THE TREATY ON THE FUNCTIONING OF THE EUROPEAN UNION	115
6.1 INTRODUCTION	115
6.2 REGULATION 1/2003 AND THE 2004 GUIDELINES	119
6.3 PUBLIC INTERESTS: ECONOMIC VERSUS LEGAL PERSPECTIVES	120
6.4 DIFFERENCES BETWEEN THE GUIDELINES AND THE WELFARE ECONOMIC APPROACH TAKEN BY ART. 101(3)	126

6.5	CASE LAW IN THE NETHERLANDS: THE ACM.....	130
6.6	TOWARDS A FRAMEWORK FOR BALANCING BENEFITS	137
6.7	FINAL REMARKS	142
7.	CONSUMER DAMAGES FOR BREACH OF ANTITRUST RULES. HOW TO REACH FULL COMPENSATION FOR CONSUMERS?	145
7.1	INTRODUCTION	146
7.2	THREE COMPENSATION METHODS.....	148
7.3	TWO DEMAND CURVES	156
7.4	COMPARING COMPENSATION METHODS.....	158
7.5	DETERMINING COMPENSATION	160
7.6	CONCLUSIONS	168
7.7	APPENDIX: MATHEMATICAL EXPOSITION AND CALCULATIONS	170
8.	CAREER DEVELOPMENT AFTER CARTEL PROSECUTION: CARTEL VERSUS NON-CARTEL MANAGERS	176
8.1	INTRODUCTION	176
8.2	LEGAL FRAMEWORK	178
8.3	DATA COLLECTION	179
8.4	CAREER DEVELOPMENT	182
8.5	EMPIRICAL RESULTS.....	188
8.6	CONCLUSION.....	198
9.	CONCLUSIONS: IMPLICATIONS OF FINDINGS FOR THE EFFECTIVENESS OF CARTEL LAW	201
10.	REFERENCE LIST.....	213
11.	SAMENVATTING—DISSECTING CARTELS: FROM DISCOVERY TO DAMAGES 214	
	DANKWOORD.....	227

1. Preface

This PhD focuses on several economic aspects of cartels and cartel enforcement. Why cartels? They have always fascinated me, even before *The Informant* came out in 2009.

While completing my master's degree in Economics, I was curious about why managers would apply for leniency and what affected the timing of their applications. I was about to make a list of all the sanctioned cartels in the Netherlands and call up their managers, but then I realised that none of them was actually going to tell me what I wanted to know. After all, why would they?

I changed course and instead made a list of sanctioned cartels in the Netherlands and their managers at the time they were sanctioned, as well as the jobs the managers held (if any) in the years following the cartel decision. In order to study whether there was a career effect for managers at firms subject to a cartel decision. And so it began...

This introduction sets out how the five articles relate to the developments in competition policy and how they relate to the different phases of cartel enforcement. By doing so it introduces and summarizes the five chapters of this PhD thesis:

- Article 1: *Involved in a Dutch Cartel: Who Blows the Whistle?* (submitted in 2019)
- Article 2: *The Interaction of Public and Private Cartel Enforcement* (published in 2019).
- Article 3: *A veritable tower of Babel: on the confusion between the legal and economic interpretations of Article 101 (3) of the Treaty on the Functioning of the European Union.* (published in 2015)
- Article 4: *Consumer damages for breach of antitrust rules: how to reach full compensation for consumers?* (published in 2017)
- Article 5: *Career development after cartel prosecution: cartel versus non-cartel managers.* (published in 2012)

At the end of this journey, I can honestly say that cartels have not bored me yet; on the contrary, my research in this area has revealed even more interesting aspects of the topic. To name just a few that I was unable to include: the stability of cartels, optimal fines for cartels, and several aspects of

damages claims—including umbrella effects and hangover periods, i.e. the periods after the end of the infringement.

I hope that my articles, by looking at different stages of cartel enforcement, have resulted in a modest but interesting contribution to the literature. I for one, have enjoyed it all.

2. Introduction

2.1 Keeping pace with developments in competition policy

When starting to work as a competition economist in 2010 on real-world antitrust cases. It turned out that the world was (obviously) not black and white, and that there were many shades of grey (legally, at least) between a non-infringing agreement between firms and a hardcore cartel.

If firms can prove that agreements between themselves are beneficial to consumers or society, the agreement can be exempted from cartel prohibition. This has been a particularly hot topic in the Netherlands, where the ACM concluded negatively on the closure of coal power plants in 2013 and assessed the impact of the more sustainable 'Chicken of Tomorrow' in 2015.

Economics can help by weighing benefits for consumers against restrictions in competition. But how to quantify the public interest needed to qualify for such a self-assessment (art. 101 (3) TFEU and the national equivalents), and how to measure such benefits to consumers?

This assessment resulted in an article co-authored with Barbara Baarsma and published in *European Competition Journal*: 'A veritable tower of Babel: on the confusion between the legal and economic interpretations of Article 101(3) of the Treaty on the Functioning of the European Union' (Article 3). This article involves the qualitative assessment of the legal and economic way of looking at public interest and a comparison of EU case law.

Another development in the field of competition policy is private enforcement. The European Commission had set the target of stimulating private enforcement and looking for a way for public fines and damages claims interact positively. For competition economists, it began to get truly interesting after the publication of 'Quantifying antitrust damages: Towards non-binding guidance for courts' in 2009, commissioned by the Commission. In November 2014, the European Commission succeeded in having the Directive on Antitrust Damages formally signed into law.

In the Netherlands, the first private damages claims began as follow-on cases for the cartels in elevators and escalators, gas insulated switchgear and air cargo. As an economist, it was interesting to be involved in these follow-on damages cases; however, they revolved (mainly) around business-to-business (B2B) transactions and hence B2B claims. How would these claims relate to consumers being harmed by a cartel?

From an economics perspective, a few methods can calculate damages to consumers. None of these methods are very practical, or lead to full compensation. This led to a theoretical article showing that these methods, combined with common utility functions and demand curves do provide a bandwidth of consumer damages as a result of antitrust violations (Article 4). This article, 'Consumer Damages for Breach of Antitrust Rules: How to Reach Full Compensation for Consumers', was co-authored with José Mulder and Viktória Kocsis and published in *Journal of Competition Law & Economics* in 2017.

The private damage claims that were emerging throughout Europe sparked a legal and economics debate relating to the potentially negative interaction between those claims and the discovery of cartels through the leniency programme.

While most studies remained qualitative or were mostly based on theoretical models (with formulas showing the likelihood of leniency applications), there was a gap in literature in analysing the interaction in an empirical way. What would have a stronger impact on the decisions of firms—public cartel enforcement with fines (and also reductions in fines) or private damages claims?

Together with Daan in 't Veld an online questionnaire with conjoint questions was designed and set out under Dutch business managers and competition lawyers to fill it in. The conjoint analysis showed whether firms would apply for leniency under different combinations of public and private cartel enforcement. The journal *World Competition* published an article describing our research, 'The Interaction of Public and Private Cartel Enforcement', in 2019 (Article 2).

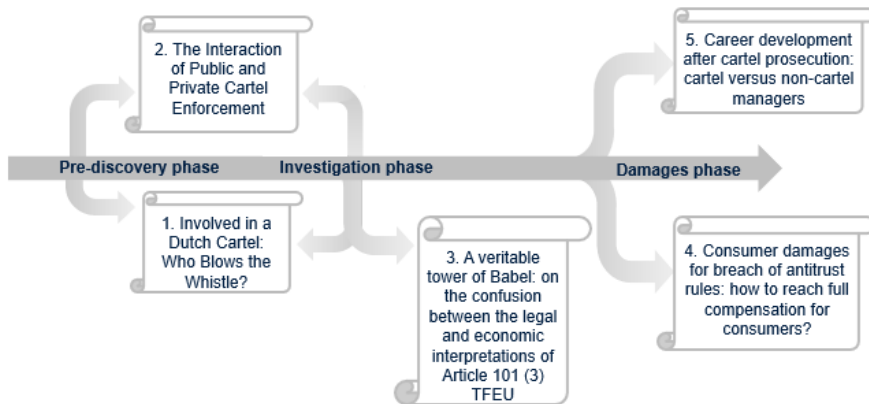
The final article also relates to leniency applications. At the beginning of this journey, there was no point in asking cartel firm managers why they applied for leniency because they would not have told so. For the final article, a database of all Dutch cartels, their characteristics and whether they applied for leniency has been compiled. In order to analyse what cartel level and which cartel member factors influence the choice to apply for leniency after all. In doing so, the journey of this PhD thesis and five articles has come full circle. This article, titled 'Involved in a Dutch Cartel: Why Blow the Whistle?' was finished in 2019 and submitted to *World Competition* (Article 1).

2.2 How the articles relate to the different phases of cartel enforcement

Now it is clear how the five articles of this PhD were inspired by developments in the field of cartel enforcement. Let's look at how these five articles relate to the cartel enforcement procedure. Figure 2.1 shows this procedure, starting with the pre-discovery phase.

The summary in the next section links every one of the five articles to the relevant phase(s).

Figure 2.1 The phases of cartel enforcement



3. Summary—Dissecting cartel: from Discovery to Damages

The pre-discovery phase—determinants of a leniency application

1. *Involved in a Dutch Cartel: Who Blows the Whistle? (submitted in 2019)*

Article 1, on determinants of a leniency application, showed that 16% of all cartel cases in the Netherlands are discovered through a leniency application. This means that one sixth of all sanctioned cases are brought forward to the ACM before the authority has begun its investigation. The overwhelming majority of the cases begin with an investigation by the ACM, after which (at least some of) the cartels file a leniency application through one or more of its members. Of the cartels fined during 2002 and 2019, 32% were involved in at least one leniency application.

For this article, a dataset of cartel cases sanctioned in the Netherlands has been compiled, includes cases dating from 1998 (under the former Netherlands Competition Authority) until 2019 (under the ACM). The dataset contains information on (among other things) cartels' periods of activity, the number of members in a cartel, types of infringement, and cartel member characteristics (such as turnover, market share within a cartel, fines, and whether they decided to apply for leniency). Similar studies have been undertaken for cartel cases in the US, Europe and Korea. Several papers empirically analyse determinants of leniency applications on a cartel and cartel level. Amongst others Hoang et al. (2014)¹, who assesses the likelihood of a cartel member being a chief witness in European Commission cases in the period 2000–11 and Kim & Kim (2016), which analyses Korean cartel cases in the period 2005–09². Brenner (2011) takes a different approach to

¹ Hoang, C. T., Hüschelrath, K., Laitenberger, U., & Smuda, F. (2014). Determinants of self-reporting under the European corporate leniency program. *International Review of Law and Economics*, 40, 15-23.

² Kim, N. & Kim, Y. (2016), Who Confesses For Leniency? Evidence From Korea, *Journal of Competition Law & Economics*, 12(2), 351–374.

determining what influences the likelihood of applying for leniency.³ He looks at it from a resource-based perspective and a culture perspective. The resource-based view uses the size of a firm as a proxy for being equipped with an efficient legal department, having high-quality management, and operating in multiple countries. Since cooperating with the competition authority decreases uncertainty, Brenner argues that leniency applications are more likely to be observed by firms with a culturally based preference for uncertainty avoidance.

This article not only expands the number of countries assessed but also adds new determinants that might explain why a firm would blow the whistle. These determinants include whether a cartel is discovered through an application for leniency, the budget of the relevant competition authority, and GDP in the year of the decision. Lastly, this article expands the existing literature by adding robustness analysis for upheld cartel cases and the leniency reduction.

The results of the econometric analysis are robust and lead to the following conclusion:

- individual cartel members that face a higher base fine or that are part of a listed company are more likely to apply for leniency.
- cartels that are active in the construction and manufacturing sectors are more likely to result in at least one leniency application.
- an important determinant of applying for leniency is whether the cartel is discovered by a leniency application, which increases the likelihood of self-reporting.
- while cartels involved in fixing terms other than prices are more likely to self-report, cartels involved in information exchange are less likely to blow the whistle.
- cartels that are involved in multiple types of infringement during the same cartel period are more likely to result in an application for leniency. The length of the cartel period has only a small positive effect on the likelihood of self-reporting.

³ Brenner, S. (2011), Self-disclosure at international cartels, *Journal of International Business Studies*, 42(2), 221–234.

- the number of cartel members has a small negative effect.

Article 1 analyses the decision to blow the whistle on the level of *existing cartels* (meaning cartels that have been exposed and sanctioned). Article 2 looks at the same issue, but from another perspective; it assesses the interaction between the leniency programme and private damages claims from the perspective of *potential cartels*.

The pre-discovery phase—interaction between leniency programme and private damage claims

2. *The Interaction of Public and Private Cartel Enforcement, published in World Competition, 42(1), 87–120 (2019). Co-authored with Daan in 't Veld*

Article 2 analyses the choice to apply for leniency as depending on factors of cartel enforcement policy, including both public and private cartel enforcement policy. By doing so, it analysis whether there is an interaction effect between public and private enforcement. The question is whether the interaction effects strengthen or counteract the overall deterrent effect, in particular for civil damages following cartel cases and the leniency programme.

The effect of this interaction has been a topic of discussion amongst several authors⁴ but empirical results are missing thus far. This article tries to fill the gap in existing research by extending the empirical analysis of the effectiveness of the leniency programme to include private cartel enforcement instruments. It assesses the destabilising effect, and therefore effectiveness of the leniency programme based on both public and private instruments.

Most, if not all, researches analysing the deterrence effect of cartel policy focus only on public cartel enforcement. Different methods have been applied, ranging from theoretical models, laboratory experiments, discussing trends based on descriptive statistics of detected cartels⁵ and surveys

⁴ See for example Green, J., & McCall, I. (2009). Leniency and civil claims. *Competition Law Insight*, 3-5.

⁵ Marvão, C. M. P., & Spagnolo, G. (2014). What do we know about the effectiveness of leniency policies? A survey of the empirical and experimental evidence. A Survey of the Empirical and Experimental Evidence (October 1, 2014) provide a short description.

amongst firms and/or competition lawyers⁶, to more sophisticated empirical econometric studies such as the conjoint analysis of Van der Noll and Baarsma (2017).⁷ Complementary to Article 2, the approach of Van der Noll and Baarsma allows judgements about the relative importance of morality versus policy. The authors find that for 39% of the firms, the possible consequences of enforcement seem more important drivers of compliance than moral views on the law.

By conducting a survey that includes a conjoint analysis, across a panel of Dutch firms and competition lawyers, the authors assessed how firms consider the different policy factors. Hence, this survey targets firms in general and not specifically sanctioned cartel members. Both Article 1 and 2 show that the level of fines is a relevant factor when cartel members are deciding whether or not to blow the whistle. However, contrary to the first article, Article 2 explicitly takes private damages claims into account. This was not feasible for the first article because no information was available on how individual sanctioned cartels in the Netherlands perceived the risk of a damage claim.

Furthermore, Article 2 shows that firms are triggered to apply for leniency by the magnitude of the personal fine faced by its directors, and the reduction of said fines following a successful application for leniency. Despite the increasing number of damages claims in the Netherlands, Dutch firms do not see civil claims as a deciding factor when considering whether or not to apply for leniency (at the time of research: 2016). Based on the analysis among firms, there is no negative interaction between civil claims and the leniency programme. At the same time, the overall deterrence effect on firms might be limited to the personal fines as they do not have the added effect of damages claims. The lawyers did take private enforcement elements into account when advising their clients on a leniency application. Both groups of respondents answered that in 16–19% of the presented enforcement situations, they would continue with their agreement and not apply for leniency or take advice to so do.

⁶ Hüsichelrath, K., Leheyda, N., & Beschorner, P. (2011). The deterrent effect of antitrust sanctions: Evidence from Switzerland. *The antitrust bulletin*, 56(2), 427-460.

⁷ Van Der Noll, R., & Baarsma, B. (2017). Compliance with cartel laws and the determinants of deterrence—an empirical investigation. *European Competition Journal*, 13(2-3), 336-355.

The empirical analysis in Article 2 consists of a conjoint analysis and a nested logit regression on the data gathered through the online survey. The conjoint method of analysis was chosen to minimise the social bias and strategic bias. Regular survey questions were added to provide context to the results and the results were discussed with competition lawyers (who did not participate in the survey).

The conjoint analysis, together with the regular questions and the discussion with competition lawyers, made it clear that choosing to apply for leniency involves negative effects, and not only in terms of civil liability. The question is whether the reduction of fines would be enough to offset these negative effects.

Article 1 and 2 together offer a broader view on the leniency programme. The second article not only assesses the relevant determinants, but also, in doing so, tests the effectiveness of the leniency programme for existing cartels and the interaction of private enforcement instruments.

Article 1 and 2 are both linked to the second phase—the investigation phase. Cartel members can still apply for leniency once an authority has formally started its investigation; 18% of the Dutch sanctioned cartel cases involve a leniency application that was launched after an authority began its investigation.

The investigation phase—the role of public interest and non-competition public interest

3. *A veritable tower of Babel: on the confusion between the legal and economic interpretations of Article 101 (3) of the Treaty on the Functioning of the European Union. Published in European Competition Journal, 1-24. Co-authored with Prof. dr Barbara Baarsma*

During the investigation phase, before a competition authority imposes a fine, firms have the option of attempting to show that their agreement or conduct should be exempted from the cartel prohibition. In order to do this, they have to prove that the agreement in question fulfils the requirement of Article 101(3) TFEU and therefore benefits consumers or society. In the case that the agreement in question offers more benefits than restrictions in competition, the cartel prohibition might be declared inapplicable.

Firms can also invoke this exemption outside investigations by authorities—for example, if they want to begin acting in a way that could contravene competition laws. In these situations, they can perform the self-assessment of Article 101(3) TFEU.

Article 3 offers insight into what interest can be taken into account in cases brought under Article 101(3) TFEU and how this can be done. When addressing the question of whether non-competition public interests should or should not be included in competition policy, only two criteria of Article 101(3) TFEU are relevant. The article therefore focuses only on these two criteria—the scope of the efficiencies permitted by the agreement and their distribution between consumers and other parties.

There are two issues at play here; first, which interest should be taken into account, and second, how these interests can be balanced with a restriction in competition?

Regarding the first issue, the guidelines established by the European Commission take a narrow perspective that differs from case law. According to amongst others Townley (2013), the Commission deliberately aimed to reduce the relevance of public interests because it feared that some NCAs and national courts might take advantage of Article 101(3) to pursue public policy objectives at the expense of the competitive process.⁸ The guidelines provide room for at least some non-competition concerns—for example, the so-called cross-section clauses from Treaty provisions such as environmental effects and protection of employment.⁹ However, the guidelines exclude non-competition public interest concerns—such as externalities.

Whether the Commission has achieved its aim in reducing the relevance of public interests is questionable, since an analysis of case law shows that non-competition concerns have nevertheless been taken into account in cartel

⁸ Townley, C., 'Is There (Still) Room for Non-Economic Arguments in Article 101 TFEU Cases?', in C Heide-Jorgensen (ed.), *Aims and Values in Competition Law* (Copenhagen: Djøf Publishing, 2013).

⁹ Semmelmann, C. (2008). The future role of the non-competition goals in the interpretation of article 81 EC. *Global Antitrust Review*, 1, 15-47.

exemptions. A number of researchers have analysed which non-competition concerns are present in Article 101(3) case law.¹⁰

Regarding the latter issue, the guidelines limit the effects of the agreement that can be balanced to the relevant and related market and restrict the balance to include costs advantages and qualitative efficiencies. By doing so, the guidelines do not qualify all economic and non-economic benefits as efficiencies under Article 101(3) TFEU, meaning that these cannot be taken into account.

Besides the limited scope of the guidelines, firms can see self-assessments as high hurdles to clear due to the lack of a balancing framework. Article 3 presents a framework for balancing the economic benefits produced by restrictive agreements against the restrictive effects of these agreements. This is social cost–benefit analysis (SCBA), a well-known and widely used instrument for assessing the welfare effects of various projects. It provides an overview of all effects, risks and uncertainties of a project and the resulting costs and benefits to society as a whole. By quantifying these advantages and disadvantages as much as possible, and assigning monetary values to them, SCBA provides insights into the welfare effects of the measure, expressed as the balance in euros of the benefits minus the costs.

When firms in a cartel succeed in showing that their agreement has a positive net effect, it is exempted of the cartel prohibition and no fine is imposed. This closes the investigation phase. The next phase is only relevant for agreements that are not exempted and cartels that did not invoke this line of defence. In other words, the next phase is for conduct that—according to the competition authority—constitutes an infringement of competition law.

The damages phase—consumer damages for breach of antitrust rules

4. *Consumer damages for breach of antitrust rules: how to reach full compensation for consumers? Published in Journal of Competition Law & Economics, 1–19, 2017. Co-authored with dr. José Mulder and dr. Viktória Kocsis*

If an infringement is found, the firms concerned can be sanctioned. When

¹⁰ For example Lavrijssen, S. A. C. M. (2010). The protection of non-competition interests: What role for competition authorities after Lisbon. *European Law Review*, (5), 634-659.

the sanction decision becomes final and no longer open to appeal, the public enforcement procedure is finished. Purchasers of the good provided by the cartel can claim for damages in a civil enforcement procedure. The purpose of the damages phase is therefore to compensate purchasers for the harm caused to them by the cartel agreement.

At the time of writing Article 4, private damages claims were on the rise. However, they mostly concerned claims from businesses that purchased goods directly from a sanctioned cartel firm or a sanctioned dominant and abusive firm. As a number of jurisdictions are developing new rules and systems for collective damages claims, the question of how to calculate damages to consumers becomes increasingly relevant. This is especially relevant as the analysis shows that in practice, consumers are not fully compensated for the harm that they have suffered. For instance the work by Basso and Ross (2007) that shows that there are conceptual flaws in traditional measures of harm used in establishing damages. The result of under compensation is associated with downstream markets being less than perfectly competitive in practice.¹¹

One of the problems with consumer damages is that it still remains unclear how *every* individual victim who suffers harm caused by a breach of the antitrust rules could be compensated *fully* for his losses. Some case-by-case empirical research on consumer damages has been done for instance by Laitenberger and Smuda who calculate consumer damages as a result of the European detergent cartel¹², but no methodological study has been performed regarding the calculation of consumer compensation in general. Article 4 provides a solution, based on theoretical models, to the practical problem of calculating damages to consumers.

The literature on welfare economics considers different compensation methods for price increases, such as the Hicksian method, the Slutsky method, and the 'classical competition method'. Each method uses a different perspective for determining the level of compensation; the Hicksian method uses the utility level, the Slutsky method uses the consumption basket, and the classical competition method uses the consumer surplus. The

¹¹ Basso, L. J., & Ross, T. W. (2010). Measuring the true harm from price-fixing to both direct and indirect purchasers. *The Journal of Industrial Economics*, 58(4), 895-927.

¹² Laitenberger, U., & Smuda, F. (2015). Estimating consumer damages in cartel cases. *Journal of Competition Law & Economics*, 11(4), 955-973.

Hicksian method provides consumers with exactly the same utility they had before the infringement.¹³ Slutsky compensation does not bring consumers back to their initial level of utility after an antitrust infringement, but it does allow them to enjoy the amount of goods that they would have bought if antitrust rules had not been violated. In other words, the consumer can buy the same product basket as in the counterfactual situation. The classical competition sums up the allocation effect (also called welfare loss or deadweight loss and the distribution effect of a price increase.

To determine the level of compensation, each model needs to be translated into the standard theory of demand. A demand curve describes the relationship between prices and demanded quantities. Applying two well-known demand curves (the Marshallian and Hicksian curves) to the three compensating methods shows that the highest level of compensation is determined by the Slutsky method, while the lowest level of compensation is determined by the classical competition method. The Hicksian method is in between.

To compare the outcomes for the methods, plausible demand specifications in the form of utility functions are required. The two best options regarding the utility functions are the quasi-linear and Cobb–Douglas (CD) utility functions. These describe the most common forms of consumer preferences. From a practical point of view, the method that requires the least amount of information is the most suitable for application in private damages actions.

Article 4 uses the example of a cartel to consider the different calculation methods. Slutsky’s method is considered here as the upper limit, while the classical competition method is considered as the lower limit. These limits can be easily applied in practice when the amount of a consumer’s income spent on a cartel good and the overcharge are known.

The presented formulae for the upper and lower limits are not the solution to all difficulties related to claiming consumer damages; the overcharge still needs to be calculated. However, it is no longer necessary to calculate the counterfactual quantity. If these limits are applied, consumers will be fully compensated for the harm they have suffered from price-fixing. This is an important advantage of the method—one that cannot be found in the method that is currently applied in practice by consumer claims.

¹³ Hicks, J.R. (1939), *Value and capital: an inquiry into some fundamental principles of economic theory*. Oxford: Clarendon Press.

The damages phase—career development after cartel prosecution

5. *Career development after cartel prosecution: cartel versus non-cartel managers. Published in Journal of Competition Law and Economics, March 2012.*

From a conceptual point of view, the damages phase also includes damages that cartel members suffer as a result of being involved in a cartel. These damages can include reputational damage to the firm and a decrease in shareholder value, but it can also include damage to the career of the manager(s) in charge of the cartel firms. This is the subject of Article 5.

This article examines the career development of managers who were prosecuted by the Dutch Competition Authority for being involved in a cartel. The analysis compared the career development of managers in the Netherlands who had been involved in a cartel with that of a control group of Dutch managers who managed non-cartel firms.

The article analysed the different factors that could influence the career development of managers who have been involved in a cartel. It concluded that managers who have been involved in a cartel face negative career effects after the prosecution of the cartel. A manager from a sanctioned cartel firm has a lower probability of a representative role, meaning a management function, than a manager from a firm that has not been sanctioned by the authority. This negative career effect is smaller if the manager's cartel was active in the construction sector; this outcome might imply that the construction sector in the Netherlands takes a different attitude towards cartels. That implication seems plausible, considering the wide-ranging cartel that existed in this sector from 1998 to 2001.

There are three possible outcomes for a manager who has been involved in a cartel after they have been prosecuted:

1. the manager moves to a non-management job or retires;
2. the manager keeps its managerial function at the current firm, or moves to a managerial function at another firm that has been involved in a cartel;
3. the manager moves to a managerial function at another firm.

One can distinguish the latter two outcomes (in which the manager retains a managerial function) from the first outcome (in which the manager moves to a non-managerial function).

Before looking at the reasons for the differences in career development between managers, we must first establish whether the career development of managers who have been involved in a cartel differs from that of managers who have not.

It is clearly the case that career development differs between the two groups. Of the managers from the control group, 64% retained a managerial function, whereas only 36% of the managers who had been involved in a cartel in *sectors other than the construction sector* had a managerial function. If one compares the control group with the managers from *all sectors* who were involved in a cartel, the difference is far less drastic. However, this is mainly because 68% of the managers who were involved in a cartel in the construction sector were able to keep their managerial functions. Additionally, for all cartel managers there is a statistically significant negative relationship between cartel involvement and career development.

Article 5 also investigated whether that negative effect is influenced by firm size, the stage of the cartel investigation during which the manager left the cartel firm (before or after the decision), the punishment factor, or the financial penalty set by the competition authority. The analysis is done by means of a binary and multinomial logit model.

The higher the fine a cartel member receives, the higher the likelihood that a manager from that firm will retain a managerial function (either at the cartel firm or another firm) and the lower the likelihood that the manager will lose its managerial function.

The severity of the cartel infringement gives a negative effect on career development. It negatively affects the probability of a representative function and positively affects the probability of no representative function. Managers from the construction sector who have been involved in a sanctioned cartel have a higher probability of retaining their management function than managers from the general sector.

Managers who have been involved in a cartel who leave their firm before the competition authority publishes its decision are less likely to get a representative function at a cartel firm. This is surprising, because one would expect that the later the switching of jobs, the more negative the career

effects. This negative effect for managers that left the cartel firm before publication of his or her cartel involvement might indicate that other cartel firms prefer hiring managers with cartel experience.

4. Involved in a Dutch cartel: Who blows the whistle?

Abstract

In the Netherlands 16% of all sanctioned cartel cases are brought to light through a leniency application. Of these cases, 32% involved at least one leniency application. This article a dataset is compiled consisting of cartel cases sanctioned by the Dutch Competition Authority as of 2001 until mid-2019. The analysis shows that individual cartel members that are faced with a higher base fine, or are part of a listed company, are more likely to blow the whistle. The results indicate that cartels that are active in the construction and manufacturing sectors are more likely to result in at least one leniency application. An important determinant is whether the cartel is discovered by a leniency application or by the authority. While cartels involved in fixing other terms are more likely to be self-reported, cartels involved in information exchange are less likely to be faced with a whistle-blower. Cartels that are involved in multiple type of infringements during the same cartel period also have a higher chance of resulting in a leniency application. The length of the cartel period has only a small positive effect on the likelihood of self-reporting while the number of cartel members has a small negative effect.

Key words: cartel, leniency, discovered, fine, competition authority, sanction decision, self-reporting

4.1 Introduction

The leniency programme is important in helping competition authorities to discover cartels. The extent to which competition authorities rely on the leniency programme depends on the jurisdiction. At the European Commission, 69% of all cartel sanction decisions in the period 1996–2015 involved immunity, and in recent periods the percentage has been even higher.¹⁴ In Korea, 49% of cartel cases between 2005 and 2010 were detected through

¹⁴ 81% in 2006–10 and 91% in 2011–15. Wouter P.J. Wils, *The use of leniency in EU cartel enforcement: an assessment after twenty years*, World Competition, 39(3), 327–388 (2016).

leniency.¹⁵ In the Netherlands between 2002 and 2017, the rate of leniency was 32% of all cartel cases that involved a fine. Only 16% of Dutch cartel cases involving a fine were discovered through leniency.¹⁶

In the economics literature, the tipping point for self-reporting is often illustrated by means of a theoretical formula. The likelihood of a leniency application depends on the rate of detection, the cartel profit, the profit from deviating, and the fine reduction following a successful leniency application.¹⁷ In practice leniency can lead to significant reduction of fines. The average cartel fine imposed by the European Commission between 1999 and 2006 decreased by 40% after leniency.¹⁸ But what if companies are not rational and calculating? What determines whether companies apply for leniency in the real world? This paper investigates this by means of an empirical analysis of cartel decisions, leniency applications and characteristics of both the cartel and its members.

Similar studies are undertaken for European, American and Korean cartels and leniency applications. As the popularity of the leniency programme differs for these regions, the relevant factors influencing the decision to blow the whistle might also differ per jurisdiction. Hence, results of a similar analysis for Dutch cartel cases may give different results. This could be explained by specific characteristics of Dutch cartels and the small and open Dutch economy. First of all, since Dutch cartels that have interstate effect, will in general be dealt with by the European Commission. Hence Dutch cartel decisions see to mostly local markets. This is especially clear in the case of the construction sector and sectors where the bidding process is on a local or at most national level. From the Korean studies it becomes clear that cartel member characteristics that explain the application for leniency can be purely national. For example, whether or not a Korean conglomerate, a so-

¹⁵ Sae Ran Koh & Jinook Jeong, *The leniency program in Korea and its effectiveness*, *Journal of Competition Law and Economics*, 10(1), 161–183 (2013).

¹⁶ The leniency-like fine reductions that were applied to the mass fraud in the Dutch construction sector are not taken into account here, as they occurred before the leniency programme became active.

¹⁷ Massimo Motta, *Competition Policy: Theory and Practice*, Cambridge University Press, 159 onwards (2004).

¹⁸ Cento Veljanovski, *Cartel fines in Europe—Law, practice and deterrence*. *World Competition* 30.1: 65-86 (2007).

called *Chaebol* was part of a cartel (Koh & Jeong, 2013). In Dutch cartel cases the cartel members are mostly not part of an international companies and are not listed at a stock exchange. Lastly, a relatively large part (32%) of the Dutch cartel cases where a fine was imposed, was operated together or by means of a trade association, a calculation bureau or likewise.

This article extends the literature on determinants of leniency applications specifically for Dutch cartel cases. Dutch cartel cases are defined as cartels sanctioned by the Dutch competition authority (the ACM and its predecessor, the NMa). The absolute number of leniency applications in the Netherlands relative to other countries is low, and it has been at the lower end of the range for the last few years.¹⁹ The Netherlands also scores low in relation to cartel decisions, as the rate of leniency is 32% of all cartel cases where a fine was imposed by the Dutch competition authority. This low level of leniency applications is somewhat surprising, since the leniency programme became active in 2002, immediately after the media peak around the mass fraud in the construction sector. This mass cartel came to light in November 2001, putting the Dutch competition authority, the concept of cartels, and fine reduction in exchange for cooperation with the authority, on the map. Without going into a discussion on the optimal level of leniency applications for an efficient use of the programme, these statistics do show that there is room for an increase in leniency applications leading to sanctioned cartels in the Netherlands. This makes the country an interesting case from an enforcement policy perspective. What determinants at cartel and cartel member level play a role in the decision to apply for leniency in the Netherlands?

Another reason why the Netherlands is an interesting example is that it is a small and open economy. If a Dutch firm is active in a cartel, it is likely that the cartel has cross-border effects, and a potential leniency application will therefore be filed in Brussels rather than in The Hague. As shown by Hellwig and Hüscherlath (2017), Dutch firms were the most commonly involved in cartel decisions by the European Commission in 2005–15.²⁰ The Dutch firms

¹⁹ GCR Rating enforcement 2016–18. For example, there were seven leniency applications in 2016 and six in 2017, while in Germany, as the highest ranked in the EU, had 59 and 37 leniency applications respectively.

²⁰ In terms of both the absolute number (119 firms) and relative to the country's GDP. Michael Hellwig & Kai Hüscherlath, *Cartel Cases and the Cartel*

that apply for leniency with the Dutch competition authority are therefore either smaller, more local firms, and/or active in a purely or mostly Dutch cartel. This article therefore sheds light on the likelihood of smaller companies and/or local cartels applying for leniency. The final reason for looking specifically at Dutch cartels concerns the track record of the competition authority at court. The (Dutch) courts have annulled a number of large cartel fines over the years.²¹ It might be that firms, convinced of their own innocence, refrain from applying for leniency and handing over documentation, and instead opt not to cooperate with the authority and appeal its decision at a later stage. The determinants of leniency applications may therefore differ between groups of firms that did and did not appeal the authority's decision. This article assesses this difference, and adds to the existing literature on the topic, by analysing a subsample of cases where the fine was not annulled in court. This provides insight into two things. Firstly, if the relevant determinants differ between the two groups, this suggests that Dutch companies take the option of annulment by court into account when considering a leniency application. Secondly, it could be argued that the cases that are annulled do not qualify as actual cartels, and therefore excluding them removes potential bias from the empirical results.

This article analyses whether some of the same determinants that explain self-reporting in Europe, the US and Korea also do so for Dutch cartel cases. It also adds new factors to the analysis to determine whether these help to explain why a company may or may not apply for leniency. The analysis is based on a dataset of Dutch cartel cases as of 1998 until mid-2019, collected by the author. The dataset contains information on (amongst other things) the cartel period, the number of cartel members, the type of infringement; and characteristics of the cartel members such as their turnover, their market share within the cartel, the amount they were fined, and whether they decided to apply for leniency. Furthermore, results are tested for correcting factors such as policy characteristics, characteristics of the authority, and macroeconomic factors.

Enforcement Process in the European Union 2001–2015: A Quantitative Assessment, The Antitrust Bulletin, 62(2), 400–438 (2017).

²¹ For example, in the cases *Executieveilingen*, *Taxivoervoer IJsselsteden* and *Rijnmond*, *Isolerend dubbelglas*, and *Landelijke Huisartsen Vereniging*.

The analysis shows that individual cartel members that are faced with a higher base fine or are part of a listed company are more likely to apply for leniency. In terms of cartels, the results indicate that cartels that are active in the construction and manufacturing sectors are more likely to result in at least one leniency application.²² An important determinant turns out to be whether the cartel is discovered by a leniency application. While cartels involved in fixing other terms are more likely to be self-reported, if a firm is involved in information exchange it is less likely to blow the whistle. Cartels that are involved in multiple type of infringements during the same cartel period also have a higher chance of resulting in a leniency application. The length of the cartel period has only a small positive effect on the likelihood of self-reporting. The number of cartel members has a small negative effect.

Section 3.2 below describes the literature around cartels, cartel stability and the role of the leniency programme. In section 3.3 the dataset is described in more detail, and descriptive statistics are given for Dutch cartel cases and leniency applications.²³ Section 3.4 shows the results of the econometric analysis and elaborates on which factors explain the decision to apply for leniency in Dutch cartel cases. A conclusion and discussion are provided in section 3.5.

4.2 Literature and hypothesis

Some known cartels have been running successfully for decades. But often, there is a point during the life of the cartel where it breaks down or fades away. This can be prompted by the cartel's detection by the competition authority. This might be triggered by tips from purchasers or based on characteristics that make the product market prone to collusion and hence attract the attention of the authority. This can be called the external perspective (Hoang et al., 2014).²⁴

²² This is not due to cartels in those sectors having more members.

²³ For more information on the Dutch leniency programme, see P.T. Dijkstra & J. Frisch, *Sanctions and Leniency to Individuals, and its Impact on Cartel Discoveries: Evidence from the Netherlands*, *De Economist*, 166(1), 111–134 (2018).

²⁴ Cung Truong Hoang, Kai Hüschelrath, Ulrich Laitenberger & Florian Smuda, *Determinants of self-reporting under the European corporate leniency program*, *International Review of Law and Economics*, 40, 15–23 (2014).

A cartel's collapse may be largely determined by the individual cartel members, this is called the internal perspective. In theory, this means that, for at least one of its members, the cartel's activity no longer leads to a positive net effect, and the balance shifts between continuing the illegal behaviour and deviating (with or without reporting). This may have various causes (Hoang et al., 2014), such as new market entry, innovation that makes the cartel's product inferior, changing demand expectations,²⁵ or a change in the perceived risk of detection. Competition authorities aim at increasing the perceived risk of detection by sending out press releases and other documents that focus on a particular sector or that state that the budget for investigation has increased. The financial losses associated with being detected may also change, tipping the decision towards stopping the infringement and potentially blowing the whistle. This may be based on the fine, but also reputational damages that may lead to a loss of value for shareholders.²⁶

These factors may all cause a cartel to collapse, but they do not automatically mean that cartel members will apply for leniency. Cartelists may simply stop the illegal conduct and keep the former cartel hidden. It has been suggested that some cartelists will be unlikely to apply for leniency and uncover the cartel due to negative consequences that the leniency programme does not protect against, such as private damages claims.²⁷ Each of a cartel's members is, in principle, liable for damages claims from direct and indirect purchasers, including immunity recipients under the leniency programme. For this reason, if one cartel member has doubts about whether his

²⁵ For example, see Julio Rotemberg & Garth Saloner, *A super game-theoretic model of business cycle and price wars during booms*, Am. Econ. Rev. 76, 390–407 (1986).; or John Haltiwanger and Joseph Harrington, *The impact of cyclical demand movements on collusive behaviour*, The RAND Journal of Economics, 22, 89–106 (1991).

²⁶ Stijn van den Broek, Ron G. Kemp, Willem.F. Verschoor & Anne-Claire De Vries, *Reputational penalties to firms in antitrust investigations*, Journal of Competition Law and Economics, 8(2), 231–258 (2012).

²⁷ For example, see Christof R.A. Swaak & Rein Wesseling, *Reconsidering the leniency option: if not first in, good reasons to stay out*, ECLR: European Competition Law Review, 36(8), 346–354 (2015).; Or Olivia Bodnar, Melinda Fremerey, Hans-Theo Normann & Jannika Schad, *The effects of private damage claims on cartel stability: Experimental evidence* (No. 315). DICE Discussion Paper(2019).

colleagues can be trusted to keep the agreement hidden, he might be incentivised to blow the whistle himself. The alternative is that someone else will, leaving him with a full fine to pay and potentially follow-on damages.²⁸ In the case of high fines, this might leave the cartel member at a competitive disadvantage to his competitors in the post-cartel world.

Most theoretical studies that analyse the application for leniency by cartels – mostly as part of an assessment of the effectiveness of the leniency programme – focus on the level of the cartel. For example, Miller (2009) presents a theoretical framework.²⁹ Marvão (2014) is, according to the author, the first paper to focus on cartel members, and allows for heterogeneous cartel members.³⁰ According to Marvão's model, cartelists are heterogeneous in two ways: in the level of the fine they are faced with, and in their private knowledge about the likelihood of conviction. Firms that face higher fines (in absolute terms) are more likely to apply for leniency. This can be due to higher sales, or in some jurisdictions, being the ringleader of the cartel or being a recidivist. Self-reporting will occur if the perceived rate of detection is sufficiently high. This can be increased by public statements from the competition authority, whether or not the authority is focussing on a specific sector, and information on the budget or resources available to the authority. In the same paper, Marvão tests her model using an econometric analysis of cartel cases to assess the determinants of leniency application. Her empirical analysis based on US and European Commission cases in the period 1984–2009 shows that a cartel member is more likely to apply for leniency and receive immunity when it is a repeat offender.³¹ This finding is in line with her theoretical model that showed a higher application rate when there were higher fines. The model does not take into account firms'

²⁸ Giancarlo Spagnolo, *Divide Et Impera: Optimal Leniency Programs*, CEPR Discussion Paper No. 4840, December (2004), Available at SSRN: <https://ssrn.com/abstract=716143>. Maria Bigoni, Sven-Olof Fridolfsson, Chloe Le Coq & Giancarlo Spagnolo, *Fines, leniency, and rewards in antitrust*, *The RAND Journal of Economics*, 43(2), 368–390 (2012).

²⁹ Nathan H. Miller, *Strategic Leniency and Cartel Enforcement*, *American Economic Review*, 99, 750 (2009).

³⁰ Catarina M.P. Marvão, *Heterogeneous Penalties and Private Information*, *Konkurrensverket Working Paper No. 2014:1* (2014).

³¹ For European Commission cases, this relation was true only when the leniency application was presented after the cartel ended.

private information on the probability of conviction. In the current paper, I account for this using a proxy for the level of the budget of the Dutch competition authority in the year of the cartel decision and whether a certain sector is on the shortlist of the authority.³²

Brenner (2011) takes a different approach to determining what influences the likelihood of applying for leniency.³³ He looks at it from a resource-based perspective and a culture perspective. The resource-based view uses the size of a firm as a proxy for being equipped with an efficient legal department, having high-quality management, and operating in multiple countries. Large firms, according to his hypothesis, have all these things and are therefore better able to deal with dissolving a cross-border cartel organisation. His empirical analysis of European Commission cases in the period 1996–2004 does indeed show that large multinational firms were more likely to deliver evidence of cartel behaviour to the competition authority. Since cooperating with the competition authority decreases uncertainty, Brenner argues that leniency applications are more likely to be observed by firms with a culturally based preference for uncertainty avoidance. His econometric analysis does not support this last hypothesis, however.

Aside from Marvão (2014) and Brenner (2011), several other papers empirically analyse determinants of leniency applications on a cartel and cartel level. These are Hoang et al. (2014), which assesses the likelihood of a cartel member being a chief witness in European Commission cases in the period 2000–11; Kim & Kim (2016), which analyses Korean cartel cases in the period 2005–09;³⁴ and Koh & Jeong (2013), which focuses on the same jurisdiction in the period 2005–12. In analysing the determinants of leniency applications, the current paper tests whether the results of the previous studies also apply to Dutch cartels. In that sense, the results of these authors are used to formulate hypotheses.

³² Both of these variables turned out not to be significant in the regression analysis and are therefore not presented in this paper.

³³ Stefan Brenner, *Self-disclosure at international cartels*, *Journal of International Business Studies*, 42(2), 221–234 (2011).

³⁴ Nayoung Kim & Yungsan Kim, *Who Confesses For Leniency? Evidence From Korea*, *Journal of Competition Law & Economics*, 12(2), 351–374 (2016).

Firstly, most of the studies look at the number of firms involved in a cartel (except for Brenner, 2011). Most of the authors argue that the number of firms involved in a cartel infringement can be seen as a proxy for the complexity of the cartel. This leads them to two conflicting hypotheses. On the one hand, because of the complexity of a large cartel caused by its large membership, the cartel is prone to disintegration. It is more difficult to organise and maintain the cartel, and it is more vulnerable to antitrust investigation, since any of the cartelists could be 'the weakest link' (Kim & Kim, 2016). On the other hand, the very fact that a large cartel exists implies that it is tightly unified, as it succeeded in reaching an agreement despite the large number of joiners (Koh & Jeong, 2013). All authors find the same empirical effect. An increase in the number of participants lowers the likelihood of a leniency application (and immunity, depending on the exact analysis). The hypothesis that is tested in the current article is therefore that there is a negative relationship between the number of cartel members and the likelihood of applying for leniency. Marvão (2014) claims that such a relationship is due to the fact that competition authorities have trouble finding extensive and accurate evidence for the inclusion of all cartel members. However, only a small effect is found. As with all other determinants of leniency applications, it may be that there is selection bias, since only discovered (and sanctioned) cartels are taken into account in the analyses. If this selection bias is present for the number of participants, hidden cartels – such as those that have not applied for leniency – will have (on average) more members.

Secondly, most previous studies have looked at cartel duration as an explanation for applying for leniency. Two opposite hypotheses are also mentioned here. On the one hand, a longer cartel period can lead to higher fines and hence may incentivise fine-avoiding behaviour by the cartel members – i.e. self-reporting. On the other hand, Brenner (2011) argues that the longer a cartel infringement lasts, the stronger the emotional bond is between its members, which may prevent cartelists from blowing the whistle on each other. The key difference between the two hypotheses is as follows. The first is based on rational economic theory, and could apply if a leniency application were also the result of a rational balance between the pros and cons. The second, however, assumes personal and emotional influences in the

decision.³⁵ In the case of Dutch companies, this latter hypothesis is supported by previous research into the management of companies, and hence this article hypothesises a negative relationship between cartel duration and leniency applications.³⁶ Hoang et al. (2014) does not find a significant effect, while the analyses of Marvão (2014: negative effect) and Brenner (2011: positive effect) give an opposite effect. The results are therefore ambiguous.

Thirdly, the authors take into account whether a cartel consists of just one type of infringement (e.g. price fixing) or multiple infringements (e.g. price fixing and information exchange). As with the number of cartel members, the authors consider multiple infringements to be a proxy for the complexity of a cartel (Kim & Kim, 2016). This means that the same two hypotheses are formulated as for the number of cartel members, but in the opposite direction. Koh & Jeong (2013) does not find a significant result, but Kim & Kim (2016) finds a negative effect of multiple infringements on the likelihood of applying for leniency. The current analysis therefore bases its hypothesis on the results of Kim & Kim (2016) and expects to find a negative relationship. Koh & Jeong (2013) also gathered data on different types of infringement, but included only bid-rigging in the econometric model. This did not have a significant effect on the likelihood of applying for leniency.

Fourth, as stated by Motta and Polo (2003), reporting a cartel – and receiving a reduction in the fine – reduces the expected fine.³⁷ This suggests that a higher fine incentivises self-reporting. Hoang et al. (2014) expects a positive effect of the level of the fine on the likelihood of applying for leniency, and anticipates that this effect will be stronger in jurisdictions that impose personal fines on managers (such as the Netherlands). The authors also expect the career path of a cartelist's manager to be negatively affected by its involvement, and for this effect to be increased for higher levels of the fine. Surprisingly, a study on the career development of managers of Dutch firms that have been sanctioned for cartel involvement shows a (small but)

³⁵ This is supported by Peter.T. Dijkstra, Marco A. Haan, & Lambert Schoonbeek, *Leniency Programs and the Design of Antitrust: Experimental Evidence with Free-Form Communication* (2017).

³⁶ Nicole S.R. Rosenboom & Daan in 't Veld, *The Interaction of Public and Private Cartel Enforcement*, *World Competition*, 42(1), 87–120 (2019).

³⁷ Massimo Motta & Michele Polo, *Leniency programs and cartel prosecution*, *International Journal of Industrial Organization*, 21, 347–379 (2003).

significant positive effect of the level of the fine on their career.³⁸ Koh & Jeong (2013) does not find a significant effect of the fine level, but Hoang et al. (2014) does find a small positive effect on the likelihood of applying for leniency. This is in line with the hypothesis described above, and will be used as the hypothesis in the current paper.

Brenner (2010) treats listed companies as a proxy for large multinationals. Brenner's hypothesis is that such companies often have a large legal department that is capable of dealing with the competition authority and is closely involved in decision-making within the firm. This increases the likelihood that the company will cooperate with the competition authority and self-report the cartel. The econometric analysis by Brenner supports his hypothesis. The current paper also expects to see a higher likelihood of leniency applications for listed companies.

Lastly, some of the authors include different sectors of cartel activity in their model. Marvão (2014) concludes that being active in the US sectors for rubber and plastic or paper and printing increases the likelihood of receiving immunity, while in the European sectors for transport, videos and LCDs the likelihood is lower. Kim & Kim (2016) considers different sectors as a proxy for heterogeneous products, and finds a negative effect for the service sector, for example.

All of the above determinants are included in the current paper's empirical model. Other determinants from the existing literature either are not relevant for cartels in the Netherlands, or could not be included due to lack of data. For example, the number of countries in which a European cartel was active is not relevant for local Dutch cases (Hoang et al., 2014: positive effect); and decisions do not report if a cartelist has already withdrawn from a cartel (Kim & Kim, 2016: positive effect).

The empirical literature described above offers insights into what drives a leniency application. However, these do not also automatically apply to Dutch cartel cases. In particular, studies that analyse European Commission cases may have different results to analyses that are based on other

³⁸ Nicole S.R. Rosenboom *Career development after cartel prosecution: Cartel versus non-cartel managers*, *Journal of Competition Law and Economics*, 8(1), 145–165 (2012).

jurisdictions (Hoang et al., Marvão, and Brenner). As Stephen (2009) shows, a large number of European Commission cartel cases that had been triggered by a leniency application were already being investigated in the US by the Department of Justice.³⁹ Perhaps this US investigation played a greater role in the European leniency application than any of the other determinants.

