





The Assessment of Agreements for which Temporary Antitrust Immunity is Sought: Competition Authority's Perspective

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Fatih Cemil Ozbugday, Room K 421, PO Box 90153, 5000 LE Tilburg, email: <u>F.C.Ozbugday@uvt.nl</u> Fax: + 31 13 466 3042 Telephone: +31 13 466 4037 The Assessment of Agreements for which Temporary Antitrust Immunity is Sought

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Abstract

The present study provides an analysis of the conditions that led the Dutch competition authority (the NMa) to decide against a temporary antitrust immunity seeking agreement on antitrust grounds. First, a theoretical Bayesian decision framework, that is similar to that of Cooper et al. (2005), is presented to derive the optimal enforcement rule for agreements for which ex ante antitrust immunity is sought. The NMa's decisions are then investigated in an econometric background where those final decisions are linked to various industry characteristics, as the NMa took them into consideration when making its final decision. In doing so, a bivariate Probit model with sample selection is estimated to account for the fact that non-application by firms operating in a specific industry for an exemption might result in significant bias. The econometric results suggest it is more likely that concerted practices are seen as anti-competitive in more competitive and less concentrated industries. Finally, the narrative evidence on the legal and institutional background, and the econometric results are interpreted in light of the theoretical Bayesian decision framework.

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1. Introduction

In pursuit of achieving greater profits or avoiding inefficiencies, firms occasionally need to interact with each other and coordinate their actions. However, this is a difficult if not illegal task in a world where competition laws with the aim of protecting effective competition in the market regulate the economic environment and restrict the agreements among firms. Accordingly, firms have constantly been looking for ways to abstain from the constraints that are imposed by the laws. One obvious way of bypassing competition laws is obtaining antitrust immunity via exemption applications. Competition authorities have been flooded with antitrust immunity applications so long as the laws allowed them to confer exemptions. They have either granted exemptions under specific conditions or have declined those applications.

The face value of any antitrust immunity application contains a plausible-like plea such as efficiency or ruinous competition argument. Nevertheless, an agreement with antitrust immunity also enables the concerning firms to carry out anti-competitive conduct such as synchronizing business strategies. Even worse, those firms might engage in tacit collusion even after the immunity is expired. The duty of a competition policymaker with a certain dosage of discretion is then to ponder the possible positive and negative impact of the agreement that is the subject of an exemption application and to decide whether the relevant agreement is welfare-damaging or not.

An institutional change that allowed firms to ask for ex ante antitrust immunity took place in the Netherlands during the late 1990s. Following the introduction of the Competition Act of 1998 (Mededingingswet), undertakings were allowed to apply for dispensation for agreements that were already in existence and that had begun in the era of "cartel paradise", which prevailed under the superseded Economic Competition Act of 1956 (Wet Economische Mededinging). More specifically, firms were allowed to request exemption from Article 6 Mw via Article 17 Mw (which has been repealed later) of the Dutch Competition Act for their agreements that improved production/distribution or stimulated economic or technical progress, and, of which reasonable portion of the benefits accrued to consumers. The reaction was that the NMa was swarmed with dispensation requests – 1,100 at the deadline. The assessment of these exemption requests by the NMa literally took years (until 2004). In its assessment, the NMa took into account the characteristics of the industry in which the antitrust immunity seeking parties operated. Based on its assessments, the NMa: (i) rejected the request because the agreement was not anti-competitive, or (ii) granted dispensation, even though the agreements were anti-competitive by nature, or (iii) granted dispensation after altering or reformulating the initial agreements by the firms involved, or (iv) reached the decision that the Competition Act is not applicable.

In this study, I am interested in analyzing which conditions led the Dutch competition authority (the NMa) to decide against an antitrust immunity seeking agreement on antitrust grounds. First, a theoretical Bayesian decision framework that is similar to that of Cooper et al. (2005) is presented to derive the optimal enforcement rule for agreements for which ex ante antitrust immunity is sought. Then I connect the narrative evidence on the legal and institutional background to this theoretical Bayesian decision framework. Finally, I econometrically investigate the NMa's decisions and link those final decisions to various industry characteristics. In doing so, I estimate a bivariate Probit model with sample selection to account for the fact that non-application by firms operating in a specific industry for an exemption might result in significant bias. The econometric results suggest that it is more likely that concerted practices are seen as anti-competitive in more competitive and less concentrated industries. Furthermore, if advertising intensity is seen as a sign of vertical differentiation rather than the degree of monopoly power, then the results also suggest that the NMa is more likely to identify an agreement as anti-competitive in industries with more asymmetric structures. Finally, the predicted probability of classifying an agreement as anti-competitive following the bivariate Probit model estimation is calculated to be around 76 %.

The literature that assesses the decisions made by the competition bodies on anti-competitive agreements is scanty (e.g. Lauk, 2002; Gual and Mas, 2010). The current study contributes to the existing literature in the sense that it is the first study that examines the attitude of a competition authority towards the behavior seeking temporary antitrust immunity. The data generating process for our sample of multilateral anti-competitive practices is unique, and it is different from the data generating process for an authority detecting cartels or the data generating process for leniency applications.

The remainder of the paper is as follows: The next section introduces a theoretical Bayesian decision framework to derive the optimal enforcement rule for agreements for which ex ante antitrust immunity is sought. Section 3 explains the legal and institutional background, and provides narrative evidence on the Dutch competition policy enforcement during the last two decades. Section 4 describes the data used in the analysis and illustrates the empirical strategy and specification. The econometric results are presented in Section 5. Section 6 discusses the findings and the anecdotal evidence in the light of the theoretical framework and the final section concludes.

2. A Bayesian Decision Framework to Derive the Optimal Enforcement Rule for Agreements for which Ex Ante Antitrust Immunity is Sought

In an antitrust case where firms seek ex ante antitrust immunity for their agreements, the competition authority must decide whether to approve the practice based on the available evidence. In this case, the decision of the antitrust authority can be seen as a problem of drawing inferences from the available evidence and reaching enforcement decisions based on these inferences. Assume that a given antitrust immunity seeking agreement can be either welfare-enhancing and pro-competitive (denoted as "*C*") or welfare-damaging and anticompetitive (denoted as "*A*"), and let *e* be evidence observed by the competition authority. Given the evidence *e*, suppose that the antitrust authority can either grant antitrust immunity or challenge the practice. The decision of whether to grant immunity or challenge the agreement depends on the relative odds that an agreement is anti-competitive, which is expressed mathematically as $\frac{P(A|e)}{P(C|e)}$, where P(A|e) is the conditional probability of an agreement being anti-competitive and P(C|e) is the conditional probability of an agreement being pro-competitive, given the evidence *e*.

