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# Competition Law, Antitrust Immunity and Profits: A Dynamic Panel Analysis

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## Abstract

This paper tests whether the transition from the old Economic Competition Act, which was based on the so-called “abuse system”, to the new Competition Act, which was based on “prohibition system”, in the Netherlands had an impact on the price-cost margins in manufacturing industries during the period 1993-2007. The paper further investigates if the price-cost margins were higher in industries where temporary antitrust immunity was granted for subset of firms that engaged in concerted practices. The results indicate that the change in the competition law in the Netherlands had a very small and negative, yet statistically insignificant deterrent effect on the price-cost margins. Elsewhere, markups were higher in industries in which temporary antitrust immunity was granted for some class of coordinated actions.

**JEL Codes:** K21, L4, L6

**Key Words:** Price-cost margins; Competition law; Antitrust immunity; Antitrust enforcement; Dynamic panel data model; the Netherlands.

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## 1. Introduction

There is increasing curiosity among competition authorities with regard to the economic effects of competition policy and the effectiveness of enforcing the competition law. Policymakers are keen on quantifying the impact of antitrust policies. A great majority of competition authorities focus on the effects of competition policy on consumer surplus, since protecting consumers and maximizing consumer surplus is reckoned as a mission statement by many competition authorities. Yet, there is another dimension of competition policy enforcement, which is on producer surplus. Increased competition decreases monopoly power and reduces price-cost margins (controlling for other relevant factors).

This curiosity among policymakers is even more intense in the Netherlands, since there have been dramatic changes during the last twenty years. The old Economic Competition Act of 1956 (WEM: Wet Economische Mededinging), which was based on the so-called “abuse system”, was replaced by the new Competition Act (Mededingingswet), which was based on “prohibition system”. Concurrently, the new enforcement agency, the Nederlandse Mededingingsautoriteit (NMa) was established in 1998. Furthermore, the new Competition Act allowed undertakings to apply for dispensation for agreements that were already in existence and that had begun under the former Act. More specifically, firms were allowed to request exemption for agreements, decisions or conduct that improved production/distribution or stimulated economic or technical progress, and, if a reasonable portion of the benefits accrued to consumers. Furthermore, 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 on July 1st, 2005, when the NMa was given the status of Autonomous Administrative Authority. Finally, as of October 1st, 2007, the NMa has been awarded additional powers, as a result of the evaluation of the Competition Act.

In this study we investigate the impact of the change in the competition policy enforcement in the Netherlands and the impact of granting temporary antitrust immunity mentioned above on the level of industry price-cost margins for manufacturing industries. We hypothesize that a tougher competition policy reduces the ability of firms in any market to collude and, consequently, the price-cost margins will be lower, whilst controlling for other factors that are believed to affect the price-cost margins. We also hypothesize that in industries where

concerted practices are immune from antitrust law, the price-cost margins will be higher, everything else being equal. In order to test these hypotheses, we employ a two-step dynamic panel data estimation technique developed by Holtz-Eakin et al. (1988), Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). Our estimation results suggest that the change in the competition law in the Netherlands had a very small and negative, yet statistically insignificant deterrent effect on the price-cost margins. As to the impact of granting temporary antitrust immunity in the aftermath of the institutional change, we found that markups were higher in industries in which temporary antitrust immunity was granted for some class of coordinated actions.

The plan of the study is as follows: Section 2 presents a review of prior empirical research on deterrent effects of antitrust policy enforcement and on economic impact of granting antitrust immunity. Section 3 explains the institutional background for competition policy in the Netherlands. Section 4 provides the details of data employed in this study and elaborates on the empirical strategy. Section 5 presents the estimation results. Finally Section 6 discusses the empirical findings and concludes.