Other determinants may also influence the likelihood of applying for leniency. New determinants that are proposed in the current article are whether a cartel is discovered by a leniency application or by the competition authority, the budget of the competition authority, and GDP in the year of the decision.

The hypothesis about whether a cartel is discovered by leniency is based on the mathematical probabilities of both situations. That is, if a cartel is discovered by leniency this implies that at least one of its members has applied for leniency. The probability that an individual member of the discovered cartel will apply for leniency is higher than for an individual member of an undiscovered cartel. In practice this does not have to hold, since a cartel that is discovered by the competition authority might also trigger a number of leniency applications.

The budget of the authority can be seen as a proxy for the rate of detection.⁴⁰ A higher budget suggests that more resources are available for cartel detection and substantiation of the cartel decision. A higher rate of detection decreases the pay-off of cartel involvement and hence the likelihood of a leniency application.

GDP is included to correct for macro-economic terms that might influence the decision to apply for leniency. This variable might be of influence if cartels are less stable in economically good times than in bad times (or vice versa).

³⁹ Andreas Stephan, *An Empirical Assessment of the European Leniency Notice*, *Journal of Competition Law and Economics*, 5:537, 562 (2009).

⁴⁰ Other such proxies were also tested but did not result in a better model and/or significant results. These included the number of competition staff working at the authority, and whether the sector of the cartel was on the authority's agenda.

4.3 Description of data

To assess what determines an application for leniency, I gathered data by the Dutch competition authority (currently ACM, formerly NMa) for all cartel decisions that involve a cartel infringement. This paper looks only at initial decisions, since cartel members decide on a leniency application before or during the investigation phase and not during the legal procedure at court. This means that my database includes some decisions that are overturned by the court at a later stage. If those decisions were excluded, the dataset might miss out cases where a firm applied for leniency. In any case, it would miss out characteristics that influence the decision to self-report. As a robustness check, in the next section the model is also run for only those cases that have not been annulled by a court.

The database includes decisions with and without a fine. There are six decisions in which the authority concluded on an infringement but did not impose a fine. None of these cases involves a leniency application. It therefore seems unlikely that the companies considered applying for leniency when they expected a non-sanction decision. These cases are therefore excluded from further analysis.

A mass cartel was in place in the Dutch construction sector from 1998 to 2001. This involved many of the construction companies that were active in the Netherlands at the time, and most of them were given some form of leniency reduction if they handed over their administration to the authority. This was before the leniency programme was officially introduced in July 2002.⁴¹ Since this mass cartel was very different from the other cartels that have been discovered in the Netherlands, and since the firms involved did not apply for the ‘regular’ leniency programme, this mass cartel is excluded from the analysis.

The resulting database contains 63⁴² cartels, in which 366 companies were involved and were fined during the period 2002–17.⁴³ The cartel-level

⁴¹ Leniency programme 1 Juli 2002. Staatscourant 1 juli 2002, nr. 122.

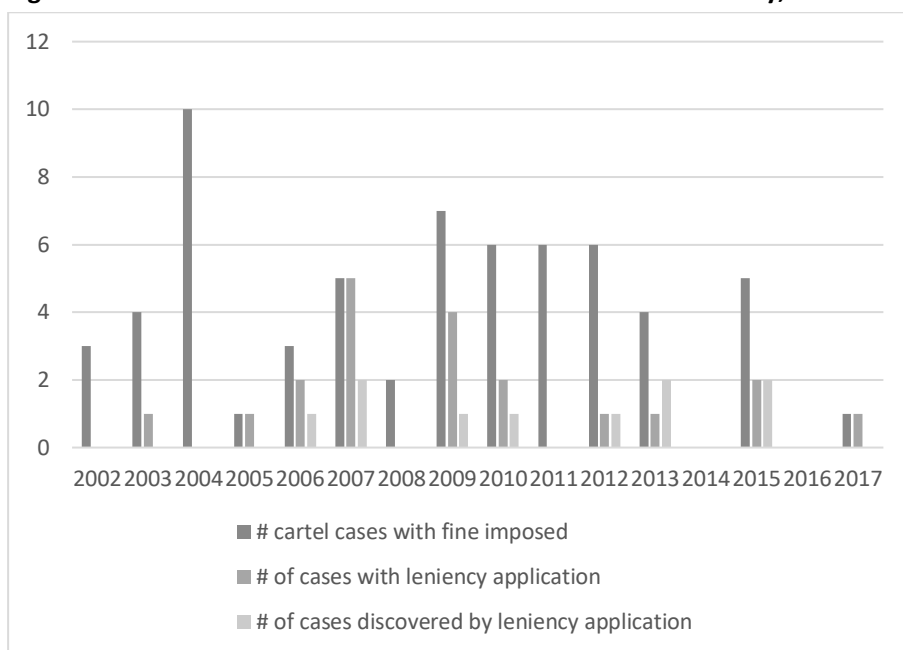
⁴² There are 64 initial cartel cases, but for one cartel it is not known whether leniency was applied. This one is therefore excluded from the database.

⁴³ These do not represent 366 unique companies, since some of them were recidivists or were active in more than one cartel at the same time. No cartels were fined in 2018.

determinants are the same within a cartel (for example, the sector), and the values for cartel member determinants may differ according to the firm (for example, the base fine).⁴⁴

Figure 4.1 shows the statistics over time. There is no clear trend in the numbers of cartel cases or leniency applications. In 32% of the sanction cases, at least one cartel member applied for leniency. In total, 16% of the sanctioned cases were discovered through a leniency application. The appendix provides an overview of the characteristics of the cartels, such as the number of members, (the number of) leniency application(s), the severity factor of the infringement, and the total fine for the cartel members. No mention is made in the sanction decision of whether any leniency applications were denied. All leniency applicants in the database therefore received a leniency reduction.

Figure 4.1 Number of cartel cases with and without leniency, over time



Note: N=63, only sanction decisions where a fine was imposed. In 2013 two (parallel) cartels were discovered through leniency, while a leniency application was filed in only one of the cases. The other was discovered through this leniency application in the parallel cartel.

⁴⁴ The appendix provides a list of the variables included in the dataset.

However, the firm that self-reported did not take part in the first cartel. See appendix for more information.

Characteristics of cartel members

The following tables show the characteristics of the cartels and their members, with a distinction between those that applied for leniency and those that did not. Significance is measured based on a two-sided t-test. Table 4.1 and Table 4.2 present the results at the cartel member level, and hence distinguish between individual firms applying and not applying for leniency. Table 4.3 and Table 4.4 show the results at a cartel level, and hence distinguish between cartels where at least one of the members applied for leniency and cartels where none of the members blew the whistle.

Cartel members that applied for leniency had, on average, a higher market share than other firms that were active in a cartel (see Table 4.1). Since the market share in the cartelised market is of interest here, this is calculated by multiplying the fine basis by ten.⁴⁵ As turnover data was not available for all cartels, this difference is based on only roughly two-thirds of the database.

Table 4.1 Characteristics of cartel members, related to the fine and firm size

	All cartel-ists	Of all leniency applicants	Of non-leniency applicants	Difference significant?	n
Market share cartel members	18.0%	23.0%	17.0%	*	305
Base fine (fine basis * gravity) (€m)	€3.0	€7.7	€2.0	***	305
Average turnover (€m)	€23.1	€35.4	€20.6		294
Fine turnover ratio before leniency reduction	17.1%	14.3%	17.7%	***	286

Note: *** p<0.01. ** p<0.05. * p<0.1. Only sanction decisions where a fine was imposed. The values of the monetary variables such as the fine and turnover are adjusted for real prices, with 2015 as the base year.

The cartel members that applied for leniency faced a significantly higher base fine than their colleagues that did not blow the whistle. This is before any reductions (leniency and other reductions) were subtracted. It seems

⁴⁵ This is not to be confused with the base fine. The fine basis is calculated by the ACM as 10% of the relevant turnover (i.e. the cartelised turnover). The base fine is the fine basis multiplied by the gravity factor, assigned by the ACM. For completeness, the maximum fine is based on the *total turnover* of the company.

that this difference was caused by the severity factor, since the average turnover did not show a significant difference between applicants and non-applicants. Oddly, relative to their turnover, leniency applicants had a lower fine (before leniency reductions) than non-applicants.

In total, 41% of the cartelists were the smallest cartel member in terms of related turnover (see Table 4.2). Of these smallest members, only 10% applied for leniency. A small portion of the cartelists were part of a listed company (5%) or part of an international company (17%). A large majority of these listed and/or international companies did not apply for leniency (roughly three-quarters). This is in line with expectations, given that listed and international companies are proxied with having a compliance programme. About 5% of all cartelists were recidivist in the Netherlands, and of those, 11% applied for leniency. Of all leniency applicants, almost 4% were recidivist. This is low in comparison with the leniency applications to the European Commission. There, 10% of all cartel members were recidivists, and 17% of all leniency applicants were recidivists (Hoang et al., 2014). The Dutch numbers are surprisingly low since the ACM, like the Commission, does not exclude recidivists from leniency reductions.

Table 4.2 Characteristics of cartel members, related to binary variables

Cartelist is:	As a percentage of total n	n	Of all leniency applicants	Of non-leni-ency applicants	Difference significant?
...smallest cartel member	41.0%	200	18.6%	47.1%	***
...part of listed company	4.9%	366	9.4%	4.2%	
...part of international company	17.4%	362	30.8%	15.2%	***
...recidivist	4.9%	366	3.8%	5.1%	

Note: Only sanction decisions where a fine was imposed are included. *** $p < 0.01$. ** $p < 0.05$. * $p < 0.1$.

Characteristics of cartels

Cartels where at least one of the members applied for leniency are slightly less concentrated than the average cartel and than cartels without a leniency application (see Table 4.3). Note that the HHI index is based on cartel sales only, since no data is available for the combined cartel market share relative to the relevant market as a whole. Asymmetry between cartel members in terms of size is one of the factors influencing the stability of a cartel.

One would therefore expect that the higher the asymmetry, the higher the difference between the largest and smallest cartel members, and the higher the percentage of leniency applications. However, from Table 4.3 it appears that asymmetry hardly differs between cartels with and without a leniency application, and the difference is not statistically significant.

Table 4.3 Characteristics of cartels with statistical significance at the cartel member level

	All cartels	Of cartels with at least one leniency application	Of cartels with no leniency application	No. of cartels	Difference significant? ⁴⁶
HHI	3,599	3,311	3,734	63	***
Asymmetry (difference in market share between largest and smallest cartel members)	31.5%	32.1%	31.1%	47	
Cartel duration (in months)	37.1	49.2	31.4	63	
Severity factor	1.8	2.1	1.7	57	
No. of cartel members	5.8	5.8	5.8	63	***
Total final fine (€m)	8.0	8.3	7.9	63	**

Note: *** $p < 0.01$. ** $p < 0.05$. * $p < 0.1$. Only sanction decisions where a fine was imposed. The values of the monetary variables such as the fine are adjusted for real prices, with 2015 as the base year.

On average, cartels where at least one of the members applied for leniency lasted longer than non-reporting cartels. However, this difference is not significant.

Cartels with at least one leniency application tend to have a higher severity factor. This does not correlate with the length of the infringement or the level of the base fine.

While the average number of cartel members is the same for cartels with and without a leniency application, the variance in the number of cartelists is very different. For cartels where leniency was applied, the number of

⁴⁶ The descriptive statistics are on a cartel level with max. 63 observations. This number is too low to provide accurate t-test results. Therefore, the significance is presented here as following from a t-test on a cartel *member* level. This is the same dataset as the logit regression in section 3.4 (hence the maximum of 366 observations).

members ranges from two to nine, whereas for non-applicants the number can be more than 20.

The total final fine for cartels with a leniency application is almost the same as for cartels without a reporter. As shown in Table 4.1, cartel members that applied for leniency have a higher average base fine (before reductions).

Table 4.4 Descriptive statistics of cartel

Cartels that involved:	All cartels	Of cartels with at least one leniency application	Of cartels with no leniency application	No. of cartels	Difference significant? ⁴⁷
...a personal fine for (at least one) director(s)	12.7%	5.0%	16.3%	63	**
...a parallel cartel	12.6%	10.0%	14.0%	63	
...a recidivist in the cartel	6.3%	5.0%	7.0%	63	
...a bidding market	39.7%	30.0%	44.2%	63	
...a trade organisation	40.0%	30.0%	44.2%	63	

Note: *** p<0.01. ** p<0.05. * p<0.1. Only sanction decisions where a fine was imposed.

A leniency application by a firm also applies to the personal fine for its directors.⁴⁸ Hence, directors that fear personal liability have a personal incentive to self-report the cartel. The Dutch competition authority has been able to impose personal fines since 2007, although the first one was imposed only in 2010. In 13% of all cartels, a director has been fined (see Table 4.4). In one cartel, the directors applied for leniency.

In the Netherlands, there have been 24 parallel cartels. That is, during (part of) the infringement periods of 12 cartels, at least one of the members was involved in another cartel with an overlapping infringement period. This is particularly relevant in the Dutch construction sector – even excluding the mass cartel in the sector. 29% of the cartels that involved parallel cartels applied for leniency.

As can be seen from Table 4.2, a relatively low number of recidivists applied for leniency (11% of cartelists). Since these recidivists were spread over multiple cartels, this means that 18% of all cartels involved at least one recidivist. As in the previous example, the majority of these cartels did not lead to a

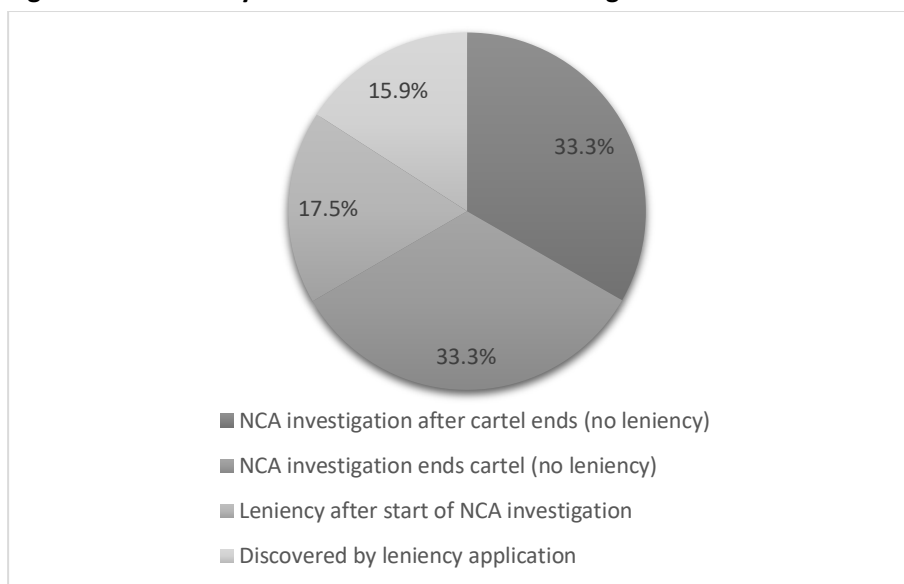
⁴⁷ See previous footnote.

⁴⁸ NMa Boetecode 2007.

leniency application. Note that the database includes only discovered and sanctioned cartels. This means that the concept of a non-recidivist can be misleading, since it might be that a cartel member of a sanctioned cartel is also taking part in a hidden cartel (Marvão, 2014). In other words, the number of recidivists may be an underestimate.

In total, 40% of all Dutch cases took place in a bidding market. This was the case in the construction, but also between healthcare providers and taxi providers. A quarter of these cartels involved a leniency application.

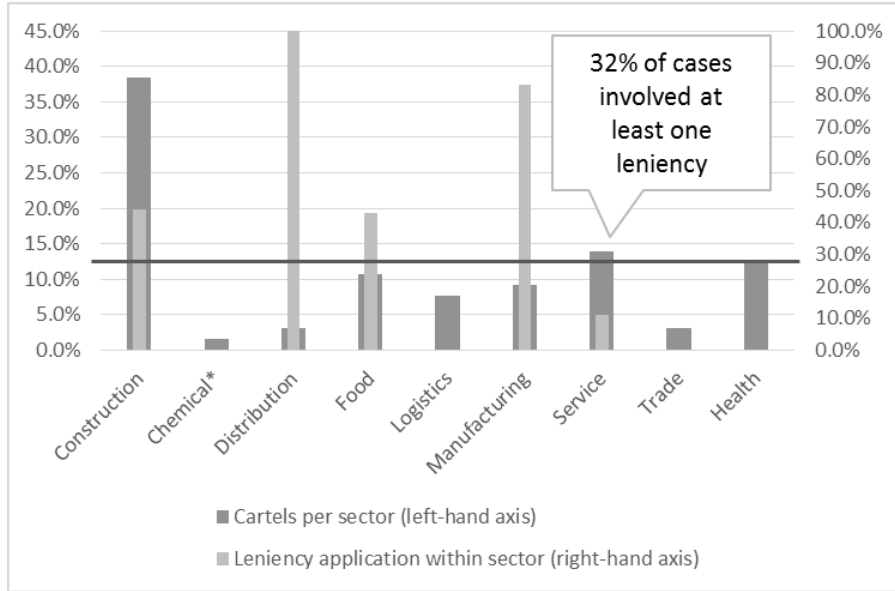
Figure 4.2 Ways in which the cartel came to light



Note: N=63, only sanction decisions where a fine was imposed. NCA, national competition authority.

The majority of the cartels (67%, as shown in Figure 4.2) were brought to light following an investigation by the Dutch competition authority. These were divided equally between an investigation after the cartel ended and an investigation which ended the cartel. Of the others, 16% of cartels were discovered by a leniency application, while 18% applied for leniency after the investigation started.

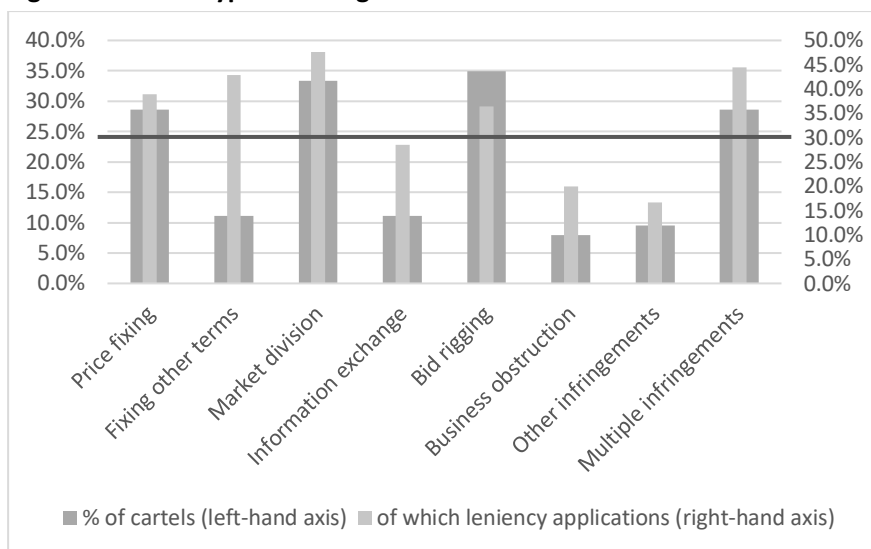
Figure 4.3 Sectors of cartel activity



Note: Only sanction decisions where a fine was imposed (n=63). Cartels can be active in more than one sector. Hence, results sum up to more than 100%.

As shown in Figure 4.3, most cartel activity took place in the Dutch construction sector, although the leniency rate was highest in the distribution sector. The difference between at least one leniency applicant and none was significantly different within each sector, except for the chemical sector.

Figure 4.4 Type of infringement



Note: Only sanction decisions where a fine was imposed (n=63). Cartels have been involved in multiple types of infringements and hence results add up to more than 100%. ‘Other infringements’ is composed of Restraints on capacity, Cover pricing and Restraints on product specifications.

Most cartels involved big rigging, market division and price fixing (see Figure 4.4). Within the different types of infringement, the rate of leniency was highest for market division. More than a quarter of all cartels were involved in multiple infringements, of which in almost half of the cartels at least one firm filed for leniency.

4.4 Results

A logit model can be run to assess what factors determine whether a cartel member will apply for leniency. The dependent variable is 1 if leniency is applied by the cartel member, and 0 if not. In the Netherlands, there are no known instances of where a firm applied for leniency but did not receive it. This means that all leniency applications received a fine reduction or immunity. In the model, characteristics of both the cartel members and the cartel are included (see Table 4.5). This is in line with Kim & Kim (2016), as well as other studies. As described in section 3.2, the model includes the following determinants that are also included in earlier studies: the number of cartel members, the cartel duration, multiple infringements, the fine level, whether a firm is listed, and the sector. Furthermore, this analysis adds to the existing

literature by taking the following new determinants into account: the budget of the competition authority,⁴⁹ whether the cartel is discovered through leniency, and GDP as a correcting factor for macro-economic development.⁵⁰

Table 4.5 shows the results of three models. Models 1 and 2 involve the base fine. Since this variable is not available in all cartel decisions, these two models have a lower number of observations. Model 3 leaves the base fine out and covers all cartels in the database (63, as opposed to 54 cartels in models 1 and 2).

On a cartel member level, the base fine is included in the model (see Table 4.5). This is calculated as 10% of the relevant turnover involved in the last year of the infringement, multiplied by the gravity factor as determined by the authority. The base fine has a positive effect that is strongly significant. This is in line with the hypothesis described in section 3.2 and the findings of Hoang et al. (2014) for Europe-wide cartels. The coefficient is very small. Whether this means that firms are insensitive to the fine level, or whether the fines are already too high, is unclear.

Being part of a listed company (most of the firms are also part of an international company) increases the likelihood of self-reporting. This confirms the hypothesis that there is a positive relationship between being listed and blowing the whistle. Potentially, this can be seen as a proxy for the professional status of a firm, another feature of which is having a compliance department and internal rules on applying for leniency once a cartel agreement is discovered internally.

Three variables at the cartel level form the basis for all the models presented in Table 4.5. The first variable is whether the cartel was active in the construction sector. As seen from Figure 4.3, 39% of all cartel cases took place in the construction sector and 44% of those cartels have at least one leniency

⁴⁹ This concerns the budget on competition-related issues, as presented in the Rating enforcements of the GCR.

⁵⁰ Alongside the budget of the ACM, other resource/priority factors were tested such as the number of competition staff, and whether a sector was on the agenda of the ACM in the year when the cartel investigation started. Alongside GDP, other macro-economic factors were tested such as the interest rate and expected growth. None of these factors turned out to affect the decision to self-report.

applicant. It is therefore not surprising that being active in a cartel in the construction sector has a positive effect on the likelihood of a firm applying for leniency.

The second variable is whether a cartel is discovered through a leniency application. This is the case where the leniency application was filed before the ACM's investigation started. If a cartel is discovered through a leniency application, that means that there is at least one cartel member that applied for leniency. Not all members of a cartel that was discovered through a leniency application necessarily applied for leniency. In addition, leniency can be applied after the authority started an investigation, so the cartel need not have been discovered through leniency (see Figure 4.2). This is also shown by a correlation of 0.4 between the independent variable discovered through leniency and the dependent variable of a leniency application. Being discovered through leniency has a positive effect on the likelihood of a leniency application by other firms. This is in line with the hypothesis discussed in section 3.2.

Third, members of cartels that involved more than one type of infringement appear to have a higher likelihood of applying for leniency. As can be seen in Figure 4.4, a quarter of the cartels were involved in more than one type of infringement: 17% were involved in two types, and 6% were involved in three types. Previous studies have formulated two opposing hypotheses. This article expected to find a negative relationship between multiple types of infringement and blowing the whistle. However, the results show the opposite. They support the theory that cartels with multiple infringements are more complex to sustain and therefore less stable, as described in section 3.2. Alongside multiple types of infringement, it has been suggested that the number of cartel members can be a proxy for the complexity of the cartel – and therefore that the more members it has, the lower the likelihood that a firm will apply for leniency. However, the findings for the number of cartel members point in another direction. The more cartel members a cartel has, the lower is the likelihood of a leniency application. This might mean that having more members does not make the cartel more complex, but instead increases the possibility that a (large) majority of the market will be covered by the cartel arrangement, which stabilises the cartel.

Several types of infringement are considered in the analysis. Price fixing, which is generally considered a hardcore cartel, does not have a significant effect.⁵¹ Fixing other terms, such as the coordination of pass-on of certain sector-wide costs or agreeing not to grant discounts, has a positive effect. Being involved in information exchange lowers the likelihood that a firm will apply for leniency. This might be because of the perceived difficulty for the competition authority in sanctioning such a cartel, which often originates from a perspective of the members that it does not constitute a cartel to begin with.

If a cartel was active in the manufacturing sector and/or had a longer duration, the likelihood of it applying for leniency is higher. The hypothesis involved a negative relationship because of the personal and emotional influences that play a role in deciding whether to self-report. The longer competitors coordinate rather than compete, the less they are likely to report each other to the authority. As the results show the opposite, this suggests that the decision to self-report is more rational than expected, and based on weighing up the pros and cons. Since a higher fine also has a positive effect on self-reporting, the results of both factors suggest that firms perceive that fines will be higher if the infringement lasts longer, and therefore that they are more likely to self-report in order to avoid the fine (although the effects are small – see Table 4.6).

Some start years of the ACM's investigation have a statistically significant and positive effect. GDP (in the year of the sanction decision) also has a positive effect on the likelihood of applying for leniency. Given that GDP fluctuates over the relevant period, this variable does not function as a time trend but rather as a corrector for macroeconomic developments. Given these macroeconomic developments, one would expect GDP in the year of the start of the investigation to be most relevant, as this year will be similar or close to the year of (decisions about) self-reporting. However, this variable is – contrary to GDP in the year of the sanction decision – not significant.

⁵¹ Not included in the regressions presented here.

Table 4.5 Results of logit model

	(1)	(2)	(3)
Variables	Leniency	Leniency	Leniency
Base fine (€m)	0.036** (0.017)		0.090*** (0.031)
Cartel member is part of listed company	1.744* (0.912)		2.363* (1.365)
Construction sector	2.333*** (0.526)	2.444*** (0.494)	4.813*** (1.340)
Discovered by leniency	1.668*** (0.446)	1.701*** (0.451)	3.679*** (0.905)
Multiple infringements	1.411*** (0.424)	1.386*** (0.447)	3.144*** (0.773)
Manufacturing sector	1.192* (0.636)	1.441** (0.562)	2.367** (1.153)
GDP in year decision (€'000)	0.028*** (0.011)		
Fixing other terms	1.689*** (0.633)		
Number of cartel members		-0.042* (0.025)	
Information exchange		-1.262** (0.627)	
Duration of cartel (month)		0.018*** (0.006)	
Dummies for start year investigation ¹			All positive
Observations	305	366	305
Number of cartels	54	63	54
R ²	0.3663	0.3489	0.5189

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1, Results are based on analysis without clustered standard errors⁵². ¹This consists of individual dummy variables

⁵² An option is to cluster standard errors by cartels. Given the small sample size of 54 and 63 cartels, there may be a small cluster problem. However, running the regressions reported in Table 4.5 with clustered standard errors only results in several (minor) changes in significance levels of several coefficients. Abstracting from variables in which only the level of significance changed (but the respective coefficients remain (in)significant), I find two substantial changes of significance

for each year (base year is 2001). The following years have a positive and significant effect: 2000–06 and 2011. 2003 is dropped and hence left out of this analysis.

Marginal effects

In each model, being active in the construction sector and whether a cartel is discovered by leniency gives the largest (significant) effect on a leniency application. Other important determinants that increase the likelihood of a leniency application are if the cartel fixed other terms, concerned multiple types of infringement and was active in the manufacturing sector. An extra month of cartel duration on the other hand gives the smallest effect and leads only to 0.1% increase in the likelihood of a leniency application. The base fine also has a small effect (below 1% per one million euro higher fine). The number of cartel members has a small negative effect.

Table 4.6 Marginal effects

	(1)	(2)	(3)
	Leniency	Leniency	Leniency
Base fine (€m)	0.2%**		0.07%
Cartel member is part of listed company	21.0%		6.3%
Construction sector	20.9%***	20.5%***	14.2%
Discovered by leniency	18.0%**	15.6%*	15.9%*
Multiple infringements	12.2%**	9.3%**	7.2%
Fixing other terms	19.3%*		
Manufacturing sector	11.3%	12.3%*	5.6%
Number of cartel members		-0.2%**	
Duration of cartel (month)		0.1%**	
GDP in year decision (€'000)	0.2%***		
Dummies for start year investigation (2004, 2005 & 2011)			***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, Results are based on analysis without clustered standard errors.

Robustness analysis

In order to see whether the described results are robust, related analysis are run. This involves firstly the same models as above in OLS format. Instead of a binary dependent variable for a leniency application, a discrete variable is used, depicting the level of leniency reduction that a cartel member received. When no leniency application was filed, that percentage is zero.

levels when clustering standard errors. GDP is no longer significant and the manufacturing sector is significant for all models.

The main effect is that the coefficients of all variables are larger.⁵³ For example, the coefficient for the base fine ranges between 1.2 and 1.5 in the OLS regression whilst the logit regression gives coefficients of 0.04 and 0.09. Being part of a listed company and the number of cartel members are no longer significant.

The second robustness analysis concerns a smaller sample of cases where the fine is not (yet) annulled in court. The base model as shown in Table 4.5 includes all initial sanction decisions in the Netherlands. Up until the time of writing 32.5% of the cartelists got the cartel fine annulled by court. All cartel members, also the ones that receive leniency can appeal the ACM decision. However, as it turns out, none of the leniency applications got the fine annulled.

If a decision is annulled, this suggests that the activities did not classify as an infringement after all.⁵⁴ One could therefore assume that a cartel member – being convinced of the legality of its behaviour – would not apply for leniency. The fine decision is not always annulled for all members of the cartel. The annulment only relates to the ones that appeal the initial decision. It is therefore interesting to run the robustness check on both the cartel member and cartel level. The robustness analysis compared the sample with upheld decisions (both on cartel and cartel level) with the full sample of both upheld and annulled decisions.⁵⁵ The following two samples are used: a sample of cases where the individual fine was upheld (cartel member level: maximum 247 firms, 54 cartels) and a sample of only cases where the sanction for all cartel members was upheld (cartel level: maximum 225 firms, 46 cartels). This latter is relevant since the appeal of one of the cartel members might say something on whether it was actually a cartel. Hence, also these cases can provide interesting insights in the determinants of self-reporting.

The results of both analyses are in broad terms the same, compared to the base model described in the previous section. The most significant change is

⁵³ Results of robustness analysis can be requested from the author.

⁵⁴ Obviously there are a number of other reasons why a decision can be annulled, for instance if the authority based the decision on unlawfully obtained information or if the limitation period expired.

⁵⁵ A comparison of upheld with only annulled decision is not possible because of the low number of observations of the latter.

that the effect for the number of cartel members and being involved in information exchange are no longer significant for both samples with upheld cases.⁵⁶ The similarity between this robustness analysis and the base model from Table 4.5 suggests that cartel members who get their fine annulled by court take largely the same determinants into account when deciding on blowing the whistle.

Ideally also a distinction would have been made between bidding and non-bidding markets. Dynamics of cartels may be different in both markets, for example because the cartel period is mostly much shorter in bidding markets and the agreements mostly relate to a (number of) specific bid project(s). Hence, there may be a compensation scheme in place for the assigned losers of a tender. The difference in results between the two markets is shown by Kim & Kim (2016). A similar distinction is unfortunately not possible with the Dutch data. Given that 78% of the data concerns a non-bidding market, there are not enough observations for to run an analysis.

To conclude, two different type of robustness analysis are run: one for the extent of leniency reduction through an OLS regression and one for a sub-sample of upheld cartel decisions. The analysis show similar results as the base model, suggesting that the results are robust for different forms of analysis and subsamples.

4.5 Conclusion and discussion

This article assesses the determinants of leniency application for cartels sanctioned by the Dutch competition authority in the period 1998–2018, at both the cartel and the cartel member level. In terms of the latter, two cartel member determinants have a positive effect on the likelihood that a firm will self-report. An increase in the base fine of €1m leads to a smaller than 1% increase in the likelihood that the firm will apply for leniency. Being part of a listed company has a larger effect. In terms of the cartel-level determinants, the greatest effect is found in the construction sector, which has the greatest likelihood of a leniency application. Roughly 40% of the sanctioned cartels were active in the construction sector (excluding the mass cartel in

⁵⁶ This may be due to the lower number of observations. The sample for cases where the decision was upheld for the entire cartel is the smallest. This gives insignificant results for being part of a listed company, GDP and a cartel agreement involving fixing other terms.

the sector that was active from 1998 to 2001). The construction sector has a greater presence in the Dutch database than in similar Europe-wide studies, which reflects the national character of the dataset. Other important determinants that increase the likelihood of a leniency application are if the cartel fixed other terms, if the cartel was discovered through leniency, and if it was active in the manufacturing sector. The two determinants that have a negative effect on self-reporting are the number of cartel members, and being involved in information exchange.

These findings offer useful insights should the Dutch competition authority want to benefit from the discovery of cartels through the leniency programme. They can be used to change the design of the fining guidelines or to adjust the authority's anti-cartel campaign efforts towards sectors that have a higher likelihood of applying for leniency. In terms of the former, the positive effect of the base fine suggests that it would be useful for the authority to increase the fines. In practice, the fine imposed hardly ever reaches the legal maximum of 10% of total turnover. It is, however, questionable whether an increase in fines would be a good move for the authority. Firstly, the maximum Dutch cartel fines have only recently been increased (in 2014). Secondly, the current study did not take the expected private damages claims into account. Together with the public fines, these will decrease the expected pay-off from cartel behaviour. Hence, alongside any potential effect of private damages claims on the likelihood of leniency applications, the combination of the two may already deter cartels and render a further increase non-optimal. This may be especially true now that private damages claims are becoming more common in practice.

Given that many Dutch cartels are active in the construction sector, and given its higher likelihood of self-reporting, the ACM could focus on that sector in detecting cartels. The same applies to the manufacturing sector.

Note that the above conclusions are based only on the discovered cartels, since the dataset covers only those cartels that were sanctioned by the authority. The results may therefore not apply to stable, extant cartels or to cartels that have been discontinued without being discovered. This article is subject to three other limitations. First, I have depended on information that was published in the cartel decisions of the ACM. No information was available on the presence of a ringleader or the total market share of all cartelists.

Second, the decision to apply for leniency may be influenced by the fear, or lack of it, of private damages claims. Since the perceived likelihood of a damages claim is not known for the individual cartels and their members, this possibility is ignored in this article. Finally, the dataset contains only leniency applications that were actually picked up by the ACM and led to a cartel decision. According to the GCR, 28 firms applied for leniency in the Netherlands in 2014, seven in 2016, and six in 2017.⁵⁷ The number of leniency applications that were made in the context of fined firms is only two in 2014 and zero in the other two years. For these latter years, one could argue that there is simply a lag in applying for leniency and in the date of the sanction decision. For older years, it seems that the ACM has a number of leniency applications of potential cartels 'in stock' that it did not pursue. Therefore, if the ACM did want to either stimulate the leniency programme or increase the number of cartel decisions, it would make sense to begin by processing those leniency applications.

This article adds to the existing literature by considering another jurisdiction and by adding some novel determinants (the budget of the authority, whether the cartel is discovered by leniency, and GDP as a correcting factor for macro-economic development). While macro-economic factors have been taken into account in the analysis, there is room for future research when it comes to micro-economic factors at the sector level. One factor that can play a determining role in the decision to (stop an infringement and) apply for leniency is an upcoming merger. Davies et al. (2015) shows that there is often intense merger activity among former cartel members after cartel breakdown.⁵⁸ The authors find that this intensity is unlikely to be caused by the desire for tacit collusion, but is rather a result of restructuring in the market. Therefore, during the final phases of a cartel, this might stimulate cartel members to merge, rather than continue the cartel. Other authors also show that firms may see a merger as an alternative to a cartel.⁵⁹

⁵⁷ GCR Rating enforcement, 2015, 2017 and 2018.

⁵⁸ Stephen Davies, Peter L. Ormosi & Martin Graffenberger, *Mergers after cartels: How markets react to cartel breakdown*, *The Journal of Law and Economics*, 58(3), 561–583 (2015).

⁵⁹ For example, George Bittlingmayer, *Did Antitrust Policy Cause the Great Merger Wave?*, *The Journal of Law and Economics*, 28, 77–118 (1985).

Furthermore, the future research could add value by extending the data with measures of financial performance. Indicators such as profitability of the cartel members can be informative as a proxy for the likelihood that they will apply for leniency. According to Hoang et al. (2014), it can be assumed that firms in financial distress have a higher likelihood of applying for leniency than their financially strong co-conspirators.

4.6 Appendix – Overview of all sanction decisions

Cartel name	Year of sanction decision	No. of cartel members	No. of leniency applications	Discovered by leniency (yes=1)	Total cartel fine (x 1,000)*	Leniency reduction (x 1,000)	Cartel duration (months)
Aanbesteding complex 1731	2004	3	0	0	€14,375	€0	0.4
Aanbesteding dakrenovatie AMC	2004	5	0	0	€890,034	€0	1.1
Aanbesteding dakrenovaties Emmtec	2004	6	0	0	€255,151	€0	1.1
Aanbesteding dakrenovatie Sporthal 'De Springers')	2004	3	0	0	€92,238	€0	2.6
Aanbesteding Herprofilering Aambeeldstraat en Mokerstraat te Amsterdam Noord	2003	3	2	0	€31,421	€134,602	0.1
Betonmortelcentrales	2006	10	0	0	€6,735,012	€0	59.8
Boomkwekerijen	2007	7	2	0	€1,246,560	€958,016	73.6
BOVAG en NCBRM	2003	2	0	0	€188,038	€0	47.9
Brabantse Schilders [Boerhaavelaan]	2009	4	1	0	€24,326	€98,104	1.0
Breedplaat- en ribcassettevloeren	2007	9	7	0	€3,867,479	€65,400,000	71.8
Caraat (thuiszorg)	2011	2	0	0	€4,633,522	€0	23.9
Dakwerkzaamheden Philips Drachten	2004	2	0	0	€13,896	€0	2.0
Eerstejaars plantuien	2012	7	0	0	€4,323,199	€0	10.7
Executieveilingen	2013	76	0	0	€12,600,000	€0	113.8
Fietsfabrikanten	2004	3	0	0	€35,600,000	€0	11.9
Garageboxen	2015	2	1	1	€306,500	€30,700,000	28.4
Garnalen	2003	16	0	0	€16,700,000	€0	35.3
Glazenwassers	2011	10	0	0	€9,603	€0	1.7
Inleenverbod uitzendbranche	2004	1	0	0	€11,979	€0	35.0
Interpay	2004	8	0	0	€20,400,000	€0	73.8

Isolerend dubbelglas	2010	4	2	1	€19,400,000	€166,000,000	15.9
Kanaalplaatvloeren	2006	4	4	0	€2,666,719	€98,500,000	61.8
Koel- en vrieshuizen Betuwe	2015	2	0	0	€1,924,000	€0	39.5
Koel- en vrieshuizen Ijmuiden/Velsen	2015	5	0	0	€3,636,000	€0	23.4
Koel- en vrieshuizen Vlissingen	2015	2	0	0	€7,362,000	€0	37.0
Landelijke huisartsenvereniging (LHV)	2011	1	0	0	€8,235,357	€0	42.9
Leesmappen	2013	14	0	0	€6,231,207	€0	66.4
Limburgse bouwzaken 1	2010	2	0	0	€3,030,926	€0	8.8
Limburgse bouwzaken 2	2010	2	0	0	€353,723	€0	8.8
Meel	2010	16	5	0	€90,400,000	€282,000,000	65.9
Meerhoven	2009	4	1	0	€77,399	€116,632	1.0
Mobiele operators	2002	5	0	0	€109,000,000	€0	11.9
Natuurazijn	2015	2	1	1	€1,810,000	€46,800,000	128.2
Nederlands Tandtechnisch Genootschap	2004	1	0	0	€479,157	€0	71.1
Openbaar Groen Maastricht	2005	8	2	0	€1,301,838	€3,039,686	1.2
OSB	2003	4	0	0	€20,600,000	€0	12.0
Paprika	2012	4	1	1	€14,600,000	€380,000,000	32.5
Psychologen	2004	4	0	0	€533,062	€0	68.9
Roosters	2007	5	4	1	€3,152,523	€120,000,000	74.8
Scheepsafval	2011	3	0	0	€3,117,785	€0	23.0
Schildersbedrijven Meiveld	2009	4	0	0	€114,993	€0	0.5
Schildersbedrijven de Tongelreep	2009	5	0	0	€63,025	€0	0.9
Schildersbedrijven Kazerne I	2009	7	1	0	€112,782	€110,128	0.5
Schildersbedrijven Kazerne II	2009	7	0	0	€87,351	€0	0.5
Sierstenen	2007	9	4	0	€2,561,486	€6,944,715	95.8

Slopersbedrijven Rotterdam Project Ka-naalweg	2013	2	1	1	€13,206	€70,220	3.0
Slopersbedrijven Rotterdam Project Geuneburg	2013	2	0**	1	€87,363	€0	2.1
Slopersbedrijven Rotterdam Project Woonzorgboerderij Bergambacht & Dillettant	2013	2	0	0	€4,063	€0	6.5
Slopersbedrijven Rotterdam	2012	2	0	0	€102,041	€0	42.0
Tango	2002	5	0	0	€1,387,169	€0	3.0
Taxivervoer IJsselsteden	2012	2	0	0	€4,753,228	€0	32.2
Taxivervoer Rijnmond	2012	2	0	0	€4,564,765	€0	22.4
Thuiszorg 't Gooi	2008	3	0	0	€3,410,541	€0	17.6
Thuiszorg Kennemerland	2008	2	0	0	€5,374,287	€0	34.8
Thuiszorg Midden-IJssel	2010	2	0	0	€6,170,980	€0	35.9
Veehouder vs AUV en Aesculaap	2002	2	0	0	€12,900,000	€0	38.3
Verkeersregeltoestellen en verkeersre-gelininstallaties	2007	5	5	1	€501,765	€10,300,000	58.2
Verzinkerijen	2006	7	4	1	€3,846,423	€11,100,000	53.8
Vorkheftrucks	2017	8	3	0	€17,200,000	€152,000,000	116.3
Wasserijen	2011	4	0	0	€19,600,000	€0	137.8
WMO Friesland (Thuiszorg)	2010	2	0	0	€2,548,313	€0	34.5
Zilveruien	2012	5	0	0	€9,710,537	€0	148.7
Zwembadchloor	2009	6	2	1	€3,435,427	€23,000,000	87.1

Note: * After leniency reduction. ** This cartel was discovered through a leniency application on a parallel cartel. However, the firm that self-reported did not take part in the 'Geuneburg' cartel.

Cartel name	Multiple infringements	Involves listed company	Sector	Type of infringement
Aanbesteding complex 1731	0	0	D	fixing other terms
Aanbesteding dakrenovatie AMC	0	0	M/C	market division
Aanbesteding dakrenovaties Emmtec	0	0	L	bid rigging, information exchange
Aanbesteding dakrenovatie Sporthal 'De Springers')	1	0	L	bid rigging, information exchange
Aanbesteding Herprofilering Aambeeldstraat en Mokerstraat te Amsterdam Noord	0	0	L	bid rigging, information exchange
Betonmortelcentrales	0	2	M	market division
Boomkwekerijen	1	0	S	market division
BOVAG en NCBRM	1	0	C	bid rigging
Brabantse Schilders [Boerhaavelaan]	0	0	C	bid rigging
Breedplaat- en ribcassettevloeren	1	0	C	cover pricing
Caraat (thuiszorg)	0	0	F	restraints on capacity, price fixing
Dakwerkzaamheden Philips Drachten	0	0	F	restraints on capacity
Eerstejaars plantuien	0	0	F	price fixing, market division, information exchange
Executieveilingen	0	0	L	market division
Fietsfabrikanten	1	1	L	market division
Garageboxen	0	0	C	bid rigging
Garnalen	1	0	S	market division
Glazenwassers	0	0	H	market division
Inleenverbod uitzendbranche	0	0	S	market division
Interpay	0	5	S	price fixing, information exchange
Isolerend dubbelglas	0	2	H	market division
Kanaalplaatvloeren	1	0	F/M	market division, business obstruction

Koel- en vrieshuizen Betuwe	1	0	H	bid rigging
Koel- en vrieshuizen Ijmuiden/Velsen	1	0	C	bid rigging
Koel- en vrieshuizen Vlissingen	1	0	C	bid rigging
Landelijke huisartsenvereniging (LHV)	0	0	M	price fixing
Leesmappen	0	0	H	market division
Limburgse bouwzaken 1	0	0	D	market division, fixing other terms
Limburgse bouwzaken 2	0	0	C	bid rigging
Meel	1	0	C	bid rigging
Meerhoven	0	0	C	bid rigging
Mobiele operators	0	3	C	bid rigging
Natuurazijn	0	0	C	bid rigging
Nederlands Tandtechnisch Genootschap	0	0	H	market division
Openbaar Groen Maastricht	0	0	H	market division
OSB	0	0	C	bid rigging
Paprika	1	0	F	market division, price fixing
Psychologen	0	0	M	price fixing, market division, bid rigging
Roosters	1	0	S	bid rigging
Scheepsafval	1	0	C	price fixing
Schildersbedrijven Meiveld	0	0	C	bid rigging
Schildersbedrijven de Tongelreep	0	0	C	bid rigging
Schildersbedrijven Kazerne I	0	0	C	bid rigging, price fixing
Schildersbedrijven Kazerne II	0	0	S	business obstruction
Sierstenen	1	1	S	restraints on product specs
Slopersbedrijven Rotterdam Project Kanaalweg	0	0	H	price fixing
Slopersbedrijven Rotterdam Project Geuneburg	0	0	C	fixing other terms

Slopersbedrijven Rotterdam Project Woon- zorgboerderij Bergambacht & Dilettant	0	0	H	price fixing
Slopersbedrijven Rotterdam	0	0	M	price fixing, fixing other terms
Tango	0	2	F	restraints on capacity, price fixing, business obstruction
Taxivervoer IJsselsteden	0	0	T	price fixing, business obstruction
Taxivervoer Rijnmond	0	0	C	bid rigging
Thuiszorg 't Gooi	0	0	S	price fixing
Thuiszorg Kennemerland	0	0	S	fixing other terms
Thuiszorg Midden-IJssel	0	0	F	restraints on trade, business obstruction, market division
Veehouder vs AUV en Aesculaap	1	0	CH	fixing other terms
Verkeersregeltoestellen en verkeersregelin- stallaties	0	1	T	price fixing
Verzinkerijen	0	1	C	price fixing, information exchange
Vorkheftrucks	0	0	C	price fixing, market division
Wasserijen	0	0	C	fixing other terms, price fixing, market division
WMO Friesland (Thuiszorg)	0	0	C	information exchange
Zilveruien	1	0	C	market division
Zwembadchloor	1	0	C	bid rigging

Note: Sectors: Construction (C), Manufacturing and related trade (M), Service (S), Food and Nature (F), Transport & Logistics (L), Trade (T), Healthcare (H), Chemical (CH), Distribution (D).

Content of database:

For each of the cartels and its members, the database contains the following data (mostly from the cartel decisions): cartel duration, year of decision, start year of investigation, base fine, fine increasing or decreasing factors, severity factor (*ernstfactor* in Dutch), fine before and after leniency, fine for directors (if applicable), leniency reduction and date of leniency application (if applicable), fine policy in place during cartel period, whether firm was a recidivist, whether there was a parallel cartel, whether there was a settlement (*vereenvoudigde afdoening* in Dutch), type of infringement, whether the cartel involved multiple types of infringement, whether the firm was listed, whether the firm was part of an international company, the sector, whether the sector was on the agenda/priority list of the authority, whether the sector was a bidding market, and whether the firm won the tender. Macro-economic variables that were added to the analysis are GDP, GDP per capita, interest rate, expected growth, and consumer price index.

5. The interaction of public and private cartel enforcement

Abstract

The prohibition of cartels is enforced by both public and private legislation, which may interact in a way that reduces their effectiveness. This paper investigates these interaction effects specifically for the leniency programme and civil damages claims, by means of a conjoint analysis. Dutch companies and competition lawyers were faced with different enforcement situations containing a mix of public and private enforcement elements and were asked in which case they were most likely to apply for leniency. Their answers are analysed with a nested logit model, allowing for the possibility that respondents would continue the cartel in either of the presented enforcement situation. For firms, the corporate and personal fine and the fine reduction mattered in deciding to apply for leniency. Competition lawyers took the fine reduction, disclosure of leniency and burden of proof into account when advising on self-reporting the agreement. Both groups of respondents answered that in 16-19% of the situations they would continue the agreement and not apply for leniency/ advice to so do.⁶⁰

5.1 Introduction

Preventing cartels is one way to enhance competition and welfare. For this reason, antitrust policies are designed to deter firms from forming a cartel or to stop an already-formed cartel. The underlying logic of these policies is

⁶⁰ The authors thank the participating economists of the Dutch Competition Authority for their input and suggestions. Special thanks to dr. Ron Kemp, the competition lawyers who were willing to discuss the research results with the authors, prof. dr. Barbara Baarsma and prof. dr. Bas ter Weel.

that firms rationally balance costs and benefits of their behaviour, and abstain from colluding if the (financial) risks are too high.⁶¹

Most competition authorities have included a leniency programme as one of the public cartel enforcement instruments. Leniency can help bring cartels to light by means of the confession of a whistle blower and provide usually the best source of evidence to uphold the penalty in court.⁶² The fines for firms and in some jurisdictions the fines and other criminal sanctions for individuals, aim on deterring the start of new cartels.