Using Bayes' rule, we can rewrite the conditional probabilities as:

$$P(A|e) = \frac{P(e|A)P(A)}{P(e)}$$

$$P(C|e) = \frac{P(e|C)P(C)}{P(e)}$$
[1]

The relative odds can then be expressed as:

$$\frac{P(A|e)}{P(C|e)} = \frac{P(e|A)}{P(e|C)} \frac{P(A)}{P(C)}$$

Thus, the policymaker's belief about the relative odds that a given practice is anti-competitive can be written as a function of the relative likelihood that the evidence observed would be generated by anti-competitive conduct, and his prior beliefs concerning the practice.

Table I: The Errors Associated with the Competition Authority's Decision of Granting Antitrust Immunity

		Actual Condition		
		ANTI-COMPETITIVE	PRO-COMPETITIVE	
Decision	CHALLENGE	True	Type-I Error	
	GRANT	Type-II Error	True	

Furthermore, as can be seen from Table I, two types of error will appear in a decision rule when granting antitrust immunity: the loss from challenging a pro-competitive and welfare enhancing practice (type-I error), and the loss from failing to disapprove an anti-competitive and welfare-damaging agreement (type-II error). In addition, let each error entail a specific loss: the loss concomitant with type-I error is denoted as L_I , and the loss concomitant with type-II error is denoted as L_I . In what follows, one can write the expected losses from type-I and type-II errors given the evidence *e* as:

$$E[Loss_{I}|e] = L_{I}P(C|e) = \frac{L_{I}P(e|C)P(C)}{P(e)}$$
[4]

$$E[Loss_{II}|e] = L_{II}P(A|e) = \frac{L_{II}P(e|A)P(A)}{P(e)}$$

where P(.) denotes probability. The optimal rule for challenging agreements that were subject of an antitrust immunity seeking behavior can then be written as:

$$\frac{P(e|C)}{P(e|A)} < \left(\frac{L_{II}}{L_I}\right) \left(\frac{P(A)}{P(C)}\right)$$

[6]

It is clear to see from (**6**) that the optimal rule depends on the prior beliefs, loss functions and the likelihoods. A decision to challenge a given exemption request is more likely if: (i) there is a weak likelihood that the evidence was produced by a pro-competitive instead of anticompetitive practice; (ii) the losses associated with type-II error are high compared to the losses associated with type-I error; and (iii) there are strong priors that an agreement is anticompetitive.

I will refer to this optimal enforcement rule when discussing the narrative evidence on the Dutch antitrust enforcement policy and the findings of the econometric analysis of the decisions in Section 6. Having introduced the simple theoretical framework, I now turn to the evolution of the enforcement of the Dutch competition policy.

3. The Enforcement of the Dutch Antitrust Policy during the Last Two Decades

This section describes the enforcement of the competition policy in the Netherlands during the last two decades. I provide a detailed description, since the institutional background is extremely informative when evaluating the decisions of the Dutch Competition Authority.

The Dutch competition policy has evolved substantially over the past two decades. The old Economic Competition Act of 1956 (WEM: Wet Economische Mededinging), which was based on the so-called "abuse system", was superseded by the new Competition Act (Mededingingswet), which was based on "prohibition system". In the meanwhile, the new enforcement agency, the Nederlandse Mededingingsautoriteit (NMa) was set up in 1998. There have been several amendments in the Competition Act since then. The Competition Act was first amended in accordance with the European Competition Law in 2004 as a result of European Regulation 1/2003. Another amendment took place in June 2005¹, when the NMa was given the status of Autonomous Administrative Authority². Finally, as of October 1st, 2007, the NMa has been awarded additional powers, as a result of the evaluation of the Competition Act³.

Under the former Economic Competition Act, the enforcer, which was the Ministry of Economic Affairs (MEA), had to plead in each case that a behavior or agreement infringed the law. The MEA, as the enforcer, had the burden of proof, which is reversed under the new prohibition system, so that the firm should demonstrate that practices or agreements associated with the law's prohibitions are compatible with the standard. Furthermore, the old Economic Competition Act's main touchstone was simply the "general interest", a concept lacking in context or guidance for decisions. Firms with a restrictive agreement that was not against the "general interest" had to notify the MEA, which consequently registered the agreement in the Dutch "Kartel Register". Furthermore, deciding whether behavior was against the general interest or not required deliberation with other ministries, which were mostly concerned about other aspects of the general interest rather than competition policy. In

¹ Dutch Official Journal (Staatscourant), 28 June 2005, nr. 122.

² The Competition Act, Articles 2(3) Mw.

³ Dutch Official Journal (Staatscourant), 29 June 2007, nr. 123.

a report by OECD (1998), it is stated that every case could turn out to be an opportunity for fundamental debate about the relative ascendancy of competition policy, and for many years competition policy undoubtedly lost. Consequently, those choices about aspects of general interest led to the lax enforcement of the old Economic Competition Act.

On the whole, the lax enforcement of the previous competition law brought about tolerance towards collusive business behavior in the Netherlands, which, in turn, raised the fame of the Netherlands as "cartel paradise". The government's confidential register of cartels included 245 agreements to divide markets, around 270 agreements to fix prices, together with around 50 exclusive dealing agreements and more than 200 agreements to control competition in distribution (OECD, 1993, p. 60).

To summarize, the competition policy under the former Economic Competition Act was completely reactive. Since other aspects of the general interest contained macro-economic policy objectives in the form of price controls, or its industrialization and regional policies, or industrial subsidies supporting sectors during the first oil crisis, antitrust policy could not find much space to itself. Furthermore, as discussed by Asbeek- Brusse and Griffiths (1998), the conflicts were resolved within the deliberations between governmental officials and business representatives. More often than not, officials at the MEA worked concomitantly with business representatives. This intimacy brought about a gentle stance towards collusive business behavior.