## **2. Review of the Relevant Literature**

### **2.1 Deterrent Effects of Antitrust Policy Enforcement**

The empirical studies examining the deterrent effects of antitrust policy enforcement can be grouped into two categories: studies at micro-level in which data arises from prosecution and studies at macro-level in which a broader section of overall economic activity is analyzed. Beginning from micro-level studies, in their analysis of the market for white pan bread, Block et al. (1981) reveal that raising Department of Justice's (DOJ) enforcement capacity or indicting a DOJ price-fixing complaint had the deterrent effect of decreasing markups in the industry. Block and Feinstein (1986) collect data on about 1000 highway contracts in the U.S. over the period from January 1975 to May 1982. Their findings of the empirical analysis suggest that increases in the level of sanctions for bid rigging had a deterrent effect in the U.S. highway construction industry. Elsewhere, Sproul (1993) used data from a survey of 25 price-fixing cases filed by the DOJ to firms operating in various industries between 1973 and 1984. Surprisingly, a filing for price fixing results in slightly higher prices. More specifically, prices increase by approximately 7 percent over the four years after indictment. The author ascribes this result to either that DOJ prosecuted cost-reducing cartels or the penalties were not

deterrent enough. Besides, he also found out that the severity of penalties was negatively associated with price.

On the other hand, studies at macro-level focused on impact of change in antitrust policy on markups in a broader section of overall economic activity. These changes in antitrust policy have mostly been in the form of tightening competition law or following a stricter antitrust policy. An example is Konings et al. (2001), where the authors investigate if the changes in the competition law and policy have an impact on the level and the dynamics of firm price cost margins in Belgium. Using a firm level panel dataset from 1992 to 1996, they reveal that competition policy in Belgium did not have an impact on price-cost margins. The authors attribute this finding to that the old price regulatory system had already disciplined Belgian firms considerably. Elsewhere, Warzynski (2001) tested whether price cost margins were lower when antitrust policy was implemented strictly relatively to the period when antitrust policy was lenient thanks to the influence of the Chicago School. In his analysis of the data for 450 American manufacturing industries from 1958 to 1994, he reveals that markups were lower when the antitrust policy was very tough<sup>1</sup>.

Taking all these into account, we would conclude that the empirical evidence on the deterrent effects of antitrust policy enforcement is mixed. This is fundamentally owing to the idiosyncrasy of the institutions, antitrust policy design and data in each study mentioned above.

## **2.2 Economic Impact of Granting Antitrust Immunity**

Firms have incessantly been searching for ways to bypass the constraints that are imposed by the antitrust laws that shape economic environment. One possible way of circumventing the competition laws is having antitrust immunity via exemption applications. Antitrust authorities have been flooded with many antitrust immunity applications involving efficiency or ruinous competition arguments as long as the laws enabled them to grant exemptions. Competition authorities have either rejected those applications or conferred exemptions under specific conditions.

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<sup>1</sup> The sample was divided in two periods: 1958-1973 when antitrust authorities monitored market structure very closely, and 1973-1994 when the impact of Chicago School led to a shift in antitrust policy.

Carlton and Picker (2007) discuss that an industry operating under the antitrust laws might demand antitrust immunity from those laws for one of the two following reasons: The industry might want to refrain from inefficiencies brought about by antitrust laws. Or, the industry might want to evade the restrictions of the antitrust laws and want to engage in anti-competitive practices such as cartelization in order to glean profits. In other words, even though the utilization of immunities, as a mechanism to enhance effective competition policy, may be socially desirable in cases where coordinated action is necessary for efficiency, some forms of exemptions might result in collective dominance on the exempted industries to the detriment of society. Worse still, the immunity holders might find it profitable to engage in tacit collusion well after the immunity is lapsed.

There have been a couple of empirical studies analyzing the impact of antitrust immunity in various industries. Most of these empirical studies center on airlines industries where antitrust immunity is granted for coordinating joint operations such as scheduling, pricing decisions, forming revenue-sharing joint ventures in international markets. To mention a few, Oum et al. (1996); Park and Zhang (2000); Brueckner and Whalen (2000); Brueckner (2003); Whalen (2007); and Bilotkach (2007) report that airline alliances with antitrust immunity offer lower fares. On the other hand, in his analysis of the effect of an agreement in which two airline companies were allowed to coordinate on capacity and sales targets, Kamita (2010) finds that the airline companies not only raised fares under antitrust immunity but also retained supracompetitive profits after the immunity expired. Bilotkach and Huschelrath (2011) discuss also that antitrust immunity might have some effects on non-price characteristics of airline markets except for the effects on prices. They argue that antitrust immunity can constrain individual partner airlines' network development, facilitate collusion, and lead to the foreclosure of the interline markets to airlines from competing alliances. Elsewhere, in his analysis of Webb-Pomerene export cartels that were exempted from the antitrust laws, Dick (1992) reports that these cartels were successful in raising prices in only three commodity industries. Interestingly, Clyde and Reitzes (1995), in their study of the U.S. international ocean shipping industry that enjoyed antitrust immunity and a conference system that permitted carriers to enter into pricing agreements, could not find a significant relationship between conference share and freight rates. Overall, the general conclusion to be drawn from these empirical studies is that the effects of antitrust immunity on market prices are indeterminate, as pointed out in Bilotkach and Huschelrath (2011).