To increase the overall deterrent effect, many jurisdictions have also introduced private cartel enforcement.⁶³ This means that victims of a cartel infringement can claim their damages caused by the cartel. The private enforcement enhances deterrence effect by increasing the total potential financial losses for cartel members. Some researchers have shown that this is a necessity since the public fines are not likely to deter price-fixing.⁶⁴

⁶¹ See G. Becker, *Crime and punishment: An economic approach*, *Journal of Political Economy* 169 (1968). Throughout this paper, we set aside moral views on compliance with the law. Many have argued to include moral and behavioural aspects into the theory of compliance and deterrence, e.g. A. Gray, *Criminal sanctions for cartel behaviour*, *Queensland University of Technology Law and Justice Journal* 364, (2008).; C. Harding, *Cartel deterrence: The search for evidence and argument*, *Antitrust Bulletin* 56 (2), (2011).; and T.J. Horton, *Restoring American anti-trust' moral arc*, *South Dakota Law Review* 62, (2017). Our aim is to disentangle the most important aspects of (public as well as private) antitrust policies, when firms and managers consider the consequences of these policies. Complementary to our paper, the approach of Van der Noll and Baarsma (2017) allows judgements about the relative importance of morality versus policy. They find that for 39% of the firms, 'the possible consequences of enforcement seem more important drivers of compliance than moral views on the law'. R. van der Noll & B. Baarsma, B, *Compliance with cartel laws and the determinants of deterrence—an empirical investigation*. *European Competition Journal*, 13(2-3), 336-355, (2017).

⁶² W.P.J. Wils. *The Use of Leniency in EU Cartel Enforcement: An Assessment After Twenty Years*. *World Competition* 39, no. 3: 327–388 (2016).

⁶³ See W.P.J. Wils, *Private Enforcement of EU Antitrust Law and Its Relationship with Public Enforcement: Past, Present and Future*. *World Competition* 40, no. 1: 3–46, (2017) for an excellent overview of the history of European private cartel enforcement and a forward looking perspective.

⁶⁴ C. Veljanovski, *Cartel fines in Europe*, *World Competition*, 30(1): 65-86, (2007).

There are, however, interaction effects between the public and private enforcement that may affect the effectiveness of the combined enforcement policies. The question is whether the interaction effects strengthen or counteract the overall deterrent effect, in particular for civil damages following cartel cases and the leniency programme. Cartel members can apply for leniency and benefit from the reduction or immunity of the public fine. They are, however, still liable for civil damages claims. The effect of this interaction has been a topic of discussion amongst several authors⁶⁵ but empirical results are missing thus far.

This article tries to fill the gap in existing research by extending the empirical analysis of the effectiveness of the leniency programme to include private cartel enforcement instruments. We assess the destabilising effect, and therefore effectiveness of the leniency programme based on both public and private instruments. Most, if not all, researches analysing the deterrence effect of cartel policy focus only on public cartel enforcement. Different methods have been applied, ranging from theoretical models⁶⁶, laboratory experiments⁶⁷, discussing trends based on descriptive statistics of detected cartels⁶⁸ and surveys amongst firms and/or competition lawyers⁶⁹, to more

⁶⁵ See amongst others M.J. Frese, *Fines and damages under EU competition law – Implications of the accumulation of liability*, Amsterdam Center for Law & Economics working paper No. 2011-05, (2011).; C. Cauffman, *The interaction of leniency programmes and actions for damages*. Maastricht: 2011/34, (2011); J. Green & I. McCall, *Leniency and civil claims*. Competition Law Insight, 3-5., (2009); Centre for European Policy Studies, Erasmus University Rotterdam, & Luiss Guido Carli. *Making antitrust damages actions more effective in the EU: Welfare impact and potential scenarios* (No. DG COMP/2006/A3/012). Brussels: European Commission, (2007).

⁶⁶ See for a short overview of game-theoretical literature regarding the impacts of leniency N.H. Miller, *Strategic leniency and cartel enforcement*. American Economic Review, 99(3), 750-68, (2009).

⁶⁷ Such as J. Hinloopen and A.R. Soetevent, *Laboratory Evidence on the Effectiveness of Corporate Leniency Programs*, 39 RAND Journal of Economics 607, (2008).

⁶⁸ C. Marvão & G. Spagnolo, *What do we know about the effectiveness of leniency policies? A survey of the empirical and experimental evidence*, (2014) provide a short description.

⁶⁹ For example: Deloitte (2007) employed a questionnaire distributed to legal advisers and firms in the United Kingdom. According to the legal advisers who

sophisticate empirical econometric studies⁷⁰ such as those of Miller (2009)⁷¹, Harrington and Chang (2015)⁷² and the conjoint analysis of Van der Noll and Baarsma (2017).⁷³

In this research, we combine two of the above methods: surveys amongst firms and competition lawyers and econometric conjoint analysis. We test the effectiveness of the leniency programme for existing cartels and the interaction of private enforcement instruments with the likelihood of applying for leniency, by means of a conjoint analysis. Our data is based on our own survey amongst Dutch firms and competition lawyers. Our survey also includes more conventional questioning techniques. Furthermore, we conducted interviews with Dutch competition lawyers to discuss the interpretation of the results.⁷⁴

While other surveys solely rely on direct questioning, we use the conjoint method to minimize the social bias and strategic bias. Conjoint analysis has been broadly accepted in market research and has been used in determining the relevant market.⁷⁵ Each respondent is faced with a number of hypothetical enforcement situations (also called vignettes). Each situation represents

participated, for each cartel the Office of Fair Trading (OFT) has published a decision on, five other cartels have been abandoned or significantly modified because of the risk of OFT investigation. This ratio is much higher according to the firms: 16 modified or stopped cartels to one detected cartel. And K. Hüschelrath, N. Leheyda & P. Beschorner, *The deterrent effect of antitrust sanctions: Evidence from Switzerland*. The Antitrust Bulletin, 56(2), 427-460, (2011).

⁷⁰ See for an excellent overview of studies with econometric methods Marvão & Spagnolo (2014).

⁷¹ Miller (2009), uses a reduced-form Poisson regression to analyse whether the introduction of the American leniency programme has increased cartel discoveries.

⁷² The authors analysed the cartel formation and duration after a cartel policy innovation. Jr. J.E. Harrington & M.H. Chang, *When Can We Expect a Corporate Leniency Program to Result in Fewer Cartels?* The Journal of Law and Economics, 58(2), 417-449, (2015).

⁷³ Van der Noll & Baarsma (2017).

⁷⁴ This involved three competition lawyers who did not take part in the questionnaire amongst lawyers.

⁷⁵ D. Hildebrand, *Using Conjoint Analysis for Market Definition: Application of Modern Market Research Tools to Implement the Hypothetical Monopolist Test*, 2006, 29(2) World Competition 315, (2006).

a trade-off between various aspects of policy instruments. This mimics real-life situations in which firms are faced with various enforcement instruments that they need to take into account. Using a conjoint is the best way to disentangle the importance of the different aspects.

Our results show that firms are triggered to apply for leniency by the magnitude of the personal fine for directors and the reduction following a successful leniency application. Despite the increasing number of damages claims in the Netherlands, Dutch firms do not see civil claims as a real factor in deciding to apply for leniency. Based on our analysis under firms, there is no negative interaction effect between civil claims and the leniency programme. At the same time, the overall deterrence effect might be limited to the personal fines while missing the added effect of damages claims.

Lawyers, on the other hand, do take private enforcement instrument into account. They would advise their client to apply for leniency, if leniency documents cannot be disclosed in a civil procedure, if the burden of proving damages caused by the cartel lies with the claimant and if their client would receive leniency reduction.

In 19% of the enforcement situations, firms choose rather to continue the infringement than to apply for leniency. In 16% of the cases, competition lawyers would advise their client to do the same. Hence, for these cases, the leniency programme is not destabilising and hence not effective for existing cartels.

First, section 4.2 describes the theory about which factors of public and private cartel enforcement deter collusive behaviour and how they influence the decision to apply for leniency. Section 4.3 introduces conjoint analysis and the nested logit model we use. Empirical results of the conjoint analysis are described in section 4.4. To put these results into perspective, respondents were also asked some general questions. The results are described in section 4.5. Section 4.6 ends with a conclusion and discussion.

5.2 Theory and method

Theory

The leniency programme destabilizes cartels by incentivising cartel participants to report the unlawful agreement to the competition authority. In return they are offered immunity or a reduction of the financial sanction(s).

Since the company that first confesses typically receives the largest reduction in fine, it destabilizes the cartel by spreading distrust among the cartel members and stimulates the race to apply first. If the incentive to apply for leniency is high, the leniency programme has a high destabilising effect on cartel conduct and can be considered effective.

It is often suggested that enabling victims to claim damages from a cartel participant undermines the effectiveness of the leniency programme.⁷⁶ A successful leniency applicant still faces the risk of a damage claim. The collaboration with the competition authority may even result in a weaker position of the leniency applicant vis-à-vis its co-infringers in follow-on damage claims.⁷⁷ Both aspects might decrease the incentive to apply for leniency. Hence potential leniency applicants might choose not to apply for leniency because of the risk of damages claims.

To determine the effectiveness of the leniency programme and the interaction effects of private cartel enforcement, we focus on active cartels. Firm managers and competition lawyers are presented with hypothetical enforcement situations and choose in which situation they are most likely to apply (or advise on applying) for leniency, or whether they would continue the cartel in both situations.⁷⁸

Previous literature on which factors determine whether or not to apply for leniency or stop the cartel consists of theoretical analysis, laboratory experiments and conjoint analysis. The theoretical studies established a trade-off between the pay-off of a firm collaborating with the competition authority with that of a not-reporting firm. The trade-off incorporates both public and private cartel enforcement instruments such as the level of the fine. The laboratory experiment of Hinloopen and Soetevent (2008) gives participants

⁷⁶ Cauffman (2011); P. Crowther & M. Holzhäuser, *The ECJ issues a preliminary ruling holding that national courts need to balance on a case-by-case basis the interest of preserving the effectiveness of leniency programmes and that of facilitating private enforcement by third parties (Pfleiderer)* [Electronic Version]. *e-Competitions*, (2011).

⁷⁷ Centre for European Policy Studies (2007), p. 501.

⁷⁸ In theory it is also possible that firms choice to stop the infringement without applying for leniency. We address this issue by means of the regular survey questions, see Section 5.6.

explicitly the choice to report the cartel to the competition authority. This choice is however not dependent on different aspects of the leniency programme and the study does not look at private damage claims. Van der Noll and Baarsma (2017) perform a conjoint analysis focusing on ending a price-fixing agreement. They only include public cartel enforcement instruments: personal and corporate fine (both estimated to have a significant effect on ending agreement), whether the industry is mentioned in the work plan of the competition authority, leniency reduction and different levels of publicity after the infringement.

None of these studies take all relevant instruments or factors into account that influence the decision to apply for leniency. We do not strive for completeness either. In our study we include personal fine, corporate fine, leniency reduction, disclosure of leniency documents, damages claims and the rebuttable presumption that the infringement causes harm. The cartel profit is presented as a fixed factor in the conjoint analysis.

Hypotheses

Now we discuss the hypothesized effects of these factors in antitrust policy. The level of the fine – both personal and corporate - has a negative effect on the likelihood of applying for leniency.⁷⁹ When the leniency reduction is 100%, this negative effect disappears. If the fine for the first cartel member to report is less than completely compensated by the reduction, this diminishes the race to apply first. The larger the remaining fine after leniency reduction for the first applicant, the larger its disincentive to apply for leniency.⁸⁰ Hence, the fine reduction affects the destabilising effect of the leniency programme in a positive way.

If leniency documents can be disclosed to claimants the destabilising effect of the leniency programme decreases. Kirst and van den Bergh (2015) show this by means of the prisoner's dilemma.⁸¹ In their model, with a probability of 20% of disclosure of leniency documents, the dominant strategy for both parties is to confess. At probabilities of 30% and higher the Pareto dominant

⁷⁹ Centre for European Policy Studies (2007).

⁸⁰ Centre for European Policy Studies (2007).

⁸¹ P. Kirst & R. Van den Bergh, *The European Directive on Damages Actions: a missed opportunity to reconcile compensation of victims and leniency incentives*. *Journal of Competition Law & Economics*, 12(1), 1-30. (2015).

outcome is for both cartel members to deny. Hence, the cartel becomes more stable when it is more likely that the leniency documents are disclosed.

The incentive to apply for leniency decreases if the amount of damages increases. Therefore, the magnitude of damages has a negative influence on the destabilising effect of the leniency programme.

To lower the threshold for purchasers of cartel products to receive compensation, the European Directive introduces a rebuttable presumption that cartel infringements cause harm (Article 17(2)).⁸² It is up to the cartel members to prove that their agreement did not cause any harm. This presumption decreases the incentive to apply for leniency.

Besides the above described enforcement elements, there are others that may influence the choice to apply for leniency and hence the destabilising effect of the leniency programme. These are, however, not included in the conjoint analysis to avoid too long and complex surveys for respondents. Compared with the selected attributes, excluded elements consist of high uncertainty for the respondents (probability on follow-on claim and rate of detection), are difficult to grasp for respondents without a legal background (joint and several liability and to a lesser extent the passing-on defence) or are thought to have little effect (limitation period, cost of applying for leniency, whether or not the industry is listed in the work plan of the authority⁸³). Lastly, we did not include reputation damages. These can take the form of losing customers, decreasing stock value and difficulties finding partners for future legal cooperation such as joint ventures. While this is expected to be a significant type of penalty and therefore a relevant factor in determining to report the cartel, the reputation damages can be different for each firm. Van der Noll and Baarsma (2017) used publicity after the infringement finding. This can be seen as a proxy for reputation damages since the infringement must be known before any reputation can be damaged. Their

⁸² European Commission, Directive of the European parliament and of 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, COM(2014) 104 (November, 26, 2014).

⁸³ van der Noll, R. & Baarsma, B. (2017).

analysis did not give significant results for publicity. Therefore, we did not include it in our conjoint analysis.

5.3 Method

Direct observation of companies' behaviour is, when it comes to deciding on leniency applications, not possible. Only those cartels that do apply for leniency and are sanctioned are observed and thereby revealed. This leaves all cartels without a leniency application and all applications that do not lead to an investigation and sanction by the authority unseen. An analysis based on revealed preferences would therefore be incomplete. This research uses stated preferences instead. When done by means of a conjoint analysis, this approach minimizes social and strategic answering bias.

The factors described above were tested in interviews with competition lawyers and conjoint analysis experts.⁸⁴ In the interviews we discussed the balance between relevance and complexity of the factors and avoiding a too long questionnaire for the respondents. Based on these interviews, the factors such as limitation period and passing on defence were dropped. Before being sent to the respondents, the conjoint questionnaire was tested amongst test companies and adjusted following their feedback.

5.4 Model

Conjoint analysis

Respondents were confronted with the hypothetical situation that, within their own company, they would discover a price agreement with a competitor. Framed in this way, it was made explicit that the respondent did not initiate the hypothetical cartel personally, so respondents would not worry about self-incrimination due to their answers. We can expect that the frame of *discovering* a cartel agreement increases the response and honesty of the answers compared to a frame where respondents are themselves involved in hypothetical illegal behaviour.

Respondents were presented eight choice sets that each represents two hypothetical situations (or vignettes) of cartel enforcement. The situations contain both public and private enforcement elements, representing the factors described in the next subsection (see Table 5.2 for the values). The two

⁸⁴ This involves different lawyers than the ones the authors held interviews about the results with.

options vary in the six characteristics discussed later on in this section.⁸⁵ Respondents were asked in which of the two situations they would be more likely to end the illegal agreement by applying for leniency, trading off the different characteristics (attributes) of both situations. A third option was presented to the respondents: to continue the agreement in both situations, as will be explained in the next subsection.

Competition lawyers were presented the same choice sets. They were asked in which of the two situations they would be more likely to advise their client to end the illegal agreement by applying for leniency.

The respondents received accompanying information about the cartel situations in the survey: explaining that the agreement took place on the most important market the company is active on, resulted in a 25% higher price and was, according to legal counsel, an infringement of the cartel law.⁸⁶

Based on the choices made by the respondents the model estimates the importance of each of the six characteristics of enforcement policy. This is based on the aggregated preference of all respondents. Because of the pairwise comparisons of situations, we use the conditional logit model. Every observation in the analysis represents one choice for either situation A or for situation B or for the no-choice option. The explanatory variable for the choice of a respondent takes into account the characteristics of both choice options.

Nested structure of choices

The goal of the choice sets is to discover how attributes of public and private cartel enforcement influence the decision to stop the cartel by applying for leniency. However, before choosing between stopping one out of two hypothetical enforcement situations, respondents could be expected to decide on whether or not to stop at all. Some respondents might, if they view the

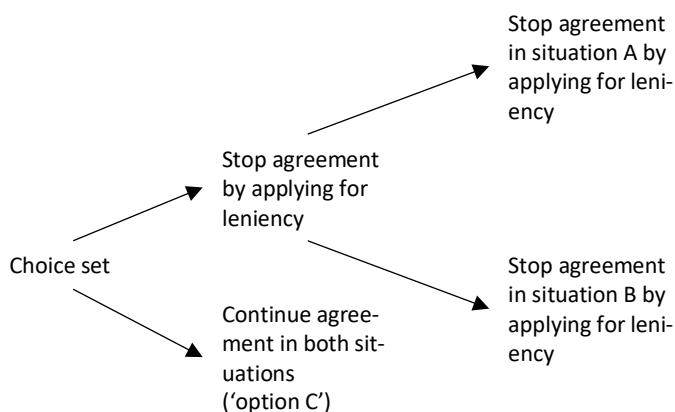
⁸⁵ To enlarge the reliability of the econometric estimations, the options are randomly presented as the left or the right choice option. This to prevent that the most appealing choice is always presented on the same side of the screen.

⁸⁶ The choice for a 25% price increase caused by the agreement is based on the found cartel overcharges by Connor (2010). He finds that the median cartel overcharge for all types of cartels over all time periods is 23.3%. This is rounded up to 25%. J.M. Connor, *Price-fixing overcharges: Revised*. Available at SSRN (2010).

consequences as relatively mild, choose to continue the cartel agreement, irrespective of the differences in cartel enforcement implementation.

To accommodate for this third, pre-emptive option, we use a nested structure to model choices. As indicated by Figure 5.1, the ‘first’ choice in our model is to either stop an agreement by applying for leniency, or to continue the agreement in both situations. We refer to this choice for continuing as ‘option C’. The ‘second’ choice in the upper right branch is what we are most interested in, between ending the cartel in situation A or situation B by applying for leniency. The nested structure of the model guarantees that a choice for either A or B can be interpreted as stopping illegal behaviour because of (sufficiently strict) policy attributes, whereas respondents consider the policies to be mild in general.

Figure 5.1 **Structure of the nested logit model**



Strictly speaking, our model represented by Figure 5.1 does not contain all possible answers, because we do not allow the option to stop an agreement *without* applying for leniency. In this case, as in the case of continuing an agreement, it is possible that the cartel would remain unnoticed, and the attributes of cartel policy would not come into actual play. By leaving out this option, we simplify the (already complex) decision for respondents, who

do not have to take into account the probability of cartel agreements being detected after they have been terminated.⁸⁷

By allowing for a nested structure, we follow recent papers arguing in favour of a third option to choice set experiments. Haaijer et al. (2001)⁸⁸ were the first to show the importance of the third ‘no choice’ base, in terms of the fit of the estimated multinomial logit model and its predictive power. Mabel (2003)⁸⁹ adds that an opt-out alternative can make choices more realistic. In a computational simulation study, Vermeulen et al. (2008)⁹⁰ show that the nested logit model leads to the most accurate estimates for choice experiments with a no-choice option.

Notice for option C in our context of cartel agreements, the term ‘no choice’ refers to the decision to continue the (illegal) agreement; yet its working is very similar to the ‘no choice’ option in these papers.

Nested logit model

Following Haaijer et al. (2001) and Vermeulen et al. (2008), we accommodate the nested logit model to include option C. This section presents the explicit model equations for the analysis in section 5.5.

In general, if respondents face K choice sets with J alternatives, the utility of alternative j in choice set k for individual i is defined as

$$u_{ikj} = \mathbf{x}_{kj}\boldsymbol{\beta} + \mathbf{z}_i \cdot \mathbf{x}_{kj}\boldsymbol{\gamma} + \varepsilon_{ikj}, \quad (1)$$

in which the vector \mathbf{x}_{kj} contains the attribute values of the j -th alternative in choice set k , \mathbf{z}_i collects firm characteristics that influence the choice for the j -th alternative, and ε_{ikj} is the error term. As utility is unobserved, we

⁸⁷ See section 5.6 for direct questions about stopping an agreement with or without applying for leniency.

⁸⁸ R. Haaijer, W.A. Kamakura & M. Wedel, *The ‘no-choice’ alternative in conjoint choice experiments*. International Journal of Market Research, Vol. 43 Quarter 1, (2001).

⁸⁹ A.A. Mabel, *‘None matters’ alternative modeling approaches of no choice option in stated choice experiments and application*. X Encuentro Economía Pública, (2003).

⁹⁰ B. Vermeulen, P. Goos and M. Vandebroek, *Models and optimal designs for conjoint choice experiments including a no-choice option*. International Journal of Research in Marketing 25(2): 94-103, (2008).

estimate the parameters using a logit model based on the observed decisions between alternatives.

Compared to Haaiker et al. (2001) and Vermeulen et al. (2008), in equation (1) we add the term $\mathbf{z}_i \cdot \mathbf{x}_{kj}$ as an explanatory variable for utility (and hence for cartel decisions). This interaction term allows for the possibility that firms respond differently to attribute values of choice sets or nests, depending on their individual characteristics. For example, large firms may be more/less sensitive to the fine as a proportion of the turnover than small firms, or large firms may be intrinsically more/less inclined apply for leniency. These types of hypotheses can be tested with our model.

In the nested logit model, the probability of individual i choosing alternative j of nest m in choice set k equals

$$P_{ijkm} = P_i(j | m) * P_i(m). \quad (2)$$

The conditional probability $P_i(j | m)$ of choosing j , given m , is as standard in a multinomial logit model, i.e.

$$P(j | m) = \frac{\exp(\mathbf{x}_{kj}\boldsymbol{\beta} + \mathbf{z}_i \cdot \mathbf{x}_{kj}\boldsymbol{\gamma})}{\sum_{j'}^{J_m} \exp(\mathbf{x}_{kj'}\boldsymbol{\beta} + \mathbf{z}_i \cdot \mathbf{x}_{kj'}\boldsymbol{\gamma})}, \quad (3)$$

and the probability of choosing a particular nest m is

$$P(m) = \frac{\exp(\lambda V_m)}{\sum_{m'}^M \exp(\lambda V_{m'})}. \quad (4)$$

The probability of choosing nest m depends, first, on the so-called *inclusive value*

$$V_m \equiv \ln \left(\sum_{j'}^{J_m} \exp(\mathbf{x}_{kj'}\boldsymbol{\beta} + \mathbf{z}_i \cdot \mathbf{x}_{kj'}\boldsymbol{\gamma}) \right). \quad (5)$$

The inclusive value can be interpreted as the expected utility a respondent experiences from choosing nest m . Second, the choice for nest m depends on parameter λ , the *dissimilarity coefficient*. It can readily be checked that for $\lambda = 1$, the nested logit model equals a regular multinomial logit model, in which choices are not nested. The dissimilarity coefficient therefore measures the difference from a standard, non-nested model.

The main outcome of the nested logit model is estimating the parameter vector β , representing the importance of the vignette attributes. From this we can extract the marginal effects of different policy attributes, in terms of the probability that a cartel is stopped by applying for leniency.

Design of conjoint choice sets

See Table 5.1 for the choice sets. Table 5.2 presents the values for each of the attributes. The values are based on the Dutch competition law. This law is the equivalent of the TFEU. In July 2016 the maximum for the fines has been increased (up to 40% of turnover for firms and 900.000 euro for managers).⁹¹

Table 5.1 A choice set presented to firms

<p>Option A:</p> <ul style="list-style-type: none"> • Your organisation receives a fine with a maximum of 10% of yearly turnover of the whole organisation (group). • Directors of your organisation are not fined personally • The fine reduction for your organisation and directors is a maximum of 50% if you report the agreement and deliver evidence to the competition authority • The damage claim represents a maximum of 15% of your company's profit during the period of the agreement • The leniency documents are not disclosed to customers of your organisation • In court your organisation needs to rebut the presumption that the agreement led to a price increase 	<p>Option B:</p> <ul style="list-style-type: none"> • Your organisation receives a fine with a maximum of 5% of yearly turnover of the whole organisation (group). • Directors of your organisation are personally fined up to 450.000 euro • Your organisation and directors receive immunity of the fine if you report the agreement and deliver evidence to the competition authority • The damage claim represents a maximum of 5% of your company's profit during the period of the agreement • The leniency documents are disclosed to customers of your organisation • In court your customers needs to rebut the presumption that the agreement did not lead to a price increase 	
0: Option A the agreement	0: Option B	0: In both situations I would not order to end

Concerning the reduction of the fine for leniency applications, it is not made explicit that when the reduction of the fine is less than 100%, chances are that another cartel member already went to the authority to report the cartel.

⁹¹ Beleidsregel van de Minister van Economisch Zaken van 28 juni 2016, nr. WJZ/16056097, houdende wijziging van de Boetebeleidsregel ACM 2014.

Table 5.2 Values of the attributes used in the conjoint analysis

Variable/attribute ⁹²	Value
Magnitude of public fine for companies ⁹³	Fine is 5% of annual turnover; Fine is 10% of annual turnover; Fine is 40% of annual turnover.
Magnitude of public fine for directors ⁹⁴	Director is not fined; the fine for directors is upmost € 450.000; the fine for directors is upmost € 900.000.
Reduction of the fine for leniency applicants ⁹⁵	Immunity; 50% fine reduction; 30% fine reduction; No fine reduction
Disclosure of leniency documents	Disclosure; no disclosure
Magnitude of damages claim	The claim represents 5% of the company's profit; The claim represents 10% of the company's profit; The claim represents 15% of the company's profit.
Burden of proof	It is presumed that the agreement caused harm; It is not presumed that the agreement caused harm.

Respondents faced with a complex choice as the (hypothetical) antitrust situation considered in this paper, might react more to information presented earlier in the experiment (order effects). In designing the conjoint experiment, we took two precautions to reduce the possibility of ordering effects. First, for half of the respondents the description of the choice sets started with public attributes (top of the list) and then the private attributes (bottom of the list); for the other half, it was the other way around. Second, within each group, the order of the choice sets was determined randomly. The second precaution prevents that the order of the choice sets has unintended effects on the answers due to learning or anchoring effects.

⁹² In the design of the conjoint choice sets it is important to have a balanced distribution of attribute values over choice options. Overall, option A should not be more attractive than option B on all attributes (or the other way around). To achieve that the choice options do not differ too much in likelihood of being chosen, weights are added to the attributes, allowing to compare the 'attractiveness' of each choice set. This introduces tension between the two choices (making the choice harder) and to prevent that respondents choose between a very appealing and a very unappealing situation. More information about the use of *effects coding* in conjoint analyses can be found in Bech & Gyrd-Hansen (2005). M. Bech & D. Gyrd-Hansen, *Effects coding in discrete choice experiments*. Health economics, 14(10), 1079-1083, (2005). The weights are given in the following footnotes.

⁹³ Weights added: Fine is 10% (0.5), fine is 40% (1).

⁹⁴ Weights added: Fine is 450.000 (0.5), fine is 900.000 (1).

⁹⁵ Weights added: 50% reduction (0.5), 30% reduction (1) and no reduction (1.5).

5.5 Conjoint analysis

Approaching respondents

Respondents were approached using the business panel of SSI.⁹⁶ Only firms with at least ten employees were admitted to the survey. This condition served as a proxy for having a sufficiently high turnover.⁹⁷ 476 responding firms remained after speeders and so-called straight liners were removed. The response per question is indicated with “*n*”.⁹⁸

We have also held a survey under Dutch competition lawyers. The population of such specialists is evidently much smaller than the entire population of Dutch firms and hence we have a much smaller sample for this group (*n*=27). No check on representativeness has been performed on competition lawyers.

The results of both questionnaires and the conjoint analysis were discussed with competition lawyers.⁹⁹ Where relevant, interesting context or interpretation of the results is included here in the text.

Firms

Respondents had to choose the situation in which they would be more likely to end an illegal agreement by applying for leniency, trading off the different characteristics (attributes) of both vignettes or choose to continue the agreement in both situations.

⁹⁶ Survey Sampling International

⁹⁷ Dutch cartel law (art. 6 Mw, similar to art. 101 TFEU) does not apply to agreements between competitors that only take up a small part of the market. This depends on the number of companies involved and their turnover (see art. 7 Mw for all conditions).

⁹⁸ The questionnaire can be requested from the authors.

⁹⁹ This involves competition lawyers that did not participate in the survey under lawyers.

Table 5.3 **Choices from the trade-offs**

Choice	Number	Perc.
End the agreement in situation A	1549	41.4 %
End the agreement in situation B	1501	40.1 %
Do not end the agreement in either case ('option C')	694	18.5 %
Total	3744	100.0 %

Note: Authors' calculations, n=476.

In as many as 18.5% of the choices, respondents answered that they would not end the agreement in either case (see Table 5.3).¹⁰⁰ This amount is surprisingly high, given this choice is incompatible with competition law (as clearly indicated in the question). In order to rationalize this choice, respondents should consider the probability of detection by the authorities as low and/or think that the drawbacks of a leniency application are worth taking the risk. The question is whether this percentage would have been lower a few years back. According to Swaak and Wesseling (2015), the leniency program has become less attractive over the years, amongst others because of private damage claims.¹⁰¹

We stress that the inclusion of the 'option C' serves those respondents who consider certain combinations of competition law attributes as relatively mild, and choose to continue an agreement. There are no indications that respondents have other (unintended) reasons to have chosen the option C. For example, the numbers of respondents choosing C does not increase for choose sets later in the survey. If so, this would indicate that respondents 'experiment' in the survey or start to lose interest.¹⁰²

Around 45% of the responding firms does not choose C in any of the eight choice sets. Out of the remaining 55% who do indicate not to end an (illegal) cartel agreement, most do so only once or twice. The distribution of choices

¹⁰⁰ For the remaining 81.5% of the trade-offs respondents chose either option A or option B, with a small (insignificant) tendency towards option A.

¹⁰¹ C.R.A. Swaak & R. Wesseling, *Reconsidering the leniency option: if not first in, good reasons to stay out*. ECLR: European Competition Law Review, 36(8), 346-354, (2015).

¹⁰² We also found no relation between choosing C with choice sets including fines reduction equal to 30 or 50%. A significant relationship would indicate an alternative interpretation of respondents for this attribute, explaining it as a signal that other firms already would have applied for leniency.

for option C has a well-behaved tail: so the 18.5% in Table 5.3 is not driven by a few extraordinary respondents. For the competition lawyers option C is chosen in only one out of eight choice sets, or none at all.

Following literature and the discussion with competition lawyers, there are several reasons why firms would not want to apply for leniency. First, the desire to cooperate (legally) with competitors in the future. This may be a very relevant factor to decide not to apply for leniency in sectors where cooperation is frequent, for instances through joint ventures. Applying for leniency and reporting your fellow conspirators will not make you a popular partner. Another form of legal cooperation is by means of joint patents. Research shows that joint patents increase the likelihood of sustaining collusion.¹⁰³ Second, while it is a business decision to apply for leniency, it also involves personal choices. For example, a CEO that discovers a cartel formed by its predecessor, may be less likely to stir up the fire caused by someone else (although one could also argue the other way around). Third, an upcoming merger can significantly influence the choice to apply for leniency.

The choices of options in Table 5.3 are evaluated using the nested structure as discussed above (see Figure 5.1 and equations (1) through (5)). Table 5.4 shows the results from the nested logit regression for three model specifications, labelled (1), (2) and (3).

¹⁰³ A. Fosfuri, C. Helmers & C. Roux, *Are joint patents collusive? Evidence from the US and Europe*, (2012).

Table 5.4 Results from the nested logit regression for firms

Model	(1)	(2)	(3)
Parameter	Est.	(s.e.)	Est. (s.e.)
<i>Choice between applying for leniency in situation A and applying for leniency in situation B</i>			
Maximal fine 5% of turnover ^{a)}	0.160	(n/a ¹⁰⁴)	0.146 (n/a)
Maximal fine 10% of turnover	-0.089	(0.060)	-0.065 (0.059)
Maximal fine 40% of turnover	-0.071	(0.063)	-0.081 (0.063)
No personal fines ^{a)}	0.534	(n/a)	0.452 (n/a)
Maximal personal fine € 450.000	-0.374***	(0.061)	-0.282*** (0.068)
Maximal personal fine € 900.000	-0.161**	(0.072)	-0.170** (0.07)
Fine reduction 100% ^{a)}	0.306	(n/a)	0.245 (n/a)
Fine reduction 50%	-0.148**	(0.065)	-0.118* (0.065)
Fine reduction 30%	-0.150**	(0.072)	-0.094 (0.069)
No fine reduction	-0.008	(0.088)	-0.034 (0.093)
No disclosure of leniency documents ^{a)}	-0.017	(n/a)	-0.006 (n/a)
Disclosure of leniency documents	0.017	(0.040)	0.006 (0.035)
Maximal claim 5% of profits ^{a)}	0.067	(n/a)	0.041 (n/a)
Maximal claim 10% of profits	-0.091*	(0.053)	-0.106** (0.050)
Maximal claim 15% of profits	0.024	(0.051)	0.066 (0.047)
Burden of proof lies with the defendant ^{a)}	-0.032	(n/a)	-0.016 (n/a)
Burden of proof lies with the claimant	0.032	(0.039)	0.016 (0.035)
<i>Choice between ending an agreement by applying for leniency and continuing both situations</i>			
Number of employees			-0.00088*** (0.000)
Turnover			0.00854** (0.004)
Perceived probability of claim to company			0.010*** (0.003)
Been involved with competition authority			-0.285 (0.202)
Nested logit $\lambda - 1$	1.038***	(0.099)	0.672*** (0.198)
Weighting according to firm size	no	no	yes
Number of respondents	476	398	398
Number of observations	3744	3152	3152
Log pseudolikelihood	-3839.36	-3197.91	-3189.56

NB: Values significant at the 10% level are marked with *; at the 5% level, with **; at the 1% level, with ***. Standard errors are robust and clustered at respondent level.

Observations in (3) are weighted following Table 5.15 to approach a more realistic firm size distribution. a) Base levels: coefficients are not estimated, but equal minus the sum of the estimated coefficients.

Source: Authors' calculations

Model (1) is the simplest specification to estimate the coefficients β for the vignette attributes. As we have a nested model, we estimate the dissimilarity coefficient λ as well, and test for the null hypothesis of non-nestedness, $\lambda = 1$. Model specification (2) adds firm characteristics (coefficient γ in equation (1)). Model (3) weights the observations for firm size, to take into account the specific distribution of our sample compared to the population. Specifically the companies with 10-20 employees have been given greater weight since the response under samples this group compared to the population of all companies in the Netherlands.

Interestingly, in model (1) only factors of public cartel enforcement have a significant effect on the chance to apply for leniency (at a 5% significance level). These are the personal and corporate fine and the reduction following the leniency application. See Table 5.5 for significance of the entire attributes. The first two attributes were also found in Van der Noll and Baarsma (2017) to be significant, confirming the main result.¹⁰⁵

We find that the personal fine is more important than the corporate fine in explaining cartel decisions. The relative size of the two factors differs from the analysis of Van der Noll and Baarsma. In this older study, the effect of the corporate fine is more than twice as large as that of the personal fine while in the current study it is the exact opposite. This is not very surprising since the analysis is based on data from 2010. While directors can be fined personally as of October 2007 in the Netherlands, the first actual fine for an

¹⁰⁴ The estimates for the base level do not have a standard error as they are not estimated directly. In Table 4.5 we report the significance of the entire attribute.

¹⁰⁵ In the study from 2010 respondents were asked how likely it was in each situation that the company would end the agreement. Ending the agreement was not conditional on applying for leniency. Furthermore, no outside option was provided to the respondents.

individual was given in July 2010. Hence, it is likely that respondents did not perceive a personal fine as very likely in 2010, while currently it is more common. In the current analysis, a personal fine of 450.000 euro, opposite to no personal fine, leads to a lower chance to apply for leniency (by 18 to 22%, see Table 5.6 below). The effect of a personal fine of 900.000 euro (opposite to no fine) is smaller, leading to a reduced chance of 15 to 18%. Perhaps respondents did not consider the highest fine level of 40% credible for example because of the recent introduction. A lower fine reduction following a leniency application, makes the leniency programme less attractive and hence less destabilising. A 100% reduction increases the chance on a leniency application by 7 to 8% as opposed to no fine reduction.

We do not find strong evidence that other attributes of public and private antitrust enforcement affect the decisions of cartel participants. Only for a maximal private claim of 10% we find a significant higher chance on a leniency application. This result is significant at a 5% significance level in models (2) and (3), but not in model (1).

The dissimilarity coefficient λ is in all three models significantly different from 1, rejecting the hypothesis that the nested logit is equal to the logit model. The inclusion of the option C – not to end either agreement – is therefore crucial and a significant improvement of the model.¹⁰⁶

Model specifications (2) and (3) add controls for number of employees, turnover, perceived probability of a claim to the company by customers, and a dummy when previously involved with a competition authority. The differences between models (2) and (3) are quite small, even though the firm weights are high, ranging from 0.2 to 4.4. The controls help explain the decision whether or not to stop either one of the agreements (the highest level at the nested logit structure). We discuss the latter two of these controls below.

To determine the awareness of companies with the Dutch or European competition authority and law, respondents were asked whether they have ever been involved with the competition authority. This involvement could be

¹⁰⁶ A value $\lambda > 1$ as in model specification (1) indicates that the nested logit happens to be inconsistent with the underlying utility maximization. This is a not uncommon finding (e.g. Mabel (2003)).

because of the firm's own activities, or because of activities by suppliers, customers or competitors. The question itself was however not focussed on cartel policy, hence companies that have been involved with regulation or other policy areas of the Dutch Competition Authority (ACM) may have also answered positively. Around 18% of the firms answered positively, 69% negatively and 14% of the firms did not know or preferred not to say ($n=459$).¹⁰⁷

The fact that a company has not been involved with the authority does not mean that the respondent is not aware of the competition law and the leniency policy. Research from 2014 shows that 87% of the responding companies had heard of the Dutch competition law.¹⁰⁸ Specifically for the leniency programme, research from 2016 shows that 30-40% of the companies is aware of the possibility to notify ones involvement in a cartel to the authority in exchange for a reduction or immunity of the fine.¹⁰⁹

A second control variable relates to the probability that their purchasers would claim damages from them. The average is 29.5% ($n=463$).

The perceived probability of a claim to the company helps explaining the decision to end one of the agreements A and B. Firms with low perceived probabilities of claims are more likely to choice option C. Number of employees and turnover give also significant coefficients, although less so in model (3) than in model (2). Previous involvement with the competition authority does not have a significant effect on the choice to end an agreement.¹¹⁰

¹⁰⁷ The size of the firms (in terms of turnover) did not affect the answer to this question.

¹⁰⁸ Pantheia, Effecten van de verruimde Bagatelvrijstelling, 13 November 2014.

¹⁰⁹ Vrije Universiteit Amsterdam, *Concurrentie over boord in de haven?* December 2016 p 74. The exact percentage depends on the region the company is located.

¹¹⁰ We also investigated the relation between option C and the (self-reported) region of activity of the firm. We find that firms active only in the Netherlands slightly more often chose option C (19.9 %) than firms also active internationally (within EU and further; 17.0 %). This difference turned out to be insignificant in the nested logit regression (note that this model specification is not reported explicitly).

Robustness check have been performed by adding more control variables and interaction terms. The results are found to be qualitatively robust: the sign and magnitude of estimated coefficients are close to those in Table 5.4.

In Table 5.5, we report the significance per attribute, combining the estimates of all values in Table 5.4 for every attribute, using likelihood ratio tests. The tests for model (1) confirm that personal fines and fine reduction are significant explanatory variables.¹¹¹ However, also the corporate fine turns out to be significant as a whole, at the 5% level. For model (2), the per-attribute aggregated results are qualitatively close to those for model (1). In model (3) the effects of the corporate fine and of the private claim are estimated to be higher. The chi-squared values in Table 5.5 can be interpreted as the order of importance of the six enforcement attributes that follow from the conjoint analysis of the firms' responses.

Table 5.5 Likelihood ratio tests

Model d Attribute	(1)		(2)		(3)	
	χ^2	p-value	χ^2	p-value	χ^2	p-value
Maximal fine as % of turnover	8.91**	0.012	8.40**	0.015	23.18**	0.000
Maximal personal fine	109.07** *	0.000	88.20***	0.000	96.05***	0.000
Fine reduction	23.73***	0.000	16.79***	0.001	18.74***	0.000
Disclosure of leniency documents	0.21	0.650	0.03	0.871	0.36	0.549
Maximal claim as % of profits	2.91	0.233	4.23	0.121	13.02***	0.001
Burden of proof	0.71	0.398	0.23	0.632	0.01	0.915
Number of employees			21.32***	0.000	4.08**	0.043
Turnover			17.28***	0.000	5.72**	0.017
Perceived probability of claim to company			25.21***	0.000	27.01***	0.000
Has been involved with competition authority			4.92**	0.027	4.13**	0.042

NB: Effects significant at the 10% level are marked with *, at the 5% level, with **; at the 1% level, with ***.

Source: Authors' calculations

¹¹¹ For attributes with only two values (a base level and one alternative level), the likelihood ratio test coincides with the t-test for the alternative value.

We now calculate the effects of different elements in antitrust enforcement implied by the estimated model. Table 5.6 presents the marginal effects of the attributes for the three models compared to the reference value.

Table 5.6 The personal fine, fine reduction and private claim have significant marginal effects¹¹²

Model d	(1)	(2)	(3)
Parameter	<i>Probability of choosing option with this attribute level (compared to reference level)</i>		
Maximal fine 5% of turnover			
Maximal fine 10% of turnover	-6.2%	-5.3%	-9.0%
Maximal fine 40% of turnover	-5.8%	-5.7%	-9.6%
No personal fines			
Maximal personal fine € 450.000	-22.3%***	-18.1%***	-18.5%**
Maximal personal fine € 900.000	-17.1%**	-15.3%**	-18.2%**
Fine reduction 100%			
Fine reduction 50%	-11.3%**	-9.1%*	-10.2%
Fine reduction 30%	-11.3%**	-8.4%	-8.8%
No fine reduction	-7.8%	-7.0%	-7.1%
No disclosure of leniency documents			
Disclosure of leniency documents	0.9%	0.3%	1.1%
Maximal claim 5% of profits			
Maximal claim 10% of profits	-4.0%*	-3.7%**	-6.9%**
Maximal claim 15% of profits	-1.1%	0.6%	0.6%
Burden of proof lies with the defendant			
Burden of proof lies with the claimant	1.6%	0.8%	-0.2%

NB: Effects significant at the 10% level are marked with *; at the 5% level, with **; at the 1% level, with ***.

Source: Authors' calculations

We use the marginal effects in Table 5.6 to calculate the potential in terms of deterrence effect for more stringent policies. For this exercise we construct a new cartel situation, A, which represents as much as possible the current state of law enforcement in the Netherlands. Situation B represents – as a benchmark – the attributes which according to all models (1, 2 and 3) lead to the highest probability of cartelists stopping a cartel by applying for leniency. Note that some of the estimates from the logit regression are insignificant (reported between brackets in Table 5.7). Table 5.7 describes for

¹¹² The probabilities are calculated using the formula $Prob(x = j) = \frac{1}{1 + \exp(-\beta_j)}$.

the situations A and B the attributes, which we can interpret at this point as antitrust policy parameters.

Table 5.7 Model-implied composition of antitrust law and its effectiveness relative to current law

Situation of law enforcement	A <i>Current</i>	B <i>Model (1, 2 or 3)</i>
Antitrust policy parameter		
Maximal fine as % of turnover	10%	(5%)
Maximal personal fine	€ 450.000	no fines
Fine reduction for firm reporting a cartel	100%	100%
Disclosure of leniency documents	No	(Yes)
Maximal claim as % of profits ¹¹³	5%	(5%)
Burden of proof lies with:	Defendant	(Claimant)
Probability of cartelists applying for leniency in situation B (compared to situation A)	n/a	72% to 78%

NB: Parameter values between brackets are based on insignificant estimates of model (1).

The last line of Table 5.7 shows the probabilities of cartelists choosing to apply for leniency in situation B, compared to doing so in situation A (the current state of law enforcement), as predicted by the model. Probabilities higher than 50% indicate that changing the composition of antitrust enforcement would increase its effectiveness. Situation B gives a range of 72 to 78%, which constitutes an upper bound of the gained effectiveness implied by our conjoint analysis.¹¹⁴

We would stress here that the model-implied ‘effectiveness’ above is concerned only with destabilising cartels by means of increasing whistleblowing. The reason for many elements of antitrust policies is, however, to deter firms from forming a cartel in the first place. Our model does not balance the destabilising and deterrence effects. Rather, our paper is aimed to disentangle the interaction of public and private enforcement on the destabilising effect.

¹¹³ Currently, Dutch law does not govern the level of damages in antitrust cases. For this reason we take the base level within our survey (5%).

¹¹⁴ Ignoring the insignificant attributes in B (and setting their value as in the current situation, A) leads to a probability of applying for leniency equal to 68 to 71%.

Competition lawyers

Competition lawyers were also asked in which of the two situations they would be more likely to advise their client to end an illegal agreement by applying for leniency. The choice being between two hypothetical situations (A and B), or continuing the agreement in both situations. Table 5.8 presents the overall number of choices.

Table 5.8 Choices from the trade-offs made by competition lawyers

Choice	Number	Percentage
End the agreement in situation A	81	42.4%
End the agreement in situation B	79	41.4%
Do not end the agreement in either case	31	16.2%
Total	191	100.0 %

Source: Authors' calculations, n=27

The share of lawyers choosing 'Do not end the agreement in either case' (around 16.2%) is quite close to this observed share for the firms (18.5%). The choices made by the firms do not seem inconsistent with what their lawyers would advise them to do.

Table 5.9 shows the results from the nested logit regression for competition lawyers. The first thing to notice is that the standard errors are much higher (between 0.22 and 0.43 for the attribute coefficients) compared to the firms' results (between 0.04 and 0.15). This is not surprising, as the number of respondents is much lower ($n=27$ responding competition lawyers versus $n=476$ firms).

Table 5.9 Results from the nested logit regression for competition lawyers

Model d Parameter	(1)		(2)	
	Est.	s.e.	Est.	s.e.
<i>Choice between applying for leniency in situation A and applying for leniency in situation B</i>				
Maximal fine 5% of turnover ^{a)}	-0.173	(n/a)	-0.222	(n/a)
Maximal fine 10% of turnover	-0.100	(0.290)	-0.025	(0.304)
Maximal fine 40% of turnover	0.273	(0.250)	0.247	(0.266)
No personal fines ^{a)}	-0.077	(n/a)	-0.175	(n/a)
Maximal personal fine € 450.000	-0.155	(0.278)	-0.205	(0.325)
Maximal personal fine € 900.000	0.232	(0.286)	0.380	(0.317)
Fine reduction 100% ^{a)}	2.170	(n/a)	2.142	(n/a)
Fine reduction 50%	-0.513	(0.326)	-0.442	(0.391)
Fine reduction 30%	-0.396	(0.320)	-0.332	(0.426)
No fine reduction	-1.260***	(0.322)	-1.368***	(0.354)
No disclosure of leniency documents ^{a)}	0.593	(n/a)	0.625	(n/a)
Disclosure of leniency documents	-0.593**	(0.237)	-0.625**	(0.315)
Maximal claim 5% of profits ^{a)}	0.052	(n/a)	0.027	(n/a)
Maximal claim 10% of profits	-0.149	(0.328)	0.006	(0.337)
Maximal claim 15% of profits	0.097	(0.234)	-0.033	(0.251)
Burden of proof lies with the defendant ^{a)}	-0.504	(n/a)	-0.529	(n/a)
Burden of proof lies with the claimant	0.504**	(0.217)	0.529*	(0.307)
<i>Choice between ending an agreement by applying for leniency and continuing both situations</i>				
Perceived probability of claim to company			0.00156	(0.014)
Nested logit $\lambda - 1$	1.017*	0.558	1.090	(1.237)
Number of respondents	27		22	
Number of observations	191		176	
Log pseudolikelihood	-156.90		-142.21	

NB: Values significant at the 10% level are marked with *; at the 5% level, with **; at the 1% level, with ***. Standard errors are robust and clustered at respondent level. a) Base levels: coefficients are not estimated, but equal minus the sum of the estimated coefficients.

Source: Authors' calculations

For lawyers, a mix of public and civil factors gives significant results. This involves the fine reduction, the disclosure of leniency documents to claimants and the burden of proof in the civil procedure. No fine reduction following a leniency application gives the largest effect and reduces the chance that lawyers will advise their clients to self-report the agreement with 68-69% (see Table 5.10 below). Personal fines are not significant for competition lawyers, while they are for the firms.

Disclosure of the leniency documents reduces the chance on the advice to apply for leniency with 29-30%. If the infringing company needs to proof that

the agreement did not cause any damages to purchasers, the chances of positive advice to apply for leniency decrease with 25-26% (opposite to the burden of proof for the claimants).

As was the case for the firms, the parameter λ is significantly different from 1 in model (1), in favour of the logit model with the nested structure, including a 'continue'-option, although only on a 10% significance level. The perceived probability of a claim does not help explain the decision to end an agreement. The average perceived probability of a claim by customers towards the client's company is 41% (n=23). For model (2) that includes this parameter, λ is not significantly different from 1 due to the large standard error.

Table 5.10 shows that fine reduction, disclosure of leniency documents, and burden of proof are the only significant attributes in both model specifications.

Table 5.10 Likelihood ratio tests

Model d Attribute	(1)		(2)	
	χ^2	p-value	χ^2	p-value
Maximal fine as % of turnover	0.84	0.656	0.72	0.700
Maximal personal fine	0.63	0.729	1.46	0.482
Fine reduction	55.58***	0.000	47.20***	0.000
Disclosure of leniency documents	9.47***	0.002	9.36***	0.002
Maximal claim as % of profits	0.25	0.881	0.02	0.992
Burden of proof	7.16***	0.007	6.71***	0.010
Perceived probability of claim to company			0.02	0.879

NB: Effects significant at the 10% level are marked with *; at the 5% level, with **; at the 1% level, with ***.