Given the lax enforcement of the domestic competition law, one might consider the involvement of European Commission (EC) and the European Competition Law as a potential threat to collusive business behavior in the Netherlands. Indeed, the fact that the Dutch were

among the last to have legislation that did not ban concerted practices utterly meant that Dutch cartels were under close scrutiny by the EC to a greater extent. The initial effect of the EC competition law was on the behavior of firms instead of the enforcement of the domestic competition law. For example, while there were 125 recorded collective exclusive dealing agreements in 1963, there were only 45 agreements registered in 1978 (Mok, 1978, p. 743-744). Part of this decrease might be ascribed to the closer scrutiny by the EC into Dutch cartels. This closer scrutiny had started in 1971, when the first EC decision conveying that a cartel among Dutch firms (the Dutch Cement Dealers' Association) had violated Article 81 TEC came^{4,5}, and it climaxed in 1977, when the EC prohibited the system of collective exclusive dealing among Dutch bicycle dealers⁶, even though it had been allowed after some adjustments under the former Economic Competition Act. More dramatically, in 1992, the EC decided that the Dutch construction cartel, which was a purely national cartel by nature, was in violation of Article 81(1) TEC and imposed a fine of 22.498 million ECU^{7} . This decision was later ratified by the European Court of First Instance. Even worse, the EC initiated a procedure against the Dutch government based on Article 226 TEC. More precisely, it argued that the Dutch competition law and administrative practices, inter alia the industry's agreements, impeded the proper functioning of the European competition rules (Drahos, 2001, p. 213).

The initial reaction of the Dutch government was to invigorate the anti-cartel policy within the existing framework. Aside from a more active policy of handling cartel complaints, this included a sequence of general prohibitions on horizontal price agreements (effective from

⁴ Decision of 16 December 1971, JO 1972 L13/34

⁵ Case 8/72

⁶ Centraal Bureau voor de Rijwielhandel, OJ 1978 L20/18

⁷ Building and construction industry in the Netherlands, OJ 1992 L92/1

July 1993) and, on market sharing agreements and collusive tendering agreements (effective from June 1994). Yet, owing to the inapplicability of these early prohibitions due to the nature of the former "abuse system"; a new Competition Act (Mededingingswet), which was based on "prohibition system", was launched in 1998, accompanied by the establishment of the new enforcement agency (NMa). The provisions of the new Competition Act were in conformity with the European Competition Law. For instance, Article 6 of the new Competition Act conformed to Article 81 TEC (now Article 101 TFEU) in its prohibition of all kinds of anticompetitive agreements. As to exemptions, the Dutch competition law subsumes all of the EU block exemptions for general types of agreements, exemptions for specific sectors, and exemptions for specific agreements.⁸ This incorporation is dynamic in the sense that the Dutch law incorporates not only those exemptions already endorsed but also those that will be endorsed in the future.⁹

Furthermore, the new Competition Act allowed undertakings to apply for dispensation for agreements that were already in existence and that had begun in the era of "cartel paradise". More specifically, firms were allowed to request exemption from Article 6 Mw via Article 17 Mw (which has been repealed later) of the Competition Act. However, one should note that not every anti-competitive practice would get antitrust-immunity. To be more specific, in Article 17 Mw it was stated: "*The director general may grant an exemption from the prohibition of Article 6(1) Mw for agreements, decisions or concerted practices, within the meaning of that Article, which contribute to improving the production or distribution or to promoting technical or economic progress, while allowing consumers a fair share of the resulting benefit, and which do not: (a) impose any restrictions on the undertakings*

⁸ The Competition Act, Articles 12-14 Mw.

⁹ The Competition Act, Article 12 Mw.

concerned, ones that are not indispensable to the attainment of these objectives, or (b) afford such undertakings the possibility of eliminating competition in respect of a substantial part of the products and services in question." Thus, Article 17 Mw specified that undertakings would be exempted from Article 6 Mw if said agreements, decisions or conduct improved production/distribution or stimulated economic or technical progress, and, if a reasonable portion of the benefits accrued to consumers. The reaction was that the NMa was swarmed with dispensation requests – 1,100 at the deadline. The assessment of these exemption requests by the NMa literally took years (until 2004). Based on assessments, the NMa (i) rejected the request, as the agreement is not anti-competitive, or (ii) dispensation was granted for some other requests, even though the agreements were anti-competitive by nature, or (iii) dispensation was granted after altering or reformulating the initial agreements by the firms involved, or (iv) reached the decision that the Competition Act is not applicable.

Having described the institutional and legal background, I now introduce the empirical strategy and describe the data.

4. Linking the Dutch Competition Authority's Decisions to Industry Characteristics in a Binary Probit Model with Sample Selection: Data and Empirical Strategy

4.1 Data Sources

We use different sources of data to link the Dutch competition authority's decisions to industry characteristics. These are Dispensation Requests Database, Production Survey (PS) and Community Innovation Survey (CIS). Below, we concisely describe these main sources of data in more detail.

Dispensation Requests Database

This database consists of original dispensation requests from the NMa archive. It is confidential and is not publicly available to researchers. The database includes the names of companies with an agreement, the code of the industry in which they were operating at the time of application (SBI¹⁰ codes), the number of companies in an agreement, the total annual revenues of the companies involved in an agreement, and the duration of agreement.

In total, there are around 1,100 dispensation applications. For the minority of the dispensation applications for which the competition law was relevant, immunity was granted. More specifically, 37 concerted practices in various industries were exempted from the competition law. There is not a clear pattern for these industries that had antitrust immunity. As to the length of the antitrust immunity, the average time period during which these multilateral restrictive practices were exempted from competition law was 5.39 years.

Production Survey (PS)

Production Survey (PS) is conducted by the Dutch Bureau of Statistics (CBS) on a yearly basis. Data from PS is available for the period between 1993 and 2006.¹¹ The PS is a sampled survey; only firms with more than 20 employees are included in the sample each year. For smaller firms, sampling fractions decrease, and consequently smallest firms will have gaps in the data for several years. Moreover, Statistics Netherlands apply a rotating sample method to reduce the administrative burden of (small) firms. This also reduces consecutive observations of firms.