### **3. The Enforcement of Dutch Competition Policy during the Last Two Decades**

Netherlands' competition policy has changed drastically over the past twenty years. 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". The new enforcement agency, the Nederlandse Mededingingsautoriteit (NMa) was synchronously established in 1998. Since then, there have been several amendments in the Competition Act. As a result of European Regulation 1/2003, the Competition Act was first amended in accordance with the European Competition Law in 2004. Another amendment came on July 1st, 2005, when the NMa was awarded the status of Autonomous Administrative Authority. Finally, as of October 1st, 2007, the NMa has been given additional powers, as a result of the evaluation of the Competition Act.

Under the former Economic Competition Act, the enforcer, which was the Ministry of Economic Affairs (MEA), had to make a plea in each case that a practice 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. Moreover, the old Economic Competition Act's main touchstone was simply the "general interest", a concept deficient in context or guidance for decisions. Firms with a restrictive agreement that was not against the "general interest" had to notify the MEA, which accordingly registered the agreement in the Dutch "Kartel Register". What is more to the point, deciding whether agreements were against the general interest or not required deliberation with other ministries, which were primarily worried about other aspects of the general interest rather than competition policy. In 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* cartel register contained 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). The endurance of these anti-competitive agreements can be seen from details that the MEA (1989) released in 1989 on 109 horizontal price agreements that were active in September 1988. 40 per cent of these agreements had survived for more than twenty years and a further 20 per cent had already celebrated their tenth anniversary (Asbeek- Brusse and Griffiths, 1998, p. 24). As to the scale of these agreements, 77 % of them were at national level, while the remaining 23 % were operating locally. Dramatically, the majority of these agreements consisted of multiple provisions, as can be seen from Table I.

In 1992, the MEA (1992) announced further details on the 201 market sharing agreements that were being kept in the register in September 1991. These agreements were relatively younger compared to the previously mentioned horizontal price agreements. Only 14 per cent had been in the register for more than two decades and another 17 per cent had been kept on the records for more than ten years (Asbeek- Brusse and Griffiths, 1998, p. 25). More interestingly, even within the general description of “market sharing”, 94 % of these agreements involved other forms of restrictive practices.

The renown of the Netherlands as cartel paradise had also been confirmed internationally, since 21 of the total 55 incidences of serious restrictions to competition of a predominantly national character that have been the subject of an Order under Article 85(1) EEC Treaty during 1970-1989 (almost 40 % of the cases) involved the Netherlands, as reported by de Jong (1990).

Having argued that the Netherlands was indeed a cartel paradise under the former Economic Competition Act, we can discuss more detailed explanations for the failure of the prosecution of anti-competitive practices. Actually, most of the explanation lies within the nature of the legislation itself. To begin with, the old Economic Competition Act postulated that cartels are not harmful, unless the government showed the contrary, which left the burden of proof to the government. Second, the term “general interest”, a concept deficient in context or guidance for decisions, was not specified within the Act, which entrusted the MEA a large margin of judgment. Finally, despite the fact that there was a cartel register, the Act did not lay down provisions for detecting unregistered restrictive agreements or for sanctions against non-



registration. Accordingly, the agreements recorded under the register represented an incomplete depiction of cartels.