Source: Authors' calculations

Table 5.11 presents the marginal effects of the attributes for competition lawyers.

Table 5.11 Fine reduction, documents disclosure and burden of proof have significant marginal effects

Model d	(1)	(2)
Parameter	<i>Probability of choosing option with this attribute level (compared to reference)</i>	
Maximal fine 5% of turnover		
Maximal fine 10% of turnover	1.8%	4.9%
Maximal fine 40% of turnover	11.1%	11.7%
No personal fines		
Maximal personal fine € 450.000	-1.9%	-0.7%
Maximal personal fine € 900.000	7.7%	13.8%
Fine reduction 100%		
Fine reduction 50%	-52.3%	-50.4%
Fine reduction 30%	-49.5%	-47.7%
No fine reduction	-67.7%***	-69.2%***
No disclosure of leniency documents		
Disclosure of leniency documents	-28.8%**	-30.3%**
Maximal claim 5% of profits		
Maximal claim 10% of profits	-5.0%	-0.5%
Maximal claim 15% of profits	-1.1%	-1.5%
Burden of proof lies with the defendant		
Burden of proof lies with the claimant	24.7%**	25.9%*

NB: Effects significant at the 10% level are marked with *, at the 5% level, with **; at the 1% level, with ***.

Source: Authors' calculations

5.6 Direct questions – other results

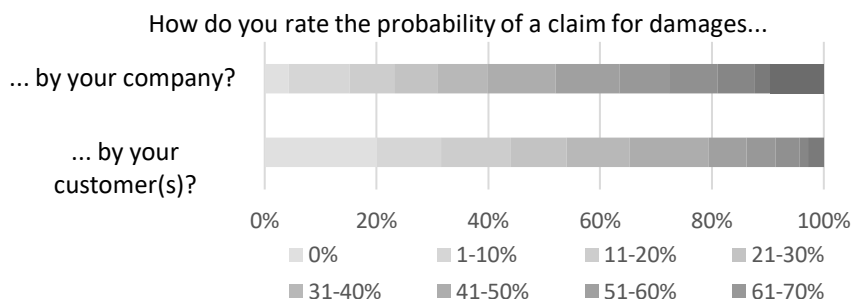
Additional to conjoint questions the survey included more general direct questions about the expectations of receiving a fine or being sued for damages as a result of cartel membership. These questions provide context for the interpretation of the conjoint analysis. This section discusses the results.

Firms

Probability of a claim for damages

Respondents were asked to consider the hypothetical situation that their supplier charged a higher price because of illegal agreements with competitors. How do they rate the probability that their company would claim damages from this supplier? See Figure 5.2. In this question, no mention was made regarding a fine by the competition authority.

Figure 5.2 Respondents' perceived probabilities of a claim for damages



Note: Author's calculations, survey, n=463

The shares in Figure 5.2 imply that the average perceived probability of a claim by the own company is 48.7%.¹¹⁵ The average perceived probability of a claim by customers towards the own company is much lower, 29.5%. The difference between the two percentages suggests that there is opportunistic behaviour of the respondent involved.

Note that companies intend to claim in almost half of the cases. Following from the discussion with lawyers, not in all cases a claim will be fined since there are also other possibilities for companies when faced with a price increase from their supplier. In most cases, companies maintain a long term business relation and will instead of claiming damages try to negotiate a discount in the near future to compensate for the price increase.

Almost half of the firms think the probability of a claim in general has increased since 2010.¹¹⁶ According to competition lawyers, these results could be biased by the sector the firms are active in. Firms in sectors that mostly supply directly to consumers are expected to have a lower perceived probability of receiving a claim for damages. However, we find that the probabilities do not differ much per sector and do not support this proposed bias. In this case, no bias is expected due to the way of (direct) questioning.

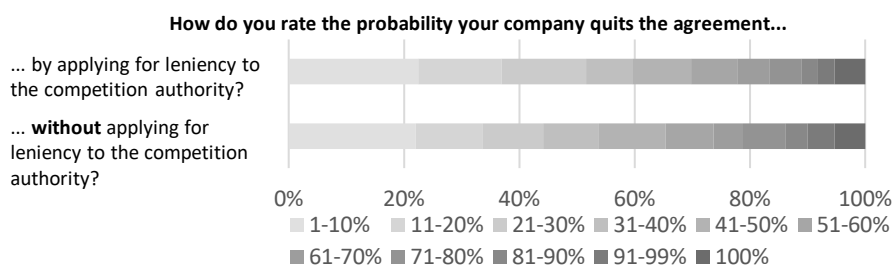
¹¹⁵ In calculating this and further average perceived probabilities, we assume mid-point probabilities for the middle categories (5% for the category 1-10%, 15% for the category 11-20%, and so on to 95% for the category 91-99%).

¹¹⁶ Excluding the respondents answering 'do not know' (29%), 68% of the respondents perceived an increase in the probability of a claim for damages (n=463).

Illegal agreement within the own firm

The following results concern the hypothetical situation that the own firm is involved in an illegal price agreement or division of the market.

Figure 5.3 **Ending an illegal agreement within the own firm**



Note: Author's calculations, survey, n=450

Figure 5.3 shows the reported probabilities of stopping the agreement by applying for leniency (37%), and without applying for leniency (40.5%).¹¹⁷ More than half of the firms reported a higher probability of quitting the agreement without applying for leniency than with applying. The reason for this could be that companies do not want to risk a negative reputation and/or damages claims. Quitting the infringement however, does not stop the liability for the infringement. During the entire limitation period (5 years in the Netherlands) firms face the risk of the cartel being reported by another cartel member, or the competition authority discovering the infringement. Both situations are about quitting an illegal agreement. So between those two options, no bias is expected due to the way of questioning. When only selecting those companies that have been involved with the competition authority, the percentages hardly change.

How do firms estimate the likelihood of receiving a fine from the authority or a claim from a customer, when the agreement was not reported to the authority? Most firms (38% of n=462) consider a fine from the competition authority for the cartel (discovered either by its own investigation or based on a complaint) to be more likely than a claim. Reversely, 30% thought a

¹¹⁷ This is the average reported probability.

claim from one or more of their customers was more likely. Almost a third of the respondents could not choose between the two.

Additionally, the respondents were asked to rate five effects from most negative to least negative for their firm. See Table 5.12. Negative reputation from reports in national newspapers were considered most negative whereas reports on the website of the ACM was considered least negative. Also the public fine was regarded to be relatively harmless compared to the other consequences.

Table 5.12 Firms expect the most negative effect from bad publicity

Effect	Ranked as 1 (most negative effect)	Ranked as 5 (least negative effect)	Average rank
Claims for damages from customer(s)	18%	22%	3.10
Reports in national newspapers and the internet that your company has violated competition law	43%	10%	2.22
Reports in professional journals that your company has violated competition law	16%	14%	2.78
Reports on the website of the ACM (the Dutch competition authority) that your company has violated competition law	12%	30%	3.33
Fine from the competition authority for your company	15%	26%	3.29

Source: Authors' calculations, n=405

Finally we asked respondents about considerations in choosing whether or not to apply for leniency, other than the ones discussed in the survey. The majority of useful answers involved negative effects on the reputation of the company. Other submitted reasons were an upcoming merger, the chance of detection by the authority, personal influences of the management or other staff, the overall financial position of the company, and the impossible position in the market after a leniency application.

These answers might be biased since respondents can simply choose the factor that most negatively affects themselves, rather than the company, such as reputation damages. This is supported by the lower rating of the effects reflecting reputation damages for competition lawyers.

Testing for awareness of antitrust law

We checked whether awareness of antitrust law (proxy is the indication previous involvement with a competition authority, in particular the ACM) has an effect on the answers to other questions. See Table 5.13. The perceived probability of a claim was higher for respondents that previously have been involved with the competition authority. The category of ‘do not know’ is lower for the two questions presented in the table, suggesting that firms with previous involvement with the ACM are better able to formulate an opinion about these matters.

Table 5.13 **The effect of previous involvement with a competition authority**

	Entire sample		Previously involved with CA	
How do you rate the probability of a claim for damages by your company?				
Average perceived probability	48.7%		54.5%	
How do you rate the probability of a claim for damages by your customer(s)?				
Average perceived probability	29.5%		35.5%	
Do you think the probability of a claim for damages has increased since 2010?				
	#	%	#	%
Yes	225	49%	52	63%
No	104	22%	17	21%
Do not know	134	29%	13	16%
Which situation do you think is more likely?				
	#	%	#	%
receiving a fine from the competition authority	172	38%	40	51%
receiving a claim from a customer	137	30%	31	39%
do not know	153	34%	11	14%

Source: Authors' calculations, n=476 (n=82 for Previously involved with competition authority)

We also checked whether awareness of antitrust law influenced the perception on the most negative results of breaching antitrust law. The answers are very similar to those represented in Table 5.12. Results also do not change significantly when selecting firms with a large turnover (e.g. more than € 20 million).

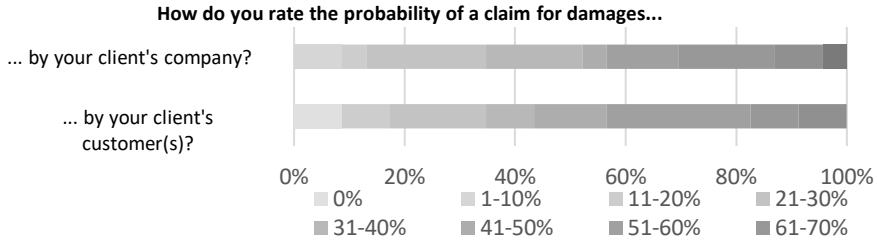
Competition lawyers

Probability of a claim for damages

Similar to the firms, the competition lawyers were asked how likely they considered a claim for damages. Respondents were asked to consider the hypothetical situation that their client's supplier charged a higher price because

of illegal agreements with competitors. How do they rate the probability that their client's company would claim damages from this supplier?

Figure 5.4 Lawyers' perceived probabilities of a claim for damages



Note: Author's calculations, survey, n=23

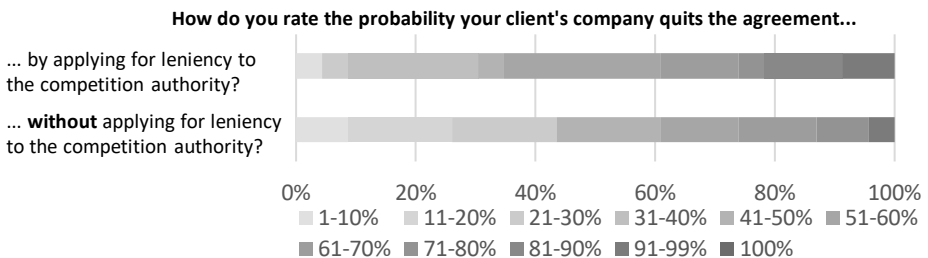
The average perceived probability of a claim by the client's company is 44%. The average perceived probability of a claim by customers towards the client's company is somewhat lower, 41% (Figure 5.4). These percentages are closer to one another than they are in the questionnaire amongst companies.

As high as 23 of the 25 responding lawyers (92%) think the probability of such a claim in general has increased since 2010. For the firms, this percentage was only 68%. Contrary to the firms, there were no lawyers who did not know the answer.

Illegal agreement in the client's firm

Competition lawyers were also asked about the hypothetical situation that the client's firm is involved in an illegal price agreement or division of the market.

Figure 5.5 Ending an illegal agreement in the client's firm



Note: Author's calculations, survey, n=23

Figure 5.5 shows the reported probabilities of the client quitting the agreement by applying for leniency (on average 56%), and without applying for leniency to the Dutch competition Authority (42%). Lawyers attach a higher probability of quitting by applying for leniency than the firms (probability of firms was 37% by applying for leniency vs. 41% without applying). This can be explained by the fact that when firms decide not to apply for leniency, the external lawyer is not always involved and hence aware of this decision. More in general, differences between firms and lawyers can be attributed by the phenomenon that lawyers only see part of the strategies of firms.

What if the illegal agreement was not reported by the company, but discovered from outside the cartel? Lawyers were asked which situation they thought to be more likely in this case: a fine from the competition authority (57%) or a claim from one or more of their customers (30%).¹¹⁸ Noteworthy is that these numbers are similar to those of the firms that have been involved with the competition authority.

Additionally, the respondents were asked to rate five effects from most negative to least negative for their firm. See Table 5.14. Lawyers considered, unlike firms, the public fine as the most negative. Least negative are reports on the website of the ACM.

¹¹⁸ 13% did not know ($n=23$).

Table 5.14 Lawyers expect the most negative effect from the fine of the competition authority

Effect	Ranked as 1 (most negative effect)	Ranked as 5 (least negative effect)	Average rank ***
Claims for damages from customer(s)	25%	5%	2.3
Reports in national newspapers and the internet that your company has violated competition law	25%	5%	2.7
Reports in professional journals that your company has violated competition law	0%	25%	4.0
Reports on the website of the ACM (the Dutch competition authority) that your company has violated competition law	0%	65%	4.4
Fine from the competition authority for your company	50%	0%	1.9

Source: Authors' calculations, n=20

5.7 Conclusion and discussion

In 19% of the enforcement situations, firms choose rather to continue the infringement than to apply for leniency. In 16% of the cases, competition lawyers would advise their client to do the same. Seeing that firms may opt for continuing the cartel did not surprise the competition lawyers we spoke to. Whether or not to apply for leniency is a business decision that involves a lot of factors, and not self-reporting may very well result in the best outcome for the firm. A conjoint analysis is, unfortunately, always restricted to the factors that are taken into account and the questions asked in presenting the choice sets to respondents. Future research could turn to the question whether the same factors are relevant for the choice of stopping the infringement without self-reporting it to the competition authority.

Based on the conjoint analysis, firms only respond to public enforcement factors. Lawyers also take private enforcement factors into account when advising on leniency. A personal fine of 450.000 euro, opposite to no personal fine, leads to a lower chance for firms to apply for leniency (by 18-22%). The effect of a personal fine of 900.000 euro (opposite to no fine) is smaller, leading to a reduced chance of 15-18%. A lower fine reduction following a leniency application, makes the leniency programme less attractive and hence less destabilising. A 100% reduction increases the chance of a firm on a leniency application by 7-8% as opposed to no fine reduction.

For lawyers the fine reduction, the disclosure of leniency documents to claimants and the burden of proof in the civil procedure are important drivers for advising on leniency. No fine reduction following a leniency application reduces the chance that lawyers will advise their clients to self-report the agreement with 68-69%. Disclosure of the leniency documents reduces the chance on the advice to apply for leniency with 29%. If the infringing company needs to prove that the agreement did not cause any damages to purchasers, the chances of positive advice to apply for leniency decrease with 25% (opposite to the burden of proof for the claimants).

The difference between the two groups of respondents is striking. Don't companies take the chance on a civil claim into account? Although claims have been filed since about 2011, the implementation of the Directive for private actions is rather recent. Or is the combination of public and private enforcement too complex? In future research, we would like to repeat the analysis to see whether the increasing number of damages claims has changed this.

Remarkably, the level of the fine has no significant effect on the advice from lawyers to apply for leniency. Perhaps this is caused by the somewhat weak track record of the ACM in upholding the fine decision in court. Alternatively, competition lawyers are more aware than firms of the possibility that some firms are unable to pay. If firms are unable to pay the expected fine, the level of the fine is of little relevance. Besides the purely financial aspect, a public fine also carries negative reputation effects, leading to exclusion from future tenders and damage to client relations. As with the public fine, civil conviction not only leads to damages to be paid by the firm, but also to negative reputation effects. Some competition lawyers argue that this effect is larger than the damages themselves. Courts may annul the fining decision of the authority but reputation damages are much harder to undo. Another form of reputation damages is through shareholders value. Empirical research amongst Dutch listed companies shows that firms lose 2.3% of market value when a Dutch or European antitrust investigation is uncovered. In monetary

terms, the level of the fine is only a small part of the lost shareholders value.¹¹⁹

Furthermore, important to note is that the public fine is capped at a maximum fine while damages are not and hence the size is less certain.

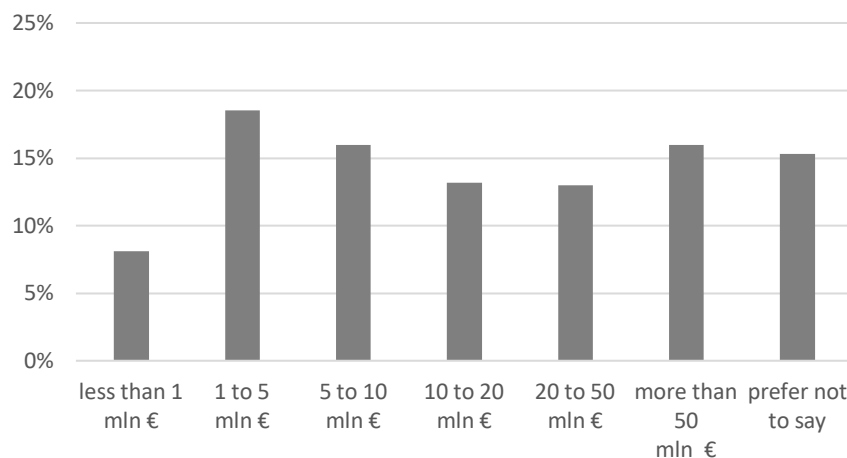
Together, the conjoint analysis, the regular questions answered by firms and the discussion with competition lawyers made clear that choosing to apply for leniency involves large negative effects, not only in terms of civil liability. The question is whether the reduction of the fine is enough to offset these negative effects. The leniency programme is designed to stimulate the race to apply first. But, given the negative effects firms are hesitant to apply first. Instead, firms may prepare a leniency statement in case a fellow conspirator reports the cartel. In the meantime, hope remains that the cartel is never reported. Seen in this way, the leniency programme seems to stimulate the race to apply second, rather than first.

¹¹⁹ S. van den Broek, R.G. Kemp, W.F. Verschoor & A.C. de Vries, *Reputational penalties to firms in antitrust investigations*. *Journal of Competition Law and Economics*, 8(2), 231-258, (2012).

5.8 Appendix A—Description of the respondents

This appendix describes general characteristics of the respondents.

Figure 5.6 Distribution of turnover among responding firms



Note: Author's calculations, survey, n=470. Six respondents did not answer to the general questions in this Appendix, i.e. n<476 here.

Table 5.15 Comparison of firm size in the sample and nation-wide, with correcting weights

Firm size category	N_sample	% sample	% nation-wide	Weight
less than 10 employees or not reported	20	4%	*	0.0
10 to 20 employees	53	11%	49%	4.4
20 to 50 employees	81	17%	30%	1.7
50 to 100 employees	88	18%	10%	0.6
100 or more employees	234	49%	12%	0.2
Total	476	100%	100%	

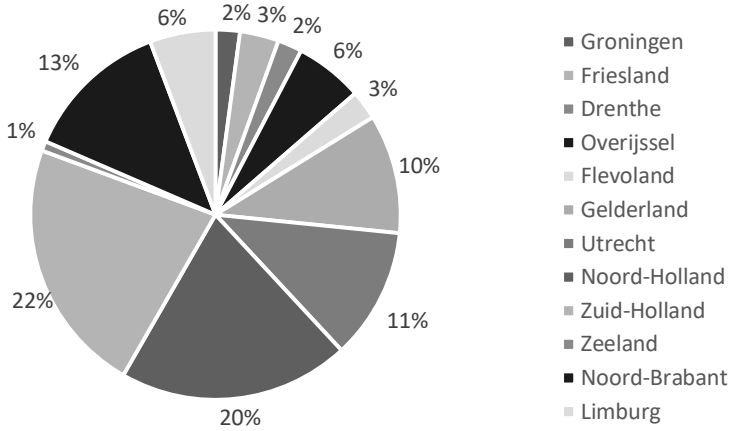
NB: * = excluded as the survey was intended for firms reporting more than 10 employees¹²⁰

¹²⁰ 4% of the respondents answered differently in the screening question (> 10 employees) and the later question regarding number of employees (less than 10 employees). It cannot be said which answer is correct. Given that the results do not change largely when weighing for number of employees (and hence excluding this category, see Table 4.15

Table 5.4), we decided not to remove these respondents from the dataset.

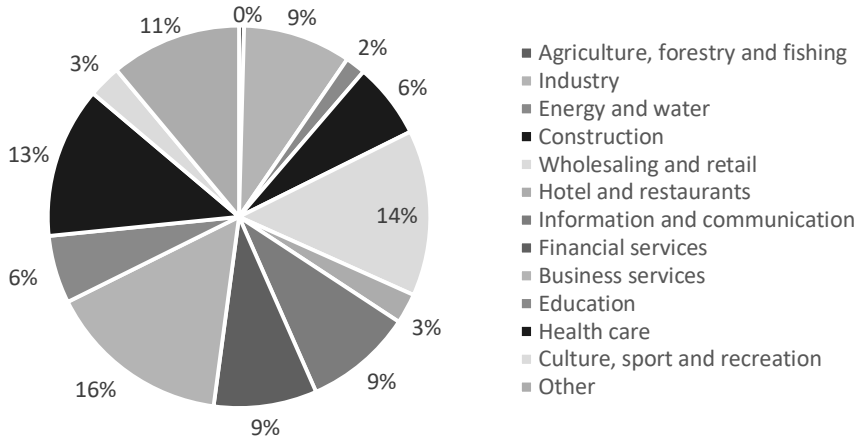
Source: Authors' calculations, n=476

Figure 5.7 Region of the head office among responding firms



Note: Author's calculations, survey, n=470.

Figure 5.8 Market sectors among responding firms



Note: Author's calculations, survey, n=470.

5.9 Appendix B—Questionnaire firms

Screening questions

1. What is your current function within your organization?

- Owner/partner
- Senior Management (CEO/VP/MD)
- Middle management
- Front line management → *Screen-out*
- Experienced: professional or non-managing → *Screen-out*
- Starter → *Screen-out*

2. How many employees work at your organization?

- 0-4 employees → *Screen-out*
- 5-9 employees → *Screen-out*
- 10-19 employees
- 20-49 employees
- 50-99 employees
- 100 or more employees
- I do not know → *Screen-out*

Text for introduction of conjoint questions

We ask you to consider the situation that you discovered a price fixing agreement or the division of the market agreement within your organization. Each of the following questions shows you two hypothetical situations of competition enforcement. The situations differ in terms of enforcement by the Dutch competition authority and private damage claims of purchasers of your product or service.

Please indicate in which situation you consider it more likely that you would order the agreement to end by applying for leniency. You could also opt to continue the agreement in both hypothetical enforcement situations.

Conjoint questions (4x)

You discovered an agreement of your organization with a competitor on your most important market. The agreement leads to a price increase of 25%. Your legal adviser indicates that the agreement is infringing the competition law.

Each situation describes a fictive cartel enforcement system. In which situation is it more likely that you would order the agreement to end by applying for leniency?¹²¹

Table 5.16

<p>U heeft in de eigen onderneming een afspraak met een concurrent ontdekt op uw meest belangrijke markt. De afspraak leidt tot een 25% hogere prijs. Uw adviseur heeft u verteld dat deze afspraak niet verenigbaar is met het kartelverbod.</p> <p>Elke situatie beschrijft een fictief karteltoezicht. Bij welke beschreven situatie is de kans het grootst dat u de opdracht zou geven de afspraak te beëindigen door een clementieverzoek in te dienen?</p>		
<p>Optie A:</p> <ul style="list-style-type: none"> • De schadeclaim die u moet betalen bedraagt maximaal 10% van uw winst over de periode van de afspraak • Uw onderneming krijgt een boete van maximaal 40% van de jaaromzet van de gehele onderneming(sgroep) • Leidinggevenden van uw onderneming krijgen geen persoonlijke boete. • Uw onderneming en leidinggevenden ontvangen maximaal 30% boetevermindering als u de afspraak meldt en hiervoor bewijsstukken aanlevert bij de mededingingsautoriteit. • In een rechtszaak ligt de bewijslast bij uw afnemers om aan te tonen dat er wel sprake was van een prijsverhoging • Afnemers van uw onderneming krijgen geen inzage in het clementiedossier. 	<p>Optie B:</p> <ul style="list-style-type: none"> • De schadeclaim die u moet betalen bedraagt maximaal 15% van uw winst over de periode van de afspraak • Uw onderneming krijgt een boete van maximaal 10% van de jaaromzet van de gehele onderneming(sgroep) • Leidinggevenden van uw onderneming krijgen een persoonlijke boete van 900.000 euro. • Uw onderneming en leidinggevenden ontvangen volledige boetevermindering als u de afspraak meldt en hiervoor bewijsstukken aanlevert bij de mededingingsautoriteit. • In een rechtszaak ligt de bewijslast bij uw onderneming om aan te tonen dat er geen sprake was van een prijsverhoging • Afnemers van uw onderneming krijgen wel inzage in het clementiedossier. 	<p>Optie C:</p> <ul style="list-style-type: none"> • De schadeclaim die u moet betalen bedraagt maximaal 5% van uw winst over de periode van de afspraak • Uw onderneming krijgt een boete van maximaal 10% van de jaaromzet van de gehele onderneming(sgroep) • Leidinggevenden van uw onderneming krijgen een persoonlijke boete van 900.000 euro. • Uw onderneming en leidinggevenden ontvangen volledige boetevermindering als u de afspraak meldt en hiervoor bewijsstukken aanlevert bij de mededingingsautoriteit. • In een rechtszaak ligt de bewijslast bij uw onderneming om aan te tonen dat er geen sprake was van een prijsverhoging • Afnemers van uw onderneming krijgen wel inzage in het clementiedossier.
0: Optie A te beëindigen	0: Optie B te beëindigen	0: Ik zou in beide situaties geen opdracht geven de afspraak te beëindigen

Note: In Dutch original

Table 5.17

<p>Option A:</p> <ul style="list-style-type: none"> • Your organisation receives a fine with a maximum of 10% of yearly turnover of the whole organisation (group). • Directors of your organisation are not fined personally 	<p>Option B:</p> <ul style="list-style-type: none"> • Your organisation receives a fine with a maximum of 5% of yearly turnover of the whole organisation (group). • Directors of your organisation are personally fined up to 450.000 euro
---	---

¹²¹ *In Dutch original:* U heeft in de eigen onderneming een afspraak met een concurrent ontdekt op uw meest belangrijke markt. De afspraak leidt tot een 25% hogere prijs. Uw adviseur heeft u verteld dat deze afspraak niet verenigbaar is met het kartelverbod. Elke situatie beschrijft een fictief karteltoezicht. Bij welke beschreven situatie is de kans het grootst dat u de opdracht zou geven de afspraak te beëindigen door een clementieverzoek in te dienen?

<ul style="list-style-type: none"> • The fine reduction for your organisation and directors is a maximum of 50% if you report the agreement and deliver evidence to the competition authority • The damage claim represents a maximum of 15% of your company's profit during the period of the agreement • The leniency documents are not disclosed to customers of your organisation • In court your organisation needs to rebut the presumption that the agreement led to a price increase 	<ul style="list-style-type: none"> • Your organisation and directors receive immunity of the fine if you report the agreement and deliver evidence to the competition authority • The damage claim represents a maximum of 5% of your company's profit during the period of the agreement • The leniency documents are disclosed to customers of your organisation • In court your customers needs to rebut the presumption that the agreement did not lead to a price increase 	
0: Option A	0: Option B	0: In both situations I would not order to end the agreement

Note: Translated to English

Direct questions

3. In which sector is your organization active?

- Agriculture, forestry and fishing
- Industry
- Energy and water
- Construction
- Wholesaling and retail
- Hotel and restaurants
- Information and communication
- Financial services
- Business services
- Education
- Health care
- Culture, sport and recreation
- Other

4. What was the turnover of your organization in 2015?

- Less than 1 million euro
- 1 to 5 million euro
- 5 to 10 million euro
- 10 to 20 million euro
- 20 to 50 million euro
- More than 50 million
- I do not want to say

5. In which province is (the Dutch office) of your organization located?

6. In which region is your organization active?

- Only in the Netherlands
- Only in Europe
- Also outside of Europe

7. What is your current function within your organization?

8. How many employees work at your organization (in the Netherlands)?

- Only me
- 1 to 5 employees
- 5 to 10 employees
- 10 to 20 employees
- 20 to 50 employees
- 50 to 100 employees
- 100 to 200 employees
- 200 to 500 employees
- 500 or more employees

Conjoint questions (4x) – see above

Direct questions continued

9. Consider that a supplier of your organization has asked higher prices in the last period as a result of an illegal price fixing agreement or market division agreement with a competitor. What is the chance that your organization would claim for damages from this supplier?

- 0%
- 1-10%
- 11-20%
- 21-30%
- 31-40%
- 41-50%
- 51-60%
- 61-70%
- 71-80%
- 81-90%

- 91-100%

10. Do you think the chance on a damage claim for price fixing or market division in general has increased since 2010?

- Yes
- No
- I do not know

11. Consider that your own organization has asked higher prices in the last period as a result of an illegal price fixing agreement or market division agreement with a competitor.

What is the chance that your organization would receive a claim for damages from your clients?

- 0%
- 1-10%
- 11-20%
- 21-30%
- 31-40%
- 41-50%
- 51-60%
- 61-70%
- 71-80%
- 81-90%
- 91-100%

12. Consider that your organization has decided to end an illegal price fixing agreement or market division agreement. What is the chance that your organization would:

- End the agreement by applying for leniency with the Dutch competition authority?
- End the agreement without applying for leniency with the Dutch competition authority?

13. Consider that your own organization has asked higher prices in the last period as a result of an illegal price fixing agreement or market division

agreement with a competitor. Which of the following situations do you think is more likely?

- That your organization is fined by the competition authority (ACM or EC) while the agreement was not reported to the competition authority.
- That your organization receives a damage claim from your client(s) while the agreement was not reported to the competition authority.
- I do not know

14. Has your organization ever been involved with the Dutch competition authority or the European Commission?

Added information: This question involved both the situation that your organization has been involved with the authority because of your own activities, and because of activities of your competitors, suppliers or clients.

This questionnaire is anonymous.

- Yes
- No
- I do not know/I do not want to say

15. Could you rank the situations below based on expected negative effect on your organization?

Please answer 1 if the situation represents the most negative effect and 5 if it represents the least negative effect.

- Claims for damages from customer(s)
- Reports in national newspapers and the internet that your company has violated competition law
- Reports in professional journals that your company has violated competition law
- Reports on the website of the ACM (the Dutch competition authority) that your company has violated competition law
- Fine from the competition authority for your company

16. Are there any other considerations that have not been addressed in this questionnaire but that do play a role in the decision to apply for leniency?

5.10 Appendix C—Robustness checks

Table 5.18 Robustness checks weighting and sector

Model d	(5)		(4')		(8')	
Parameter	Est.***	(s.e.)***	Est.***	(s.e.)***	Est.***	(s.e.)
<i>Choice between applying for leniency in situation A and applying for leniency in situation B</i>						
Maximal fine 5% of turnover ^{a)}	0.296***	(n/a)	0.146***	(n/a)	0.270***	(n/a)
Maximal fine 10% of turnover	-0.189***	(0.093)	-0.062***	(0.058)	-0.130***	(0.089)
Maximal fine 40% of turnover	-0.106***	(0.089)	-0.083***	(0.062)	-0.140***	(0.086)
No personal fines ^{a)}	0.560***	(n/a)	0.438***	(n/a)	0.545***	(n/a)
Maximal personal fine € 450.000	-0.330***	(0.104)	-0.268***	(0.072)	-0.285***	(0.114)
Maximal personal fine € 900.000	-0.229***	(0.113)	-0.170***	(0.072)	-0.260***	(0.120)
Fine reduction 100% ^{a)}	0.294***	(n/a)	0.243***	(n/a)	0.287***	(n/a)
Fine reduction 50%	-0.156***	(0.107)	-0.112***	(0.064)	-0.163***	(0.113)
Fine reduction 30%	-0.118***	(0.124)	-0.094***	(0.068)	-0.104***	(0.124)
No fine reduction	-0.020***	(0.152)	-0.037***	(0.093)	-0.019***	(0.154)
No disclosure of leniency documents ^{a)}	-0.031***	(n/a)	-0.007***	(n/a)	-0.022***	(n/a)
Disclosure of leniency documents	0.031***	(0.055)	0.007***	(0.034)	0.022***	(0.052)
Maximal claim 5% of profits ^{a)}	0.105***	(n/a)	0.040***	(n/a)	0.097***	(n/a)
Maximal claim 10% of profits	-0.191***	(0.093)	-0.106***	(0.050)	-0.218***	(0.102)
Maximal claim 15% of profits	0.086***	(0.083)	0.066***	(0.046)	0.121***	(0.085)
Burden of proof lies with the defendant ^{a)}	-0.001***	(n/a)	-0.016***	(n/a)	0.003***	(n/a)
Burden of proof lies with the claimant	0.001***	(0.070)	0.016***	(0.034)	-0.003***	(0.070)
<i>Choice between ending an agreement by applying for leniency and continuing both situations</i>						
Number of employees			-	(0.000)	-	(0.000)
			0.00071***		0.00057***	
Turnover			0.00719***	(0.003)	0.00837***	(0.004)
Perceived probability of claim to company			0.00950***	(0.003)	0.00956***	(0.005)
Been involved with competition authority			0.296***	(0.201)	-0.322***	(0.274)
Sector: Industry			-0.127***	(0.299)	-0.549***	(0.534)
Sector: Construction			-0.329***	(0.309)	-0.630***	(0.428)
Sector: Wholesaling and retail			0.145***	(0.256)	-0.121***	(0.344)
Sector: Information and communication			0.610***	(0.286)	1.169***	(0.411)
Sector: Financial services			0.433***	(0.264)	-0.289***	(0.365)
Sector: Business services			-0.003***	(0.256)	-0.233***	(0.412)
Sector: Health care			-0.338***	(0.256)	-0.460***	(0.347)
Nested logit $\lambda - 1$	1.054***	(0.160)	0.631***	(0.264)	0.904***	(0.371)
Weighting according to firm size	yes		no		Yes	
Number of respondents	476		398		398	
Number of observations	3744		3152		3152	
Log pseudolikelihood	-3819.47		-3182.09		-3152.22	

NB: Values significant at the 10% level are marked with *; at the 5% level, with **; at the 1% level, with ***. Standard errors are robust and clustered at respondent level. Observations are weighted following Table 5.15 to approach a more realistic firm size distribution.

Source: Authors' calculations

Table 5.19 Robustness checks on interaction terms

Model d Parameter	(3A)		(3C)		(3E)	
	Est.***	(s.e.) ***	Est.***	(s.e.) ***	Est.***	(s.e.)
<i>Choice between applying for leniency in situation A and applying for leniency in situation B</i>						
Maximal fine 5% of turnover ^{a)}	0.148***	(n/a)	0.146***	(n/a)	0.152***	(n/a)
Maximal fine 10% of turnover	-0.070***	(0.058)	-0.063***	(0.058)	-0.009***	(0.082)
Maximal fine 40% of turnover	-0.078***	(0.063)	-0.083***	(0.062)	-0.144***	(0.093)
Fine 5% of turnover X claim probability					-0.0002***	(n/a)
^{a)}						
Fine 10% of turnover X claim probability					-0.0019***	(0.002)
Fine 40% of turnover X claim probability					0.0021***	(0.002)
No personal fines ^{a)}	0.519***	(n/a)	0.450***	(n/a)	0.448***	(n/a)
Maximal personal fine € 450.000	-0.286***	(0.090)	-0.279***	(0.068)	-0.282***	(0.068)
Maximal personal fine € 900.000	-0.233***	(0.100)	-0.171***	(0.069)	-0.166***	(0.070)
No personal fines X claim probability ^{a)}	-0.0023***	(n/a)				
Personal fine € 450.000 X claim probability	0.0002***	(0.002)				
Personal fine € 900.000 X claim probability	0.0022***	(0.002)				
Fine reduction 100% ^{a)}	0.246***	(n/a)	0.293***	(n/a)	0.246***	(n/a)
Fine reduction 50%	-0.120***	(0.064)	-0.174***	(0.094)	-0.119***	(0.065)
Fine reduction 30%	-0.093***	(0.069)	-0.121***	(0.101)	-0.095***	(0.069)
No fine reduction	-0.033***	(0.093)	0.002***	(0.124)	-0.033***	(0.093)
Fine reduction 100% X claim probability			-0.0016***	(n/a)		
^{a)}						
Fine reduction 50% X claim probability			0.0020***	(0.002)		
Fine reduction 30% X claim probability			0.0010***	(0.002)		
No fine reduction X claim probability			-0.0013***	(0.003)		
No disclosure of leniency documents ^{a)}	-0.004***	(n/a)	-0.005***	(n/a)	-0.005***	(n/a)
Disclosure of leniency documents	0.004***	(0.035)	0.005***	(0.035)	0.005***	(0.035)
Maximal claim 5% of profits ^{a)}	0.041***	(n/a)	0.040***	(n/a)	0.042***	(n/a)
Maximal claim 10% of profits	-0.107***	(0.050)	-0.105***	(0.049)	-0.107***	(0.050)
Maximal claim 15% of profits	0.065***	(0.047)	0.065***	(0.047)	0.065***	(0.047)
Burden of proof lies with the defendant	-0.016***	(n/a)	-0.016***	(n/a)	-0.017***	(n/a)
^{a)}						
Burden of proof lies with the claimant	0.016***	(0.035)	0.016***	(0.035)	0.017***	(0.035)
<i>Choice between ending an agreement by applying for leniency and continuing both situations</i>						
Number of employees	-	(0.000)	-	(0.000)	-	(0.000)
	0.00088***		0.00087***		0.00088***	
Turnover	0.00853***	(0.004)	0.00856***	(0.004)	0.00856***	(0.004)
Perceived probability of claim to company	0.00994***	(0.003)	0.00981***	(0.003)	0.00971***	(0.003)
Been involved with competition authority	0.275***	(0.202)	0.277***	(0.202)	0.277***	(0.202)
Nested logit $\lambda - 1$	0.662***	(0.199)	0.659***	(0.199)	0.667***	(0.198)
Weighting according to firm size	No		no		no	
Number of respondents	398		398		398	
Number of observations	3152		3152		3152	
Log pseudolikelihood	-3196.98		-3197.33		-3197.27	

NB: Values significant at the 10% level are marked with *; at the 5% level, with **; at the 1% level, with ***. Standard errors are robust and clustered at respondent level. Observations are weighted following Table 5.15 to approach a more realistic firm size distribution.

Source: Authors' calculation

6. A veritable tower of Babel

On the confusion between the legal and economic interpretations of Article 101(3) of the Treaty on the Functioning of the European Union

Abstract

The current system of exemptions from the cartel prohibition (Article 101(3) TFEU) is a veritable tower of Babel. For one, there is a considerable confusion of tongues between jurists and economists on the goal of competition law. Moreover, the European Commission's Guidelines on the application of the cartel prohibition explains the law differently than is apparent from the case law. This economic paper aims to reduce the confusion of tongues by answering questions such as: what is consumer welfare, what is public interest and should non-competition-public interests be included in the assessment of competition cases? Actual cases are used to show the terminology of competition and other public interests. We develop a framework for balancing the economic benefits produced by restrictive agreements against the restrictive effects of these agreements.

JEL codes: D61, K21, L40

6.1 Introduction

According to the Book of Genesis, there was a time when everyone on earth spoke the same language. After the Great Flood, the people of the world settled in the land of Shinar, not far from the Euphrates. They agreed to build a city called Babylon (Babel), with a large tower that would reach to the sky and that would bring them great fame. But when God descended to view the tower under construction, it did not meet his approval. He remarked that as one people with one language, nothing that they sought would be beyond their reach. He therefore decided to cause confusion among the people so they no longer understood each other. And indeed, the people stopped

building the tower after this confusion of tongues. Ever since, we have spoken of Babel-like confusion.

With this cautionary tale in mind, we argue that the current system of exemptions from the prohibition against cartels is a veritable tower of Babel. Although Article 101(1) of the Treaty on the Functioning of the European Union (TFEU) prohibits cartels, some agreements and conducts¹²² are exempted from this prohibition. In other words, not every cartel is illegal. The European Commission's Guidelines on the application of Article 81(3) [now 101(3)]¹²³ of the Treaty (hereafter: the Guidelines) attempt to provide insight into how analyses cartel legality should be conducted. Since they were published in 2004, however, there has been a lively debate between economists and jurists on the interpretation of the Guidelines. The fact that there are differences between the Guidelines on the one hand and case law on the other has further worsened the already considerable confusion of tongues between jurists and economists. Consequently, the Guidelines have failed to increase legal certainty and the application of Article 101(3) has come to a standstill.

At the same time, the popularity of free-market policy has declined rapidly since the financial and economic crisis of 2008. Accordingly, in December 2009 the ultimate objectives of the European treaties changed in a subtle but important way when the Treaty of Lisbon led to the Treaty on the Functioning of the European Union. Since then, market integration has been considered less important as a driving force behind the development of EC competition law. Whereas the goal had been to establish a common market, after 2009 it was described as a 'highly competitive social market economy'. Although what is meant by a common market is clear – the concept refers to a competitive internal market characterized by the abolition by Member States of obstacles to the free movement of goods, persons, services and capital – the latter concept is not clear at all. What is a social market

¹²² By (restrictive) agreements between undertakings, we also refer to decisions by associations of undertakings and concerted practices.

¹²³ By Article 101(3) TFEU, we also refer to its predecessors, Articles 81(3) EC and 85(3) EEC. In the remainder of this paper we refer simply to Article 101, not Article 101 of the TFEU.

economy? The term ‘social’ suggests that public interests besides the prevention of market power (or its abuse) have entered the equation.

In some Member States, public demands for the inclusion of non-competition public interests are becoming louder¹²⁴. In the UK, the Office of Fair Trading (OFT) organized a roundtable in 2010 to discuss whether indirect and non-competition benefits should be included in the assessment of cartels. In his summary of the roundtable, Townley¹²⁵ disagrees with the OFT that only direct economic effects should be included. By focusing on competition effects, the “OFT thinks that it can and should ignore the EU courts’ consistent case law as well as the wishes of the Treasury”. Economists and jurists in the Netherlands have also debated the inclusion of non-competition public interests.¹²⁶ This debate was partly inspired by the chairman of the Dutch competition authority’s announcement that a new authority, to be founded in 2013, would be keeping a closer eye on public interests. In April 2013 the Netherlands Consumer Authority, the Netherlands Independent Post and Telecommunication Authority and the Netherlands Competition Authority were consolidated in a single body, the Netherlands Authority for Consumers and Markets (ACM). The ACM’s organizational strategy stated:

We are fully aware of the social context in which we operate. The creation of ACM takes place in an era in which different opinions in society are heard about the pros and cons of the free-market system, and where the protection of public interests must meet ever stricter requirements. ACM therefore chooses to

¹²⁴ AP Komninos, Non-competition Concerns: Resolution of Conflicts in the Integrated Article 81 EC, The University of Oxford Centre for Competition Law and Policy, Working Paper (L) 08/05, 2005; SACM Lavrijssen, ‘The Protection of Non-Competition Interests; What Role for Competition Authorities after Lisbon? (2010) 5 European Law Review 634–659; C Townley, ‘Is There (Still) Room for Non-Economic Arguments in Article 101 TFEU Cases?’, in C Heide-Jorgensen (ed.), Aims and Values in Competition Law (Copenhagen: Djøf Publishing, 2013).

¹²⁵ C Townley, ‘Which Goals Count in Article 101 TFEU? Public Policy and its Discontents’ (2011) 9 European Competition Law Review 441–448.

¹²⁶ Baarsma, B. (2013), On watering-down and politicizing completion supervision, *RegelMaat*, 28(2), pp. 94-104. De Bijl, P. and T. van Dijk (2012), Competition policy and public interests: an economic perspective, *Markt & Mededinging*, 4, pp. 149-156. Both articles are in Dutch.

*approach market and consumer problems in an integrated manner, while keeping in mind the different public interests that are at issue.*¹²⁷

One could argue that the ACM kept its promise on this point. In a recent case concerning better living conditions for chickens, the ACM analysed the costs and benefits with regard to animal welfare, the environment and public health. By including these non-competition public interests, ACM's analysis is clearly at odds with the Guidelines. After all, the latter only accept economic efficiencies. Contrary to this narrow perspective of the Guidelines, in the ACM assessments the non-competition public interest was monetized and weighted against competition concerns. Next to the chickens case, the ACM monetized and weighed competition and non-competition effects in a cartel case on coal. These and other Dutch case law are analysed in section 5.5.

The debate on the inclusion of non-competition public interests touches upon the discussion about the purpose of competition law in general, and of cartel prohibition in particular.¹²⁸ What one considers the purpose of competition law to be, depends on the perspective one adopts. From a legal perspective, the goal is to protect competition, whereas from an economic perspective the protection of competition is merely a means to achieve the goal of enhancing welfare, especially consumer welfare. This difference between economic and legal perspectives on the purpose of competition law is yet another factor in this modern tower of Babel: what is consumer welfare and what are public interests?

In this paper, we offer an economic perspective. In economic terms, total welfare consists of consumer welfare and producer welfare. Consumer welfare arises when consumers are willing to pay more for goods than they actually pay, while producer welfare arises when the market price is higher than that which the manufacturer would want for its goods and services. The consumer welfare standard implies that the goal of competition law should be to prevent increases in consumer prices above competitive pricing levels,

¹²⁷ ACM, Strategy Netherlands Authority for Consumers and Markets, 20 September, Den Haag: Netherlands Authority for Consumer & Markets (2013).

¹²⁸ BE Baarsma, 'Rewriting European Competition Law from an Economic Perspective' (2011) 7(3) European Competition Journal 559–585.

as well as restricting output or the deterioration of quality, services or variety through the exercise of market power by firms. In order to cover the effects on potential competition through R&D innovation and entrance, the optimal standard in competition law is consumer welfare now and over time, and both static and dynamic efficiency. Cseres,¹²⁹ for example, offers a legal perspective, and Daskalova¹³⁰ shows how the two perspectives can become confused.

This paper aims to reduce the confusion of tongues in this debate. In section 5.3, we explain the differences between the legal and economic definitions of public interest. Subsequently, in section 5.4 we address yet another source of confusion: the differences between the Guidelines on the one hand and the economic perspective on the other. In section 5.5, we explain the terminology of competition and other public interests with reference to actual cases. In section 5.6, we then develop a framework for balancing the economic benefits produced by restrictive agreements against the restrictive effects of these agreements. Finally, in section 5.7, we suggest some ways in which the stagnation in the application of Article 101(3) might be reversed. First, however, in section 5.2 we offer a more detailed overview of exemptions to the cartel prohibition.

6.2 Regulation 1/2003 and the 2004 Guidelines

Cartels are agreements between undertakings, decisions by associations of undertakings and concerted practices which may affect trade between Member States and which have as their object or effect the prevention, restriction or distortion of competition. When an agreement is found to restrict competition, the next step is to determine the pro-competitive benefits produced by that agreement and to assess whether these pro-competitive effects outweigh the anti-competitive effects. The cartel prohibition may be declared inapplicable in case of agreements which (1) contribute to improving the production or distribution of goods or to promoting technical or economic progress, (2) while allowing consumers a fair share of the resulting benefits, and which (3) do not impose restrictions that are not

¹²⁹ KJ Cseres 'The Controversies of the Consumer Welfare Standard' (2007) 3(2) *The Competition Law Review* 121–173.

¹³⁰ V Daskalova, *Consumer Welfare in EU Competition Law: What Is It (Not) About?* TILEC Discussion Paper 2015-011 (Tilburg: TILEC, 2015).

indispensable to the attainment of these objectives, and (4) do not afford such undertakings the possibility of eliminating competition in respect of a substantial part of the products concerned. When addressing the question of whether non-competition public interests should or should not be included in competition policy, only criteria (1) and (2) are relevant. The presence of public interests does not influence the analysis of the latter two criteria. In this paper we therefore focus on the scope of the efficiencies permitted and their distribution among consumers and other parties.

It has been possible to present efficiencies as a defence since Regulation 1/2003 was introduced in May 2004. This modernizing reform eliminated the notification system of cartels and established the premise for a more decentralized and harmonized application of Community competition rules by National Competition Authorities (NCAs) and national courts. Before 2004, only the Commission had been able to grant an exemption pursuant to Article 81(3) EC when judging an agreement in the notification procedure (the Commission had a monopoly on granting exemptions). NCAs were allowed to conclude on an infringement of the cartel prohibition if the criteria of the exemption had not been met.¹³¹ Since May 2004, however, Article 101 has been directly effective. Undertakings are required to self-assess whether their agreement restricts competition under Article 101(1) and, if so, whether the agreement might benefit from an exemption under Article 101(3). Since the adoption of Regulation 1/2003, the Commission has ceased to apply Article 101(3) in case law. In addition, in case law in the Member States, Article 101(3) has never been used in a decisive manner to conclude that Article 101(1) is inapplicable. The stagnation in the application of Article 101(3) has to some extent been caused by confusion about the various definitions of public interests, an issue to which we now turn.

6.3 Public interests: economic versus legal perspectives

Lawyers, political scientists and others who are involved in competition cases tend to approach the concept of public interests differently from economists. The former define public interests in terms of the primacy of politics: any democratically-elected government is free to designate any objective of

¹³¹ Agreements without an effect on trade between Member States could be assessed by NCAs. In these cases, NCAs have the option of granting an exemption under the national equivalent of Article 101(3).

its own choosing as being in the public interest. In other words, something is a public interest because politicians determine that it is the responsibility of the government to guarantee that interest. Political scientists assert that public interests are identified in an interactive process involving political, governmental, societal and market players; in other words, it is a matter of political administration. If one wants to answer policy questions or identify public interests, however, this definition is of little use. What is more, it is based on circular thinking: something is in the public interest because it falls under the responsibility of the government, and it falls under the responsibility of the government because it is in the public interest.

In economics, public interests can only exist if there is loss of welfare due to the malfunctioning of the market. Public interests are therefore defined as interests that cannot be generated by the market because of market failure(s). Public interests are thus the opposite of private and social interests, interests that can be secured in a market.