Community Innovation Survey (CIS)

¹⁰ De Standaard Bedrijfsindeling (the Standard Industrial Classification).

¹¹ Data for the industries transport and telecom only covers the period 2000-2006.

Data on innovation activities has been collected from the Dutch section of Community Innovation Survey (CIS). CIS is a European harmonized questionnaire, held every two years, containing questions about innovative activities in companies. Our innovation data covers the period 1996-2006. In fact, we use six consecutive CIS-surveys: *i.e.* CIS2 for 1994-1996, CIS2, 5 for 1996-1998, CIS3 for 1998-2000, CIS3, 5 for 2000-2002, CIS4 for 2002-2004, and CIS2005 for 2004-2006. Moreover, firms with less than ten employees are not included in CIS.

Yet, there are some shortcomings that limit the options for research. For instance, CIS contains industries that are not present in PS and vice versa. This reduces the number of industries that can be examined. Second, CIS suffers from lower response rates and the responses can be selective, as it is most likely that innovative firms are more inclined to respond than firms that do not innovate. Moreover, since we do not have CIS data in odd years, we interpolate the innovation data. Finally, CIS does not capture all aspects of innovation. For example, information on human capital formation is not included in CIS.

Taking the caveats of our sources for granted, after aggregating firm level data to industry level data, we merged the two data sources at the 4 (and sometimes 3) digit SIC-code. Having juxtaposed the datasets provided by the CBS and the NMa, we have obtained a sample of 225 observations. However, as there are missing variables for some of the observations in the CBS dataset, the numbers of observations for various covariates are incomplete and different from each other. Subsequently, the final sample employed for the econometric analysis of the NMa's decisions contains 116 industries.

4.2 Empirical Strategy and Variables

Before I proceed with the estimation strategy, I will first discuss how the dependent variable is constructed. Referring back to the NMa's verdicts on dispensation applications, the decisions of rejections of the requests because the agreements were not anti-competitive and the decisions of the non-applicability of the competition law indicate "not anti-competitive" agreements. On the other hand, the agreements that were granted dispensation even though they were considered as anti-competitive, and the agreements that were altered or reformulated because they were considered as anti-competitive, are classified as "anti-competitive". Thus, we know about the existence of an anti-competitive agreement in an industry conditional on exemption application, and thence can specify our dependent variable as a binary variable taking value 1 for "anti-competitive" agreements, and 0 for "not anti-competitive" agreements based on the NMa's decisions.

Besides, the data set can also be enriched, as the beginning dates of the agreements are known from exemption requests. For instance, if the NMa considered an agreement as anticompetitive in 2001, and if the beginning of the agreement was in 1998, then it can be inferred that the agreement was characterized as being anti-competitive in 1999 and 2000 as well. The implied assumption here is that the nature of the collusive act was constant throughout the agreement and that the agreement did not break up during that period.

Above all, sample selection might be a huge problem in the current context, since nonapplication by firms operating in a specific industry for an exemption might result in significant bias. Stated differently, a particular case in a given industry is not chosen randomly. Thus, concerning the estimation technique, I have considered using Probit model with sample selection developed by van de Ven and van Pragg (1981). This model assumes that there is an underlying relationship in the form of

$$y_j^* = X_j\beta + \varepsilon_{1j}$$

[Latent equation] [7]

such that we are able to observe only the binary outcome, which is the presence of an anticompetitive agreement in our setting

$$y_j^{probit} = \left(y_j^* > 0\right)$$

[Probit equation] [8]

Nonetheless, the dependent variable is not always observed. Instead, the dependent variable for observation *j* is observed only if

$$y_j^{select} = \left(Z_j \gamma + \varepsilon_{2j} > 0 \right)$$

[Selection equation] [9]

where ε_1 and ε_2 are standard normally distributed (i.e. $\varepsilon_1 \sim N(0,1)$ and $\varepsilon_2 \sim N(0,1)$) and corr($\varepsilon_1, \varepsilon_2$) = ρ . When $\rho \neq 0$, standard Probit techniques applied to the Probit equation results in biased estimates. However, the Probit model with sample selection yields consistent and asymptotically efficient estimates for all the parameters in this class of models. Furthermore, for the model to be identified, the selection equation should have at least one variable that is not in the Probit equation, which is ensured in our case.

The log-likelihood function is defined as:

$$\ln L = \sum_{\substack{j \in S \\ y_j \neq 0}} \ln \{ \Phi_2(X_j \beta, Z_j \gamma, \rho) \} + \sum_{\substack{j \in S \\ y_j = 0}} \ln \{ \Phi_2(-X_j \beta, Z_j \gamma, -\rho) \} + \sum_{j \notin S} \ln \{ 1 - \Phi(Z_j \gamma) \}$$
[10]

where *S* is the set of observations for which y_j is observed, $\Phi_2(.)$ Is the cumulative bivariate normal distribution function (with mean $[0 \ 0]'$), $\Phi(.)$ is the standard cumulative normal.

In the maximum likelihood estimation of this model, ρ is not straightforwardly estimated. Instead, inverse hyperbolic tangent, atanh, of ρ is directly estimated:

$$\operatorname{atanh} \rho = \frac{1}{2} \ln \left(\frac{1+\rho}{1-\rho} \right)$$
[11]

As previously noted, the empirical model I will use is a Probit model with sample selection with the following specification:

 $anti-competitive_{jt} = \beta_0 + \beta_1 service_{jt} + \beta_2 boone_{jt} + \beta_3 import_{jt} + \beta_4 hhi_{jt} + \beta_5 pcm_{jt} + \beta_6 entry_{jt} + \beta_7 infotrade_{jt} + \beta_8 advertising_{jt} + \beta_9 patent_{jt} + \beta_{10} growth_{jt} + \varepsilon_{1j}$

[Probit Equation]

$$\begin{split} exemption 98_{j} &= \gamma_{0} + \gamma_{1} service_{j} + \gamma_{2} boone 98_{j} + \gamma_{3} import 98_{j} + \gamma_{4} hhi 98_{j} + \gamma_{5} pcm 98_{j} \\ &+ \gamma_{6} entry 98_{j} + \gamma_{7} infotrade 98_{j} + \gamma_{8} advertising 98_{j} + \gamma_{9} patent 98_{j} \\ &+ \gamma_{10} growth 98_{j} + \gamma_{10} cocompet 98_{j} + \varepsilon_{2j} \end{split}$$

[Selection Equation]

where *j* denotes industry; *t* denotes year; ε_{1j} and ε_{2j} are unobserved error terms; β and γ are the regression parameters. The set of regressors, *X*, for the Probit equation includes industry characteristics that provide information about the structure of an industry, i.e. how competitive it is, how likely entry is etc. The reason for the inclusion of the industry characteristics is that the NMa also took the industry conditions into consideration when making its final decision on an agreement. Therefore, we would, a priori, expect that it is more likely that the NMa labeled the agreements in industries with less competitive and more asymmetric structures as "anti-competitive".