In brief, 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. Moreover, as indicated by Asbeek-Brusse and Griffiths (1998), the conflicts were resolved within the deliberations between business representatives and governmental officials. More often than not, officials at the MEA worked concomitantly with business representatives. This intimacy brought about a gentle stance towards collusive business behavior.

Having understood that the local legislative climate posed little threat to coordinated business behavior, one might ask the question of whether exposure to trade in the Dutch economy had a disciplining effect on concerted practices. However, the fact that three-fourths of Dutch consumers' purchases were domestic proves this statement to be wrong. More specifically, industries such as construction, utilities, financial transactions, transport, retail trade, and consumer and professional services, which cover a great majority of the economic activities, were isolated from imports (OECD, 1998, p. 7).

Given the lax enforcement of the domestic competition law, one might also consider the involvement of European Commission (EC) and the European Competition Law as a second potential threat to collusive business behavior in the Netherlands. Actually, the fact that the Dutch were among the last to have legislation that did not prohibit coordinated actions utterly meant that Dutch cartels were under close inspection 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 attributed to the closer inspection by the EC into Dutch cartels. This closer scrutiny had started in 1971, when the first EC decision stating that a cartel among Dutch firms (the Dutch Cement Dealers' Association) had violated

Article 81 TEC came<sup>2,3</sup>, and it climaxed in 1977, when the EC prohibited the system of collective exclusive dealing among Dutch bicycle dealers<sup>4</sup>, even though it had been allowed after some adjustments under the former Economic Competition Act. Over and above, 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<sup>5</sup>. 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. Stated more precisely, it brought forward that the Dutch competition law and administrative practices, inter alia the industry's agreements, hindered 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. Except for a more active policy of dealing with cartel complaints, this included a sequence of general prohibitions on horizontal price agreements (effective from 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 introduced in 1998, accompanied by the establishment of the new enforcement agency (NMa).

Article 6 of the new Competition Act complies with Article 101 TFEU (ex Article 81 TEC and ex Article 85 EEC Treaty) in its forbiddance of all types of anti-competitive 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.<sup>6</sup> 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.<sup>7</sup>

Elsewhere, the new Competition Act enabled undertakings to apply for dispensation for agreements that were already in existence and that had begun in the pro-cartel period. More specifically, undertakings were allowed to request exemption from Article 6 Mw via Article

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<sup>2</sup> Decision of 16 December 1971, JO 1972 L13/34

<sup>3</sup> Case 8/72

<sup>4</sup> *Centraal Bureau voor de Rijwielhandel*, OJ 1978 L20/18

<sup>5</sup> *Building and construction industry in the Netherlands*, OJ 1992 L92/1

<sup>6</sup> The Competition Act, Articles 12-14 Mw.

<sup>7</sup> The Competition Act, Article 12 Mw.

17 Mw (which has been repealed later) of the Competition Act. However, one should bear in mind that not every anti-competitive agreement would get antitrust-immunity. To be more precise, 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 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.”* Hence, Article 17 Mw specified that agreements 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. In return for applying for an exemption, undertakings were compelled to provide data on several features of the planned cooperation: the number of firms involved, the duration of agreements, the total sales of all firms involved in cooperative agreement etc. The reaction was that the NMa was swarmed with dispensation requests – 1,100 at the deadline. The evaluation of these exemption requests by the NMa literally took years (until 2004). Based on assessments, the NMa (i) declined the request, as the agreement was not anti-competitive, or (ii) exemption 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. Referring to the NMa’s verdicts on dispensation applications, of these dispensation requests, 47 % did not violate any of the new competition rules, whereas of the other 53 %, only 9 % were granted as exemptions by the NMa.

There were a couple of different motives of parties to seek dispensation. For some of them, the main motivation was legal certainty. Firms wanted to abstain from the ambiguity about competition issues, as there had been substantial changes in the competition law and its enforcement, which left most of the companies hesitant about their agreements with other undertakings. In spite of the fact that general prohibitions on horizontal price agreements and, on market sharing agreements and collusive tendering agreements became effective as of July 1993, and of June 1994, respectively; there were not many prosecutions during the period between the early prohibitions and the change in the competition law (between 1993 and

1998). On the other hand, the motivation for undertakings with anti-competitive agreements was different. At the time of the change in the law, there were some “cartels” with huge amounts of investments experiencing overcapacity problems. The members of those “cartels” wanted to divide overcapacity, and, in search of legal protection, they sought antitrust immunity for their agreements<sup>8</sup>.