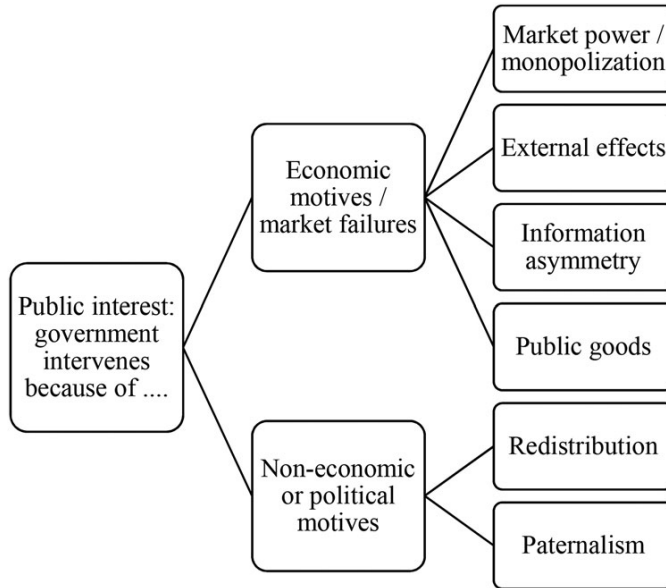
Economic theory describes four types of market failure: lack of effective competition, information asymmetry, external effects and public goods. The first reason for government action is when competition is seriously threatened, such as in the case of a natural monopoly, or in the case of a dominant supplier or the threat of one arising as a result of a merger. A second type of market failure is information asymmetry between the producer and the consumer. In most cases, this problem occurs when consumers are unable to assess quality properly and therefore give suppliers an opportunity to overcharge. A third type of market failure occurs through external effects, that is, effects of production and consumption that influence production opportunities and welfare but that do not have a price (for example, 'excessive' noise pollution in aviation). Finally, public goods may give rise to government action in the public interest. Consumers are often unwilling to pay for these goods on an individual basis because it is impossible to exclude people from the use of the good and the marginal cost of an extra user is zero.

From an economic perspective, government action is only required to correct a market failure if the remedial costs of government action are no higher (in terms of welfare) than the costs of the market cure. Every government action thus requires the weighing of the social costs and benefits in order to determine whether the intervention is indeed welfare-enhancing.

When defending the public interest in cartel cases, only three of the four market failures are important: market power, externalities and information asymmetry. Obviously, public goods fall outside the scope of competition supervision, as public goods demand government production. Moreover, it is self-evident that the market failure of market power lies at the very core of competition policy. External effects may also play a role, however; take the example of new, cleaner car technology. If using this technology were to lead to a price increase, individual undertakings would probably be reluctant to use it if their competitors were not and were therefore able to sell their cars at lower prices. If they were to agree with their competitors that from now on every manufacturer would use the more expensive but cleaner technology, they would not risk losing their market share. Such an agreement could have an effect on the market power of certain car manufacturers whose clients were willing to pay more for a cleaner car. On the other hand, the agreement might be necessary to reduce the negative external effects on the environment. Another example is that of a public interest defence that relates to mitigating information asymmetry. Take the case of poultry farmers that invest in more living space for their chickens. As this entails higher production costs, these farmers will want to signal this extra quality to customers. If they agree upon a quality mark that reflects strict requirements on the minimum living space and if customers are indeed willing to pay more for these eggs, then the hallmark will improve their market position. The question, then, is whether this increase in market power is offset by the quality improvement for customers.

Next to market failures, governments may also have political motives for intervening in the market (see Figure 6.1). Usually two such motives are involved: the government may intervene in order to correct an unequal division of income (redistribution of welfare), or it may intervene to correct undesirable and wrong decisions or stimulate more desirable and correct choices on the part of individuals and firms. In these latter cases, economists speak of 'demerit' and 'merit goods', or paternalism.

Figure 6.1 **Public interest from an economic perspective**



In theory, a government should start by identifying the public interests at stake. In practice, however, government intervention is often based on a mix of political and economic motives. This complicates the definition of the relevant public interests. As a result, the definition of the public interest – even if the market failure is in itself clear – is often omitted. This is also because a public interest only arises when the cost of correcting failures outweighs the benefits, and governments rarely make this balance explicit. The public interest is therefore not adequately defined, and this is problematic. In the case of competition policy, competition authorities operate within frameworks that are set by governments. If public interests arise beyond the competition framework, and if the government fails to define these interests properly, it is not clear to the competition authority how it should handle these non-competition public interests. In the case of education and health care, for example, tensions arise between monitoring competition and the public nature of the service. When the public interests concerned are not properly defined, an independent competition authority will be unable to handle these tensions. What does the government mean by ‘good healthcare’? As long as this and what is meant by minimum quality standards

remains unclear, it will be difficult for the competition regulator to weigh a possible increase in market power against an improvement in quality. In this paper, we distinguish between two potential situations. In the first situation, the competition authority deals with a case where public interests have been properly defined, and in the second, it deals with a case where public interests have not been properly defined.

Non-competition public interests are sometimes referred to as non-economic interests. From an economic perspective, the distinction between economic and non-economic interests is irrelevant, because a broad concept of welfare is applied; in other words, a concept of welfare that includes things that people value, but that are not traded on markets. Perhaps well-being would be a better term. The only non-economic public interests are redistribution and paternalism. Both are political interests as discussed above.

The Guidelines do not use the term 'non-economic effects' either, but merely distinguish between competition and non-competition effects (Figure 6.2) and quantitative and qualitative effects (Figure 6.3). Non-competition concerns such as the protection of employment, the environment and media pluralism are frequently identified as public interests, but other terminology is also used for these: public policy or general interest considerations.¹³² Whichever term is used, it does not correspond with the economic concept of public interest.

¹³² AP Komninos, *Non-competition Concerns: Resolution of Conflicts in the Integrated Article 81 EC*, The University of Oxford Centre for Competition Law and Policy, Working Paper (L) 08/05, 2005; N Petit, *The Guidelines on the Application of Article 81(3) EC: A Critical Review*. Working Paper, Institut d'Études Juridiques Européennes, N 4/2009; H Schweitser, *Competition Law and Public Policy: Reconsidering an Uneasy Relationship. The Example of art. 81*. EUI Working Papers, LAW 2007/30 (2007); C Semmelman, 'The Future Role of the Non-competition Goals in the Interpretation of Article 81 EC' (2008) 1 *Global Antitrust Review* 15–47.

Figure 6.2 Examples of competition and non-competition effects

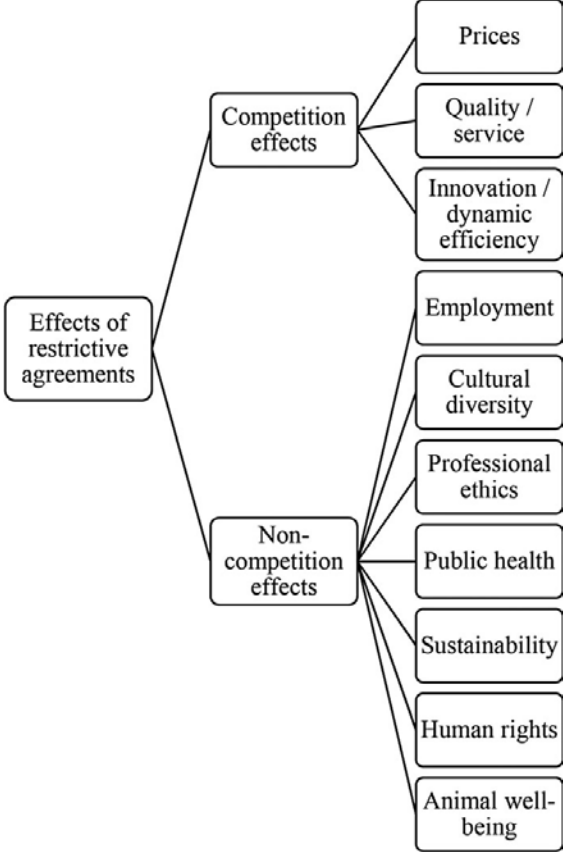
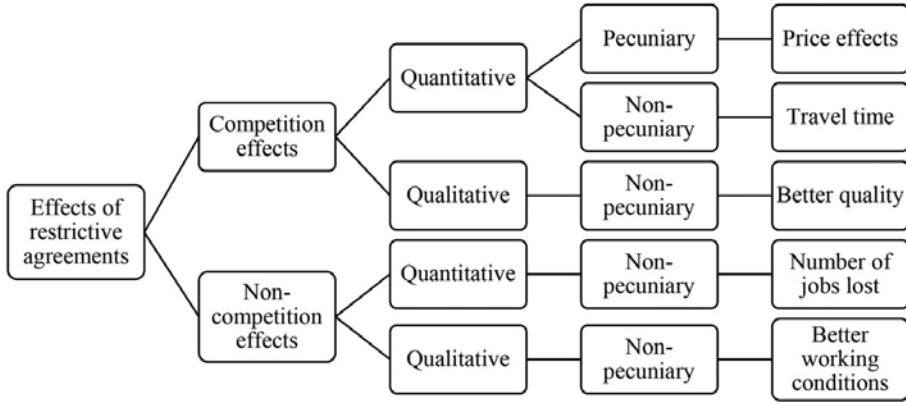


Figure 6.3 Dividing competition and non-competition effects into quantitative / qualitative and pecuniary / non-pecuniary effects



6.4 Differences between the Guidelines and the welfare economic approach taken by Art. 101(3)

Now that we have clarified the economic perspective and various important economic concepts, in this section we address another source of confusion: the differences between the Guidelines and the economic perspective. The Guidelines adopt an economic perspective when stating that the objective of Article 101 is to protect competition on the market as a means of enhancing consumer welfare and of ensuring an efficient allocation of resources (paras 13 and 33). Hence, in terms of the objective of cartel law, both the Guidelines and the welfare economic approach have the same starting point. However, as is summarized in Table 6.1, the Guidelines and the economic perspective differ on several other aspects. For one, the Guidelines do not take an economic perspective when they indicate that the kinds of efficiencies that can be taken into account when granting exemptions from the cartel prohibition are limited to cost advantages and qualitative efficiencies¹³³ (paras 59 to 72).

¹³³ The production of new or improved goods or services and better services as a result of technological advances and synergies that would not be possible without cooperation.

Table 6.1 Differences between Guidelines and economic perspective

Aspect	Guidelines	Economic perspective
Objective of Article 101	Protect competition on the market as a means of enhancing consumer welfare and of ensuring an efficient allocation of resources	Protect competition on the market as a means of enhancing consumer welfare
Kinds of efficiencies	Cost advantages and qualitative efficiencies	Economic benefits (correction of market failure) + Non-economic benefits (political motives)
Non-competition concerns accepted	Only cross-section clauses	Any public interest
Balancing	Anti-competitive effects versus pro-competitive effects	All effects including non-competition effects
Definition consumers	Users (direct + indirect)	All actors
Which market	Relevant + related market	All markets
Indirect effects	No, only effects on the same market	Yes, also effects on other markets
Distribution of effects	At least net neutral effect for users	Does not provide minimum requirements

Indeed, the Guidelines provide room for at least some non-competition concerns: ‘Goals pursued by other Treaty provisions can be taken into account to the extent that they can be subsumed under the four conditions of Article 81(3)’ (para 42). This means that effects on the environment (Article 11 TFEU), protection of employment (Article 147 TFEU), cultural diversity (Article 167 TFEU), consumer protection (Article 169 TFEU) and economic and social cohesion (Article 175 TFEU) can be taken into account. These other Treaty goals are called cross-section clauses. It is nevertheless confusing, in this regard, that the Guidelines refer to balancing anti-competitive and pro-competitive effects (e.g., para 11), thereby excluding non-competition effects. Most non-competition public interests do not entail pro-competitive effects.

One type of non-competition public interest that is included in welfare analyses, but that does not fall under the strict definition in the Guidelines, is that of externalities. The definition of ‘consumers’ in para 84 seems to imply that the benefits or potential benefits to individuals who are not users of the good covered by a restrictive agreement will not be taken into account. As they ignore the positive external effects (less the negative externalities) of the agreement on non-users of the good, restrictive agreements with

positive external effects might be judged not to comply with Article 101(3), despite benefitting a large group of people. Nevertheless, the Commission does recognize benefits for society as a whole when ‘the efficiencies lead either to fewer resources being used to produce the output consumed or to the production of more valuable products and thus to a more efficient allocation of resources’ (para 85). Hence, the Commission might see the benefit for users as a minimum requirement.¹³⁴ This would still mean, however, that the existence of positive external effects for non-users is irrelevant when deciding whether one of the four criteria has been satisfied (‘consumers must receive a fair share of the resulting benefits’).

This exclusion of non-users also affects the delineation of the markets involved. According to the Guidelines, both positive and negative effects of the agreement are measured and balanced in relation to the relevant market to which the agreement applies (paras 33–43). As the agreement can have an effect on non-users, however, it may also have an effect on other markets as well. The Commission states that if that other market is unrelated to the relevant market, negative effects on the relevant market cannot be compensated by positive effects on the other market. Compensation is only possible if these two markets are related, and this is only the case if the two markets involve by and large the same group of consumers (para 43). Hence, if roughly the same group of people suffers from a price increase but simultaneously benefits from efficiency gains, both effects can be taken into consideration in the application of Article 101(3). This is yet another difference between the Guidelines and the welfare perspective.

A final point before moving to the analysis of Dutch case law is the following. Adding to the confusion is the fact that the narrow perspective taken in the Guidelines also differs from case law. In *Compagnie Maritime Belge v Commission*, to cite just one of the many examples, the Court of First Instance held that:

For the purposes of examining the merits of the Commission’s findings as to the various requirements of Article [101(3)] of the Treaty ... regard should naturally be had to the advantages arising from the agreement in question, not

¹³⁴ ACM, *Position Paper Competition & Sustainability*. Draft version, July (Den Haag: Netherlands Authority for Consumer & Markets, 2013).

*only for the relevant market ... but also, in appropriate cases, for every other market on which the agreement in question has might have beneficial effects...*¹³⁵

Merola and Waelbroeck¹³⁶ suggest that the Guidelines do not include out-of-market efficiencies for the following reason:

Back in 2004, the Commission indeed feared that, in the case of an agreement which harms consumers of product A/Member State A and benefits to consumers of product B/Member State B, NCAs and national courts might give preference to consumers of a certain product market/geographic market, on the basis of non-economic considerations (national bias, for instance).

This is in line with the fear of the Commission expressed by Petit¹³⁷ and Townley.¹³⁸ According to these authors, the Commission deliberately aimed to reduce the relevance of public interests because it feared that some NCAs and national courts might take advantage of Article 101(3) to pursue public policy objectives at the expense of the competitive process.

Whether this aim has been achieved is questionable, since an analysis of case law shows that non-competition concerns have nevertheless been taken into account in cartel exemptions.¹³⁹ Petit¹⁴⁰ cites several cases that show that the protection of employment, cultural diversity and media pluralism, regional development and professional ethics are all public interests that have been taken into account when assessing Article 101(3). One case that has contributed to the confusion about whether a strict or wider

¹³⁵ General Court, 28 February 2002, *Compagnie Maritime Belge and others v Commission* T-86/95. ECR 2002, p II-1011, para 343.

¹³⁶ M Merola and D Waelbroeck (eds), *Towards an Optimal Enforcement of Competition Rules in Europe. Time for a Review of Regulation 1/2003?* (Global Competition Law Centre, 2010).

¹³⁷ N Petit, *The Guidelines on the Application of Article 81(3) EC: A Critical Review*. Working Paper, Institut d'Études Juridiques Européennes, N 4/2009.

¹³⁸ C Townley, 'Is There (Still) Room for Non-Economic Arguments in Article 101 TFEU Cases?', in C Heide-Jorgensen (ed.), *Aims and Values in Competition Law* (Copenhagen: Djøf Publishing, 2013).

¹³⁹ A Jones and B Sufirin, *EU Competition Law* (Oxford University Press, 2008).

¹⁴⁰ N Petit, *The Guidelines on the Application of Article 81(3) EC: A Critical Review*. Working Paper, Institut d'Études Juridiques Européennes, N 4/2009.

definition of public interests should be employed is that of the *Métropole Télévision I* case.¹⁴¹ The Court stated that:

Admittedly, in the context of an overall assessment, the Commission is entitled to base itself on considerations connected with the pursuit of the public interest in order to grant exemption under Article [101(3)] of the Treaty (para. 118).

6.5 Case law in the Netherlands: the ACM

A number of researchers have analysed which non-competition concerns are present in Article 101(3) case law.¹⁴² This paper focuses on case law in the Netherlands. Our first reason for doing so is that in its strategy, the ACM¹⁴³ states that its primary goal is to increase consumer welfare. Although this is not the same as stating that the goal of competition law is to increase consumer welfare, it does show that the ACM is willing to take an economic perspective. Furthermore, the ACM has paid a relatively large amount of attention to non-competition concerns, especially the concept of sustainability.¹⁴⁴ This concept involves environmental and natural resource issues, general healthcare, animal welfare and fair trade.¹⁴⁵ In doing so, the ACM has

¹⁴¹ Joined Cases T-528/93, T-542/93, T-543/93 and T-546/93, ECR 1996, II-649.

¹⁴² See, e.g., N Petit, *The Guidelines on the Application of Article 81(3) EC: A Critical Review*, Working Paper, Institut d'Études Juridiques Européennes, N 4/2009; H Schweitser, *Competition Law and Public Policy: Reconsidering an Uneasy Relationship. The Example of art. 81*. EUI Working Papers, LAW 2007/30 (2007); AP Komninos, *Non-competition Concerns: Resolution of Conflicts in the Integrated Article 81 EC*, The University of Oxford Centre for Competition Law and Policy, Working Paper (L) 08/05, 2005; SACM Lavrijssen, 'The Protection of Non-Competition Interests; What Role for Competition Authorities after Lisbon?' (2010) 5 *European Law Review* 634–659; C Semmelman, 'The Future Role of the Non-competition Goals in the Interpretation of Article 81 EC' (2008) 1 *Global Antitrust Review* 15–47.

¹⁴³ ACM, *Strategy Netherlands Authority for Consumers and Markets*, 20 September, Den Haag: Netherlands Authority for Consumer & Markets (2013).

¹⁴⁴ ACM, *Position Paper Competition & Sustainability*. Draft version, July (Den Haag: Netherlands Authority for Consumer & Markets, 2013).

¹⁴⁵ Minister of Economic Affairs, *Besluit van de Minister van Economische Zaken van (datum), (nr.), houdende beleidsregel inzake de toepassing door de Autoriteit Consument en Markt van artikel 6, derde lid, van de Mededingingswet bij mededingingsbeperkende afspraken die zijn gemaakt met het doel om duurzame ontwikkeling te bevorderen* (26 June 2013).

the support of the Dutch Minister of Economic Affairs, who has argued that sustainable production can be welfare-enhancing.¹⁴⁶ An examination of Dutch case law therefore provides a useful opportunity to analyse how this NCA weighs public interests in competition cases.

The majority of case law, both in the Netherlands and beyond, addresses agreements that allegedly produce environmental benefits. These cases concern environment-friendly packaging, collective waste management and recycling systems. The agreements constitute an attempt to respond to the market failure of externalities, that is, negative external effects on the environment. As such, these restrictive agreements concern non-competition public interests. It should come as no surprise that externalities are the most common market failure considered in competition cases. This is because first, public goods fall outside the jurisdiction of competition rules. These goods are services of a general interest or a general economic interest; that is, (economic) activities that public authorities identify as being of particular importance to citizens and that would not be supplied (or would be supplied under different conditions) if there were no public intervention. Examples include transport networks, postal services and social services. Secondly, information asymmetry may play a role in competition cases, as it can cause market parties to enter into a restricted agreement. Consider hallmark, certification or recognition schemes, for instance. If the requirements that a market party has to meet are too strict in terms of the public interest at hand, or if the requirements are discriminatory, these instruments may have anti-competitive effects. The public interest at hand is an externality (recall the example of the poultry farmers in section 5.3). A third reason why externalities are the most common market failure considered in competition cases relates to extensive experience with quantifying and monetizing external effects. Although this experience was mainly acquired in fields other than competition economics, the tools that have been developed can also be used in competition cases. In this way, the analysis of external effects fit into the framework of the Guidelines.

While present in case law, negative externalities have never played a decisive role in granting an exemption or, since 2004, in declaring Article 101(1) inapplicable. One reason for this could be that reducing negative

¹⁴⁶

Ibid.

externalities requires some form of coordination between market parties, something that may restrict competition. Often there are other, less restrictive ways to achieve the same reduction of negative externalities, meaning that not all four of the criteria in Article 101(3) are fulfilled.

Dutch case law on Article 101(3) and its national equivalent that involves non-competition public interests consists of four decisions made prior to 2004, and five informal opinions/analyses as of 2004.¹⁴⁷ These cases are summarized in Table 6.2Table 6.1. The two most recent analyses by the ACM – on coal and chicken meat – are highly relevant, because both the positive and the negative effects of the agreement are monetized. These analyses will be discussed in more detail.

Table 6.2 Dutch case law on exemptions to the cartel prohibition (Please note that the Dutch competition authority, ACM, was previously called the NMa)

Year	Description of the case	Decision / conclusion
1998 ¹⁴⁸	The Batteries Foundation, known as Stibat, represents 481 importers and producers of batteries. Stibat is responsible for the cooperative collection and processing of used batteries. The collection, storing and recycling of environmentally harmful batteries prevents the high cost of repairing environmental damage from being passed on to future generations. Based on the literature, Stibat argues that prevention of environmental pollution is generally cheaper than cleaning up pollution.	An exemption was granted for five years for the system of collecting and disposing of used batteries, which is collectively organized and financed by Stibat. The ACM took the view that Stibat’s system provides environmental and economic benefits. However, the ACM rejected the request for an exemption for the provisions relating to the compulsory charging of the next link in the distribution chain (in this case, the customers) for the cost of disposal and the associated commitment to declare the cost separately in invoices.

¹⁴⁷ Cases that involved non-competition public interests but that did not restrict competition (Article 101(1)) are excluded here.

¹⁴⁸ ACM, Decision on the Batteries Foundation, case number 51 (1998).

1999 149	The Dutch Flower Auctions Association (DFAA) brings together all seven flower auctions in the Netherlands. As the association of Dutch flower auctions, the DFAA sets specifications in the form of supply regulations, after consulting the entire chain. One part of the supply regulations concerns the packaging of florists' products. For a flower grower to be eligible for compensation, the packaging material should meet certain criteria conformity with DFAA's waste policy and sufficient demand).	Exemption from the prohibition on cartels was allowed with regard to the criterion that the packaging must be in conformity with the DFAA's waste policy. This exemption was granted for a ten-year period. The ACM stated that users would benefit from the use of less environmental harmful packaging material, which would lead to more sustainable economic development. The criterion of sufficient demand for a particular type of material, was rejected because this impedes the introduction of new material.
2001 150	The collection, storing and recycling of environmentally harmful white and brown goods, prevents the high costs of repairing environmental damage from being passed on to future generations. It was argued that it is cheaper to prevent damage to the environment than to repair damage to the environment. The agreement contained a compulsory charging of the next link in the distribution chain (in this case, the customers) for the cost of collecting the white and brown goods.	An exemption was granted for the collective system of collection, storing and recycling. Besides financing the collecting system, parties claim that externalizing the cost of collecting the goods would enhance the awareness and participation of consumers to the system. The ACM stated that there are less restrictive ways to achieve this. Hence, an exemption was denied for the compulsory charging to consumers.
2003 151	The Dutch Paper Recycling Foundation (hereafter the DPRF) has drawn up an agreement on the waste management contribution for paper and cardboard in 2002. The agreement forms part of the infrastructure for the collection and processing of old paper and cardboard, which is managed by the DPRF. The DPRF system aims to safeguard the collection and recycling of old paper and cardboard from households at times of low prices for old paper and cardboard, in order to bring about a high and stable collection ratio. The system becomes effective when market prices are too low to cover the costs of collection and recycling. At this point, a waste management charge is levied on (yet to be processed) new paper and cardboard and compensation is paid out to municipalities, so that they can dispose of old paper and cardboard free of charge.	Regarding the DPRF, the ACM was of the opinion that this removal structure had led to an improvement in the distribution of old paper and cardboard. It was also of the opinion that the consumer benefits from the fact that as the structure for removing old paper and cardboard is guaranteed, consumers can dispose of old paper and cardboard free of charge and the collection of old paper and cardboard continues to be guaranteed when international market prices are low. The resulting advantages to the environment also benefit the user. As the competition in the markets for new paper and cardboard is not substantially affected by the agreement, the agreement was granted a five-year exemption. While neither the benefits nor the non-competition public interest considerations were quantified, the authority stated that users of paper and cardboard receive a share of the

¹⁴⁹ ACM, Decision on the Dutch Flower Auctions Association (DFAA), case number 492, 9 July (1999).

¹⁵⁰ ACM, Decision on the White and Brown Goods Foundation, case number 1153, 18 April (2001).

¹⁵¹ ACM, Decision on the Dutch Paper Recycling Foundation (DPRF), number 3007/ 33.0316, case number 3007, 10 December (2003).

		benefits of better distribution and environmental benefits (the question of whether this share is fair appears to have been left unanswered).
2011 152	Shrimp fishermen wanted to agree on quantity-reducing measures, among other things. The goal was to guarantee shrimp stocks. However, the ACM concluded that stocks were not endangered.	The ACM concludes that the agreement and the competition restriction were not essential for attaining the stated objectives.
2013 153	Five coal plants that had been built in the 1980s were to be closed. This would lead to a more sustainable energy supply. The ACM viewed the positive effects on the environment as benefits in the sense of the first criterion of Article 101(3). Closing down the plants would result in an average annual emissions reduction of 4.7 Mton CO ₂ , 1.5 kton NO _x , 2.0 kton SO ₂ and 0.1 kton particles between 2016 and 2021.	The ACM concludes that the positive effects would not compensate for the increase in price.
2013 154	Four construction companies propose to renovate 1,000 houses (phase 1) to make them energy neutral. Parties claim that the initiative is necessary to enable the shift to innovative home renovation and to bring about optimal renovation techniques. In phase 2, 10,000 houses will be renovated by the four companies.	In its informal view the ACM acknowledges the benefits of energy neutral houses for current and future consumers. Furthermore the ACM sees that cooperation on innovating and developing techniques can be necessary. However, the ACM doubts whether the number of 1,000 houses are indeed necessary to achieve this goal. The authority casts even more doubt on the absence of competition between the construction companies in phase 2.
2014 155	The Ministry of foreign affairs wishes to gain more insight into the origin of coal sold on the Dutch market. This would improve local conditions of communities, workers and the environment in areas of origin of coal, with respect for human rights, labour, environment and conflict-sensitive business practices.	The ACM concluded that the information exchange deemed necessary by energy producers does not meet the criteria for indispensability or benefit to users. According to the ACM there are other alternatives and, because of the small share of Dutch purchases on the global coal market it is unlikely that the agreement will lead to better local conditions.

¹⁵² ACM, Informal view on MSC certification for shrimp sector, 7011 (2011).

¹⁵³ ACM (2013c).

¹⁵⁴ ACM, Informal view on the initiative De Stroomversnelling, ACM/DM/2013/205913 (2013).

¹⁵⁵ ACM, Advice on origin transparency in the coal chain, ACM/DM/2014/206176 (2014). ACM, Underlying information by letter ACM on origin transparency in the coal chain, ACM/DM/2015/201067 (2015).

2015 156	The agreement has as a goal improved living conditions for chickens. It involves sustainability arrangements made between producers and retailers about completely replacing from 2020 regularly produced broiler chicken meat. From 2020 on only chicken meat meeting certain conditions will be available in supermarkets.	The ACM analysed and quantified the costs and benefits with regard to animal welfare, the environment, and public health. The estimated price increase and hence the costs of the agreement outweighed its benefits.
-------------	--	--

The agreement to close five coal plants in the Netherlands forms part of the Energy Agreement for Sustainable Growth. The members of the trade association of the Dutch energy industry (the EN) planned to close down five coal power plants that had been built in the 1980s. Closing the plants in question would lead to reduced emissions of carbon dioxide (CO₂), sulphur dioxide (SO₂), nitrogen oxide (NO_x) and particles. The agreements would therefore make Dutch energy production more sustainable. The EN asked the ACM to assess whether the plan could be reconciled with the cartel prohibition. In its analysis, the ACM argued that the positive effects that a more sustainable energy supply would have on the environment could be seen as benefits in the sense of the first criterion of Article 101(3). The ACM recognized that the agreement would bring benefits for Dutch society as a whole.¹⁵⁷ The benefits for the environment were calculated for society as a whole by means of the prevention cost method and damage cost methodology.¹⁵⁸

At the same time, however, all energy consumers would have to pay higher prices. In practice, all Dutch citizens are energy consumers, meaning those who would benefit would be the same as those left worse off by the price increase. In total, the positive benefit of reducing emissions of the three

¹⁵⁶ ACM (2015).

¹⁵⁷ ACM, Analysis by the Netherlands Authority for Consumers and Markets (ACM) of the planned agreement on closing down coal power plants from the 1980s as part of the Social and Economic Council of the Netherlands' SER Energieakkoord, 26 September 2013.

¹⁵⁸ Using the prevention cost method, the reduction in emissions can be expressed in terms of avoided costs. It determines the value of an agreement's environmental benefits using the costs of other measures that, as a consequence, do not have to be taken (avoided costs). The damage cost methodology estimates the value of reduced emissions for Dutch citizens. This value is expressed mainly in terms of health and life expectations and not in terms of willingness to pay for a better environment. These and other methods are discussed in section 6.

components (CO₂, SO₂ and NO_x) was quantified at 30 million euros per year. This had to be weighed against the negative effect of the agreement, the expected price increase of 75 million euros per year. Based on these numbers, the ACM concluded that the positive effects did not compensate for the price increase.

A second analysis by the ACM concerned better living conditions for chickens.¹⁵⁹ The goal was to phase out the mass production of broiler chicken meat, which is currently part of the standard supermarket product range, completely by 2020. Mass production methods cause chickens to grow extremely fast, explaining their being known in the Netherlands as *plofkip* ('exploding chicken'). The ACM analysed the costs and benefits with regard to animal welfare, the environment and public health. The benefits for the environment were calculated for society as a whole by means of the prevention cost method. The authority furthermore concluded that the agreement did not have any effect on public health, hence no benefits were included. The benefits concerning animal welfare were quantified using willingness-to-pay surveys. Whereas in the coal plants case, the ACM concluded that the benefits accrued to the entire population, in this case, ACM argued that they applied only to those people who cared about animal welfare and were indeed willing to pay for it. It was found that consumers were willing to pay 68 eurocents per kilo for animal welfare. The environmental effects amounted to 14 eurocents per kilo, resulting in total benefits of 82 eurocents per kilo of chicken meat. The estimated price increase and hence the cost of the agreement was 1.46 euros per kilo, and thereby outweighed the benefits of the agreement.

Both assessments by the ACM are clearly at odds with the Guidelines. After all, the latter only accept economic efficiencies. However, the assessments are consistent with the position paper of ACM and the policy rules of the Minister of Economic Affairs. In both assessments, the non-competition public interest was monetized and weighed against competition concerns. The ACM concluded with respect to both agreements, however, that the benefits

¹⁵⁹ ACM, ACM's Analysis of the Sustainability Arrangements Concerning the 'Chicken of Tomorrow'. Reference: ACM/DM/2014/206028, 26 January 2015.

would not compensate for the price increase that would result from the agreement.

To summarize, since 2004 a small number of Dutch cases have been brought under Article 101(3). In none of these cases were non-competition public interests the *rationes decidendi* for allowing the agreement. This can partly be explained by the fact that the system is based on self-assessment. Self-assessments tend to remain uncovered until a competition authority starts to ask questions or competitors raise objections. Consequently, we do not have any court views on the arguments used in the analysis of Article 101(3). Although the ACM and the Dutch Ministry of Economic Affairs have done their best to provide guidance on the application of externalities, it is likely to remain unclear to undertakings how they should approach this and other non-competition interests.

6.6 Towards a framework for balancing benefits

In light of this, we now consider some ways in which non-competition interests could be included in the assessment of cartel cases. Returning to the distinction made earlier, two situations can arise: a competition authority either deals with a case in which public interests are properly defined, or it handles a case in which public interests are not or have not been properly defined.

Situation 1: The government fails to define public interests properly (broadly speaking, this is the current situation)

In this first situation, there are two options for allowing for other public interests in competition cases. These options are in addition to Article 101(3) and constitute an attempt to convince the NCA that the disadvantages of restricting competition may be offset by efficiency gains, by pointing to countervailing buyer power and the potential entry of efficiency and quality improvements. Given the understandable reluctance on the part of most competition lawyers to admit that competition is indeed restricted, and given that it is uncertain whether an NCA will accept a defence on the grounds of efficiency, there have been very few attempts to construct a defence on the grounds of efficiency. This lack of successful examples further discourages undertakings from using an efficiency-based defence.

The first option is to investigate whether competition is indeed restricted by an agreement. If the market parties involved are able to show that there is no noticeable restriction of competition, whereas the NCA assumes that anti-competitive effects may occur, then the agreement cannot be prohibited on the basis of Article 101(1). This means that other public interests that the market parties involved would like to serve with the agreement are not put at risk. After all, Article 101 entails a two-stage process whereby it is impossible to consider the benefits and disadvantages simultaneously. Instead, the disadvantages must be assessed first (in paragraph 1). In other words, one must first be found guilty before one can cite efficiency as a defence; possible benefits cannot be included in the equation until a restriction on competition has been established (in paragraph 3).

The second option is to inquire into the feasibility of classifying the restriction of competition as an ancillary restraint. This is relevant in cases in which, besides a main non-restrictive activity or transaction, an ancillary restraint is necessary for the implementation of the same activity or transaction. Supposing that the main clause is not problematic under the cartel prohibition (no restriction of competition) and that the ancillary clause is in itself anti-competitive, but also necessary to achieve the main clause, then the ancillary restriction is not prohibited on the grounds of Article 101(1). Consider the example of saving a fish species from extinction (main clause) by setting fishing quotas (ancillary restriction). For the quota to be allowed, it should be shown objectively that in the absence of this restriction, it would be difficult or impossible to save the fish species from extinction. In that case, the restriction would be regarded as objectively necessary for the implementation of the agreement and proportionate to it. As the Guidelines rightly stress in para. 30, the application of the ancillary restraint concept is not the same as the application of a defence under Article 101(3): “The application of the ancillary restraint concept does not involve any weighing of pro-competitive and anti-competitive effects. Such balancing is reserved for Article [101(3)].”

Situation 2. The government has defined public interests (the ideal situation)

If the relevant public interests have been properly defined by politicians, NCAs can balance non-competition public interests against competition

concerns. The tool that is pre-eminently suited to weighing up the various anti-competitive and welfare effects is social cost-benefit analysis; SCBA for short. SCBA is grounded in welfare economics. In essence, SCBA entails weighing up different effects of the restrictive agreement by comparing its welfare effects on society as a whole to a counterfactual (no agreement or a less restrictive agreement). This instrument is explained in more detail below.

The inclusion of the welfare criterion makes it possible to measure the effects of restricting competition on consumer welfare. Admittedly, this will make the outcome of a case more unpredictable; in other words, legal uncertainty will increase. It is also true that consumer welfare is difficult to measure, but this applies equally to measuring whether or not competition has been restricted. As Townley¹⁶⁰ rightly points out, “Ease of measurement is not a proxy for importance.”

Although conducting a welfare analysis of competition policy using an SCBA might sound inappropriate and impractical, this is not the case. In addition, although one might assume that such analyses only deal with hard economic issues such as sales and employment, this is also untrue. After all, the economic concept of welfare is broad and covers environmental impact and the importance of safety, for example, as well as all of the other aspects that influence welfare.

Social Cost-Benefit Analysis methodology: a brief explanation

SCBA is a well-known and broadly used instrument for assessing the welfare effects of various projects.¹⁶¹ It provides an overview of the effects, risks and uncertainties of a measure and the resulting costs and benefits to society as a whole. By quantifying these advantages and disadvantages as much as possible, and assigning monetary values to them, SCBA provides insights into

¹⁶⁰ C Townley, ‘Which Goals Count in Article 101 TFEU? Public Policy and its Discontents’ (2011) 9 European Competition Law Review 441–448.

¹⁶¹ See RJ Brent, *Applied Cost-Benefit Analysis* (Cheltenham: Edward Elgar Publishing, 2006). For an overview of multiple studies and G Romijn and G Renes, *A General Guidance for Cost-Benefit Analysis* (The Hague: CPB Netherlands Bureau for Economic Policy Analysis/PBL Netherlands Environmental Assessment Agency, 2013) for a guide to using SCBA). The definitions used in this section are taken from Romijn and Renes.

the welfare effects of the measure expressed as the balance in euros of the benefits minus the costs. Expressing effects in monetary terms as far as possible makes it possible to compare these effects and present the results in an accessible form. The net present value of all effects is calculated to allow effects at different moments to be compared. The analysis is therefore intergenerational and includes future consumers. The outcome (aggregate of all effects) is the increase or decrease of welfare.

The social cost and benefit analysis itself does not comment on whether the restrictive agreement should be exemption, it only shows the welfare effects. It aggregates all effects for each actor and for all actors together. This twofold approach enables one to see respectively who benefits from the restrictive agreement and who is harmed. This overview on both actor level and society level provides insight in the distribution of effects. So, although cost-benefit analysis does not put a value on the degree to which various groups in society experience the costs or benefits of a measure, it can reveal and describe these distributional effects. This approach enables the NCA to see who benefits from the restrictive agreement and who is harmed, and whether the agreement has net aggregate benefits or costs. This overview at both the level of actors and of society provides insight in the distribution of effects and would enable an NCA to focus on consumer welfare.

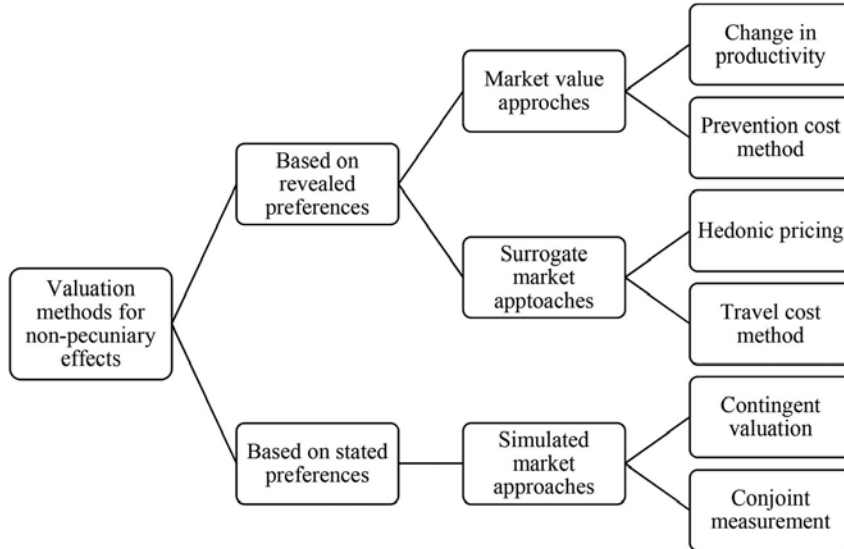
As described in section 5.4, the Guidelines use a rather narrow framework for balancing the negative effects and positive benefits of a restrictive agreement. By contrast, using the SBCA framework for an analysis of the cartel exemption takes all welfare effects into account. We can make a distinction between two types of effects: direct effects are effects in the markets where the intervention is made, and indirect effects are those in related markets. Direct effects are caused by the restrictive agreement and indirect effects are caused by the direct effects. For example, if a restrictive agreement leads to more cost efficiency, this is termed a direct effect. An indirect effect can occur where the producers pass on these efficiency gains to consumers in the form of lower prices. To adopt the terms of the Guidelines, one could speak of effects on the relevant market versus effects on related markets (para. 43). For example, fuel efficiency gains caused by the introduction of a new production method agreed by two or more car manufacturers affect the car market, but accompanying fuel efficiency gains are also enjoyed in the

energy market. Both kinds of effects can be pecuniary or non-pecuniary. In the latter case, economists speak of external effects (see section 5.3).

There are several methods for monetizing these effects (Figure 6.4), and these methods are based on various categories. The primary distinction in valuation methods is between stated and revealed preference methods. Stated preference methods are based on preference data that are not observable in the market and that have to be drawn from people's stated responses to hypothetical questions in surveys in which a market is simulated. On the other side, revealed preference methods are based on preference data that are observable in the market and that can be revealed from observations of real-world choices. Revealed preference methods can be further divided into the market value approach and the surrogate market approach. The former determines pecuniary value by using the costs of, or the revenues gained from, the effects themselves. Consider preventive costs that are intended to prevent the occurrence of a particular kind of damage. Surrogate market approaches obtain monetary values from the costs or revenues of surrogates, such as travel expenses or house prices. All of these valuation methods are frequently used in practice and have been tested both in the academic literature (peer review) and in court cases.

Although SCBA is a powerful tool, it has drawbacks. For one thing, a SCBA requires that all (important) effects can indeed be quantified and monetized. If this is not possible, then a SCBA is not suitable. An inherent limitation of SCBA is that it can never take into consideration all the welfare effects of agreement. The best approach seems to be an SCBA complemented by an explicit and clear presentation of effects that cannot be monetized. Another disadvantage is that discussion can arise about the assumptions and that the often complex calculations can be challenged. This applies more strongly as the method is based on stated instead of revealed preferences. A third disadvantage is that you can strategically deploy the limitations of the SCBA by exaggerating or downplaying them depending on the desired outcome.

Figure 6.4 Overview of valuation methods



In view of the public and academic debate on the inclusion or exclusion of non-competition public interests in competition policy, we would recommend using another term for SCBA. To avoid confusion, we suggest that ‘competition cost-benefit analysis’ would be a better title for the method. It makes it clear that the entry requirement for such an analysis is the competition restriction. The competition cost-benefit analysis itself does not comment on whether the restrictive agreement should be exempted; it only shows its effects, and is thereby a useful tool for the competition authorities that are ultimately responsible for the decision.

6.7 Final remarks

The waning popularity of free-market policies was caused in part by the overly one-dimensional approach taken to the market in the pre-crisis period, as well as by the fact that unrealistic expectations were raised about the outcomes of deregulated markets. For a long time, the general expectation was that the deregulation of markets was preferable, as long as these markets were strictly supervised by the competition authorities. As indicated above, however, market failure is more comprehensive than market power,

and deregulation should be based on an analysis of all of the public interests involved.

After the 2008 crisis, the general public took the view that the unilateral policy emphasis on free markets and competition might be jeopardizing other public interests. This led to pressure on NCAs to weigh up other public interests when assessing competition cases. The ACM in the Netherlands, for example, takes not only prices, but also quality and accessibility into account in its assessment of cases in the healthcare sector.

The solution to neglect of non-competition-public interests in competition policy, perceived or otherwise, should not be to broaden the scope of supervision to include other interests. By contrast, governments should be required to define public interests more explicitly. Governments are responsible for defining public interests, and this task cannot be shifted to NCAs.

Competition law, after all, is only meant to resolve problems concerning market power. Governments should solve other market failures with other policy instruments. In other words, the balancing of various types of public interests ultimately requires political judgment, and politicians are democratically elected in order to make such decisions. An NCA has only one task: to assess the competitive effects of mergers, cartels and abuse of dominance cases. Whether interests such as employment or security of supply outweigh the restriction of competition quickly becomes a political issue, and NCAs should not concern themselves with such balancing acts. There is one exception, however: provided that the public interest that is invoked to legitimize the efficiencies has a proper foundation in law and/or explicit political decisions (such as a minimum quality standard for healthcare), then it would be much more feasible to weigh the various interests in a social cost-benefit analysis. In practice, however, public interests tend not to be properly defined.

Extending the scope to cover other public interests would also be risky, because market parties might get the impression that, in the context of a self-assessment, they could freely weigh the anti-competitive effects of their agreements against the possible benefits.

A strict application of the cartel prohibition does not mean that competition supersedes other public interests. All legally approved cartels fall outside the

ban on cartels; a statutory fixed book-price agreement is allowed, for example, but a private book-price-fixing agreement is not. Another example is the Albany case, which created a legal exception for agreements made in the framework of collective labour agreements.¹⁶² The reason for allowing a legal cartel is that other public interests are deemed to be more important than competition.

¹⁶² Case C-67/96, ECR 1999, I-5751

7. Consumer damages for breach of antitrust rules. How to reach full compensation for consumers?

Abstract

Over the years the number of damages claims has increased. The level of compensation, however, has understated the true harm suffered by purchasers. Hence, victims of a breach of antitrust rules are not fully compensated. This is true especially for consumers since the large majority of damages cases pertain to non-consumers claiming damages.

There has been some case-by-case empirical research on consumer damages but no methodological study has been done on the calculation of consumer compensation in general. This paper aims to fill that gap. By using the example of a cartel, we consider different calculation methods. We determine the theoretical upper and lower limits for compensation. These limits can be easily applied in practice when the consumer's income spent on a cartel good and the overcharge are known. More importantly, by using these limits, consumers are fully compensated for the harm suffered as a result of price-fixing.

JEL: D11, D21, L13, L41

7.1 Introduction

Compensation paid to purchasers because of price-fixing often significantly understates the true harm suffered.¹⁶³ Damages awarded usually only consist of the loss of consumer surplus while deadweight loss is often ignored. Even when deadweight loss is taken into account, the total damages are lower than the harm suffered by purchasers.¹⁶⁴ This is also the case when the level of overcharge is known. One of the reasons for this understatement is the general lack of data on the counterfactual quantity – the quantity purchased if price-fixing would not have occurred. Therefore, in practice, victims of price-fixing are not fully compensated. This is the case in particular for consumers who suffered as a result of price-fixing because most damages cases have – until now at least – been initiated by businesses and not by consumers. This is true even though the European legal framework explicitly acknowledges harm for all victims.¹⁶⁵

One of the problems with consumer damages is that it still remains unclear how *every* individual victim who suffers harm caused by a breach of the antitrust rules could be compensated *fully* for his losses.¹⁶⁶ Some case-by-case empirical research on consumer damages has been done¹⁶⁷, but no methodological study has been performed regarding the calculation of consumer

¹⁶³ L. J. Basso & T.W. Ross, Measuring the True Harm from Price-Fixing to Both Direct and Indirect Purchasers, *Journal of Industrial Economics*, 58(4): 895-927 (2010).

¹⁶⁴ Basso & Ross (2010), p. 900. The authors use ‘harm’ to represent the losses in economic surplus faced by purchasers. ‘Damages’ are a legal term representing payments that cartel members must make as a result of the harm caused.

¹⁶⁵ Anyone, including both consumers and undertakings, has the right to claim compensation before the Court for the harm caused by them by an infringement of article 101 or 102 TFEU. (Directive 2014/104/EU of the European Parliament and of the Council of 26 November 2014 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, par. 3.)

¹⁶⁶ Another problem is that the individual losses of consumers are often not large enough to start a damages procedure. Due to the absence of options for collective redress, consumer damages are often not claimed at all. For this reason, the European Commission invited Member States to adopt a collective redress framework in 2013.

¹⁶⁷ F.e. U. Laitenberg & F. Smuda, Estimating consumer damages in cartel cases, *Journal of Competition Law and Economics*, 11(4), 955–973 (2015).

compensation in general.¹⁶⁸ The European Consumer Consultative Group therefore urges that “innovative and practical solutions to the calculation of damages are needed to replace the often impossible task of calculating the exact loss”.¹⁶⁹ This paper tries to answer to this call. Based on different compensation methods it shows what level of compensation should be granted to consumers for their damages suffered by infringement of antitrust rules. Infringement can either concern a price-fixing cartel or abuse of dominance. In this paper, a cartel is taken as an example (article 101 TFEU).

The different methods provide an upper and lower limit. Both the upper and lower limit of compensation are higher than damages awarded in practice. Our results are therefore consistent with Basso & Ross (2010). To partly overcome the problem of data availability as pointed out by Basso & Ross (2010), the upper and lower limits of compensation are established using only two elements: the overcharge and the portion of his income that the consumer has spent on the cartel good. The presented limits are not the holy grail in terms of data requirements. The overcharge¹⁷⁰ still needs to be calculated, but calculating the counterfactual quantity is no longer required. More importantly, consumers are fully compensated for the harm suffered as a result of price-fixing and hence these limits are in line with the EU Directive on damages.¹⁷¹

This paper starts with a description of how consumers are harmed by a price increase. This is based on theoretical microeconomics and lays the groundwork for the discussion of the three different methods used to determine

¹⁶⁸ The existing empirical research on consumer damages results in an overcharge multiplied by the quantity purchased (or overcharge as a percentage of turnover). When it comes to consumer damages, there is no equivalent of the lost profit that businesses can claim from infringers.

¹⁶⁹ European Consumer Consultative Group (2010), *Opinion on private damages actions*. Available at: <http://bit.ly/28XoNPG>, § 2.3. Last accessed: July 10, 2017.

¹⁷⁰ In this paper, the overcharge is defined as the difference between the cartel price and the counterfactual price, divided by the counterfactual price. This formula is used, among others, by J.M. Connor & Y. Bolotova, Cartel overcharges: survey and meta-analysis, *International Journal of Industrial Organization*, 24: 1109–1137 (2006) and by M. Boyer & R. Kotchoni, *The Econometrics of Cartel Overcharges*, Cirano, 2011s-35 (2011).