The first variable describing the market structure is *service*, a dummy variable which is equal to one for service industries, and zero for manufacturing industries. The concentration measure used is Hirshman-Herfindahl Index (*hhi*), which is defined as the sum of the squares of the market shares based on sales. By construction, higher values of this variable designate more concentrated market structures. Additionally, in order to proxy for market power and competition, Boone indicator – a new competition indicator developed by Boone (2008), *boone*, (also known as profit elasticity) is also included in the analysis. The main idea of Boone indicator is that tougher competitions. This measure is obtained from an econometric specification which relates profits to efficiency captured by the average variable costs. More specifically, profit elasticity gauges the percentage decrease in a firm's profits in

response to a 1 percentage increase in the firm's cost per unit of output. This regression is applied to firms operating in the same industry. The estimated parameter measures profit elasticity and, comparing this parameter over time or across industries enables us to make inferences on changes in the level of competition. More precisely, higher values of the Boone indicator indicate that the industry is more competitive.

An alternative measure for the extent of competition is the price-cost margin (*pcm*). This measure refers to the firm's ability to set its prices above its marginal costs. Price-cost margins are calculated at industry level as a share of gross profits to total sales. Gross profits are obtained by subtracting total wages and the costs of intermediate inputs from value added. Besides, in order to proxy import competition, the shares of total imports in total sales in a given industry, *import*, are included. In addition, the ratios of the new entrant firms to all the firms in the industry (*entry*) are included as a proxy for entry barriers.

Furthermore, to proxy the degree of asymmetry in an industry, advertising intensity (*advertising*), which is defined at the industry level as advertising expenditures divided by total sales, and the ratio of firms with at least one patent application (*patent*) are included. Elsewhere industry averages of the binary variables indicating if firms use trade associations as information resources (*infotrade*) are included in the analysis to proxy the degree of interaction in an industry. Finally, as a measure of market demand growth, the percentage growth of sales in the relevant market (*growth*) is also considered at industry level in the current analysis.

Since we know about the existence of an agreement in an industry conditional on exemption application, which implies that our sample might be non-random, we should also specify a selection equation. In the selection equation, the dependent variable is a binary variable which is equal to one if there was at least one exemption application in industry j in year 1998, and

zero otherwise. As to the explanatory variables, the same set of explanatory variables in the Probit equation is included with their 1998 values, as the application date for the exemption was 1998. Furthermore, for identification to be more complete, I also include another variable, *cocompet98*, which is the average of the binary variables for firms indicating whether they are involved in collaboration with their competitors for innovation. I argue that the more collaboration for innovation with competitors in an industry, the more likely that firms seek antitrust immunity via Article 17 Mw for their concerted practices.

Descriptive statistics for all these variables are presented in Table II for the whole sample, as well as separately for service and manufacturing industries. Having explained the data and the empirical strategy, we can now turn to estimation results which are demonstrated in the next section.

<INSERT TABLE II HERE>

5. The Empirical Results

This section displays the results of the estimation of the models described above. In Table III, I present the results of both the Probit models with sample selection and the simple Probit models with various specifications to provide a baseline of comparison. We report the marginal effects, calculated at the sample means in Table IV.

First of all, the estimates of the correlation coefficient between error terms of the Probit equation and selection equation suggest that we should refer to selection models, since the correlation coefficient in all specifications are statistically significantly different from zero, which can be seen from atanh(rho) in Table III. Apparently, exemption application by firms in an industry is not random, and it is dependent on the industry characteristics, which can

also be seen from the highly statistically significant coefficients in the selection equation¹². This suggests that the parameter estimates in simple Probit models are plagued by sample selection bias, which indicates a major problem. Therefore, we restrict our attention to the results of the Probit model with sample selection when interpreting the estimation results.

First of all, the dummy variable *service* is negative and highly statistically significant (at 1 % level) in the third and fourth models, implying that it is less likely that the NMa considers an agreement as anti-competitive in a service industry. Second, contrary to the prior expectations, the results of the Probit equation provide strong evidence that it is more likely that concerted practices are seen as anti-competitive in more competitive industries: the coefficient on *boone* is positive and statistically significant at 1 % and 5 % significance levels in various models. Third, albeit being statistically insignificant, the coefficient on the variable *import* that proxies import competition is positive. Fourth, the results strikingly suggest that it is more likely that the NMa classifies an agreement as anti-competitive in a less concentrated industry: the coefficient on *hhi* is negative and statistically significant in all bivariate Probit models, the impact of price-cost margins on the incidence of finding an agreement as anti-competitive is imprecise. Finally, the likelihood of recognizing an agreement as anti-competitive goes down with the ease of entry: the coefficient on *entry* is negative and hardly statistically significant (at 10 % level) in the third and fourth models.

<INSERT TABLE III HERE>

¹² I will not interpret the results from the selection equation in the current analysis, as a richer analysis is already provided by Brouwer and Ozbugday (2011) on the determinants of antitrust immunity seeking behavior at industry level using the same data.

Elsewhere *advertising* enters positively and highly statistically significantly to the third and fourth models: the NMa is more likely to label an agreement as anti-competitive in industries where advertising intensity is high. On the other hand, none of the variables of *infotrade*, *patent*, and *growth* has a precise impact on the propensity to find an agreement as anti-competitive, since the coefficients on these variables are statistically insignificant.