Herein might someone doubt that hardcore cartels were not contained in the subsample of the dispensation requests with anti-competitive agreements. “Dirty” cartels should not be expected to be on the original list in the first place, so to speak, since one cannot expect cartels to be reported in 1998, as they had already been declared illegal in 1994. This notion is partially true, as there were very few price-fixing cases in these exemption requests. Nonetheless, the remaining dispensation requests with anti-competitive agreements contain market sharing agreements, bid rigging agreements (which has always been a problem in the Netherlands, and not been seen as restrictive), joint production agencies (e.g. asphalt production) etc, which were evident breaches of the competition law. Indeed, these were typical Dutch cartels operating at national or local level. Furthermore, one should note that even though there were general prohibitions under the former Economic Competition act, these provisions were laxly applicable and the enforcement was very weak in the sense that there were very few prosecutions during the period of 1993-1998.

## **4. The Data and Empirical Specifications**

### **4.1 Data Sources**

We use several two different sources of data. These are Dispensation Requests Database and Production Survey (PS). Below, we briefly describe these main sources of data.

#### *Dispensation Requests Database*

This database includes original dispensation requests from the NMa achieves. The database is confidential and is not publicly available to researchers. It contains the names of undertakings with an agreement, the code of the industry in which undertakings were operating at the time of application (SBI<sup>9</sup> codes), the number of parties in an agreement, the total annual revenues of the companies involved in an agreement, and the duration of agreement.

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<sup>8</sup> Interview with Prof. van Sinderen (the Chief Economist of the NMa)

<sup>9</sup> De Standaard Bedrijfsindeling

In total, there are approximately 1,100 dispensation applications. The median number of parties in these applications is 50. Besides, the average duration of the agreements for which exemption was sought is 6.5 years with a standard deviation of 8.7 years. For the minority of the dispensation applications for which the competition law applied, immunity was granted. To be more specific, 37 concerted practices in various industries were exempted from the competition law. There is not a clear pattern for these industries with antitrust immunity. As to the duration of the antitrust immunity, the average time period during which these multilateral restrictive practices were exempted from the competition law was 5.39 years.

### *PS*

Production Survey (PS) is conducted by the Dutch Bureau of Statistics (CBS) on an annual basis. Data from PS is available for the period between 1993 and 2006.<sup>10</sup> The PS is a sampled survey; only firms with more than 20 employees are contained in the sample each year. For smaller firms, sampling fractions decrease, and consequently smallest firms will have gaps in the data for several years.

After aggregating firm level data to industry level data, we merged the two data sources at the 3 (and sometimes 4) digit SIC-code. Having juxtaposed the datasets provided by the CBS and the NMa, we have obtained a sample of 112 industries for which data is running from 1993 to 2007.

## **4.2 Empirical Strategy and Variables**

In the current study, we try to measure if tougher competition policy enforcement had deterrent effects by regressing industry price-cost margins on a dummy indicating the change in the competition law in the Netherlands and a set of control variables. Concurrently, we also investigate if the price-cost margins have been higher in those industries where temporary antitrust agreement has been conferred for some class of concerted practices. The following specification is employed to test the impact of the change in the competition law in the Netherlands:

$$pcm_{it} = \gamma pcm_{i,t-1} + \beta_1 law_{it} + \beta_2 import_{it} + \beta_3 export_{it} + \beta_4 dgdp_{it} + \beta_5 growth_{it} \\ + \beta_6 hhi_{it} + \beta_7 lawXhhi_{it} + TIME + \varepsilon_{it}$$

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<sup>10</sup> Data for the industries transport and telecom only covers the period 2000-2006.

[1]

Besides, we also estimate the following model to investigate the impact of granting temporary antitrust immunity on price-cost margins in industry after the change in the competition law:

$$pcm_{it} = \delta pcm_{i,t-1} + \theta_1 immunity_{it} + \theta_2 import_{it} + \theta_3 export_{it} + \theta_4 dgdp_{it} + \theta_5 growth_{it} + \theta_6 hhi_{it} + TIME + \varepsilon_{it}$$

[2]

where

$i$  = industry

$t$  = year.