¹⁷¹ Directive 2014/104/EU, par. 13.

the appropriate levels of consumer compensation (section 6.2). The literature on welfare economics, in particular when it is based on consumer preferences, considers different compensation methods for price increases, such as the Hicksian method, the Slutsky method and the 'classical competition method'.¹⁷² Each method uses a different point of departure for determining the level of compensation: the Hicksian method uses the utility level, the Slutsky method uses the consumption basket and the classical competition method uses the consumer surplus. To determine the level of compensation, each model needs to be translated into the standard theory of demand. For this reason, section 6.3 describes the Marshallian and Hicksian demand curves. These demand curves are used to compare the level of compensation following each of the three compensation methods. This comparison results in an upper and lower limit of compensation, which is described in section 6.4. Using the quasi-linear and Cobb-Douglas utility functions, we show that these limits are independent of consumer preferences (section 5). These utility functions are chosen because they describe the most common forms of consumer preferences, the unit price elasticity is applicable and for an income elasticity of zero, two of the compensation methods are equal. The conclusions drawn in section 6 therefore hold true when these utility functions are applied. The calculation methods are discussed in the Appendix.

7.2 Three compensation methods

How do cartels harm consumers? To explain the effects of antitrust violations on individual consumers, we use the standard utility and welfare theory. Let us take a normal good, for instance beer, pasta or e-books, that later will become the cartel good.¹⁷³ Consumers spend the rest of their income on all other products and services. We assume that an individual consumer

¹⁷² This term is chosen because this method closely resembles the theoretical framework for calculating damages in antitrust cases (e.g. Oxera (2009), *Towards non-binding guidance for courts*, Study prepared for the European Commission, December 2009 (2009), p. 14 & RBB (2016), *Study on the Passing-On of Overcharges*. Final report. Report No. KD-02-16-916-EN-N, p. 10).

¹⁷³ All examples are real life cartel examples. During the 1990s a Dutch beer cartel existed and more recently, in 2013, a German beer cartel was fined. The Italian National Competition Authority (NCA) fined a pasta cartel in 2009. Recently, Apple settled a case about price-fixing of e-books for American consumers (see <https://ebooklawsuits.com/mainpage/Home.aspx>). Last accessed: July 15, 2017.

spends his money fully in such a way that he maximizes utility. In other words, he makes optimal choices.

In the original situation, all firms producing a specific product respect the antitrust rules and compete normally. In that situation, the consumer price of the product equals its competitive price.

Then (some) producers of the product decide to collude and increase the price. The consumer will be affected in two ways.¹⁷⁴ First of all, due to the price increase, the cartel product becomes relatively more expensive and the other products relatively less expensive. Secondly, the consumer's income allows him to buy less of the cartel product than before, which causes his real income to decrease. As a result of these two effects, the consumer is no longer able to consume his original optimum number of goods. Furthermore, the consumer is forced to spend his money differently. As a result, he experiences less utility than in the counterfactual situation. This loss of utility is the harm that the consumer suffers when a cartel increases the price.¹⁷⁵

Theoretically, three different methods can be considered to determine the appropriate level of consumer compensation. All three of them are discussed below.

The Hicksian method: compensating utility

This method was coined by Hicks. A loss in utility can be repaired by means of what every economic handbook on microeconomics calls *Hicksian compensating variation*. Compensating variation refers to the amount of additional income a consumer would need to reach his initial utility level after a

¹⁷⁴ Hence, the consumer faces a price increase from p_0 to p_c . Please note that when calculating the consumer damages based on consumer prices, the extent of passing-on is irrelevant and is therefore ignored. For cases where the overcharge is known only in the upstream markets, passing-on should be taken into account from the direct purchaser to the end consumer. See RBB (2016) for more information on how to do that.

¹⁷⁵ This also includes consumers who cease to purchase the cartel product because of the price increase.

change in prices, or a change in product quality, or, for that matter, the introduction of new products.¹⁷⁶

As the Hicksian compensating variation provides consumers with exactly the same utility as before the infringement, it seems to be a perfect method to achieve full compensation for consumers. Unfortunately, using this method is practically infeasible. First of all, it does not compensate for the damages suffered by counterfactual consumers who stop purchasing due to the price increase. Secondly, the compensating variation depends on several factors: the overcharge, the price of the other goods, the consumer's income and the exact form of the utility function. As a result it is difficult, if not impossible, to determine the compensating variation per consumer in real life, as only a consumer's income can be assessed accurately and objectively. Estimating the overcharge has proven to be difficult.¹⁷⁷ Utility functions differ per individual by definition and there is no method for computing the price of all other goods. Even though the Hicksian method provides us with relevant insights about utility loss, it does not seem feasible to apply it in practice for compensating victims of antitrust infringements.

¹⁷⁶ J.R. Hicks, *Value and capital: an inquiry into some fundamental principles of economic theory*. Oxford: Clarendon Press (1939).

¹⁷⁷ See J.E. Lopatka & W.H. Page, *Indirect purchaser suits and the consumer interest*, ANTITRUST BULLETIN, 48, 531 (2003).

Box 1 Simple example to illustrate the Hicksian method

Let's explain the Hicksian method with a simple example. Imagine that the firms that produce product x agree to raise the consumer price of x from 1 euro to 1.20 euro. As the consumer is a direct purchaser and end consumer, he is faced with the complete cartel overcharge. There is no passing-on in this case. The price of all other products remains 1 euro.

As explained above, an increase in price p_x forces the consumer to spend his money differently on x and the other goods, Y . In order to explain this difference, we must assess how the price increase affects his demanded quantity of x and Y . To do that, we use the consumer's utility function and income. For the simplicity of this example, let's assume the utility is represented by a Cobb-Douglas (CD) utility function:

$$U(x, Y) = x^{0.1}Y^{0.9}$$

The CD utility function implies that a consumer always spends the same portion of his income on a good. In this example he spends 10% on x and 90% on Y . The exact demanded quantity depends only on the price. Assume that the consumer's income is 2,000 euro, hence he spends 200 euro on x . As a result of the price increase from 1 to 1.20 euro, the demanded x will drop from 200 to 166 units, while the consumption of Y will not change.

Consequently, his utility will drop. In order to exactly compensate for this utility loss, his income needs to increase by 36.9 euro. If the consumer's initial income is higher than 2,000 euro, the amount of money needed to compensate for his utility loss will increase accordingly. For instance, when the original income is equal to 3,000 euro, 55.2 euro will be needed to repair the utility that he lost. This is shown graphically in Appendix, part VII.A)

Consumers who spend a larger portion of their income on x are more strongly affected by the increase in x 's price. Imagine for instance another consumer who values x more than the previous consumer. His utility is reflected by the following function:

$$U(x, Y) = x^{0.25}Y^{0.75}$$

The Slutsky method: compensating consumption

A second method is the Slutsky compensating variation. This method has been mentioned frequently in consumer theory. The income compensation equals the additional income that would enable consumers to buy the original combination of the cartel good and the other goods.¹⁷⁸ The Slutsky compensating variation does not bring victims back to their initial level of utility after an antitrust infringement, but it does allow them to enjoy the amount of goods that they would have bought if antitrust rules had not been violated. In other words, the consumer can buy the same product basket as in the counterfactual situation. However, his new optimal purchase lies at a higher utility level.

In the case of the Slutsky method, the damages or compensation per unit equal the overcharge. To get the total damages, this overcharge needs to be multiplied by the quantity purchased in the counterfactual. The total compensation consists of two parts: it includes the overcharge that consumers paid for the number of cartel products that they are still buying, plus the damages for not being able to buy as many units as they would have done in the counterfactual. For this latter part, the overcharge is multiplied by the difference between the counterfactual quantity and the reduced quantity caused by the price increase. Overall, this simply leads to damages being equal to the overcharge times the quantity demanded in the counterfactual. Consequently, the consumer achieves a higher utility level after compensation. Therefore, the damages calculated using the Slutsky method result in a compensation that is higher than the financial damages in terms of utility loss and hence than the Hicksian compensation.

¹⁷⁸ A. Mas-Colell, M. Whinston & J. Green, MICROECONOMIC THEORY, Oxford University Press, New York (1995).

Box 2 Simple example to illustrate the Slutsky method

Assessing the monetary value of the Slutsky compensating variation is relatively simple. Let's again assume that some producers of product x agree to raise the price of product x from 1 euro to 1.20 euro, and that consumers will be charged the complete overcharge (the entire increase is passed on). The price of Y remains equal to 1 euro. Assume again that the consumer has an income of 2,000 euro and that his utility function is

$$U(x, Y) = x^{0.1}Y^{0.9}$$

At the original price, he will consume 200 units of x . According to the Slutsky method, he must be able to buy the same amount of x after receiving compensation. This implies that his income needs to be raised by 40 euro ($200 \cdot 0.2$ euro). If his income equals 3,000 euro, he needs to receive compensation to the amount of 60 euro ($300 \cdot 0.2$ euro). This is shown graphically in Appendix, part VII.B.

The utility function of another consumer who spends more money on x than the first consumer, is:

$$U(x, Y) = x^{0.25}Y^{0.75}$$

In this case, the consumer will need to receive more compensation to overcome his spending loss. If he has an income of 2,000 euro, he will need 100 euro to keep on consuming 500 units of x ($500 \cdot 0.2$ euro). If he has an income of 3,000 euro, the Slutsky compensating variation is 150 euro, which will enable him to keep on buying 750 units of x ($750 \cdot 0.2$ euro).

Similarly to the Hicksian method, the Slutsky method has some practical limitations. For instance, the amount of the cartel product that a consumer would have purchased at the counterfactual price is essential in calculating the Slutsky compensating variation. This counterfactual quantity is hard to determine.

One way to determine the counterfactual is through utility functions, but as stated above, these are practically infeasible. Since most theoretical models

or simulations also use utility functions to determine damages for consumers, these methods are also not feasible in practice. A more practice proof way to determine the counterfactual is by comparing the amount of purchased good during the cartel period with the amount before and/or after the cartel period. This before-and-after approach entails comparing the price and/or quantity during the cartel with the same competition parameters before and/or after the cartel. This development over time makes it possible to determine the counterfactual price and quantity. Several methods can be used to determine the counterfactual price.¹⁷⁹ While the before-and-after approach may be a good approach for companies claiming their damages from the cartel members, it is unlikely that consumers will keep a purchasing administration over a longer period of time. Hence, without the possibility of translating it into a practical demand curve, the Slutsky compensating variation seems only to be of theoretical use.

Classical competition method: compensating surplus

A third method to determine the appropriate level of consumer compensation is the one frequently mentioned in the competition literature.¹⁸⁰ The European Commission also recognizes this method as one that can determine the effects of a price-fixing infringement. For convenience, this method will be called the 'classical competition method'.

While the other two theories involve damages based on the change in utility (Hicks) or income (Slutsky), the classical competition method is based on demand. The starting point is the change in demand of an individual consumer after a price increase. The damages according to the classical competition

¹⁷⁹ See among others Oxera (2009); H.W. Friederiszick & L.H. Röller, *Quantification of harm in damages actions for antitrust infringements: Insights from German cartel cases*, JOURNAL OF COMPETITION LAW AND ECONOMICS, 6(3): 595–618 (2010); European Commission (2011), *Quantifying harm in actions for damages based on breaches of Article 101 or 102 of the treaty on the functioning of the European union*, Draft guidance paper, June 2011 (2011); E. Clark, M. Hughes & D. Wirth, *Study on the conditions of claims for damages in case of infringement of EC competition rules-Analysis of economic models for the calculation of damages*, Ashurst, Brussels (2004).

¹⁸⁰ See among others Oxera (2009) and M. Hellwig, *Private Damage Claims and the Passing-On Defense in Horizontal Price-Fixing Cases: An Economist's Perspective*, In Basedow, J. (ed.), PRIVATE ENFORCEMENT OF EC COMPETITION LAW, Kluwer Law Aspen Publishers, New York (2007).

method consist of two effects. First, if the price increases from the competitive price to the cartel price the quantity demanded decreases. This shift in the demand is the *allocation effect*. In economic literature, this is also called the welfare loss or deadweight loss, because no one benefits from this effect. Consumers cannot buy all units demanded and the cartel members do not sell these units and hence do not receive the related revenues. The second effect is the *distribution effect*. A consumer buys fewer units of the cartel good at a higher price. To determine damages according to the classical competition method, the two effects are added together.

An important advantage of the classical competition method compared to the other two methods is that it can be used for actual consumers *and* counterfactual consumers who stopped buying the cartel product after a price increase. If the price rises, the demand of the counterfactual consumer for that product decreases to (almost) zero. Hence, the counterfactual consumer is only faced with the allocation effect as he stops buying the product at the cartel price.

The classical competition method has similar limitations as the other two methods since this method can only be used in practice if the price level and the quantity purchased in the counterfactual are known. Even though the European Commission (2011) and Oxera (2009) both present the classical competition method as useful in practice, this remains challenging when it comes to consumer damages claims. Take the example of the beer cartel in the Netherlands in the 1990s. It is very unlikely that consumers kept track of the number of beers they bought during a period of several years. Furthermore, as Basso & Ross (2010) show, using this method results in a compensation level that is often not enough for full compensation.¹⁸¹

Each of the described methods has its limitations in calculating consumer damages in practice. This is partly due to the fact that the first two methods are based on individual utility specifications, which are often unknown in practice. One way to get around this problem is to translate utility functions to demand functions. The latter has more observable characteristics – for instance, price elasticity – that can be applied in practice.

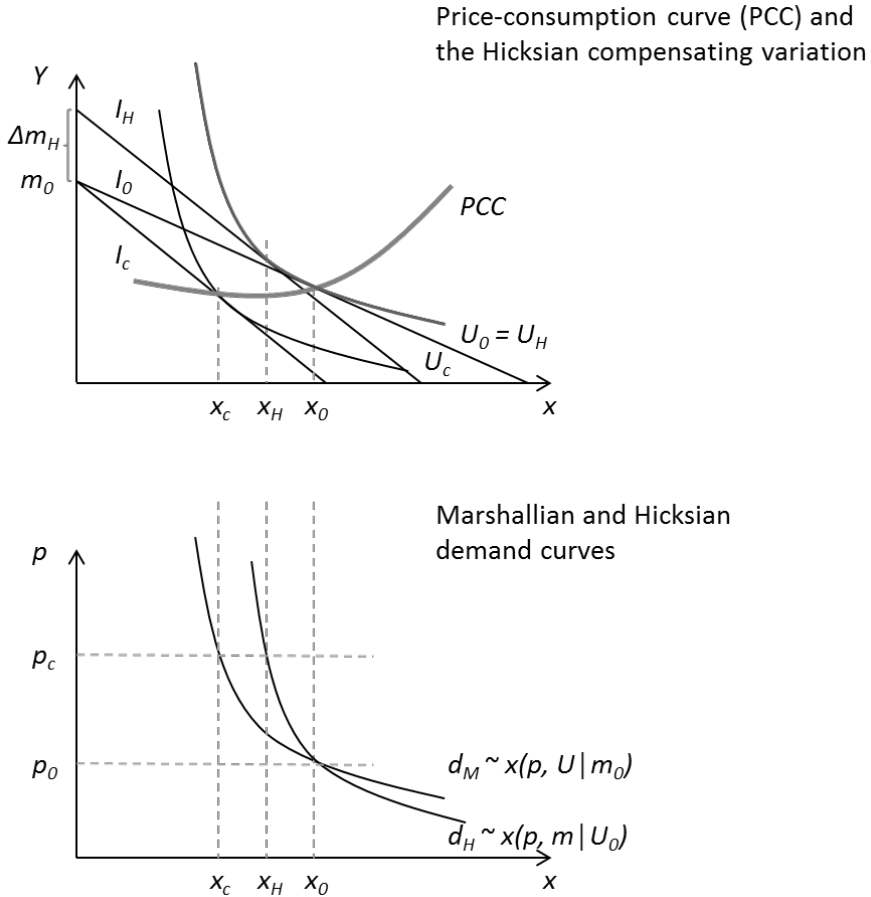
¹⁸¹ Basso & Ross (2010), p. 901.

7.3 Two demand curves

All three methods can be used in practice to determine consumer compensation if they are translated into the standard theory of demand. A demand curve describes the relationship between prices and demanded quantities.

Figure 7.1 shows the Marshallian and the Hicksian demand curves for the consumer's original (pre-cartel) consumption of product x . The most commonly known curve is the Marshallian demand curve (see the d_M curve in the lower part of Figure 7.1). Marshallian demand is based on the assumption that consumers have a fixed income that will be spent optimally on a good. For normal goods, this implies that if the price of a particular good increases the consumer will buy less of it. All possible consumption baskets are located on the price-consumption curve (PCC; see the thick line in the top part of the figure). Along the Marshallian demand curve, every optimal choice represents different levels of utility; the higher the price, the less utility a consumer will experience.

Figure 7.1 Hicksian and Marshallian demand curves



Note: x is the amount of cartel good, Y is the amount of composite good, U denotes indifference curves and I budget constraints, p is the price of the good: p_0 is the price before the cartel and p_c is the cartel price. The original income is m_0 and Δm denotes the compensation. The subscript H refers to Hicks and M to Marshall.

A less frequently used demand curve is the Hicksian demand curve (see the d_H curve in the lower part of Figure 7.1). Price-quantity combinations on a Hicksian demand curve represent optimal choices of consumers given a fixed utility level. These baskets are located along the indifference curve U_0 . Contrary to the Marshallian demand curve, along the Hicksian demand curve every optimal choice corresponds to a different income level (see U_0 in the top part of the figure). This is the income level at which a consumer is able

to achieve the same utility level at different prices. The higher the price, the more income a consumer needs to receive to achieve the same level of utility.

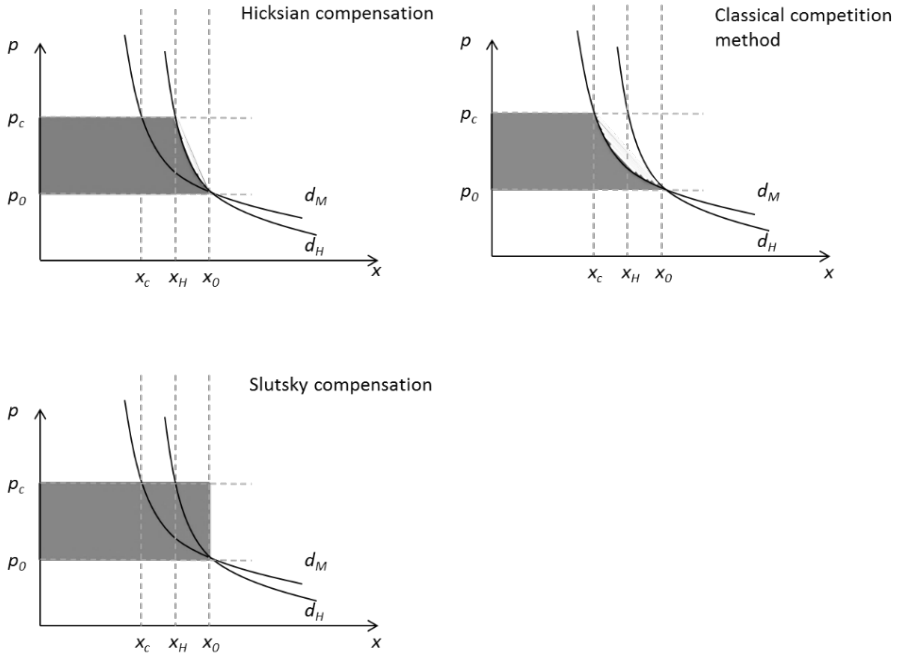
The demand curves intersect at the counterfactual price-consumption combination (PCC at U_o), which is the starting point for calculating the level of compensation. When the price of product x rises due to a cartel agreement, the Marshallian and Hicksian demand curves provide us with the 'price-compensation space'.

7.4 Comparing compensation methods

The Hicksian method corresponds to the Hicksian demand curve and the classical competition method to the Marshallian demand curve. As mentioned above, the Slutsky method creates the highest compensation which falls above both demand curves. Figure 7.2 illustrates these methods.

The *Hicksian compensating variation* equals the area under the Hicksian demand curve (d_H) between p_c and p_o . The Marshallian demand curve (d_M) serves as the basis for the classical competition method: damages equal the area under the Marshallian demand curve between p_c and p_o , that is the lost consumer surplus and the dead weight loss. Finally, the *Slutsky compensating variation* amounts to the rectangle between the original consumption level and zero consumption and between p_c and p_o . As can be seen from Figure 7.2, the Slutsky compensation level is not constrained by either the Marshallian or Hicksian demand curve.

Figure 7.2 Compensation by the different methods illustrated by demand curves



The classical competition method is similar to the Slutsky method in the sense that it also combines the overcharge with the quantity bought by the consumer. The main difference between Slutsky and the classical competition method is that the first assumes that a consumer should, after receiving compensation for damages, be able to purchase the same quantity of cartel products as in the *counterfactual situation*. The classical competition method, on the other hand, uses the *quantity demanded at the cartel price* as a main element to calculate damages. The damages calculated using the Slutsky method will therefore always be higher than those calculated using other methods. This is shown graphically Figure 7.2.

As Figure 7.2 also shows, the highest level of compensation is determined by the Slutsky method and the lowest level by the classical competition method, with the Hicksian method in between. In the case of normal goods, receiving compensation according to the Slutsky method implies that consumers can buy more of the composite good than before receiving compensation, and more than follows from any other level of compensation.

The Hicksian demand curve (used for the Hicksian compensation method) lies above the Marshallian demand curve (used for the classical competition method) for any price above the original price. This is because the classical competition method leaves the consumer with the utility that he can achieve at the cartel price and only compensates for the consumer surplus that he has lost because of the cartel. The Hicksian method also compensates for the utility loss.

The Hicksian level of compensation is higher than the compensation level based on the classical competition method. The only exception is the situation in which the income elasticity is zero. In that case the two compensation levels are equal. Income elasticity shows by which percentage the consumption of a good changes as a result of an income change of 1%.¹⁸² The income elasticity is zero when a change in income does not influence the consumed amount of the good. This is the case for demand specifications derived from quasi-linear utilities. After compensation, a consumer will not consume more of the good than before compensation and he will fully spend the compensation on other goods. Referring to our illustration in Figure 7.1, this would imply that the Hicksian and Marshallian demand functions are identical.

7.5 Determining compensation

As the above argument shows, the Slutsky method provides the highest level of compensation, while the classical competition method results in the lowest level. Hence, the Slutsky and classical competition method can be interpreted as the upper and lower limits of compensation, respectively. In order to compare the upper and lower bound, we require some plausible demand specifications to narrow down a wide range of consumer preferences. As we will show later, for these specifications the compensation levels either do not depend on the type of utility functions or their difference is negligible. Furthermore, these specifications need relatively little information for their practical application.

¹⁸² This relationship follows from $\Delta m_H = \Delta m_C \left(1 + \frac{\mu \Delta m_{CC}}{2m_0} \right)$ if the income elasticity is constant and differs from 1, where Δm_i is the level of compensation, $i = (H, CC)$, H refers to the Hicksian and CC to classical competition method; μ is the income elasticity ($\mu \neq 1$) and m_0 is the income before compensation.

Unit price elasticity rule

The first selection criterion relates to price elasticity. On the one hand, it is known from the economic literature that for a cartel to be effective and stable the demand for the cartel good should not be price elastic.¹⁸³ After all, if the demand is price elastic, consumers would reduce consumption by more than 1% in response to a 1% price change and the cartel would not be profitable. On the other hand, price elasticity will probably not be much lower than 1. If this is the case, firms would be able to increase their revenue individually because consumers do not reduce their consumption significantly as a result of a price increase.

Based on these observations, we assume for the present analysis that for a cartel product price elasticity equals 1, i.e. lies between elastic and inelastic values.¹⁸⁴ This assumption seems realistic if we consider that a monopoly would achieve maximal revenue if it chooses a price at which the price elasticity is 1, assuming there are no variable costs. As cartels have a market share of circa 80% on average¹⁸⁵, we can assume that the cartel outcome will be close to the monopoly outcome.

Please note that we cannot make assumptions regarding point elasticity, i.e. for the effect of a 1% price change on consumption volume, because the median cartel overcharge is around 20%.¹⁸⁶ Therefore, we need to assume the effect of a price change larger than 1% and we will use interval elasticity instead of point elasticity. In terms of interval elasticity, unit price elasticity means that an $x\%$ price change or overcharge reduces the demanded quantity with exactly $x\%$. For a 20% overcharge it implies 20% less consumption of the cartel good.

¹⁸³ Y.V. Bolotova, *Cartel overcharges: An empirical analysis*, JOURNAL OF ECONOMIC BEHAVIOR & ORGANIZATION, 70: 321–341 (2009); M. Ivaldi, B. Jullien, P. Rey, P. Seabright & J. Tirole, *The Economics of Tacit Collusion*, Final Report for DG Competition, European Commission, March 2003 (2003).

¹⁸⁴ Note that for demand functions that have constant unit price elasticity the above-mentioned interval elasticity rule also applies.

¹⁸⁵ See Bolotova (2009).

¹⁸⁶ J.M. Connor, *Price-fixing overcharges*, Mimeo, Purdue University, 27 April 2010 (2010).

Specific utility functions

Based on standard microeconomics,¹⁸⁷ we have selected utility functions that describe the most common forms of consumer preferences and to which we can apply the condition of unit price elasticity.¹⁸⁸ ¹⁸⁹ These preferences are described by quasi-linear (in particular, quadratic and logarithmic) and Cobb-Douglas (CD) utility functions. Additional favorable characteristics of these utility functions ensure that calculations are easily feasible.

For *quasi-linear preferences*, it holds that the consumption of a good is independent of any income change given the same relative prices. In other words, the income elasticity of these goods is zero.¹⁹⁰ The *quadratic quasi-linear utility function* is often used in analyses as it yields a linear demand function. A well-known characteristic of linear demand is that the price elasticity varies along the demand curve. Therefore, we use the assumption of unit interval elasticity and narrow down the parameter values to that case (see Appendix). The *logarithmic quasi-linear utility function* is also common as it determines a hyperbolic demand with unit price elasticity, which characteristic corresponds exactly to our assumption regarding price elasticity (see Appendix).

For the *Cobb-Douglas utility function*,¹⁹¹ it applies that a consumer always spends the same portion of his income on each product. This also means that the same percentage of the compensation will be spent on the related good.

¹⁸⁷ E.g. Mas-Colell et al. (1995).

¹⁸⁸ As we take the composite goods into consideration, we assume away perfect substitution and perfect complementarity. Furthermore, we do not consider inferior and luxury goods.

¹⁸⁹ We can approximate unit consumption by a continuous consumption function. As the overcharge most commonly falls within the range of 10 to 20% (Bolotova, 2009) and price elasticity is close to 1, the consumption of this special good will not differ substantially from 1.

¹⁹⁰ As stated earlier, in this case the Hicksian and classical competition formulas determine the same compensation as the Hicksian and Marshallian demand functions are the same.

¹⁹¹ The Cobb-Douglas utility function is a specific form of CES function (see A. K. Dixit and J.E. Stiglitz, *Monopolistic Competition and Optimum Product Diversity*. AMERICAN ECONOMIC REVIEW 67(3): 297–308. (1977)). We have chosen the CD utility function because it is commonly used in consumer analyses due to its favorable characteristics.

Furthermore, and similarly to the logarithmic utility function, the Cobb-Douglas type utility function also yields constant unit price elasticity of the demand (see Appendix).

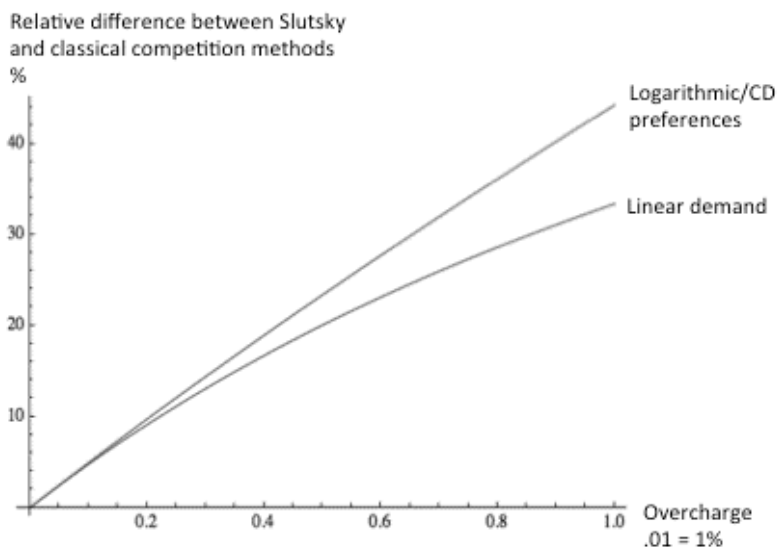
Upper and lower limits

The first result is that, because of the unit price elasticity rule, the difference between compensations determined by the Slutsky method and the classical competition method does not depend on the parameters of utility specifications but only on the cartel overcharge (the relative difference between p_0 and p_c ; see Appendix) and the income spent on the cartel product. This makes it possible to overcome the disadvantages of using these compensation methods described in section 6.2 and apply them in practice.

Secondly, calculations show that the difference between the outcomes of the utility functions is either zero (logarithmic and CD utility functions) or negligibly small (linear demand). For instance, at a 10% overcharge, the Slutsky method offers a compensation level that is either 4.7% or 4.9% higher than the classical competition method for logarithmic/CD utility functions and linear demand, respectively. At a 50% overcharge, it is either 20% or 23.3% higher than for the classical competition method. As Figure 7.3 and these calculations show, the difference increases with the overcharge. The difference between the values determined by the Slutsky method and the classical competition method is always higher at logarithmic/Cobb-Douglas preferences than at linear demand.

The difference is 0.16% point at a 10% overcharge and 3.3% point at a 50% overcharge. This difference is, therefore, negligible.

Figure 7.3 Relative difference between Slutsky and classical competition method for logarithmic/CD utility functions and linear demand (quadratic quasi-linear utility function)



Proposition 1: *Given the unit price elasticity rule, compensation levels calculated by the logarithmic and Cobb-Douglas utility functions are the same. These compensation levels are somewhat higher than the compensation levels calculated under linear demand. The higher the overcharge, the greater the difference. However, the difference remains negligible.*

The proof of this proposition is based on the mathematical calculations that can be found in the Appendix.

Information needs for calculation

An important conclusion of the previous section is that the difference between the analysed utility specifications is negligible when the unit price elasticity rule is applied. Consequently, the level of compensation can be independent of consumer preferences. Therefore, specifications that require the least amount of information are the most suitable for application in private damages actions.

For the following reasons, the logarithmic quasi-linear (instead of the quadratic quasi-linear) and/or the Cobb-Douglas (CD) utility function are chosen. First, as is shown extensively in the Appendix, logarithmic quasi-linear and

CD preferences result in the same compensation. Therefore, the choice between these two preferences is of no consequence. Second, calculating compensation for linear demand (i.e. quadratic quasi-linear preferences) requires more data about preferences than using the logarithmic quasi-linear and CD preferences. In the case of linear demand, in addition to the overcharge, one also needs to know the maximum reservation price of a consumer for the cartel good. This information is hardly ever available.

For logarithmic quasi-linear and CD preferences, one only needs to know which part of his income a consumer spends on the cartel good (I_x) and what the overcharge is, expressed as a percentage (δ). Due to these low information needs, these are the preferred utility specifications. The following proposition summarizes this result.¹⁹²

Proposition 2: *The compensation values based on the Slutsky method (Δm_s) and classical competition method (Δm_{CC}) are calculated using the following simple equations:*

$$\Delta m_s = I_x \delta \text{ (upper limit)}$$

$$\Delta m_{CC} = I_x \ln(1 + \delta) \text{ (lower limit)}$$

where I_x denotes which part of his income a consumer spends on the cartel good and δ denotes the overcharge, expressed as a percentage. $\ln()$ represents the logarithm of the overcharge. To calculate compensation values, only these two values need to be known.

Remember that for the calculation in Proposition 2 the overcharge on consumer prices is meant. If in a certain damages case only the overcharge in the upstream market is known, the pass-on rate from the direct purchaser to the end consumer should also be known to calculate the overcharge faced by consumers.

In practice, calculating the overcharge is difficult enough to create a hurdle for claimants. We do not deny this fact and this article does not give a solution to this problem. However, if the overcharge is calculated on the consumer price level or the passing-on is known, the above two formulas

¹⁹² For the proof, see the calculations in the Appendix.

produce a good approximation of a lower and an upper limit for the range of compensation. Assume, for instance, that a consumer spends 200 euro per year on a cartel good that contains 20% overcharge (see Table 7.1, examples 1 and 2). Based on the formulas from Proposition 2 and the underlying assumptions, his compensation should be in the range of 36.5 to 40 euro per year. Based on the arguments put forward in the previous sections, this result indeed is independent of the price and the consumed quantity as compensation levels depend only on the cartel overcharge and the income spent on the cartel product.

At a given overcharge, the relationship between the three different compensation measures is fixed. This fixed relationship is independent of changes in income level, price level and corresponding levels of quantity (see the examples in Table 7.1). It is, however, not possible to establish a rule of thumb for the relationship between the compensation in practice and the upper and lower limit.

Table 7.1 Numerical examples that illustrate compensation in theory and practice, based on logarithmic and CD utility functions

	Example 1	Example 2	Example 3	Example 4
Income spent on the cartel good	€ 200	€ 200	€ 300	€ 300
Price counterfactual	€ 1.00	€ 0.50	€ 2.00	€ 1.00
Price cartel	€ 1.20	€ 0.60	€ 2.0	€ 1.30
Overcharge in euros	€ 0.2	€ 0.1	€ 0.4	€ 0.3
Overcharge (%)	20%	20%	20%	30%
Quantity counterfactual	200	400	150	300
Quantity cartel	166.6	333.3	€ 125.0	€ 230.8
Upper limit (Slutsky method)	€ 40.0	€ 40.0	€ 60	€ 90
Lower limit (classical competition method)	€ 36.5	€ 36.5	€ 54.7	€ 78.7
Compensation in practice	€ 33.3	€ 33.3	€ 50.0	€ 69.2

In practice, the compensation is calculated as the cartel quantity times the absolute overcharge.¹⁹³ No attention is paid to the deadweight loss and consumers are not compensated for it.¹⁹⁴ Compensation in practice can be expressed by a similar formula to the one above:

¹⁹³ E.g. Laitenberger & Smuda (2015), Basso & Ross (2010)

¹⁹⁴ Basso & Ross (2010), RBB (2016), p 13.

$$\Delta m_{practice} = (P_c - P_0)Q_c$$

From the formula and table it can be seen that the compensation in practice is always below the lower limit. This is in line with the findings of Basso & Ross (2010). Hence, from a perspective of full compensation, applying $\Delta m_{practice}$ is not preferable. The upper and lower limit provide better measures of harm. They are, however, not the solution to everything. For all measurements – also the one applied in practice – the overcharge must be calculated first. However, for the limits presented in this paper, one does not need to know the counterfactual quantity. They do require information about the income spent on the cartel product, though.

Let us look at the possibilities to collect data about this income. The most direct way would be if consumers would still have all of their receipts for the cartel product. These could then be added up to arrive at the income spent on the cartel product. In real life this is not a very realistic scenario. However, it is increasingly common for information about consumer purchases to be collected. This can be done either in the form of scanner data¹⁹⁵, through loyalty programs that keep track of people's purchases or in the online account of e-commerce companies. The study by Laitenberger & Smuda (2015) is an example where a consumer panel data set was used to determine consumer damages as a result of the washing powder cartel. The data set in question also included typical socio-demographic variables, which would make it possible to test for heterogeneousness of consumer preferences. An example where online accounts could be used in e-commerce sectors is the American e-books lawsuit.¹⁹⁶

If consumers have not kept their receipts and there are probably no digital data on consumer purchases, the most pragmatic way to determine income spent on the cartel product is by taking the total consumption of the product (turnover) and dividing it by the number of consumers. The resulting consumption per individual consumer may be an overestimation or underestimation. This can be caused by either i) unequal consumption by consumers (not all consumers buy the same amount) or ii) unequal preferences of

¹⁹⁵ RBB (2016), p 271.

¹⁹⁶ <https://ebooklawsuits.com/mainpage/Home.aspx>. This case resulted in a settlement and hence, most likely, no full compensation was offered.

consumers (not all consumers have a similar price elasticity). Both aspects could be studied by performing a sensibility analysis. For i) one could assume that the individual consumption shows a normal or log normal distribution, for ii) one could assume that half of the consumers have a logarithmic or Cobb-Douglas utility function and half have a quadratic utility function and see whether that leads to different outcomes.

7.6 Conclusions

Various authors have addressed the harmful effects of antitrust infringements and the possible damages claims of purchasers. However, currently there is no consensus about the method that should be used to compensate individual consumers for this harm. Furthermore, as Basso & Ross (2010) show, the damages awarded to purchasers understate the true harm suffered from the price-fixing. This is true irrespective of whether the cartel overcharge is known or not. The understatement is caused, amongst other things, by the difficulties of calculating the counterfactual quantity (the but-for quantity).

This paper's objective is to develop a practical method for calculating consumer damages from a price-fixing cartel. Practical in the sense that the problems with data requirements are partly overcome. We use standard utility and welfare theory to present different measures for losses in consumer surplus. Three calculation methods are suggested in the economic literature. According to the Hicks method, after compensation, consumers need to be able to enjoy the same utility level as before the price increase. According to the Slutsky method, after compensation, consumers need to be able to buy the same quantity of goods as before the price increase. This method provides a consumer with compensation through which he can achieve a higher utility level than before the cartel. According to the classical competition method, consumers should receive the difference between the consumer surplus they had before and after a cartel.

Application of the Slutsky method results in the highest compensation values. Using the classical competition method produces the lowest values. If consumers do not change their consumption quantity as a result of an income change for given relative prices, then the Hicksian and classical competition methods result in the same compensation.

To determine the upper and lower limits of compensation, some plausible demand specifications are needed to narrow down a wide range of consumer preferences to those that can be applied in practice. Based on theoretical and empirical evidence, unit price elasticity is a plausible assumption for consumer preferences in a cartel situation. Because of the unit price elasticity rule, compensation methods do not depend on the parameters of utility specifications, including prices and quantities. To derive our results, we used the quasi-linear and Cobb-Douglas utility functions and Hicksian and Marshallian demand curves. The latter two are commonly used for normal consumption goods. These utility functions were chosen because they describe the most common forms of consumer preferences, the unit price elasticity is applicable and for an income elasticity of zero, two of the compensation methods are equal. It would be interesting to see in future research whether the conclusions hold true for other specifications of utility, for example the strictly quasi concave ordinal utility function as used by Willig.¹⁹⁷ Another potential extension of the model could be based on a general form of constant elasticity of substitution (CES) functions.¹⁹⁸

The presented formulae for the upper and lower limits are not the solution to everything. The overcharge still needs to be calculated. Calculating the counterfactual quantity however is no longer needed. More importantly, by using these limits, consumers are fully compensated for the harm suffered from price-fixing. The same cannot be said of the measurement that is currently applied in practice.

¹⁹⁷ R. Willig, *Consumer's surplus without apology*, THE AMERICAN ECONOMIC REVIEW, 66(4): 589–597 (1976).

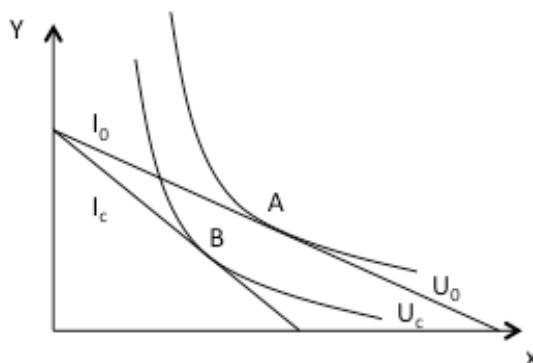
¹⁹⁸ See Dixit & Stiglitz (1977) and S. Brakman and B.J. Heijdra. THE MONOPOLISTIC COMPETITION REVOLUTION IN RETROSPECT. Cambridge University Press (2004).

7.7 Appendix: mathematical exposition and calculations

Hicksian compensation method

The following model explains the effects of antitrust violations on individual consumers. Let us denote a certain normal good by x . All other products and services that a consumer may spend his income on are represented by Y . At time $t=0$, all firms producing x compete normally. In that situation, the consumer price of product x equals the competitive price p_0 . As Figure 7.4 shows, the consumer will spend his income in such a way that he ends up at point A on the tangent of the indifference curve U_0 and budget constraint I_0 (see Figure 7.4). After all, A represents the point where the consumer enjoys the maximum amount of utility possible with his income.

Figure 7.4 Due to a cartel price the consumer's utility reduces



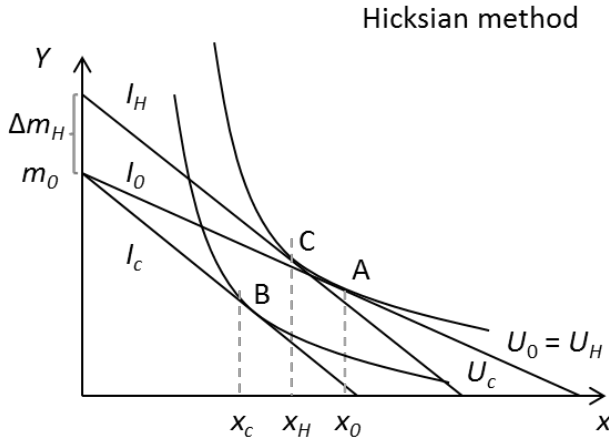
Note: x is the amount of cartel good, Y is the amount of composite good, U denotes indifference curves and I budget constraints. Subscript 0 refers to the counterfactual and c to the cartel situation.

At time $t=1$, (some) producers of x decide to meet up and increase the price of x . As a result, the consumer price of product x rises to p_c , and the consumer's budget line will become steeper: I_0 changes to I_c . Consequently, the consumer is no longer able to consume the original optimum A . The optimal point is now B , where U_c and I_c are tangential and U_c is lower than U_0 .

Figure 7.4 shows how a cartel forces a consumer to shift his consumption from point A on U_0 to B on the lower indifference curve U_c . By raising the consumer's income, this loss of utility can be repaired. As Figure 7.5 shows, shifting budget line I_c upwards until it becomes tangential to indifference curve U_0 , proves that an increase of Δm_H gives the consumer back his original level of utility (see point C). After receiving that extra income, the consumer

reaches U_h , which is equal to U_0 as every point on the indifference curve represents the same amount of utility. Δm_H is called the Hicksian compensating variation.

Figure 7.5 The compensation by Hicks



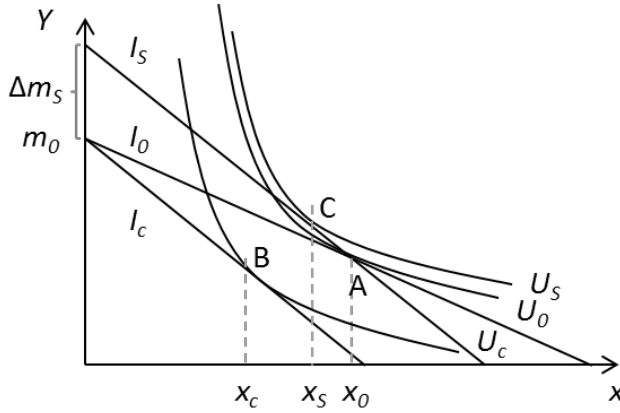
Note: x is the amount of cartel good, Y is the amount of composite good, U denotes indifference curves and I budget constraints. Subscript 0 refers to the counterfactual and c to the cartel situation. The income in the counterfactual situation is m_0 and Δm denotes the level of compensation. Subscript H refers to the Hicksian method.

Slutsky compensation methods

A second method is the Slutsky compensating variation. The income compensation equals the additional income that would enable consumers to buy the original combination of x_0 and Y_0 . The Slutsky compensating variation does not bring victims back to their initial level of utility after an antitrust infringement, but it does allow them to enjoy the amount of x_0 and Y_0 that they could have bought if antitrust rules had not been violated.

In other words, the consumer can buy the same product basket as in period $t=0$. However, his new optimal purchase lies at a higher utility level (point C on the indifference curve U_s in Figure 7.6).

Figure 7.6 The compensation by Slutsky



Note: x is the amount of cartel good, Y is the amount of composite good, U denotes indifference curves and I budget constraints. Subscript 0 refers to the counterfactual and c to the cartel situation. The income in the counterfactual situation is m_0 and Δm denotes the level of compensation. Subscript S refers to Slutsky.

Notations for mathematical calculations

x : quantity of cartel good; Y : quantity of composite good

m_0 : income before compensation

δ : overcharge defined as $\delta = \frac{p_c}{p_0} - 1$, where p_0 is the counterfactual price and p_c is the cartel price

Δm_i^j : level of compensation determined by method i for preference type j

Indices $i = S, H, CC$ correspond to the Slutsky, Hicks and classical competition methods of compensation, respectively, and indices $j = Q, L, CD$ correspond to the preference types of quadratic quasi-linear, logarithmic quasi-linear and Cobb-Douglas, respectively.

\ln stands for logarithm.

a, b, c, d, α are utility specific parameters

Quadratic quasi-linear utility function (Q)

Utility and demand functions:

$$U(x, Y) = x \left(a - \frac{bx}{2} \right) + Y$$

$$x(p) = a - bx$$

Compensation values where the interval elasticity at the cartel price is 1:

Interval elasticity: $\varepsilon = 1 - \frac{2a}{2a - p_0 - p_c}$. The interval elasticity is equal to 1 at price $p|_{\varepsilon=-1} = \frac{a(1+\delta)}{2+\delta}$. Thereby it is assumed that $p_c \approx p|_{\varepsilon=-1}$, $p_0 = \frac{a}{2+\delta}$.

Given these prices, the compensation values are:

$$\Delta m_s^Q = \frac{a^2 \delta (1 + \delta)}{b(2 + \delta)^2}$$

$$\Delta m_{CC}^Q (= \Delta m_H^Q) = \frac{a^2 \delta}{2b(2 + \delta)}$$

$$\Delta m_{CC}^Q = \Delta m_s^Q - \frac{a^2 \delta^2}{2b(2 + \delta)^2}$$

Logarithmic quasi-linear utility function (L)

Utility and demand functions, compensation and relationships:

$$U(x, Y) = c \ln Bx + Y$$

$$x(p) = \frac{c}{p}$$

$$\Delta m_s^L = c\delta$$

$$\Delta m_{CC}^L (= \Delta m_H^L) = c \ln(1 + \delta)$$

$$\Delta m_{CC}^L = \Delta m_s^L \frac{\ln(1 + \delta)}{\frac{1}{1 + \delta} - 1}$$

Cobb-Douglas utility function (CD)

Utility and demand functions, compensation and relationships:

$$U(x, Y) = dx^\alpha Y^{1-\alpha}$$

$$x(p) = \frac{\alpha m_0}{p}$$

$$\Delta m_S^{CD} = \alpha m_0 \delta$$

$$\Delta m_{CC}^{CD} = \alpha m_0 \ln(1 + \delta)$$

$$\Delta m_{CC}^{CD} = \Delta m_S^{CD} \frac{\ln(1 + \delta)}{\frac{1}{1 + \delta} - 1}$$

As the calculation of the logarithmic and Cobb-Douglas preferences shows, the relationship between the Slutsky method and the classical competition method is the same. Therefore, in the further analysis we shall not make a distinction between them.

Relative difference between compensations by Slutsky and classical competition method

Relative difference (%) between compensation by Slutsky and classical competition method calculation for linear demand (quadratic quasi-linear preferences), using the classical competition method as the basis:

$$\frac{\Delta m_S^Q - \Delta m_{CC}^Q}{\Delta m_{CC}^Q} = \frac{\delta}{2 + \delta}$$

Relative difference (%) between compensation by Slutsky and classical competition method calculation for logarithmic and Cobb-Douglas preferences, using the classical competition method as the basis:

$$\frac{\Delta m_S^{L/CD} - \Delta m_{CC}^{L/CD}}{\Delta m_{CC}^{L/CD}} = \frac{\delta}{\ln(2 + \delta)} - 1$$

As the formulas show, these relative differences only depend on the overcharge.

Similar formulas and results are obtained if the Slutsky compensation value is used as the basis. Therefore, the conclusions are robust

8. Career development after cartel prosecution: Cartel versus non-cartel managers

Abstract

I examine the career development of managers after they have been subjected to cartel prosecution by the Netherlands Competition Authority (NMa). A representative function is used as an indicator for a career outcome after prosecution. I compare the career development of Dutch managers involved in a cartel with that of a control group of Dutch managers of non-cartel companies. I analyse the different factors that may influence the career development of cartel-involved managers. This article concludes that cartel-involved managers face negative career effects after the prosecution of the cartel. A cartel-involved manager has a lower probability of a representative function than another manager. This negative career effect is smaller if the cartel was active in the construction sector. This outcome might point at a different culture towards cartels in the construction sector in the Netherlands, which seems plausible considering the wide-ranging cartel that existed in this sector between 1998 and 2001.

JEL: K21; JEL; L40; JEL; L41

8.1 Introduction

In the Netherlands, agreements between companies that restrict, hinder, or impede competition—which are called cartels—face prosecution. A company can be fined if the cartel is detected and prosecuted by the Netherlands Competition Authority (*Nederlandse Mededingingautoriteit*, NMa) for a maximum amount of 10 percent of its overall worldwide revenues. Furthermore, the executives involved can be personally fined for an amount of up to 450,000 euro.¹⁹⁹ In addition to these administrative fines, which represent the direct negative effect on the company and their executives, the

¹⁹⁹ Mededingingswet (Dutch Competition Act) ch. 3, § 1, art. 6-7 (1998).

prosecution of a cartel is made public. This publicity may cause indirect negative effects in the form of reputation damage and might have negative or positive effects on the career of managers involved in a cartel.

This potential outcome could have a deterrent effect on the formation of cartels. Are the career chances of cartel-involved managers different from those of cartel-free managers? If so, one might argue that a manager faces negative reputation damage in the form of decreased career opportunities due to cartel involvement. This reputation damage could give managers an extra incentive not to engage in these prohibited agreements. Cartel involvement might, on the other hand, also result in a positive effect on career opportunities when shareholders assume that cartels are not easily detected and prefer someone who increases the value of the shares by being involved in a cartel. This article tries to answer whether the career development of cartel-involved managers is different from cartel-free managers and how their careers are affected.