<INSERT TABLE IV HERE>

In order to show the magnitude of the impact of the variables considered above, I also display the marginal effects of the covariates on the expected probability of classifying an agreement as anti-competitive (E[anti-competitive = 1]) at sample means in Table IV. The marginal effects indicate that the NMa is 84 percentage points less likely to reach the final decision that an agreement is anti-competitive in service industries compared to manufacturing industries. Interestingly, a unit increase in the profit elasticity (*boone*) is associated with 1.3 percentage increase in the probability of labeling an agreement as anti-competitive, which implies that it is more likely to come across an anti-competitive agreement in more competitive industries according to the evaluations of the Dutch competition authority. Likewise, a unit increase in concentration (*hhi*) is linked to the decreased likelihood of diagnosing an agreement as anticompetitive by 6 percentage points. On the other hand, the NMa is 2.1 percentage points less likely to identify an agreement as anti-competitive, as the ratio of new entrants (*entry*) increase by one unit. Finally, a unit increase in advertising intensity (*advertising*) is associated with 35 percentage points increase in the probability of finding an agreement anticompetitive.

Having presented the results, I now interpret them in the light of the theoretical framework described in Section 2.

6. Discussion

In this section, I first apply the narrative evidence on the institutional background to the simple Bayesian decision framework for the assessment of agreements for which ex ante antitrust immunity is sought, and then I interpret the econometric results in connection to this analysis.

To remember, the optimal decision rule in an antitrust case where firms seek ex ante antitrust immunity for their agreements depends on the prior beliefs, loss functions and the likelihoods. A decision to challenge a given exemption request is more likely if: (i) there is a weak likelihood that the evidence was produced by a pro-competitive instead of anti-competitive practice; (ii) the losses associated with type-II errors are high compared to the losses associated with type-I error; and (iii) there are strong priors that an agreement is anticompetitive.

Let me begin with the first element of the decision rule, which is the likelihood that the evidence was produced by whether a pro-competitive or anti-competitive agreement. A set of firms with a purely anti-competitive agreement is less likely to ask for exemption in the Dutch case. Stated differently, "dirty" cartels should not be expected to be on the original list in the first place, since one cannot expect cartels to be reported in 1998, as they had already been declared illegal in 1994. This view is partially correct, as there were very few price-fixing cases in these dispensation requests. Furthermore, the main motivation for the parties to apply for dispensation was legal certainty. Firms wanted to avoid the blackbox about competition issues, since there had been drastic changes in the competition law and its enforcement, which left most of the companies hesitant about their agreements with other undertakings. Thus, the

data (evidence) generating process for our sample of multilateral anti-competitive practices is different from the data generating process for an authority detecting cartels or the data generating process for leniency applications. Therefore, taking the legal background, the nature of the agreements, and the motivation of the firms into account, I would conclude that there is a strong likelihood that the evidence, e, is more likely to be produced by a procompetitive agreement, which should hinder the probability of a decision to challenge an agreement.

The second element of the decision rule is the relative size of the losses associated with type-II error (failing to prosecute an anti-competitive agreement) compared to the losses associated with type-I error (challenging a pro-competitive agreement). As expressed by van Sinderen and Kemp (2008), the NMa needed to build reputation as a real "cartel fighter". Consequently, failing to prosecute an anti-competitive agreement would generate significant losses concerning the reputation of the Dutch competition authority and the deterrent effects of its very existence. On the other hand, challenging as many agreements as possible would boost the reputation of the NMa as a "cartel fighter". Indeed, this phenomenon of "cartel fighter" was later confirmed by the former head of the NMa during a press interview where he praised the competition authority for clearing 350 cartels thanks to the dispensation requests¹³. Therefore, notwithstanding the need to mention the losses of the firms in any case, I would conclude that the relative size of the losses concomitant with type-II error, L_{II}, is much bigger compared to the losses concomitant with type-I error, L_I, in the current analysis.

¹³ http://www.trouw.nl/tr/nl/5009/Archief/archief/article/detail/2791911/2002/12/23/Nederland-is-kartellandaf.dhtml [last access on 24 July 2011].

The third element of the decision rule is whether there are strong prior beliefs that an agreement is anti-competitive. As mentioned in the section that describes the institutional background, the lax enforcement of the previous competition law had resulted in tolerance towards collusive business behavior in the Netherlands, which, in turn, raised the fame of the Netherlands as "cartel paradise". In addition, anything in which firms coordinate was considered as a cartel in the Dutch context. Therefore, I would conclude that there are strong priors that an agreement is anti-competitive at the time of dispensation applications.

In brief, the second and the third elements (the relative size of the losses concomitant with type-II error and the existence of strong prior beliefs that an agreement is anti-competitive) are expected to surpass the first element (the likelihood that the evidence was produced by a pro-competitive practice) when the narrative evidence on the legal and institutional background are applied to the simple Bayesian decision framework for the assessment of agreements for which ex ante antitrust immunity is sought. Therefore, the NMa is expected to be more likely to classify an agreement as anti-competitive at the time of application.

Having linked the narrative evidence on the legal and institutional background to the theoretical Bayesian decision framework for the analysis of the dispensation requests, I now interpret the econometric results on the analysis of the decisions of the NMa.

In the econometric analysis, I have linked the Dutch competition authority's decisions to industry characteristics, since the NMa also took the industry conditions into consideration when making its final decision on an agreement. Thus, the expectation is that it is more likely that the NMa labeled the agreements in less competitive industries as "anti-competitive". Nonetheless, the findings of the empirical analysis reveal that it is more likely that concerted practices are seen as anti-competitive in more competitive and less concentrated industries. Furthermore, if advertising intensity is seen as a sign of vertical differentiation rather than the degree of monopoly power, then the results also suggest that the NMa is more likely to identify an agreement as anti-competitive in industries with more asymmetric structures, which is contrary to theoretical predictions. Finally, the predicted probability of classifying an agreement as anti-competitive following the bivariate Probit model estimation is found to be around 76 %, which is consistent with the expectation that the NMa is more likely to label an agreement as anti-competitive at the time of application.