$pcm_{it}$  = industry price-cost margin

### **Lagged Dependent Variable**

$pcm_{i,t-1}$  = lagged industry price-cost margin

### **Variable for the Impact of the Competition Act (Mededingingswet)**

$law_{it}$  = 1 if industry operated under the Competition Act (Mededingingswet)

### **Variable for Antitrust Immunity**

$immunity_{it}$  = 1 if antitrust immunity is provided to some subset of firms in industry

### **Proxies for Exposure to Trade**

$import_{it}$  = 1 if import intensity of industry (the shares of total imports in total sales in industry) is in the first quartile, 2 if import intensity of industry is in the second quartile, 3 if import intensity of industry is in the third quartile, and 4 if import intensity of industry is in the fourth quartile. Quartiles are defined using all manufacturing industries in the sample.

$export_{it}$  = 1 if export intensity of industry (exports-sales ratio) is in the first quartile, 2 if export intensity of industry is in the second quartile, 3 if export intensity of industry is in the third quartile, and 4 if export intensity of industry is in the fourth quartile. Quartiles are defined using all manufacturing industries in the sample.

### **Proxies for the Change in Market Demand**

$dgdp_{it}$  = change in real Gross Domestic Product (GDP)

$growth_{it}$  = percentage growth of sales in the relevant market

### **Variables for Market Structure**

$hhi_{it}$  = Hirshman-Herfindahl Index

### **Interaction Term**

$lawXhhi_{it}$  = Hirshman-Herfindahl Index interacted with the change in the competition law.

### **Time Dummies**

TIME = year fixed effects

In the current study, 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. The lagged price-cost margins are included as a regressor to control for the fact that some industries may have been colluding secretly or tacitly prior to time  $t$ , a fact that might otherwise obfuscate the relationship between the introduction of the Competition Act and industry price-cost margins. As one might remember, 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 had been allowed to request exemption from Article 6 Mw that prohibited restrictive concerted practices. The variable *immunity* controls for those industries in which some subset of firms received exemption from Article 6 Mw. Furthermore, in order to control for exposure to trade we have included import and export intensities. Besides, as crude proxies for increase in market demand, change in real Gross Domestic Product (GDP) (*dgdp*) and percentage growth of sales in the relevant market (*growth*) are also included. On the other hand, in order to control for market structure we include Hirshman-Herfindahl Index (*hhi*), which is defined as the sum of the squares of the market shares based on sales. By construction, the higher values of this variable indicate more concentrated market structures. Adopting a static and traditional view, one would expect that price-cost margins in concentrated industries will be higher, as firms are enjoying higher levels of profits owing to less number of competitors. In addition to control variables described above, we include interaction term between change in the competition law (*law*) and concentration measure (*hhi*), to check if the impact of concentration on price-cost margins were aggravated under the new system. The underlying thought is that once a stricter antitrust policy was enforced, firms might have preferred mergers or takeovers as possible strategies rather than engaging in illegal and dirty coordinated actions. Finally, we consider the time-specific effects as fixed and include time dummies in the analysis.

Equations [1] and [2] are dynamic panel regressions with a lagged dependent variable on the right-hand side. By construction, the unobserved industry effects are correlated with the

lagged dependent variable, which makes standard estimators inconsistent. Elsewhere, one should also be aware of the reverse causality in the specification above. More specifically, *growth* and *hhi* might be endogenous with respect to price-cost margins. Thus, we plan to address the above-mentioned econometric issues under a Generalized Method of Moments (GMM) framework following Holtz-Eakin et al. (1988), Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). We first consider Arellano-Bond estimation, also known as “difference GMM”, which uses lagged independent variables as instruments after the equation has been differenced to eliminate unobserved fixed effects. Secondly, we implement the Arellano-Bover/Blundell-Bond estimation, also known as “system GMM”, which is built on a system of two equations (the equation with levels and the transformed equation). A common feature of these estimators is that they require no autocorrelation in the errors. Having performed the estimations, we will run some specification tests to verify the absence of autocorrelation. Besides, in order to ensure more-efficient estimation we will use optimal or two-step GMM in both estimation procedures. However, the problem in this context is that standard errors for the two-step GMM estimator might be downward biased as shown by Arellano and Bond (1991). Therefore, we will use a bias-corrected robust estimator of the variance-covariance matrix for the two-step GMM estimator devised by Windmeijer (2005).