Two research routes are followed in this article. First, I examine career development after cartel prosecution. This examination is done for Dutch managers involved in a cartel in The Netherlands and a control group of Dutch managers of non-cartel companies. The career development of the control group is used to establish whether the cartel managers face negative career effects from their cartel involvement. The analysis is done using a binary logit model.

Second, the factors that may influence the career development of cartel-involved managers are analysed using logit models (a binary and multinomial logit model). These factors are: the sector in which the cartel was active, the period of job switching (before or after the publication of the cartel by the NMa), the punishment factor, and the level of the fine.

The article proceeds as follows. 7.2 presents the legal framework and the research hypothesis. 7.3 describes the data collection. The data consists of cartel and control companies and their managers. 7.4 explains the model for career development together with a description of the data. I compare the career development for cartel managers and control managers. 7.5 presents the results of the econometric analysis for the career development of managers. The difference between cartel and control managers is tested using

logit models, taking account of the different variables that might influence the career of cartel managers. 7.6 concludes.

8.2 Legal framework

This section explains the workings of the cartel law articles of the Dutch Competition Act and the hypothesis of this article. In January 1998, the Dutch Competition Act and the NMa were established. The NMa is active in detecting and prosecuting cartels, among other activities. The legal framework for cartels consists of Article 6 of the Dutch Competition Act.²⁰⁰ Article 6(1) includes the prohibition of agreements, and Article 6(3) includes the exemptions, under which agreements between companies are not prohibited. If Article 6(1) applies but Article 6(3) does not, there is an infringement of Article 6 of the Competition Act. Agreements between companies may fix the price of a product between competitors, divide the market, determine the supply conditions, or reduce the total output to increase the price. Firms that are involved in a cartel could voluntarily confess their cartel to the NMa and apply for the leniency program. A firm would confess when it is afraid that the cartel will be detected. When the cartel applies for leniency, it cooperates with the competition authority and supplies evidence on the existence of the cartel. In return, the company is granted (partial) immunity for fines.²⁰¹

In its first annual report, the NMa stated that the Dutch business sector soon realized that, with the establishment of the competition authority, the Dutch business environment had changed.²⁰² Now, more than ten years after the introduction of the Competition Act and the NMa, one may assume that cartelization is seen as undesirable by companies due to the sanctions associated with it. (This does not imply that cartels do no longer occur.) The bad reputation of cartels is expected to negatively affect the career chances of cartel-involved managers. Future employers would be less willing to hire a manager who was active in a cartel.

²⁰⁰ This law is very similar to the legislation that is used by the European Commission, Treaty on the Functioning of the European Union art. 101, 2008 O.J. (C 115).

²⁰¹ Massimo Motta, *Competition policy: Theory and practice* (Cambridge Univ. Press 2004); NMa, *Richtsnoeren Clementie* [Leniency guidelines] (2009).

²⁰² NMA, *Jaarverslag* [Annual report] (1998).

The central hypothesis of this article is that *managers involved in a cartel face negative career effects*. For the analysis, this hypothesis would imply that the career development of cartel managers differ from the career development of control managers (who have not been involved in a prosecuted cartel). More specifically, cartel managers will end up in a less-representative job function than managers from the control group. In this article, a representative job is defined as a management function or a function in the board of directors.

8.3 Data collection

In this part, I discuss how I collected the data on the cartel and control managers and how I found the jobs of cartel-involved managers after cartel prosecution.

Cartel managers

I gathered data for Dutch companies involved and punished in a cartel. It could be the case that, in a specific sector, cartel-involvement is observed relatively often. An example is the construction sector. It appeared from the investigations started by the NMa that many companies in this sector were involved in a cartel. Therefore, one could expect that, in this sector, cartel-involvement is not seen so much as a negative attribute. Hence, managers in this sector might face different career development after being prosecuted for cartelization than cartel-involved managers in other sectors. To get a representative view of the whole economy, I selected cartel companies from all sectors. To select the cartel-involved companies, I used the NMa's decisions on infringing Article 6 of the Competition Act. Through the historical files from the Chamber of Commerce, I found the former managers of the companies. Not all companies are registered at the Chamber of Commerce, and some have merged or went bankrupt after the dissolving of the cartel. In case of a merger, it is impossible to track down which parts of the cartel company were taken over or still exist. Furthermore, it might be the case that a manager was fired because of downsizing after the merger and not because of his cartel involvement. Therefore, merged companies and companies that are not registered are excluded from the data set. Foreign companies are also excluded because those managers could not be traced in the Dutch databases.

Before tracking down where the cartel-involved managers worked after the cartel, it must be clear at which date future employers could be aware of the

managers' cartel involvement. For sectors other than the construction sector, there are two options. The first one is the end date of the cartel, as defined in the decision by the NMa. However, it might be the case that a future employer does not know about the existence of the cartel when the cartel ended, but no decision has yet been published by the NMa. Therefore, a second option is the date that the NMa publishes its decision on the cartel case. Both options are used and two data sets are made. Data set 1 includes all the executives who obtained a new job in the period between the end date of the cartel and the date of the decision by the NMa. Data set 2 includes all executives that left the cartel company after the publication date of the NMa's decision. Executives that left the cartel company before the end of the cartel are not included.

For the construction sector as well, two options exist. The first option is to use the moment at which a whistle-blower revealed the cartelization practices in this sector. This occurred in November 2001.²⁰³ At that moment, it was not clear yet which companies were involved in the large cartel, but future employers could be alerted about the possibility of the cartel-involvement of applicants from a construction company. The second date is October 13, 2004, when the NMa published Report 4155 at the end of the cartel investigations in the construction sector. In this report, most of the companies that applied for leniency or handed over their administration are included. This second date may be the most suitable, because since then, future employers could know with certainty whether a participant came from a company involved in the cartel. As with the other sectors, two data sets are made to compare. Data set 1 includes the managers that left the cartel company between November 2001 and October 2004, and Data set 2 includes the managers that left their companies after October 2004.

²⁰³ Before January 1998 and until December 2001, several companies in the construction sector engaged in price agreements or agreements about dividing the geographical market. The NMa investigated this sector and wrote Report 4155, in which the companies are listed that were involved in this mass fraud. In total, the NMa had to deal with 650 companies that were involved in the 'construction case.' This all came to light in November 2001 due to the statements of whistleblower Ad Bos. NMa, Rapport GWW-Activiteiten, Nummer 4155_1/50. R19 [Report of Civil Engineering Activities, No. 4155_1/50.R19] (Oct. 13, 2004); NMa, Jaarverslag [Annual report] (2004).

Control group

The control group consists of managers of similar companies (in sector and size) as the cartel-involved companies who differ in that they were never prosecuted for cartel involvement. In theory, the control companies could also be cartel companies, but because they have not been prosecuted, the managers do not face possible career effects. The control companies are selected by picking a company from the peer group of the cartel company in the Amadeus database.²⁰⁴ Here, the size of the company and the type of activities (that is, the sector) are criteria to form a peer group for companies. As is well known, many companies in the construction sector were involved in cartel fraud. Therefore, it is not worthwhile to make a control group for that sector. In this case, a control group is composed from the general sector, consisting of 50 managers from 13 companies using the same selection method as before.

Future careers

To find the current jobs of the managers, I used the database Company.info.²⁰⁵ In this database, 750,000 managers and members of boards of directors can be found. This database has some drawbacks. Only management functions and functions in the board of directors are included in the database. Consequently, if a former cartel manager still works at the cartel-involved company after prosecution but no longer works at a representative level, then he is not included in that database. Further, managers that have retired are not included.

It might be the case that a manager of a cartel company got another job somewhere else before he retired. Also, former cartel-involved managers could have had more than one job after the cartel, but Company.info only publishes current jobs. In the next section, I explain the model for career development.

²⁰⁴ Amadeus is a database with financial, economic, and geographic information of European companies.

²⁰⁵ Company.info is an online database with information about all companies in the Netherlands. Annual reports, press articles, market analyses, managers and board of directors, extracts of the Chamber of Commerce, and other documents are found here. More information is available at www.groep.company.info.

8.4 Career development

The first subsection explains the model for career development. This model helps with the further analysis of career development. The model formulates career outcomes by which the career development for each manager can be categorized. The second part shows the division of the cartel managers and control managers into these career outcomes. The last part of 7.4 compares the outcomes for the two groups of managers.

The model for career development

Figure 8.1 shows a typical career path for managers by the upward sloping curve. Suppose that, at time x in the life of a manager, the cartel is detected and the company and the manager are punished. After time x , does the prosecuted manager's career development follow its original path, or is there a negative effect on the manager's career path that causes a lower function or even a non-representative function (as shown on the y -axis)? If there is a negative effect, as expected in this article, how does one's career evolve afterwards? Does it return to its original path or to a lower path? The possible negative career outcomes are indicated by the grey area, since there is uncertainty about the career path of a cartel-involved manager after cartel prosecution.

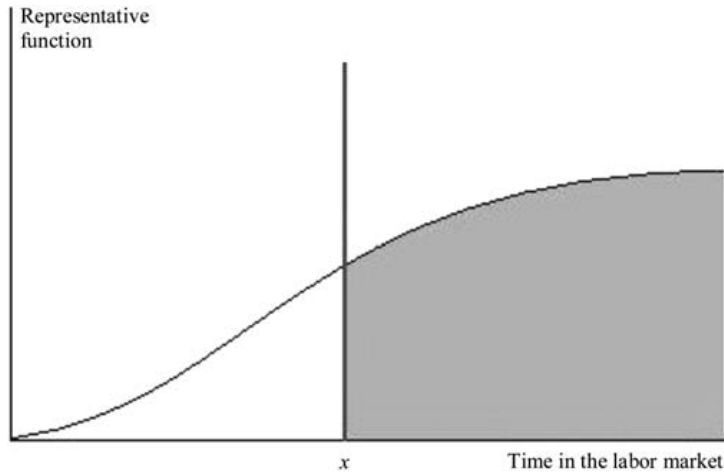
Knowledge about the typical career path of managers is needed. This development can then be compared with the career paths of cartel-involved managers after the cartels have been detected and the managers have been punished. The group of cartel-free managers functions as a control group, which represents the typical career path of managers. Career theories were investigated but were not useful for this research because the implications of such theories could not be exploited due to limited availability of data.

To analyse the career of a manager after cartel involvement, there are three possible situations after cartel prosecution. These situations do not differ with the age of a manager. The situations are formulated in statements to function as criteria to divide the potential career development into three categories:²⁰⁶ (1) a manager moves to a non-representative job or retires; (2) a manager keeps his/her representative function at the cartel-involved

²⁰⁶ In this article, a representative job is defined as a management function or a function in the board of directors.

company or gets a representative function at another prosecuted cartel-involved company; and (3) a manager moves to a representative function at another company.

Figure 8.1 Typical career path.



It is not possible to distinguish between retired cartel-involved managers and the managers that currently have a non-representative function. Therefore, these managers are grouped into one category (the first statement) instead of two. From the three statements, it appears that a distinction is made between representative jobs (the last two statements) and nonrepresentative jobs (the first statement). Within a representative function, the distinction is made between a cartel company (the manager's original company or another cartel-involved company, as described by the second statement) and another company (as described in the third statement).

A distinction could be made between better or worse jobs. This could be done with the salary as a criterion. Because salary levels are not public information for all companies, one can look at the size of the company, because research has suggested that a positive relation exists between the salary of top representative functions and the size of the company.²⁰⁷ However, this variable appeared to be highly insignificant, and, therefore, this distinction is not made. This article makes the assumption that the whole management

²⁰⁷ Michael Firth, M. Tam & M. Tang, *The Determinants of Top Managerial Pay*, 27 OMEGA INT'L J. MANAGERIAL SCI. 617 (1999).

of the cartel-involved company was aware of the cartel and therefore could be held responsible for it.

Table 8.1 The share of cartel managers with representatives functions after cartel prosecution

Category	Construction Sector		General Sector		All Sectors	
	Frequency	%	Frequency	%	Frequency	%
No representative function	10	32.3	32	64.0	42	51.8
Function at a cartel company	12	38.7	7	14.0	19	23.5
Function at another company	9	29.0	11	22.0	20	24.7
<i>Total</i>	<i>31</i>	<i>100.0</i>	<i>50</i>	<i>100.0</i>	<i>81</i>	<i>100.0</i>

Note: The division in this table is based on 16 of the 25 cartel companies in the construction sector and 18 of the 24 cartel companies in the general sector. Hence, it represents the majority of all cartel companies and their managers.

Data description

Cartel managers

In the construction sector, 25 prosecuted cartel companies that are Dutch, not merged, and registered at the Chamber of Commerce database were found. Of those, 16 contained useful information about their management. For these 16 companies, there are 31 managers that were in function during the cartel. Table 8.1 shows the division of these 31 managers over the three categories of careers after cartel prosecution.

Starting with 24 cartel companies in the other sectors²⁰⁸ that are Dutch, not merged, and registered at the Chamber of Commerce database, 18 companies had management data available. For convenience purposes, this group is called the general sector in this article. For these 18 companies, 50 managers are found. These managers are also included in Table 8.1.

For both the construction and general sectors altogether, a small majority of the cartel-involved managers does not have a representative function. What is remarkable is that the results differ per sector. In the construction sector, almost one third of all managers have a representative job at another company. Of the managers that did get a representative job at another non-

²⁰⁸ This group contains several sectors, including the telecom sector, bike manufacturing sector, fish sector, and the gas selling sector, among others.

cartel company, only four are still working in the construction sector. For the general sector, the opposite is true. Only 22 percent of the managers have found a representative job at another company. The large majority has no representative function.

In sum, the proportion of managers that still has a representative function is larger in the construction sector than in the general sector, respectively 67.7 percent versus 36 percent.

Control managers

The group of control managers consists of 50 managers from the general sector. Because the total group of possible cartel-free companies in the general sector is very large, the use of statement 2, *a representative function at the same or another cartel company*, is of little value for comparing the control group with the cartel-involved managers.²⁰⁹ Therefore, for the comparison of the cartel managers with the control managers, only two values for career are used: no representative function and representative function (both at the same company and at another company, statement 2 and 3). For the econometric analysis in section 7.5, the comparison between each group will therefore only be done by means of a binary logit model. The second analysis of this article, the effect of different factors on the career development of cartel-involved managers, is done with a multinomial model.

As shown in Figure 8.2, the majority of the control managers have a representative function. In the next section, this outcome will be compared with the career development of the cartel-involved managers.

Comparing cartel managers with control managers

The careers of the cartel-involved managers (as described in Table 8.1) are compared with a control group of cartel-free managers to see whether the career development paths differ between the two groups. When a significant difference between the career development paths of the two groups is found, it can be concluded that cartel involvement affects the careers of managers. The best way to compare the control managers with the cartel-involved ones is to compare them only to the cartel managers from the

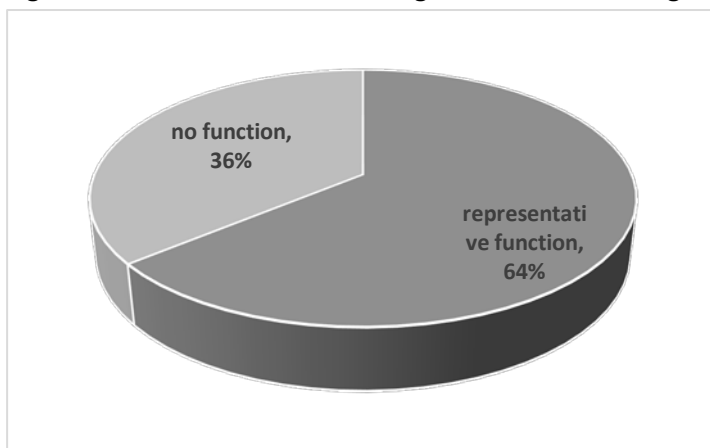
²⁰⁹ It appears that only 4 percent of the control managers are still at the same company or at a company from the selected sample. Due to the small size of the sample, this percentage is relatively low.

general sector, since all the control managers are from the general sector. Notice that in this comparison, there are only two possible outcomes for a career.

As shown in Figure 8.3, the division between the two categories is completely opposite for the control managers and the cartel-involved managers. All figures are characterized by a negative effect of cartel involvement on the careers of managers. The first two are significant on a 5-percent level, the third at a 10-percent level.

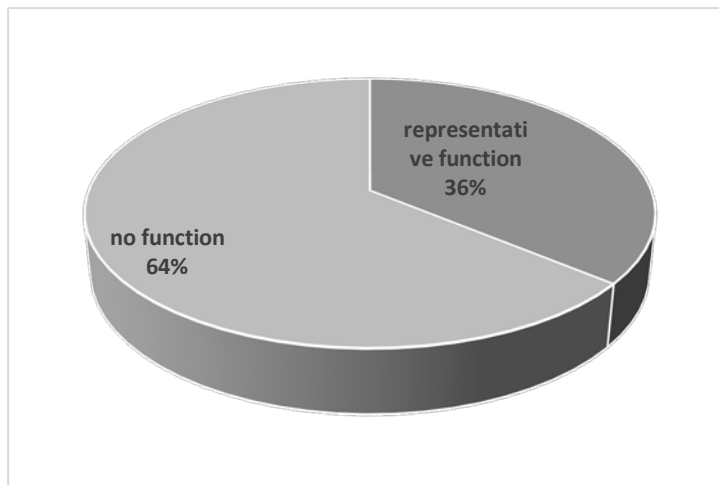
Table 8.2 shows the number of managers per group with a representative function, together with the confidence interval of that number. Using the confidence interval, a range for the percentage of managers with a representative function is calculated (as shown in the third column).²¹⁰ The percentages in the figures might vary within this confidence percentage without changing my conclusions.

Figure 8.2 Functions of managers from the control group.



²¹⁰ The confidence interval of *all cartel managers* is not representative because this group is significant at 10 percent and the confidence interval is set at 95 percent.

Figure 8.3 Functions of cartel managers in the general sector.



Source: Table 8.1, *infra*.

Figure 8.2 and Figure 8.3 clearly indicate that the career development paths for the two groups of managers (the cartel group and control group) are different and that cartel-involvement negatively affects careers. Of the managers from the control group, 64 percent have a representative function, whereas this is true for only 36 percent of the cartel-involved managers.

Comparing the control group with all cartel-involved managers (in the general and construction sectors), gives a less drastic difference, as is seen in Figure 8.4. However, this result is mainly because 67.7 percent of the cartel managers from the construction sector were able to keep their representative functions. However, as is also shown in Figure 8.4, there is a statistically significant negative relationship (at the 10-percent level) between cartel involvement and career development.

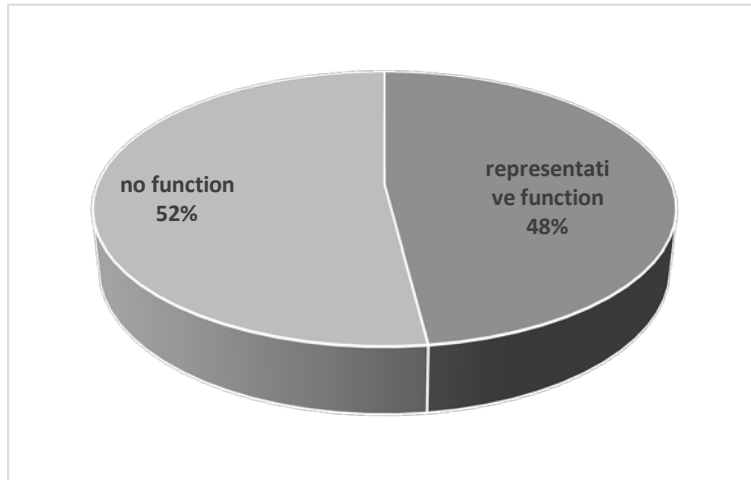
These first descriptive results lead to the tentative conclusion that the career development of managers in the general sector is negatively influenced when they have been involved in a cartel. This conclusion is tested in section 7.5 using a binary logit model.

Table 8.2 **The negative effect of cartel involvement on *career* in all groups**

Group	Managers with representative function	95% confidence interval	Figure
Control managers in general sector*	32 out of 50	25-30 out of 50, 50-78% with representative function	2
Cartel managers in general sector	18 out of 50	11-25 out of 50, 22-50% with representative function	3
All cartel managers**	39 out of 81	30-48 out of 81, 37-59% with representative function	4

Notes: * Indicates that significance of this group is the same as for 'cartel managers in general sector.' A logistic regression of cartel involvement on *career* for all managers (cartel and control) in the general sector is run. ** Indicates significance at 10%.

Figure 8.4 **Functions of all cartel managers**



Source: Table 8.1, *infra*.

Furthermore, the second analysis of this article investigates whether this negative effect is influenced by factors such as company size, period between switching jobs, the punishment factor, and the financial penalty set by the NMa, as described in section 5. This analysis is done using a binary and multinomial logit model (with three outcomes for career development), explained in section 5.

8.5 Empirical results

In this section, the comparison of the career development of cartel-involved and control managers is tested more profoundly to determine whether

cartel involvement has an effect on the career development of a manager. Furthermore, I examine the effect of explanatory variables on the career development of cartel-involved managers. I first describe and explain the explanatory variables. In the second subsection, I examine the effect of cartel involvement on managers' careers using a binary logit model. In the third subsection, I analyse the factors influencing the career outcome using both a binary and a multinomial logit model.

Description of the explanatory variables

In this part, I describe the explanatory variables that might influence the career development (*career_binary*). The following variables are included: a dummy for cartel involvement, the fine and the punishment factor set by the NMA, a dummy variable to indicate in which sector the cartel was active,²¹¹ a dummy variable for Data sets 1 and 2,²¹² and the age of the manager. The expected effect on the dependent variable, *career*, for all independent variables is presented in Table 8.3.

As shown in section 4, cartel-involved managers face negative career effects compared with cartel-free managers. This outcome is represented by a dummy for cartel involvement with managers from the control companies as the base group.²¹³ The hypothesis is that the managers from the control group have a higher (or positive) probability of getting or keeping a representative function.

The size of the company influences the career of a manager. This is expected to be a positive relation because, even if cartel involvement has a negative effect on *career*, having experience as a manager of a large company might increase career chances at other companies. Even a negative impact on

²¹¹ Only the construction sector and general sector are distinguished in this variable due to the low number of observations in the separate sectors of general sector.

²¹² General sector: Data set 1, managers that left the company between the end date of the cartel and the date of the decision by the NMA; Data set 2, executives that left the cartel company after the publication date of the decision. Construction sector: Data set 1, managers that left the cartel company between November 2001 and October 2004; Data set 2, managers that left the company after October 2004.

²¹³ Cartel managers are given a 1, and managers from the control group are given a 0.

one's career might then result in a representative function. This effects is measured by the amount of the fine because the fine takes up about 10 percent of the revenue of the company.²¹⁴ It might be assumed that the larger the company, the higher the revenue and hence the fine.²¹⁵

The expectation is that the higher the degree of anticompetitiveness of the cartel, the less a manager is able to keep or get a representative function. This is measured by the punishment factor announced by the NMa in its decisions ('rekenfactor' in Dutch).²¹⁶ This factor depends on the duration of the cartel, among other factors.

Table 8.3 The expected effect of independent variables on *career*

Variable	Expected Effect on <i>Career</i>
Fine	+
Punishment factor	-
Construction sector	-/+ (less negative than general sector)
Age	-
Data set 1	-/+ (less negative than Data set 2)
Cartel dummy	-

Being active in a cartel in the construction sector might diminish somewhat the negative effect on a manager's career because many companies in that sector have been involved in a cartel. The hypothesis is that this only works for intra-sector job changes because the culture in the general sector is expected to be different.

²¹⁴ The fine is not always 10 percent of the revenue of the company. The amount can be multiplied with a factor representing the punishment factor. When a company applies for leniency, the fine can be reduced. No companies from this data set applied for leniency.

²¹⁵ A combination of the fine and punishment factor is not statistically possible. The fine divided by a punishment factor gives collinearity with the cartel dummy, and the other combinations are not significant.

²¹⁶ The percentage for the financial penalty is set at 10 percent of the revenue of the company. This 10 percent is multiplied by the punishment factor, which represents the anticompetitiveness of the cartel. For most forms of conduct, this factor ranges from 1.5 to

3. NMa, Boetecode van de Nederlandse Mededingingsautoriteit [Penalty Code of the Dutch Competition Authority] (June 29, 2007).

The expectation is that age negatively influences *career*, since the older a person, the higher the probability of retirement.²¹⁷ Regarding Data sets 1 and 2, the expectation is that future employers are more aware of the cartel involvement of the managers when the manager applies for a new job at a later point in time than immediately after the end of the cartel. Hence, the managers of Data set 2 are assumed to face more negative results.

In Table 8.4, the descriptive statistics of the dependent and independent variables are summarized. In the dependent variable *career_binary*, the control group is also represented. This is also the case for the independent variable *cartel_dummy*, which indicates that 62 percent of all managers in the analysis are cartel managers (81 managers of the 131 managers in total). For the other variables, the cartel and control managers are described separately.

Because the managers from the control group did not get a fine, are not subject to a punishment factor, and are all from the general sector, they have no value for these independent variables. The only independent variables for the control group that do have a value in this analysis are *age* and *data set 1*. These independent variables are shown at the bottom three rows of Table 8.4. Comparing the age of cartel managers with that of control managers shows that, not only are the control companies similar to the cartel companies, but also, the managers are rather similar as appears from the average age. In the analysis, these variables are included in the variable *age* and *data set 1*.

Cartel versus control managers

In the previous section, the career development of cartel-involved and control managers is compared based on the number of managers with a representative function after the cartel prosecution. The conclusion from last section is that the career of managers in the general sector is negatively influenced when they have been involved in a cartel. The effect of cartel involvement on the career of managers from both sectors was less clear.

²¹⁷ When a manager retires, he/she is found in the group of *no representative function*.

Table 8.4 Descriptive statistics for the dependent and independent variables

Variable	Number observations	Mean	Standard Deviation	Min	Max
Career_binary	131	0.54	0.50	0	1
Independent Cartel Variables					
Fine (thousands)	81	3505.38	4948.71	5	12630
Punishment factor	81	1.42	0.66	0.2	2.42
Construction	81	0.38	0.49	0	1
Age*	80	59.45	9.27	35	87
Data set 1	81	0.28	0.45	0	1
Independent Control Group Variables					
Cartel dummy	131	0.62	0.49	0	1
Age	50	61.92	9.16	46	89
Data set 1	50	0.56	0.50	0	1

Note: *Indicates that one observation is missing

In the current section, this effect is analysed by means of a binary logit model with two career outcomes: no representative function and a representative function. The regression is as follows:²¹⁸

$$career_binary = \beta_0 + \beta_1 fine + \beta_2 punishmentfactor^2 + \delta_1 construction + \beta_3 age + \delta_2 dataset1 + \delta_3 carteldummy$$

As is shown in Table 8.5, this logit regression has an R² of 0.1581, which is rather low. This model has a significant Chi² and hence points at a relationship between career development and the explanatory variables. The variables *fine* and *cartel dummy* have the expected signs. Whether *construction* has the expected effect on a manager's career can be determined by the marginal effect. This effect calculates the change in the probability of having a representative function caused by a shift from the general sector to the construction sector. The sign of *cartel dummy* indicates that being involved in a cartel has a negative effect on a manager's chances of having a representative function.

²¹⁸ In this model, the square of *punishment factor* is taken, because doing so gives the lowest Bayesian Information Criterion (BIC) outcome.

To interpret the results from Table 8.5, the marginal effects (ME) are calculated. The following situation is taken as benchmark: the fine is 3,505,000 euro (the mean); the punishment factor² is 1.5 (the mean); the cartel was active in the general sector; the age is 59.5 years; and the manager is found in

Data set 2. Table 8.6 gives the probabilities that managers have a representative function (at the cartel company or another company) for cartel managers and control managers.

Table 8.5 Regression output of the binary logit model

Variable	Coefficient	P> z
Fine (thousand)	0.0002291	0.000*
Punishment factor2	-0.0180903	0.911
Construction	2.411759	0.000*
Age	-0.0141913	0.521
Data set 1	-0.2627717	0.531
Cartel dummy	-2.557122	0.000*
Constant	1.606256	0.206
N = 130, Pseudo R ² = 0.1581, Prob > Chi ² = 0.0001		

Note: * Indicates significance at 5%.

Table 8.6 Cartel-free managers' higher probability of having a representative function

Variable	ME for Cartel Managers	ME for Control Managers
Probability of representative function	26.3%	82.1%

Note: The MEs do not add to 100%, because they are not two different outcomes of career but a distinction between the two values of the independent variable cartel dummy.

This same model cannot be used to analyse the effect of all the different explanatory variables on the career of the managers. This is because of collinearity among the variables *punishment factor*, *fine*, and *cartel dummy*. The correlation between *punishment factor* and *cartel dummy* is especially high, as shown by the correlation coefficients in Table 8.7.

Furthermore, the number of control managers that have a representative function at the same company (or at another company within the control group) is small due to the small size of the control group. Therefore, the analysis of the independent variables is presented in the next subsection with both a binary and multinomial logit model.

As I discuss in section 4 and at the beginning of this section, the career of managers in the general sector is negatively influenced when they have been involved in a cartel. The binary logit model shows a negative effect of cartel involvement on the career development of managers. Furthermore, the marginal effects indicate that a cartel-involved manager has a lower probability of obtaining a representative function than a control manager. It can therefore be concluded that cartel involvement negatively affects the careers of managers.

Table 8.7 **The high correlation between *punishment factor* and *cartel dummy***

	Cartel Dummy
Punishment factor	0.80
Fine (thousand)	0.40

Table 8.8 **Values of *career* in binary and multinomial model**

Career_Binary	Career_Multinomial
No representative function	1. No representative function
Representative function	2. Function at cartel company 3. Function at other company

Note: (1) A manager moves to a non-representative job or retires; (2) a manager keeps his/her representative job at the cartel involved company or a manager gets a representative function at another prosecuted cartel involved company; (3) a manager moves to a representative job at another company.

Career development cartel managers

In the prior paragraph, it is concluded that cartel involvement has a negative effect on the career of managers. In this paragraph, the different factors influencing the career of the cartel manager are analysed. First, a binary logit model is used and, later on, a multinomial model. In Table 8.8, the values for the dependent variable career are shown.

Binary Model

The regression is as follows:

$$career_binary = \beta_0 + \beta_1 fine + \beta_2 \sqrt{punishment\ factor} + \delta_1 construction + \beta_3 age + \delta_2 dataset1$$

The signs of the explanatory variables and their significance are the same as is shown in Table 8.5 except for *punishment factor*.²¹⁹ To calculate the marginal effects, the same benchmark situation is used as described above except that the square-root of the punishment factor is now 0.5. The marginal effects of the explanatory variables in this situation are shown in Table 8.9.

The probability of a representative function is 58.6 percent in the benchmark situation. The marginal effect of an increase of the fine by 1 million euro increases with the level of the fine. A manager has at most a 6.1-percent higher probability when the fine increases by 1 million euro. This maximum occurs when the fine is between 2.7 million euro and 3.2 million euro. The probability of having a representative function also increases with the amount of the fine.

Table 8.9 Marginal effect on probability of *career* for cartel managers

Variable	Marginal Effect
Probability of representative function = 58.6%	
Fine (thousands)	+0.0059%
Square Root of Punishment Factor	-46.0%
Construction	+34.0%

Note: In this model, the square root of punishmentfactor is taken, because doing so gives lowest Bayesian Information Criterion (BIC) outcome.

As is shown by the negative sign of the marginal effect, the higher the square root of the punishment factor, the lower the probability of a representative function.²²⁰ The size of the marginal effect of *punishment factor* decreases with the value of the punishment factor. At the highest value, 1.55, the marginal effect is at the lowest, 20.4 percent.

The managers from the construction sector have a higher probability of a representative function than those from the general sector. In the benchmark situation, the probability of a representative function increases by 34 percent if a manager was active in a cartel in the construction sector.

²¹⁹ In this model, *punishment factor* is significant with $P > |z| = 0.000$ and a coefficient of -2.16 . Pseudo R^2 is now 0.1463.

²²⁰ See *supra* note 21.

Multinomial logit model

As is shown in Table 8.8, above, the dependent variable career now has three outcomes. The regression is as follows:

$$\text{career_multinomial} = \beta_0 + \beta_1 \text{fine} + \beta_2 \sqrt{\text{punishmentfactor}} + \delta_1 \text{construction} + \beta_3 \text{age} + \delta_2 \text{dataset1}$$

Table 8.10 presents the marginal effect of the significant explanatory variables for each career outcome. The benchmark situation is the same as described above.

The variable *fine* has a negative effect on the outcome of having no representative function and, again, a positive effect on a function at another company. Apparently, having experience as a manager of a larger company positively influenced one's career opportunities to have a representative function. The marginal effects for both categories of career show an inverse *u*-curve: first the marginal effect increases with the level of the fine; then, the effect decreases.

The higher the square root of the punishment factor, the higher the probability of having no representative function. This result is shown by the positive sign of the marginal effect. This effect is expected; the more intense the anticompetitiveness of the cartel, the higher the punishment factor, and hence, the higher the probability of having no representative function.

Table 8.10 Marginal effects on probability of *career* outcomes in the benchmark situation

Variable	ME No Representative Function	ME Function at a Cartel Company	ME Function at Another Company
If the fine increases with €1.000	-0.0063%	ns	+0.0055%
If the square root of the punishment factor increases by one	+46.5%	ns	48.1%
If the firm is in the construction sector	-42.4%	+34.9%*	ns
If the manager leaves the company earlier (Data set 1)	ns	-10.2%	ns

Note: "ns" indicates not significant; * indicates significance at 10%.

The effect on having a representative function at another company is different. The higher the value of the square root of the punishment factor, the

lower the probability of having a representative function at another company. This outcome is also expected, and it points at a negative effect between the size of the anticompetitiveness of the cartel and the probability of a representative function at another company. For both career outcomes, the marginal effect decreases with the value of the square root of the punishment factor. This indicates diminishing negative effects of the punishment factor on a manager's career.

Moving a manager from the general sector to the construction sector decreases the manager's probability of having no representative function by 42.4 percent.

The marginal effect of *data set 1* on having a representative function at a cartel company is significant. This marginal effect indicates that, when a manager leaves the cartel company earlier (before the decision by the NMa), he or she has a lower probability of getting a representative function at a cartel company. This is surprising, because one would expect that the later the switching of jobs, the more negative the career effects. This negative marginal effect for managers that left the cartel company before publication of his or her cartel involvement might indicate that other cartel companies prefer hiring managers with cartel experience.

Conclusion on the career development of cartel managers

Table 8.11 summarizes the effects of the significant independent variables (at the 5-percent level) on having a representative function.²²¹ These effects are the same for both models except for *data set 1*.

Table 8.11 The same relationship between *career* and independent variables in both models

Variable	Effect on Representative Function (at a Cartel and Another Company)
Fine	Positive effect
Punishment factor	Negative effect
Construction	Positive effect
Age	Not Significant
<i>Data set 1</i>	<i>Negative effect (only on function at cartel company)</i>

²²¹ For the multinomial model, this includes two outcomes; *function at cartel company* and *function at other company*.

Sources: Table 8.9 & Table 8.10, *infra*.

Increasing the financial penalty for cartel managers (*fine*) gives a higher probability of having a representative function (at a cartel and another company) and a lower probability of having no representative function. The anticompetitiveness of the cartel gives the opposite effect. The punishment factor negatively affects the probability of a representative function (at a cartel and another company) and positively affects the probability of no representative function.

Having been involved in a cartel in the construction sector increases the probability of having a representative function compared with the general sector. The sector variable indicates that being a manager in the construction sector has a negative effect on having no representative function and a positive effect on having a representative function (at a cartel and another company). This outcome means that managers from the construction sector have a higher probability of getting a representative function than managers from the general sector. The opposite is the case for getting no representative function.

8.6 Conclusion

This article investigates the career development of cartel-involved managers after cartel prosecution. This analysis is done in two ways: (1) by comparing career development with a group of cartel-free managers from similar companies (in size and sector) in the same period; and (2) by analyzing different factors that influence the career outcomes of cartel-involved managers. The first analysis is done using a binary logit model. For the second analysis, a multinomial model is used with three outcomes; *no representative function* after the prosecution, *a representative function at a prosecuted cartel company* (the same or another company), and *a representative function at another company* (not a cartel company).

First, a binary model is run with only two values for career: *a representative function* and *no representative function*. Table 8.1 shows that a slight majority (of 51.8 percent) of all cartel managers have no representative function after cartel prosecution. This share is not a convincing majority to conclude that cartel-involved managers face negative career effects. It is interesting to see that the result differs for the two sectors. A greater proportion of cartel managers from the construction sector have a representative function than those from the general sector.

Comparing this outcome with the control group from the general sector shows that the career development of cartel-involved managers is the exact opposite of the development of the control group. Of cartel-involved managers, 64 percent do not have a representative function. For the control group, this share is only 36 percent. This statistically significant difference points at a negative career effect of cartel involvement. Also, the binary logit model concludes with a negative effect of cartel involvement, as shown by the negative sign of the coefficient for the explanatory variable *cartel dummy*. Furthermore, the marginal effects indicate that a cartel-involved manager has a lower probability of getting a representative function than a control manager does. It can thus be concluded that cartel involvement negatively affects the careers of managers.

For the cartel-involved managers, the influences of different explanatory variables on the careers of managers after cartel prosecution are analysed. Table 8.11 showed the conclusion for the significant variables. The level of the fine positively influenced a manager's career opportunities on a representative function. This positive effect shows that this variable better represents the size of the company and the manager's experience as a manager of a larger company—and hence has a positive influence on the careers of the managers—than the anticompetitiveness of the cartel.

The reputation of cartel involvement is different in the construction sector because managers from the construction sector have a higher probability of getting a representative function and a lower probability of ending up with no representative function after prosecution of the cartel.

The punishment factor has a negative effect on the probability of having a representative function. This result indicates that the competition authority could increase the career effects of cartel managers by increasing the punishment factor.

It is striking that the managers of the control group have a higher probability of getting representative functions than the cartel managers from the same (general) sector. Therefore, this article concludes that cartel-involved managers face negative career effects after the prosecution of their cartels. This negative effect is lower if the cartel was active in the construction sector.

These results show that the cartel policy of the NMa (deliberate or not) is effective in establishing negative reputations of cartel-involved managers, resulting in negative career effects for those managers. This effect could be expanded by increasing the punishment factor and examining the damage to managers' reputations by the different punishment options for cartel involvement.

One option that could be examined is the civil prosecution of a jail sentence. The expectation is that the damage to a manager's reputation would be large. This effect could be analysed by comparing the career effects of cartel-involved managers among countries with different punishment options. Another option for future research is to see whether the career effects differ between different management functions.

9. Conclusions: Implications of findings for the effectiveness of cartel law

This PhD adds to the literature on the effectiveness of the leniency programme, the impact of damages claims and the interaction between these. What do the findings imply for the effectiveness of cartel law—through public as well as private enforcement?

Economic theory shows that the threat of damages (in whatever form) following from cartel activity influences the decision to apply for leniency. As such, the success and effectiveness of the leniency programme are closely linked to the developments around damage claims and firms' awareness of the impact of other damages.

Taking a step back from the individual conclusions of the PhD articles, this conclusion looks at past developments in cartel enforcement policy, the impact on damages claims and the deterrence effect on new and existing cartels in the Netherlands.

The leniency programme

In the summer of 2002, the Dutch leniency programme was introduced, in the hope that, as with other jurisdictions, it would stimulate cartel members in the Netherlands to blow the whistle. Almost 20 years later, cartels persist in the Netherlands (although at the time of writing, December 2019, the most recent cartel was fined by the ACM in 2017).

What does this tell us about the effectiveness of the Dutch leniency programme? Apparently, cartels are not deterred—at least not completely. Does this mean that the programme is effective because it brings the remaining cartels to light? No, it does not. As shown in Chapter 3 (Article 1), only 16% of all cartel cases in the Netherlands are discovered through a leniency application. This is a significantly lower percentage than in other jurisdictions.²²²

²²² At the European Commission, 69% of all cartel sanction decisions in the period 1996–2015 involved immunity, and in recent periods the percentage has

Nevertheless, it is questionable whether achieving 100% discovery would in fact imply that the leniency programme has reached maximum effectiveness. The goal of the programme is to destabilise cartels by increasing the benefits to individual members—especially the first one—by moving back from coordinating to competing. In creating distrust among cartel members, the leniency programme deters the forming of new cartels and the continuance of existing ones. A relevant question therefore is how many cartels (discovered and undiscovered) would exist without the leniency programme. This question is yet unanswered by economic research and most likely will never be answered, just because of the nature of undiscovered cartels – we do not know what we do not know. Studies coming close are Miller (2008) and Brenner (2009).

Miller (2009) uses a method of moments to show that the revision of the US leniency programme in 1993 resulted in an increase in the detection rate.²²³ There was an increase in cartel discoveries following the introduction of the revised programme, followed by a decrease below pre-leniency levels. According to the author, this suggests a shakedown of existing cartels at the time of its introduction, followed by a stronger deterrence effect, meaning, fewer cartels.

Brenner analysed something similar for the European leniency programme introduced in 1996.²²⁴ The author finds a strong increase in the number of cartel convictions immediately following the introduction of the programme, but no evidence that cartels became more fragile after 1996.

Deterrence effect

Two other studies have looked at whether cartels are discontinued because of cartel policy: one in the UK in 2007 and the other in the Netherlands in

been even higher. In Korea, 49% of cartel cases between 2005 and 2010 were detected through leniency. Wils, W.P.J. (2016), *The use of leniency in EU cartel enforcement: an assessment after twenty years*, *World Competition*, 39(3), 327–388 & Koh, S.R. and Jeong J. (2013), *The leniency program in Korea and its effectiveness*, *Journal of Competition Law and Economics*, 10(1), 161–183.

²²³ Miller, N.H. (2009). Strategic leniency and cartel enforcement. *American Economic Review*, 99(3), 750-68.

²²⁴ Brenner, S. (2009). An empirical study of the European corporate leniency program. *International Journal of Industrial Organization*, 27(6), 639-645.

2010.²²⁵ Both studies are based on questionnaires among businesses and competition lawyers.

In the UK, according to the lawyers surveyed, for each of the cartel decisions published by the Office of Fair Trading in the period 2000-06, five initiatives were abandoned or significantly modified. According to the companies surveyed, the equivalent figure was 16 for each of the sanctioned cartels. The authors also asked the respondents about the importance of the different sanctions. Public fines scored relatively high for lawyers (the second most-important sanction after criminal penalties), while it scored fourth for business. The latter group perceived adverse publicity as being more important. Noteworthy is that both groups considered private damage claims as least important (as at 2007).

In the Netherlands, as a consequence of the cartel policy of the Dutch competition authority, 60% of the instances that were likely to infringe cartel law were stopped, changed or did not start to begin with.²²⁶ In 13% of all cases, the authority had become aware of the agreement, leading to a sanction decision. As the total number of sanction decisions is known, the authors were able to conclude that, for every sanction decision imposed by the Dutch competition authority, there were almost five instances where illegal behaviour was stopped or changed without the authority being aware of it.²²⁷

In showing this, it remains unclear whether cartels are stopped because of the threat of sanctions, the leniency programme, or for other reasons. It does show, however, the overall deterrence effect of cartel law.

The effects of the leniency programme on the number of self-reported cartels

To see the effects of the leniency programme on the number of cartels reported to the competition authority, it is interesting to look at the effect of changes in the programme. As of 2007, the Dutch competition authority can

²²⁵ Deloitte (2007). The deterrent effect of competition enforcement by the OFT, November 2007. SEO (2010). Anticipatie op kartel- en concentratietoezicht, SEO-rapport nr. 2010-76 (also published as Baarsma, B., Kemp, R., van der Noll, R. and Seldeslachts, J. (2012). Let's Not Stick Together: Anticipation of Cartel and Merger Control in The Netherlands. *De Economist*, 160(4), 357-376.

²²⁶ Based on the responses from competition lawyers, who have advised on 423 instances in total.

²²⁷ Baarsma, et al. (2012), op. cit.

also fine directors when it finds an infringement of cartel law. Directors can apply for leniency and not be fined at all, or have their fine reduced. Dijkstra and Frisch (2018) analyse the impact of introducing personal fines for directors of cartelists on the number of cartel discoveries in the Netherlands.²²⁸ As the average number of cartel discoveries has fallen over time, the authors do not find more cartels being desisted after the policy change.²²⁹ Besides this, the number of cartels discovered by the ACM that involve a leniency application decreases as well. This considers all leniency applications and not only the first one, which suggests that, under the revised leniency programme, it is less attractive to apply for leniency.

Chapter 3 (Article 1) shows similar results, with both the number of cartels sanctioned by the ACM and the number of cases that involve at least one leniency application decreasing over time. Calculating the cases that involve leniency, as a ratio of all sanctioned cartels, also shows a decrease in the period 2002-14. However, when adding more recent years, up until 2017, the development of this ratio becomes more or less constant, with a very small downwards trend.

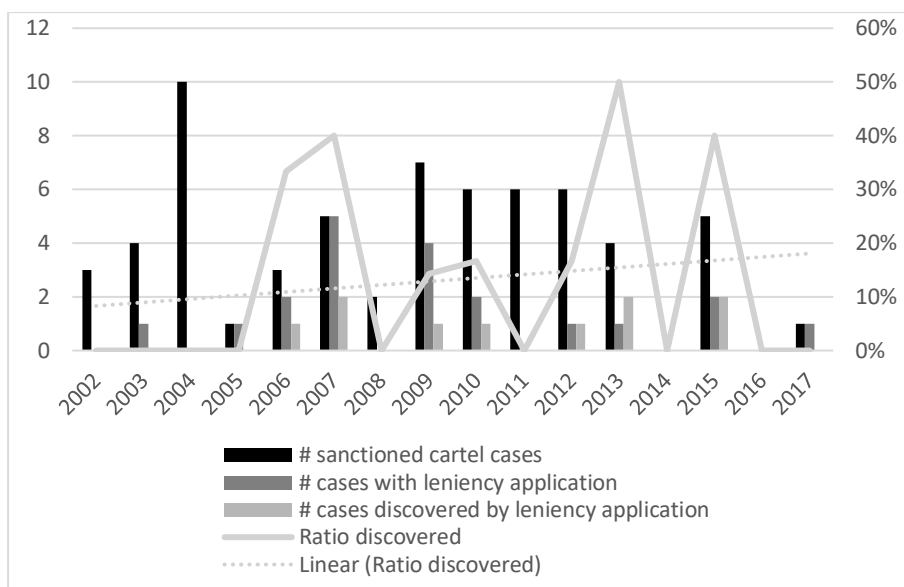
As described above, the number of leniency applications includes both the first whistle-blower and cases where a cartel member applies for leniency during or after the dawn raid. Looking solely at cartel cases discovered through leniency application²³⁰ as a ratio of all sanctioned cartels gives an upward-sloping trend in the period 2002-17 (see Figure 9.1). This means that, of the cartel cases fined by the ACM, an increasing number is brought to light by one of the cartel members blowing the whistle. This suggests an increase in the destabilising working of the leniency programme. However, the overall level of cartels discovered through self-reporting remains relatively low, and below the level in other jurisdictions. Over 2002-17, 16% of all cases were discovered through a leniency application and after 2010, this is 21%.

²²⁸ Dijkstra, P.T. and Frisch, J. (2018). Sanctions and Leniency to Individuals, and its Impact on Cartel Discoveries: Evidence from the Netherlands. *De Economist*, 166(1), 111-134.

²²⁹ This is measured as the number per quarter in the pre-revision (July 2002-September 2007) and after-revision period, (October 2007-June 2014).

²³⁰ Meaning before the ACM started its investigation.

Figure 9.1 Development of number of sanctioned cartel cases in the Netherlands



Source: Chapter 3 (Article 1)

Financial impact of a cartel infringement under public cartel enforcement

Dijkstra and Frisch (2018) find indications that the decrease in cartel cases was in part caused by a higher deterrence effect. They draw this conclusion based on the harsher enforcement—through a significant increase in fines—after the revision of the leniency guidelines.²³¹

Chapter 3 (Article 1) does also find an increase in final fines, when 2002 is excluded.²³² What would one expect from higher fines: more or fewer leniency applications? As a successful leniency application reduces the fine—potentially by a considerable amount—one could argue that the higher the fine, the more attractive the leniency programme becomes. In line with this,

²³¹ This increase seems to be measured by comparing the average fine in the two periods. It does not necessarily entail an upwards trend in the level of the fine over the total period. For instance, the average fine in 2010 was much higher than in the surrounding years, which has a high impact on the overall average fine in the period after the revision: 2007 to summer 2014.

²³² Hence, after leniency reductions. The average fine in 2002 was €8.3 million in nominal terms. In real terms this is €10.3 million. Both numbers are well above the average of the other years.

Motta and Polo (2003) state that reporting a cartel—and receiving a reduction in the fine—reduces the expected fine.²³³ This suggests that a higher fine incentivises self-reporting.

Using the expected fine implies that the perceived likelihood of detection and conviction are also relevant. The effect of a higher fine is therefore likely to differ depending on the exact situation faced by the cartel member. With a less than 100% perceived probability of detection, a higher fine can disincentive a leniency application. This could be the case, for instance, when a cartel member is unsure whether the cartel will be discovered, or unsure whether the authority will be able to prove the cartel.

The results on the effect of higher fines on leniency are mixed. For instance, Koh & Jeong (2013) do not find a significant effect of the fine level, but Hoang et al. (2014) find a small positive effect on the likelihood of applying for leniency. Results are also mixed between Chapter 3 and 4 (Article 1 and 2). Chapter 3 (Article 1) shows a positive effect of an increase in fines for applying for leniency, while Chapter 4 (Article 2) shows a negative effect. This difference may in part be explained by the underlying research methodology. While Chapter 3 (Article 1) is an ex post analysis of firms that has actually applied for leniency in the period 2002-18, Chapter 4 (Article 2) is based on ex ante analysis of perceived behaviour by people who discover an illegal agreement within their firm. Beside the difference in timing (ex ante versus ex post), Chapter 3 (Article 1) has a bias in that it relates to sanctioned cartels only. Therefore, any conclusion drawn from this analysis might not apply to currently undiscovered cartels. Lastly, in Chapter 4 (Article 2), the survey respondents were faced with elements of both public and private cartel enforcement, while private cartel enforcement is not examined in Chapter 3 (Article 1)

Chapter 3 (Article 1) shows that cartel members that apply for leniency on average face a substantially higher fine (the base fine, hence before any leniency reduction) than those who do not apply: € 7.7 million versus € 2.0 million. The analysis shows that cartel members that face a higher base fine have higher chance of applying for leniency. This effect is small, however, meaning an increase of less than 1% in the chance of self-reporting from an increase in the base fine of €1 million.