7. Conclusion

In an economic environment where antitrust laws regulate to what extent firms could interact, firms have constantly been seeking ways to circumvent the constraints that are imposed by the laws. One obvious way of bypassing competition laws is obtaining antitrust immunity via exemption applications. The face value of any antitrust immunity application contains a plausible-like plea such as efficiency or ruinous competition argument. Nevertheless, an agreement with antitrust immunity also enables the concerning firms to carry out anticompetitive conduct such as synchronizing business strategies. The duty of a competition policymaker with a certain dosage of discretion is then to ponder the possible positive and negative impact of the agreement that is the subject of an exemption application and to decide whether the relevant agreement is welfare-damaging or not.

An institutional change that allowed firms to ask for ex ante antitrust immunity took place in the Netherlands during the late 1990s. Following the introduction of the Competition Act of 1998 (Mededingingswet), undertakings were allowed to apply for dispensation for agreements that were already in existence and that had begun in the era of "cartel paradise", which prevailed under the superseded Economic Competition Act of 1956 (Wet Economische Mededinging). More specifically, firms were allowed to request exemption from Article 6 Mw via Article 17 Mw (which has been repealed later) of the Dutch Competition Act for their agreements that improved production/distribution or stimulated economic or technical progress, and, of which reasonable portion of the benefits accrued to consumers. The reaction was that the NMa was swarmed with dispensation requests -1,100 at the deadline. The assessment of these exemption requests by the NMa literally took years (until 2004). In its assessment, the NMa took into account the characteristics of the industry in which the antitrust immunity seeking parties operated and made its final decision on whether the agreements were anti-competitive or not.

The present study provides an analysis of the conditions that led the Dutch competition authority (the NMa) to decide against a temporary antitrust immunity seeking agreement on antitrust grounds. First, a theoretical Bayesian decision framework that is similar to that of Cooper et al. (2005) is presented to derive the optimal enforcement rule for agreements for which ex ante antitrust immunity is sought. Then the NMa's decisions are investigated in an econometric background where those final decisions are linked to various industry characteristics, as the NMa took them into consideration when making its final decision. In doing so, a bivariate Probit model with sample selection is estimated to account for the fact that non-application by firms operating in a specific industry for an exemption might result in significant bias. The econometric results suggest that it is more likely that concerted practices are seen as anti-competitive in more competitive and less concentrated industries.

To conclude, if the narrative evidence on the legal and institutional background, and the econometric results are interpreted in the light of the theoretical Bayesian decision framework, the above analysis suggests that the NMa, as a newly-established reputationbuilder, might have over-reported and erred on the side of classifying non-serious coordination mechanisms as cartels that could easily be disciplined or dissolved under competitive market structures.

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Variables	Manufacturing		Serv	Service		All		
variables =	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.		
PROBIT EQUATION VARIABLES								
service					0.461	0.499		
boone	9.536	5.910	6.259	7.169	8.759	6.384		
import	50.074	22.968	9.395	13.577	33.000	28.045		
hhi	16.559	17.605	5.114	6.818	13.763	16.423		
pcm	1.987	10.944	19.901	26.765	6.199	17.818		
entry	7.676	11.235	10.262	8.965	8.757	10.424		
infotrade	3.302	12.293	2.211	8.277	2.767	10.530		
advertising	1.303	1.676	1.407	2.508	1.328	1.915		
patent	16.297	18.066	2.754	12.908	9.705	17.157		
growth	9.360	57.536	9.941	53.284	9.506	56.487		
SELECTION EQU	ATION VARI	ABLES						
boone98	10.180	5.730	6.891	7.076	9.403	6.231		
import98	50.328	23.285	9.300	13.348	33.152	28.276		
hhi98	15.712	18.121	5.790	6.057	13.298	16.598		
pcm98	0.391	9.041	34.848	34.960	8.423	23.652		
entry98	9.085	7.290	11.141	7.642	9.945	7.506		
infotrade98	11.920	11.644	6.568	7.968	9.309	10.370		
advertising98	1.496	1.731	1.712	2.655	1.549	1.999		
patent98	11.954	11.243	9.751	10.572	10.888	10.976		
growth98	12.252	66.417	7.174	28.547	10.989	59.338		
cocompet98	6.758	9.614	5.356	9.012	6.074	9.350		

Table II: Descriptive Statistics

	Mod	Model 1 Model 2		lel 2	Mod	lel 3	Model 4		
	Probit Model with Sample Selection	Simple Probit	Probit Model with Sample Selection	Simple Probit	Probit Model with Sample Selection	Simple Probit	Probit Model with Sample Selection	Simple Probit	
anti-competitive									
service	0.1034	-0.2578	0.1273	-0.1417	-2.9674 ***	-1.1121	-2.9140 ***	-1.1877 *	
	(0.3546)	(0.4468)	(0.3512)	(0.4737)	(1.0306)	(0.7227)	(1.0424)	(0.7043)	
boone	0.0719 ***	0.0816 ***	0.0738 ***	0.0474	0.0409 **	0.0526	0.0444 **	0.0576	
	(0.0214)	(0.0289)	(0.0230)	(0.0323)	(0.0207)	(0.0444)	(0.0222)	(0.0461)	
import	0.0092 *	0.0005	0.0092 *	-0.0007	0.0097	-0.0013	0.0087	-0.0063	
	(0.0053)	(0.0072)	(0.0054)	(0.0069)	(0.0068)	(0.0085)	(0.0071)	(0.0093)	
hhi	-0.1001 ***	-0.0638 ***	-0.1034 ***	-0.1221 ***	-0.2000 ***	-0.2114 ***	-0.1975 ***	-0.2016 ***	
	(0.0194)	(0.0202)	(0.0212)	(0.0420)	(0.0487)	(0.0450)	(0.0513)	(0.0442)	
pcm	-0.0047	-0.0086	-0.0049	-0.0169	0.0038	-0.0287 *	0.0043	-0.0285 *	
	(0.0066)	(0.0097)	(0.0065)	(0.0109)	(0.0093)	(0.0170)	(0.0096)	(0.0170)	
entry	-0.0236	-0.0059	-0.0248	0.0021	-0.0645 *	-0.0495	-0.0681 *	-0.0601	
	(0.0220)	(0.0246)	(0.0223)	(0.0307)	(0.0367)	(0.0363)	(0.0382)	(0.0376)	
infotrade			0.0042	0.0188	0.0040	0.0198	0.0022	0.0155	
			(0.0082)	(0.0141)	(0.0125)	(0.0148)	(0.0117)	(0.0144)	
advertising					1.1438 ***	0.8811 ***	1.1239 ***	0.8838 ***	
					(0.3616)	(0.2430)	(0.3681)	(0.2353)	
patent					0.0065	0.0096	0.0082	0.0152	
					(0.0084)	(0.0123)	(0.0090)	(0.0129)	
growth							-0.0054	-0.0159	
							(0.0098)	(0.0106)	
constant	1.4127 ***	0.1953	1.4142 ***	0.6508	1.3626 ***	0.6420	1.4172 ***	0.8834	
	(0.3633)	(0.4792)	(0.3631)	(0.5234)	(0.4968)	(0.6248)	(0.5475)	(0.6654)	