²³³ Motta, M. and Polo, M. (2003). Leniency programs and cartel prosecution. *International Journal of Industrial Organization*, 21(3), 347-379.

Chapter 4 (Article 2) shows that higher fines—corporate and personal—lead to a lower likelihood of a leniency application. When the leniency reduction is 100%, this negative effect disappears. Hence, the fine reduction for the first applicant contributes to the destabilising effect of the leniency programme.

The analysis furthermore shows that the personal fine is more important than the corporate fine in explaining the decision to apply for leniency. The relative size of the two factors differs from the analysis of Van der Noll and Baarsma (2012). In this earlier study, the effect of the corporate fine is more than twice as large as that of the personal fine, while in Chapter 4 (Article 2) (2019) it is the exact opposite. This is not surprising since the analysis of Van der Noll and Baarsma is based on data from 2010. While as of October 2007 directors in the Netherlands can be fined personally, the first actual fine for an individual was levied in July 2010. Hence, it appears that, in 2010, respondents did not perceive a personal fine as very likely, while nowadays it is more common. In Chapter 4 (Article 2), a personal fine of €450,000, as opposed to no personal fine, leads to a lower likelihood of applying for leniency. The data from Chapter 3 (Article 1) shows that only a small proportion of the cartel members whose directors faced a personal fine in fact applied for leniency.

The relevance of the above results is emphasised by the fact that, in 2016, the Ministry of Economic Affairs increased the maximum amount for corporate and personal fines. Since July 1st in that year,²³⁴ a firm can be fined 40% of annual turnover—as opposed to the previous 10%. Directors of cartel firms can be fined €900,000 instead of the previous maximum of €450,000.²³⁵ None of the cartel decisions covered in Chapter 3 (Article 1) were subject to these new fine thresholds. Hence, no conclusion on the effect of the increase itself can be drawn from Chapter 3 (Article 1). The findings from Chapter 3 (Article 1) on the level of the fine suggest that a higher fine will lead to more leniency applications. From Chapter 4 (Article 2), it follows that this will lead to fewer applications, unless the applicant receives full immunity.

²³⁴ For cartel investigations since July 1st 2016 on which the ACM has not yet reported .

²³⁵ Beleidsregel van de Minister van Economisch Zaken van 28 juni 2016, nr. WJZ/16056097, houdende wijziging van de Boetebeleidsregel ACM 2014.

However, the effect in Chapter 4 (Article 2) is bigger for a personal fine of €450,000, as opposed to no personal fine, than for a personal fine of €900,000 (as opposed to no fine). Perhaps respondents did not consider the highest fine level of 40% to be credible, for example because at the time of the survey it had only just been introduced.

Summing up, based on Chapter 3 (Article 1), the number of sanctioned cartel cases goes down. This suggests either fewer cartels in the Netherlands and/or a higher level of deterrence. Either way, it remains unclear whether this is due to the leniency programme or not. From the cases involving leniency, an increasing feature is that firms come forward before the start of the investigation by the ACM. This suggests an increase in the destabilising working of the leniency programme.

The leniency programme is designed to stimulate the race to apply first; however, given the negative effects of applying, firms seem to be hesitant to be first. Instead, they may prepare a leniency statement in case a co-conspirator self-reports the cartel first. In the meantime, the cartel members hope that the cartel will never be reported. Seen in this way, the leniency programme seems to stimulate the race to apply second, rather than first. The results described in Chapter 3 (Article 1) support this conclusion. Data shows that, of the 20 cartels that involved one or more leniency applications, the large majority (13 cases) had more than one applicant. This shows that if a cartel is faced with a whistle-blower among its members, the chances are high that more cartel members will come forward to mitigate the fine.

From interviews done for Chapter 4 (Article 2), it followed that companies consider a number of factors when deciding whether to self-report. The conjoint analysis covered some of these—for instance, the maximum level of a private damages claim.

Besides this, reputation damages were considered important. Empirically, researchers have looked at the effect of such reputation damages and, specifically, a loss of value for shareholders²³⁶ and a negative effect on the career of cartel managers (Chapter 7, Article 5).²³⁷ Empirical research among

²³⁶ van den Broek, S., Kemp, R.G., Verschoor, W.F. and De Vries, A.C. (2012). Reputational penalties to firms in antitrust investigations. *Journal of Competition Law and Economics*, 8(2), 231-258.

²³⁷ Rosenboom, N.S.R. (2012). Career development after cartel prosecution: Cartel versus non-cartel managers. *Journal of Competition Law and Economics*, 8(1), 145-165.

Dutch listed companies shows that firms lose 2.3% of market value when a Dutch or European antitrust investigation is uncovered. In monetary terms, the level of the fine is only a small part of the lost shareholder value. A study of managers of Dutch firms that have been sanctioned for cartel involvement shows that those involved in the cartel face negative career effects after the prosecution of the cartel.

It has been suggested that some cartelists will not apply for leniency and uncover the cartel due to the negative consequences that the leniency programme does not protect against, such as private damages claims.²³⁸ Where this is the case, the balance might be shifting from deterring cartels by means of public enforcement policies to deterring cartels through private enforcement.

Shifting the balance? The introduction of damages claims

A shift towards deterring cartels through private enforcement in the EU and in the Netherlands can realistically be seen as of 2010. From then onwards, the Dutch courts were faced with the first cartel damages claims (24 June 2010 *TenneT v ABB* following the gas-insulated switchgear cartel²³⁹; 31 May 2011 *CDC v Akzo Nobel* following the sodium chlorate cartel²⁴⁰). These legal procedures often span multiple years and there are large amounts of damages at stake for the defendants. For example, ABB blew the whistle and received immunity under the European leniency programme, escaping a fine of €215.2 million.²⁴¹ However, during the filing of the case, TenneT sued ABB for €29.7 million in damages.²⁴² In the other Dutch civil damages case, one of the defendants had to pay the public fine in full. Arkema France was fined

²³⁸ For example, see Swaak, C.R.A. and Wesseling, R. (2015). Reconsidering the leniency option: if not first in, good reasons to stay out. *European Competition Law Review*, 36(8), 346-354; or Bodnar, O., Fremerey, M., Normann, H.T. and Schad, J. (2019). *The effects of private damage claims on cartel stability: Experimental evidence* (No. 315). DICE Discussion Paper.

²³⁹ <https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:RBONE:2013:BZ0403>

²⁴⁰ <https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:GHAMS:2015:3006>

²⁴¹ https://ec.europa.eu/rapid/press-release_IP-07-80_en.htm?locale=en

²⁴² <https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:RBONE:2013:BZ0403> para 2.8.

for €59 million for participating in the sodium chlorate cartel.²⁴³ Afterwards CDC sued this company, together with the three other defendants, for more than €100 million.²⁴⁴

While the first Dutch court procedure of a follow-on claim of a national cartel (meaning, based on an NMa or ACM decision) has yet to come, these European cases are likely to have an impact on the willingness of Dutch companies to apply for leniency. The leniency programme protects cartel members (in part) against the public fine, but there is no such protection against private follow-on claims. Furthermore, with private damages claims increasingly becoming a common part of the life cycle of a cartel, large purchasers might push harder for an out-of-court settlement to get compensated for the cartel price. By doing so, the cartelists end up paying (some) damages.

Taking 2010 as the tipping point into the era of damage claims, the dataset with Dutch cartels (Chapter 3, Article 1) does not show a drop in the number of cartels that came to light through a leniency application. The undiscovered cartel cases that were reported to the competition authority—a total of ten—are split 50:50 between the period 2002-10 and 2011 to the present (using the year of the decision).

Also, Chapter 4 (Article 2) does not show a strong effect of damages claims on a leniency application. Only for a maximum private damage claim of 10% is there a significantly lower chance of a leniency application and only for the firms (as opposed to the competition lawyers) being questioned. This may be because cartel enforcement is relatively new. Potentially, similar studies will give a different result if repeated in five to ten years.

It could be that firms—and their advisers, to a lesser extent—do not perceive damages claims as a realistic possibility. Once the EU Directive on Damages becomes effective, more cartels claims are expected.²⁴⁵ The Directive states that “[t]he full effectiveness of Articles 101 and 102 TFEU, and in particular

²⁴³ https://europa.eu/rapid/press-release_IP-08-917_en.htm?locale=en

²⁴⁴ <https://www.carteldamageclaims.com/competition-law-damage-claims/sodium-chlorate-cartel/>

²⁴⁵ Directive 2014/104/EU of the European Parliament and of the Council of 26 November 2014 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.

the practical effect of the prohibitions laid down therein, requires that anyone —[...] can claim compensation before national courts for the harm caused to them by an infringement of those provisions” (para. 3) To ensure this full effectiveness, the Directive instructs Member States on how to set up their legal framework in assessing private damages claims. In doing so, the Directive provides guidelines on pass-on, disclosure of leniency documents, and the burden of proof for an assumption of harm.

One could therefore argue that there is still a world to win in terms of the deterrence effect of private cartel enforcement. A way to increase this deterrence effect is by making directors, in addition to the firm, liable for private damages claims. As can be seen from Chapter 4 (Article 2), the personal fine had a higher impact on the likelihood of applying for leniency than the corporate fine. When the people who decide on the continuance or start of an illegal agreement are one and the same as those personally affected by the cartel enforcement, the effectiveness might increase. On the other hand, Chapter 4 (Article 2) showed that imposing a fine on a director does not increase the likelihood of applying for leniency. In practice, only a small part of all sanctioned cartels also involved a fine for the directors (just over 10%). More from a practical point of view, it is questionable whether a director would have the ability to pay the claimed damages.

Currently, there are mostly business-to-business damages claims. Thus, a customer (often a fairly large firm) claims the overcharge paid during the infringement period. When the cartel involves consumer goods, the overcharge could in principle be passed on to consumers. For instance, the braking system cartel or any of the other car parts cartels in the EU.²⁴⁶ Consumer damages claims are, however, scarce in practice – first of all because individual consumers have not suffered enough damages to warrant the costs and effort of a legal proceeding. Secondly, consumer claims are difficult (as explained in Chapter 6, Article 4). This is because the compensation process for fully compensating each individual victim harmed by the breach of antitrust rules remains unclear. The first issue can be solved by forming a consumer claim and having in place an effective regime for collective redress. The second issue can be solved by using the upper and lower limits following from the theoretical Chapter 6 (Article 4). These can be easily applied in practice when the consumer’s income spent on a cartel good and the overcharge are

²⁴⁶ European Commission (2018). Antitrust: Commission fines maritime car carriers and car parts suppliers a total of €546 million in three separate cartel settlements. Press release, Brussels, 21 February.

known. More importantly, by using these limits, consumers are fully compensated for the harm suffered as a result of price-fixing.

In a number of jurisdictions, the regime for collective redress has been updated. This is also the case in the Netherlands with the new Act on the Resolution of Mass Claims in Collective Action (Wet Afwikkeling Massaschade in Collectieve Actie, WAMCA). At the time of writing, this had not yet been enacted.

While private damages claims can still win in terms of having an effect on deterrence, in another way this area of enforcement policy has matured over time. In practice most, if not all, European Commission cartel cases are being investigated by law firms, funders, direct purchasers and claim vehicles as to whether the case offers a possibility to claim for damages. This depends, amongst other factors, on the value of commerce of the cartelised product or service, the expected overcharge and the level of pass-on. At the same time, the same types of party have been focusing on follow-on damage claims of an abuse of dominance case. The most well-known ones are the interchange fees of Mastercard/Visa and the Google Shopping case.

Looking to the future

In the EU, the area of private damages claims is evolving, with such claims becoming a solid component in the enforcement of cartels. Moreover, they are likely to continue to be brought by or on behalf of customers. If this deters leniency applications, the most deterring effect is to be experienced by the first leniency applicant. As such, any further development of private cartel enforcement might scare off cartelists, exposing the cartel to the competition authority. In the Netherlands, this could lead to a stop in the upward trend of cases self-reported by a whistle-blower (see Figure 9.1).

As an absolute number (10) and as a percentage of all cases (16% in 2002-19), the cases discovered through leniency do not make up a large part of all sanctioned cartels in the Netherlands. Therefore, from an overall enforcement perspective, a shift from public enforcement with a carrot-like leniency programme towards a stick with actual thorns might be an improvement.

10. Reference list

- Rosenboom, N, Involved in a Dutch Cartel: Who Blows the Whistle? (under review)
- Rosenboom, N., D in 't Veld., (019). The Interaction of Public and Private Cartel Enforcement. *World Competition*, 42(1), 87-120.
 - Rosenboom: 50%
 - In 't Veld: 50%
- Baarsma, B., & Rosenboom, N.S.R. (2015). A veritable tower of Babel: on the confusion between the legal and economic interpretations of Article 101 (3) of the Treaty on the Functioning of the European Union. *European Competition Journal*, 1-24.
 - Baarsma: 50%
 - Rosenboom: 50%
- Rosenboom, N. S., Kocsis, V., & Mulder, J. D. (2017). Consumer damages for breach of antitrust rules: how to reach full compensation for consumers?, *Journal of Competition Law & Economics*.
 - Rosenboom: 40%
 - Kocsis: 40%
 - Mulder: 20%
- Rosenboom, N.S.R. (2012), Career development after cartel prosecution: cartel versus non-cartel managers. *Journal of Competition Law and Economics*, March 2012.

11. Samenvatting—Dissecting cartels: from Discovery to Damages

De fase voorafgaand aan de ontdekking—determinanten van een clementieverzoek

1. *Involved in a Dutch Cartel: Who Blows the Whistle? (ingediend in 2019)*

Uit artikel 1, dat betrekking heeft op de determinanten van een clementieverzoek, bleek dat 16% van alle kartelzaken in Nederland wordt ontdekt door middel van een clementieverzoek. Dit betekent dat een zesde van alle zaken waarvoor een sanctie is opgelegd, aan de ACM wordt gemeld voordat de autoriteit met haar eigen onderzoek is begonnen. De overgrote meerderheid van de kartelzaken begint met een onderzoek door de ACM, waarna (ten minste bij enkele van) de kartels een clementieverzoek indienen via een of meer van haar leden. Van de kartels die in 2002 en 2019 een boete kregen opgelegd, was in 32% van de gevallen sprake van ten minste één clementieverzoek.

Voor dit artikel is een dataset van in Nederland gesanctioneerde kartelzaken samengesteld, met zaken die dateren van 1998 (onder de voormalige NMa) tot 2019 (onder de ACM). De dataset bevat informatie over (onder andere) de perioden waarin kartels actief waren, het aantal leden van een kartel, het soort inbreuk en de kenmerken van kartelleden (zoals omzet, marktaandeel binnen een kartel, boetes, en of zij besloten hebben een clementieverzoek in te dienen). Soortgelijke studies zijn uitgevoerd voor kartels in de VS, Europa en Korea. In verschillende documenten worden de bepalende factoren voor clementieverzoeken op kartel- en kartelniveau empirisch geanalyseerd. Onder meer Hoang et al. (2014)²⁴⁷, die de kans analyseerde dat een kartellid een klokkenluider is in kartelzaken van de Europese Commissie in de periode 2000-2011, en Kim & Kim (2016), die de Koreaanse kartelzaken in de periode

²⁴⁷ Hoang, C. T., Hüschelrath, K., Laitenberger, U., & Smuda, F. (2014). Determinanten van zelfrapportage in het kader van de Europese bedrijfsclémentieregeling. *International Review of Law and Economics*, 40, 15-23.

2005-2009 analyseert. Brenner (2011) volgt een andere benadering om te bepalen wat de kans op een clementieverzoek beïnvloedt.²⁴⁸ Hij bekijkt het vanuit een resource-based perspectief en een cultuurperspectief. In het resource-based perspectief wordt de omvang van een onderneming als proxy gebruikt voor het beschikken over een efficiënte juridische afdeling, het hebben van een hoogwaardig management en het actief zijn in meerdere landen. Aangezien samenwerking met de mededingingsautoriteit de onzekerheid vermindert, stelt Brenner dat clementieverzoeken eerder worden waargenomen door ondernemingen met een cultureel bepaalde voorkeur voor het vermijden van onzekerheid.

Artikel 1 breidt niet alleen het aantal beoordeelde landen uit, maar voegt ook nieuwe determinanten toe die zouden kunnen verklaren waarom een bedrijf het kartel aan de mededingingsautoriteit zou melden. Deze factoren zijn onder meer of een kartel wordt ontdekt door middel van een clementieverzoek, het budget van de betrokken mededingingsautoriteit en het BBP in het jaar van de beslissing. Ten slotte breidt dit artikel de bestaande literatuur uit met een robuustheidsanalyse van kartelzaken die bij de rechtbank overeind blijven en de bepalende factoren voor de hoogte van de clementiereductie.

De resultaten van de econometrische analyse zijn robuust en leiden tot de volgende conclusie:

- individuele kartelliden die een hogere basisboete krijgen opgelegd of die deel uitmaken van een beursgenoteerde onderneming, hebben meer kans om een clementieverzoek in te dienen.
- kartels die actief zijn in de bouw- en de productiesector, hebben meer kans dat ten minste één kartellid een clementieverzoek indient.
- een belangrijke bepalende factor voor het indienen van een clementieverzoek is of het kartel wordt ontdekt door een clementieverzoek, waardoor de kans op zelfrapportage toeneemt.
- terwijl kartels die zich bezighouden met de vaststelling van andere voorwaarden dan de prijzen, eerder geneigd zijn om zichzelf te melden,

²⁴⁸ Brenner, S. (2011), Self-disclosure bij internationale kartels, *Journal of International Business Studies*, 42(2), 221-234.

zullen kartels die zich bezighouden met de uitwisseling van informatie, minder geneigd zijn om de klok te luiden.

- kartels die gedurende dezelfde kartelperiode de mededinging via meerdere soorten inbreuken beperkten, zullen eerder aanleiding geven tot een clementieverzoek. De duur van de kartelperiode heeft slechts een klein positief effect op de kans van zelfrapportage.
- het aantal kartelleden heeft een klein negatief effect op de kans op een clementine-aanvraag.

In artikel 1 wordt het besluit om clementie aan te vragen geanalyseerd op het niveau van *bestaande* kartels (d.w.z. kartels die aan het licht zijn gebracht en gesanctioneerd door de autoriteit). In artikel 2 van dit proefschrift wordt dezelfde kwestie bekeken, maar dan vanuit een ander perspectief; namelijk de wisselwerking tussen de clementieregeling en private schadeclaims wordt beoordeeld vanuit het perspectief van *potentiële* kartels.

De fase voorafgaand aan de ontdekking—interactie tussen de clementieregeling en private schadeclaims

2. *The Interaction of Public and Private Cartel Enforcement, published in World Competition, 42(1), 87–120 (2019). Medeauteur: Daan in 't Veld*

In artikel 2 wordt de keuze om een beroep te doen op de clementieregeling geanalyseerd op basis van factoren die verband houden met het kartelhandhavingsbeleid. Dit betreft zowel het publieke kartelbeleid (via de mededingingsautoriteit) als het private kartelbeleid (via het civiele recht). Daarbij wordt geanalyseerd of er sprake is van interactie tussen publieke en private handhaving. De vraag is of de interactie-effecten het algemene afschrikkende effect versterken of tegengaan, met name de interactie tussen civielrechtelijke schade na kartelzaken en de clementieregeling.

Het effect van deze interactie is een onderwerp van discussie geweest onder verschillende auteurs²⁴⁹, maar empirische resultaten ontbreken tot nu toe. Dit artikel probeert dit gat in het bestaande onderzoek op te vullen door de empirische analyse van de effectiviteit van de clementieregeling uit te breiden met private kartelhandhavingsinstrumenten. Het beoordeelt het

²⁴⁹ Zie bijvoorbeeld Green, J., & McCall, I. (2009). Clementie en burgerlijke vorderingen. *Inzicht in het mededingingsrecht*, 3-5.

destabiliserende effect, en daarmee de doeltreffendheid van de clementieregeling op basis van zowel publieke als private instrumenten.

De meeste, zo niet alle, onderzoeken die het anticipatie-effect van het kartelbeleid analyseren, richten zich alleen op publieke kartelhandhaving. In de literatuur zijn verschillende methoden toegepast, variërend van theoretische modellen, laboratoriumexperimenten, het analyseren van trends op basis van beschrijvende statistieken van opgespoorde kartels²⁵⁰ en enquêtes onder bedrijven en/of mededingingsadvocaten²⁵¹, tot meer verfijnde empirische econometrische studies zoals de conjoint analyse van Van der Noll en Baarsma (2017).²⁵² In aanvulling op artikel 2 maakt de aanpak van Van der Noll en Baarsma het mogelijk om een oordeel te vellen over het relatieve belang van de moraal ten opzichte van het beleid. De auteurs vinden dat voor 39% van de bedrijven de mogelijke gevolgen van handhaving belangrijker drijfveren voor de naleving lijken dan morele opvattingen over de wet.

Door het uitvoeren van een onderzoek met een conjoint analyse, met een panel van Nederlandse bedrijven en mededingingsadvocaten, beoordeelden de auteurs hoe bedrijven aankijken tegen de verschillende beleidsfactoren. Dit onderzoek is dan ook gericht op ondernemingen in het algemeen en niet specifiek op gesanctioneerde kartelleden. Uit zowel artikel 1 als artikel 2 blijkt dat de hoogte van de boetes een relevante factor is wanneer kartelleden besluiten om al dan niet het kartel aan de autoriteit te rapporteren. In tegenstelling tot het eerste artikel wordt in artikel 2 echter uitdrukkelijk rekening gehouden met private schadeclaims. Voor het eerste artikel was dit niet haalbaar omdat er geen informatie beschikbaar was over de wijze waarop individuele gesanctioneerde kartels in Nederland het risico van een schadeclaim inschatten.

²⁵⁰ Marvão, C.M.P., & Spagnolo, G. (2014). Wat weten we over de effectiviteit van het clementiebeleid? Een overzicht van het empirische en experimentele bewijs. Een overzicht van het empirisch en experimenteel bewijsmateriaal (1 oktober 2014) geeft een korte beschrijving.

²⁵¹ Hüscherlath, K., Leheyda, N., & Beschorner, P. (2011). Het afschrikkingseffect van antitrustsancties: Bewijs uit Zwitserland. *Het antitrustbulletin*, 56(2), 427-460.

²⁵² Van Der Noll, R., & Baarsma, B. (2017). Naleving van de kartelwetten en de bepalende factoren voor afschrikking - een empirisch onderzoek. *European Competition Journal*, 13(2-3), 336-355.

Voorts blijkt uit artikel 2 dat ondernemingen een clementieverzoek indienen op grond van de hoogte van de persoonlijke boete die hun bestuurders riskeren, en de vermindering van deze boetes na een succesvol clementieverzoek. Ondanks het toenemende aantal schadeclaims in Nederland zien Nederlandse ondernemingen private claims niet als een beslissende factor bij het overwegen of zij al dan niet een clementieverzoek zullen indienen (ten tijde van het onderzoek: 2016). Op basis van de analyse onder ondernemingen is er geen negatieve interactie tussen civiele claims en de clementieregeling. Tegelijkertijd kan het algemene anticipatie-effect voor ondernemingen beperkt blijven tot de persoonlijke boetes, aangezien bedrijven zich niet door het risico op schadeclaims lijken te laten beïnvloeden. De advocaten houden daarentegen wel rekening met private handhavingselementen bij het adviseren van hun cliënten over een clementieverzoek.

Beide groepen respondenten antwoordden dat zij in 16-19% van de gepresenteerde handhavingssituaties met hun kartelgedrag zouden doorgaan en geen clementieverzoek zouden indienen of hiertoe zouden adviseren.

De empirische analyse in artikel 2 bestaat uit een conjoint-analyse en een *nested* logit-regressie op de gegevens die via de online-enquête zijn verzameld. De conjoint-analyse is gekozen om de sociale en strategische vooringenomenheid tot een minimum te beperken. Er zijn reguliere vragen aan de enquête toegevoegd om de resultaten in de juiste context te plaatsen en de resultaten zijn na afloop besproken met een aantal mededingingsjuristen (die niet aan de enquête deelnamen).

De conjoint-analyse, samen met de reguliere vragen en de discussie met de mededingingsadvocaten, heeft duidelijk gemaakt dat de keuze voor een clementieverzoek negatieve gevolgen heeft, en niet alleen op het gebied van de wettelijke aansprakelijkheid voor een claim. De vraag is of de vermindering van de boetes voldoende zijn om deze negatieve effecten te compenseren.

Artikel 1 en 2 houden beiden ook verband met de tweede fase, de onderzoeksfase. Kartelleden kunnen nog steeds een clementieverzoek indienen zodra een autoriteit formeel met haar onderzoek is begonnen; dit gebeurt in 18% van de Nederlandse gesanctioneerde kartelzaken.

De onderzoeksfase—de rol van publieke belangen en niet-concurrentiebelangen

3. *A veritable tower of Babel: on the confusion between the legal and economic interpretations of Article 101 (3) of the Treaty on the Functioning of the European Union. Published in European Competition Journal, 1-24. Medeauteur: Prof. dr. Barbara Baarsma*

Tijdens de onderzoeksfase, voordat een mededingingsautoriteit een boete oplegt, hebben ondernemingen de mogelijkheid om aan te tonen dat hun overeenkomst of gedrag moet worden vrijgesteld van het kartelverbod. Daartoe moeten zij aantonen dat de betrokken overeenkomst voldoet aan het vereiste van artikel 101, lid 3, VWEU en derhalve ten goede komt aan de consumenten of de samenleving. Indien de betrokken overeenkomst meer voordelen biedt dan concurrentiebeperking, kan het kartelverbod buiten toepassing worden verklaard.

Bedrijven kunnen ook een beroep doen op deze vrijstelling buiten het onderzoek van de autoriteiten om, bijvoorbeeld als ze willen beginnen te handelen op een manier die in strijd zou kunnen zijn met de mededingingswetgeving. In deze situaties kunnen zij de zelfbeoordeling van artikel 101, lid 3, VWEU uitvoeren.

Artikel 3 biedt inzicht in welke belangen in aanmerking kunnen worden genomen bij een beroep op artikel 101, lid 3, VWEU en hoe dit kan worden gedaan. Deze kwestie is met name relevant in de discussie omtrent 'groene concurrentie' waarbij bedrijven samen optrekken ten behoeve van duurzaamheid of dierenwelzijn.

Bij de beantwoording van de vraag of niet-concurrentiebelangen al dan niet in het mededingingsbeleid moeten worden opgenomen, zijn slechts twee criteria van artikel 101, lid 3, VWEU relevant. Artikel 3 richt zich daarom alleen op deze twee criteria—de mate waarin door de overeenkomst gegenereerde efficiëntieverbeteringen kunnen worden meegenomen in de afweging en de verdeling ervan tussen consumenten en andere partijen. Er spelen hier twee kwesties: ten eerste, met welke belangen moet rekening worden gehouden en ten tweede, hoe kunnen deze belangen worden afgewogen tegen een beperking van de concurrentie?

Wat het eerste punt betreft, hebben de door de Europese Commissie opgestelde richtsnoeren een eng perspectief dat afwijkt van de jurisprudentie.

Volgens onder meer Townley (2013) heeft de Commissie doelbewust getracht de relevantie van publieke belangen binnen het mededingingsrecht te verminderen omdat zij vreesde dat sommige nationale mededingingsautoriteiten en nationale rechterlijke instanties gebruik zouden maken van artikel 101, lid 3, om doelstellingen van openbare orde na te streven ten koste van het concurrentieproces.²⁵³ De richtsnoeren bieden ruimte voor ten minste enkele non-concurrentiebelangen, bijvoorbeeld de zogenaamde cross-section clauses uit het Verdrag, zoals milieueffecten en de bescherming van de werkgelegenheid.²⁵⁴ In de richtsnoeren worden echter niet-concurrentiebelangen zoals externe effecten, uitgesloten van meeweging onder lid 3.

Of de Commissie haar doel heeft bereikt om de relevantie van publieke belangen te verminderen, is twijfelachtig, aangezien uit een analyse van de jurisprudentie blijkt dat bij kartelvrijstellingen toch rekening is gehouden met niet-concurrentiebelangen. Een aantal onderzoekers heeft geanalyseerd welke niet-concurrentiebelangen in de jurisprudentie van artikel 101, lid 3 zaken, aanwezig zijn.²⁵⁵

Wat betreft de vraag over hoe effecten kunnen worden afgewogen, beperken de richtsnoeren deze effecten van overeenkomsten tot de relevante en verwante markt en beperken zij de afweging tot kostenvoordelen en kwalitatieve efficiëntieverbeteringen. Daardoor kwalificeren de richtsnoeren niet alle economische en niet-economische voordelen als efficiëntieverbeteringen in de zin van artikel 101, lid 3, VWEU, hetgeen betekent dat deze niet in aanmerking kunnen worden genomen.

Naast de beperkte reikwijdte van de richtsnoeren kunnen bedrijven zelfevaluaties zien als hoge hindernissen die moeten worden genomen vanwege het ontbreken van een afwegingskader. Artikel 3 biedt een afwegingskader om de economische voordelen van beperkende overeenkomsten af te wegen

²⁵³ Townley, C., "Is there (Still) room for non-Economic Arguments in Article 101 TFEU Cases", in C Heide-Jorgensen (red.), *Aims and Values in Competition Law* (Kopenhagen: Djøf Publishing, 2013).

²⁵⁴ Semmelmann, C. (2008). De toekomstige rol van de doelstellingen van het niet-concurrentiebeding bij de uitlegging van artikel 81 EG. *Global Antitrust Review*, 1, 15-47.

²⁵⁵ Bijvoorbeeld Lavrijssen, S. A. C. M. (2010). De bescherming van niet-concurrentiebelangen: Welke rol voor de mededingingsautoriteiten na Lissabon. *European Law Review*, (5), 634-659.

tegen de beperkende gevolgen van deze overeenkomsten. Dit is een maatschappelijke kosten-batenanalyse (MKBA), een bekend en veelgebruikt instrument voor de beoordeling van de welvaartseffecten. Het geeft een overzicht van alle effecten, risico's en onzekerheden van een project en de daaruit voortvloeiende kosten en baten voor de samenleving als geheel. Door deze voor- en nadelen zoveel mogelijk te kwantificeren en er monetaire waarden aan toe te kennen, geeft MKBA inzicht in de welvaartseffecten van de maatregel, uitgedrukt als het saldo in euro's van de baten minus de kosten.

Wanneer samenwerkende ondernemingen erin slagen aan te tonen dat hun overeenkomst een positief netto-effect heeft, wordt deze vrijgesteld van het kartelverbod en wordt er geen boete opgelegd. Hiermee wordt de onderzoeksfase afgesloten. De volgende fase is alleen relevant voor overeenkomsten die niet zijn vrijgesteld en kartels die zich niet op deze verdedigingsgrond hebben beroepen. Met andere woorden, de volgende fase is voor gedragingen die volgens de mededingingsautoriteit een inbreuk op het mededingingsrecht vormen.

De schadefase—consumentenschade wegens schending van de mededingingsregels

4. *Consumer damages for breach of antitrust rules: how to reach full compensation for consumers? Published in Journal of Competition Law & Economics, 1–19, 2017. Medeauteurs: dr. José Mulder en dr. Viktória Kocsis*

Indien een inbreuk wordt vastgesteld, kunnen de betrokken ondernemingen worden gesanctioneerd. Wanneer de sanctiebeslissing definitief wordt en niet meer voor beroep vatbaar is, is het publieke handhavingstraject beëindigd. De afnemers van de door het kartel geleverde goederen kunnen een schadevergoeding eisen in een civiele handavingsprocedure. Het doel van de schadevergoedingsfase is dus de kopers te vergoeden voor de schade die zij door de kartelovereenkomst hebben geleden. Dit betreft veelal de vorm van een prijsopslag gedurende de kartelperiode.

Ten tijde van het schrijven van artikel 4 werden er in de praktijk steeds meer private schadeclaims ingediend bij voormalig kartelleden. Deze claims hadden echter meestal betrekking op vorderingen van ondernemingen die goederen rechtstreeks bij een gesanctioneerde onderneming hadden

gekocht. Nu een aantal landen nieuwe regels en systemen voor collectieve schadeclaims aan het ontwikkelen zijn, wordt de vraag hoe de schade voor consumenten moet worden berekend, steeds relevanter. Dit is met name relevant omdat uit analyse blijkt dat consumenten in de praktijk niet volledig worden vergoed voor de schade die zij hebben geleden. Bijvoorbeeld het werk van Basso en Ross (2007) laat zien dat er conceptuele tekortkomingen zijn in de traditionele schadeberekenningsmethoden die worden gebruikt om de schade vast te stellen. Het resultaat van ondercompensatie wordt in verband gebracht met het feit dat de downstreammarkten waarop de consumenten de goederen kopen in de praktijk minder dan perfect concurrerend zijn.²⁵⁶

Een van de problemen met de schade voor de consument is dat het nog steeds onduidelijk is hoe *elk* individueel slachtoffer dat schade ondervindt van een schending van de antitrustregels, *volledig* kan worden gecompenseerd voor zijn verliezen. Er is bijvoorbeeld door Laitenberger en Smuda, die de schade van consumenten specifiek als gevolg van het Europese wasmiddelenkartel berekenen,²⁵⁷ empirisch onderzoek naar de schade van consumenten gedaan, maar er is geen methodologische studie verricht naar de berekening van de consumentenvergoeding in het algemeen. Artikel 4 biedt een oplossing, op basis van theoretische modellen, voor het praktische probleem van de berekening van de consumentenschade.

In de literatuur over welzijnseconomie worden verschillende compensatiemethoden voor prijsstijgingen overwogen, zoals de Hicksian-methode, de Slutsky-methode en de 'klassieke concurrentiemethode'. Elke methode gebruikt een ander perspectief voor het bepalen van de hoogte van de compensatie; de Hicksian-methode gebruikt het nutsniveau, de Slutsky-methode gebruikt het consumptiemandje, en de klassieke concurrentiemethode gebruikt het consumentensurplus. De Hicksian-methode biedt de consument precies hetzelfde nutsniveau dat hij vóór de inbreuk had.²⁵⁸ Slutsky-compensatie brengt de consument niet terug naar zijn oorspronkelijke gebruiksniveau na een mededingingsinbreuk, maar stelt hem wel in staat te

²⁵⁶ Basso, L. J., & Ross, T. W. (2010). Het meten van de werkelijke schade van prijsafspraken voor zowel directe als indirecte kopers. *The Journal of Industrial Economics*, 58(4), 895-927.

²⁵⁷ Laitenberger, U., & Smuda, F. (2015). Schatting van de schade voor de consument in kartelzaken. *Journal of Competition Law & Economics*, 11(4), 955-973.

²⁵⁸ Hicks, J.R. (1939), *Waarde en kapitaal: een onderzoek naar enkele fundamentele principes van de economische theorie*. Oxford: Clarendon Press.

profiteren van dezelfde hoeveelheid goederen (mandje) die hij zou hebben gekocht als de mededingingsregels niet waren overtreden. Met andere woorden, de consument kan hetzelfde productmandje kopen als in de zogenoemde counterfactual situatie. De klassieke concurrentie vat het allocatie-effect (ook wel welvaartsverlies of deadweight loss genoemd) en het verdelingseffect van een prijsverhoging samen.

Om de hoogte van de compensatie te bepalen, moet elk model worden vertaald naar een vraagcurve. Een vraagcurve beschrijft de relatie tussen prijzen en gevraagde hoeveelheden. Door twee veel gebruikte vraagcurves (de Marshalliaanse en Hicksiaanse curve) toe te passen op de drie compensatiemethoden blijkt dat het hoogste compensatieniveau wordt bepaald door de Slutsky-methode, terwijl het laagste compensatieniveau wordt bepaald door de klassieke concurrentiemethode. De Hicksiaanse methode zit er tussenin.

Om de uitkomsten van de methoden te kunnen vergelijken zijn plausibele vraagspecificaties in de vorm van nutsfuncties nodig. De twee beste opties met betrekking tot de nutsfuncties zijn de quasi-lineaire en Cobb-Douglas (CD) nutsfuncties. Deze beschrijven de meest voorkomende vormen van consumentenvoorkeuren. Vanuit praktisch oogpunt is de methode die de minste informatie vereist, het meest geschikt voor toepassing in particuliere schadevergoedingsacties.

In artikel 4 wordt het voorbeeld van een kartel gebruikt om de verschillende berekeningsmethoden in aanmerking te nemen. De methode van Slutsky wordt hier beschouwd als de bovengrens, terwijl de klassieke concurrentiemethode als de ondergrens wordt beschouwd. Deze boven- en ondergrens kunnen in de praktijk gemakkelijk worden toegepast wanneer het deel van het inkomen van een consument dat aan een kartelgoed wordt besteed en de kartelopslag bekend zijn.

De voorgestelde formules voor de boven- en ondergrens zijn niet de oplossing voor alle problemen in verband met het eisen van schadevergoeding voor de consument; de kartelopslag moeten nog worden berekend. Het is echter niet langer nodig om de counterfactual hoeveelheid te berekenen. Als deze grenzen worden toegepast, zal de consument volledig worden vergoed voor de schade die hij door de prijsafspraken van de kartelleden heeft geleden. Dit is een belangrijk voordeel van de methode—een voordeel dat

niet behaald wordt door de methode die momenteel in de praktijk wordt toegepast door consumentenclaims.

De schadefase— carrière-ontwikkeling na de vervolging van het kartel

5. *Career development after cartel prosecution: cartel versus non-cartel managers. Published in Journal of Competition Law and Economics, March 2012.*

Vanuit een conceptueel oogpunt omvat de schadefase—naast de schadeclaims die afnemers kunnen indienen—ook de schade die kartelleden lijden als gevolg van hun betrokkenheid bij een kartel. Deze schade kan bestaan uit reputatieschade voor de onderneming en een daling van de aandelhouderswaarde, maar ook uit schade aan de carrière van de manager(s) die de leiding hadden over de kartelondernemingen. Dit is het onderwerp van artikel 5.

In dit artikel wordt de loopbaanontwikkeling onderzocht van managers wiens bedrijven door de Nederlandse Mededingingsautoriteit zijn vervolgd voor betrokkenheid bij een kartel. De analyse vergelijkt de loopbaanontwikkeling van managers in Nederland die betrokken waren bij een kartel met die van een controlegroep van Nederlandse managers die niet-kartelbedrijven bestuurden.

In het artikel zijn de verschillende factoren geanalyseerd die de loopbaanontwikkeling van managers die bij een kartel betrokken zijn geweest, zouden kunnen beïnvloeden. Het artikel concludeert dat managers die betrokken zijn geweest bij een kartel, na de vervolging van het kartel, te maken krijgen met negatieve gevolgen voor hun carrière. Een manager van een gesanctioneerd kartelbedrijf heeft een lagere kans op een nieuwe danwel dezelfde managementfunctie, dan een manager van een bedrijf dat niet door de mededingingsautoriteit is gesanctioneerd. Dit negatieve carrière-effect is kleiner als het kartel van de manager actief was in de bouwsector; deze uitkomst zou kunnen impliceren dat de bouwsector in Nederland een andere houding aanneemt ten opzichte van kartels. Die implicatie lijkt plausibel, gezien het massakartel dat van 1998 tot 2001 in deze sector bestond.

Er zijn drie mogelijke uitkomsten voor een manager die betrokken is geweest bij een kartel nadat hij is vervolgd:

1. de manager stapt over naar een niet-managementfunctie of gaat met pensioen;
2. de manager behoudt zijn managementfunctie bij het huidige bedrijf, of krijgt een managementfunctie bij een ander bedrijf dat betrokken is geweest bij een kartel;
3. de manager stapt over naar een managementfunctie bij een ander bedrijf.

Men kan de laatste twee uitkomsten (waarbij de manager een managementfunctie behoudt) onderscheiden van de eerste uitkomst (waarbij de manager overstapt naar een niet-managementfunctie).

Voordat we de redenen voor de verschillen in loopbaanontwikkeling tussen managers bekijken, moeten we eerst vaststellen of de loopbaanontwikkeling van managers die bij een kartel betrokken zijn geweest, verschilt van die van managers die dat niet zijn geweest.

Het is duidelijk dat de loopbaanontwikkeling tussen beide groepen verschilt. Van de managers uit de controlegroep behield 64% een leidinggevende functie, terwijl slechts 36% van de managers die betrokken waren bij een kartel in *andere sectoren dan de bouwsector* een leidinggevende functie had na het kartel. Als men de controlegroep vergelijkt met de managers uit *alle sectoren* die bij een kartel betrokken waren, is het verschil veel minder drastisch. Dit komt echter vooral omdat 68% van de managers die betrokken waren bij een kartel in de bouwsector hun managementfunctie konden behouden. Bovendien is er voor alle kartelmanagers een statistisch significant negatief verband tussen kartelbetrokkenheid en loopbaanontwikkeling.

In artikel 5 werd ook onderzocht of dit negatieve effect wordt beïnvloed door de omvang van de onderneming, de fase van het kartelonderzoek waarin de manager het kartelbedrijf heeft verlaten (voor of na de beslissing), de ernstfactor of de financiële sanctie die door de mededingingsautoriteit is vastgesteld. De analyse wordt uitgevoerd aan de hand van een binair en multinomiaal logitmodel.

Hoe hoger de boete die een kartellid krijgt, hoe groter de kans dat een manager van die onderneming een leidinggevende functie behoudt (bij de kartelonderneming of bij een andere onderneming) en dus hoe kleiner de kans dat de manager zijn leidinggevende functie verliest.

De ernst van de kartelinbreuk (vastgesteld door de mededingingsautoriteit) heeft een negatief effect op de loopbaanontwikkeling. Het heeft een negatief effect op de waarschijnlijkheid van een managementfunctie.

Managers die betrokken zijn geweest bij een kartel en die het bedrijf verlaten voordat de mededingingsautoriteit haar besluit publiceert, hebben minder kans om een managementfunctie bij een ander kartelbedrijf te krijgen. Dit is verrassend, omdat men zou verwachten dat hoe later de overstap naar een andere baan, hoe negatiever de carrièrekansen zijn.

Dankwoord

De laatste woorden van dit PhD boek bestaan uit het bedanken van de mensen die me gedurende dit gehele traject hebben geholpen, elk op hun eigen manier. En daarvoor ga ik terug naar het begin.

Vanaf het allereerste begin was Luuk hierbij als steun. Nog even los van zijn steun als vriendje, man en vader van mijn kinderen, gaf hij altijd een nuchtere kijk of het promotietraject. Nooit verloor hij het vertrouwen dat het me zou lukken. Waar dit in het begin tot uiting kwam in het meelezen van artikelen en het aanhoren van mijn gedachten rondom clementie en schadezaken, vonden we de laatste jaren een goede ‘gezamenlijke’ avondbesteding in het kijken van de Champions League (hij) en het werken aan mijn laatste artikel (ik).

In 2010 ging ik full time aan de slag bij SEO. Dat ik dit kon combineren met een promotieonderzoek werd me al snel expliciet duidelijk gemaakt door Barbara Baarsma. In een van mijn eerste weken daar—nota bene in de lobby van de toen nog NMa—zei ze tegen me dat een vastbijter zoals ik dat vooral moest doen. Direct gevolgd door het advies dit vooral te combineren met het vroeg krijgen van kinderen. Dit laatste advies heb ik enkele jaren later pas opgevolgd. Gedurende onze gezamenlijke jaren bij SEO heeft ze me altijd gesteund en heb ik veel van haar geleerd, zowel voor mijn proefschrift als tijdens het werken aan mededingingszaken. Het was leuk om samen aan artikel 3 te werken.

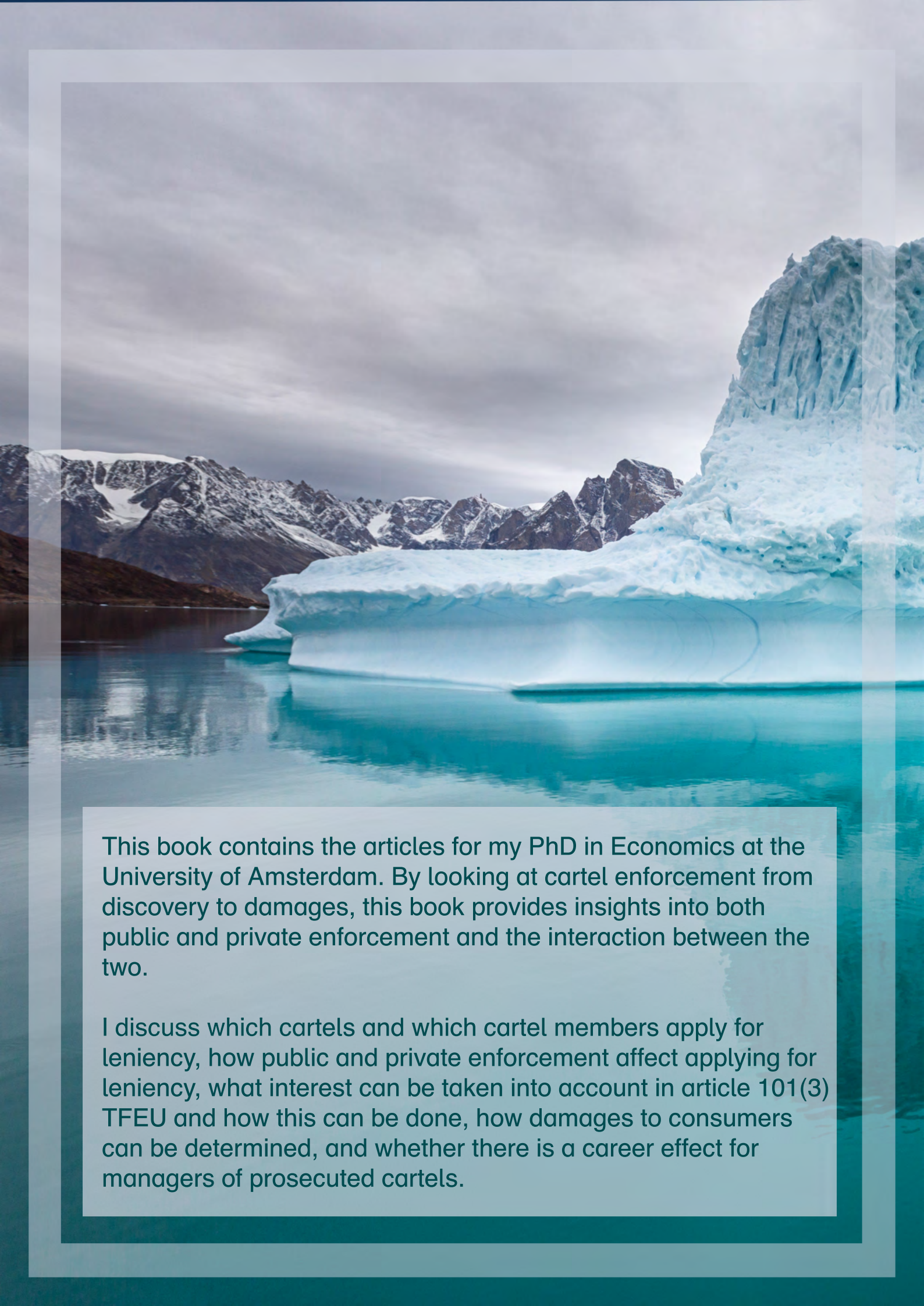
Na terugkomst van mijn tweede zwangerschapsverlof gaf Bas ter Weel me het bemoedigende laatste zetje om het nu toch echt af te maken. Hij hielp me bij de aanpak van mijn laatste artikel en het komen tot de finale ‘schil’ van dit proefschrift: de samenvatting en conclusie.

Verder mogen mijn (andere) coauteurs niet onbesproken blijven. In chronologische volgorde bedank ik José Mulder, Viktória Kocsis en Daan in 't Veld. Daarnaast zijn er verschillende collega's (zowel bij SEO als bij Oxera) bij wie ik terecht kon voor vragen over onder andere Stata commando's die niet deden wat ik wilde. Veel dank ook aan Oxera, waar ik de ruimte kreeg om de laatste loodjes van mijn proefschrift af te ronden.

Speciale dank gaat uit naar Ron Kemp en Peter Dijkstra van de ACM die bij mijn laatste twee artikelen bereid waren met mij te sparren en mijn, soms erg gedetailleerde vragen, te beantwoorden. Specifiek voor artikel 2 dank ik de Nederlandse mededingingsjuristen die de enquête hebben ingevuld of die ik mocht interviewen voor de benodigde context over hoe een cliënt nou eigenlijk tot een clementieverzoek komt.

Dank ook aan de leden van de promotiecommissie voor hun beoordeling van het manuscript: Professor doctor Maarten Pieter Schinkel, professor doctor Jeroen Hinlopen, professor doctor meester Rein Wesseling, professor doctor Erik Brouwer, professor meester doctor Anna Gerbrandy.

Tot slot, veel dank aan vrienden en familie die gedurende de jaren geduldig bleven vragen hoe het ging met mijn onderzoek en die—in sommige gevallen—al een tijd lang hun nette pak klaar hebben hangen voor de ceremonie. Speciale dank aan Huub en mijn paranimfen Heleen en Elleke.



This book contains the articles for my PhD in Economics at the University of Amsterdam. By looking at cartel enforcement from discovery to damages, this book provides insights into both public and private enforcement and the interaction between the two.

I discuss which cartels and which cartel members apply for leniency, how public and private enforcement affect applying for leniency, what interest can be taken into account in article 101(3) TFEU and how this can be done, how damages to consumers can be determined, and whether there is a career effect for managers of prosecuted cartels.