Table III: The Results of the Probit Models with Sample Selection and the Simple Probit Models for the Analysis of the NMa's Decisions

(a) *: Significant at 10 % level, **: significant at 5 % level, ***: significant at 1 % level, (b) z-statistics are based on robust standard errors in parentheses.

	Model 1 Model 2			Model 3			Model 4	
	Probit Model with Sample	Simple Probit N	Model Simple	e Probit Model with	Simple Pr	obit Model	Simple	
	Selection	<u>Probit</u> with Sa	<u>imple Probi</u>	t Sample Selection	<u>Probit</u> wi	th Sample	Probit	
exemption98						_		
service	-0.8642 ***	-0.8721 *	***	-1.0482 ***	-1.050	0 ***		
	(0.2809)	(0.2804)		(0.2894)	(0.2894	·)		
boone98	-0.0233 **	-0.0235 *	**	-0.0207 *	-0.020	3		
	(0.0118)	(0.0119)		(0.0123)	(0.0123)		
import98	-0.0110 ***	-0.0110 *	***	-0.0112 ***	-0.011	2 ***		
	(0.0029)	(0.0029)		(0.0029)	(0.0029)		
hhi98	-0.0308 ***	-0.0308 *	***	-0.0276 **	-0.027	5 **		
	(0.0118)	(0.0118)		(0.0115)	(0.0115)		
pcm98	0.0134 ***	0.0134 *	**	0.0158 ***	0.015	8 ***		
	(0.0027)	(0.0028)		(0.0029)	(0.0029)		
entry98	0.0652 ***	0.0653 *	***	0.0652 ***	0.065	1 ***		
	(0.0117)	(0.0117)		(0.0128)	(0.0128)		
infotrade98	0.0241 ***	0.0239 *	***	0.0260 ***	0.026	1 ***		
	(0.0062)	(0.0063)		(0.0075)	(0.0075)		
advertising98	0.0362 *	0.0359 *	•	0.0022	0.001	8		
	(0.0200)	(0.0200)		(0.0198)	(0.0198)		
patent98	-0.0240 ***	-0.0239 *	***	-0.0248 ***	-0.024	9 ***		
*	(0.0059)	(0.0058)		(0.0064)	(0.0065)		
growth98	-0.0227 ***	-0.0227 *	***	-0.0279 ***	-0.027	9 ***		
-	(0.0058)	(0.0058)		(0.0070)	(0.0070)		
cocompet98	0.0178 **	0.0176 *	*	0.0036	0.003	4		
-	(0.0083)	(0.0084)		(0.0124)	(0.0124	.)		
constant	-1.2562 ***	-1.2505 *	***	-1.1335 ***	-1.134	6 ***		
	(0.1956)	(0.1956)		(0.2225)	(0.2222)		
atanh(rho)	-1.9642 ***	-1.9668 *	**	-1.4935 ***	-1.476	1 ***		
	(0.4105)	(0.4480)		(0.2663)	(0.2605)		
Obs. Censored	1099	109	99	1099		1099		
Obs. Uncensored	110	110	0	110		110		
Observations		127	116		116		116	
Prob>Chi2	0.000	0.000 0.00	000 0000	0.000	0.000	0.000	-	
Pseudo-R2		0.18	0.22	0.000	0.40	2.000	0.42	

Table III: The Results of the Probit Models with Sample Selection and the Simple Probit Models for the Analysis of the NMa's Decisions (Continued)

(a) *: Significant at 10 % level, **: significant at 5 % level, ***: significant at 1 % level, (b) z-statistics are based on robust standard errors in parentheses.

Table IV: The Marginal Effects of the Covariates on the Expected Likelihood of Classifying an Agreement as Anti-competitive in Probit Models with Sample Selection (E[anticompetitive = 1])

	Model 1	Model 2	Model 3	Model 4	
	Probit Model with Sample Selection				
anti-competitive					
service	0.0215	0.0265	-0.8401 ***	-0.8355 ***	
	(0.0710)	(0.0699)	(0.0912)	(0.0972)	
boone	0.0155 ***	0.0161 ***	0.0129 *	0.0139 *	
	(0.0048)	(0.0052)	(0.0075)	(0.0083)	
import	0.0020 *	0.0020 *	0.0031	0.0027	
	(0.0011)	(0.0011)	(0.0021)	(0.0022)	
hhi	-0.0216 ***	-0.0226 ***	-0.0628 **	-0.0618 **	
	(0.0072)	(0.0080)	(0.0255)	(0.0270)	
pcm	-0.0010	-0.0011	0.0012	0.0013	
	(0.0015)	(0.0015)	(0.0029)	(0.0030)	
entry	-0.0051	-0.0054	-0.0203	-0.0213 *	
	(0.0047)	(0.0048)	(0.0126)	(0.0129)	
infotrade		0.0009	0.0013	0.0007	
		(0.0018)	(0.0040)	(0.0037)	
advertising			0.3593 **	0.3515 **	
			(0.1519)	(0.1582)	
patent			0.0020	0.0026	
			(0.0028)	(0.0031)	
growth				-0.0017	
				(0.0032)	
Pr(anti-competitive = 1)	0.87	0.86	0.76	0.76	

(a) *: Significant at 10 % level, **: significant at 5 % level, ***: significant at 1 % level, (b) z-statistics are based on robust standard errors in parentheses.