In order to take into account the endogeneity of *growth* and *hhi*, we have used one lag of these variables together with the remaining exogenous regressors as instruments. The employment of instruments for two endogenous variables and one lagged dependent variable will necessitate numerous instruments, which might result in the famous case of “instrument proliferation”, as stated in Roodman (2009). “Instrument proliferation” might lead to overfitting endogenous variables. In this case we fail to take out the endogenous components and bias coefficient estimates. Another problem associated with instrument proliferation is that it might vitiate the Hansen test of instrument validity. However, since there is no formal test and procedure for identifying and solving these problems, researchers have come up with the rule of thumb proposing that the number of instruments should be less than or equal to the number of observational units. Therefore, we try to stick to this rule of thumb in our GMM estimations.

Table II provides summary statistics on industry characteristics during both pre- and post-implementation of the new Competition Act. During the old Economic Competition Act era,



price-cost margins appear to be lower, which can also be seen from the evolution of price-cost margins depicted in Figure I. We also present an overview of the changes in the price-cost margins under the old Economic Competition Act and under the New Competition Act in Figure II. Just looking at descriptive measures, one can say that the deterrent impact of the new Competition Act has been heterogeneous across Dutch manufacturing industries. Yet, without effectively controlling for other relevant factors in an econometric setting, we cannot reach sound and scientific conclusions.

## 5. The Empirical Results

Tables III and IV report difference and system GMM estimates of various specifications, respectively, for the impact of change in the competition law on the price-cost margins. In all specifications, fixed year dummies are included as well. The reported standard errors have the finite sample correction developed by Windmeijer (2005) to handle the potential finite sample bias of two-step GMM.

We would first like to draw reader's attention to the satisfactory results of specification tests. The tests concerning serial correlation do not reject the presence of first order, but rejects second order serial correlation. Besides, we cannot reject the null hypothesis that the population moment conditions are correct, since the Sargan tests do not reject the validity of over-identifying restrictions in all specifications.

The results show that exposure to trade (*import* and *export*), market structure (*hhi*), and changes in market demand (*dgnp* and *growth*) do not have statistically significant effects on the price-cost margins of Dutch manufacturing industries in any specification. The outcome of the imprecise effect of import intensity on industry price-cost margins is also in line with the finding of Konings et al. (2001), where the authors found that import competition does not lead to lower price-cost margins in the Netherlands. Elsewhere, concentration (*hhi*) has a positive but statistically insignificant effect on price-cost margins. Furthermore, whether the impact of industry concentration has been higher after the change in the competition law has not been confirmed in the current setting, since the interaction term (*lawXhhi*) has a positive but statistically insignificant coefficient in the seventh specification.

In both difference and system GMM estimates of all specifications, we find that the coefficient of the lagged price-cost margins (*lag\_pcm*) is highly statistically significant (at 1 % level) indicating that we should reject a static model in favor of a dynamic model. Finally, the variable in which we show our greatest interest, that is, the introduction of the new Competition Act (*law*) is negatively and insignificantly related to the price-cost margins, which seems not to corroborate our first maintained hypothesis: the transition from the old system to the new system did not bring about statistically significant deterrent effects.

Subsequently, in Tables V and VI we present difference and system GMM estimates of various specifications, respectively, for the impact of granting temporary antitrust immunity on the industry price-cost margins. Just as in the former specifications, fixed year dummies are included to control for year fixed effects. Similarly, we present the standard errors with Windmeijer (2005) correction.

The failure to reject the null hypotheses of both the serial correlation and the Sargan tests provide support for our model. Likewise, the fact that the coefficient of the lagged price-cost margins (*lag\_pcm*) is highly statistically significant (at 1 % level) in both difference and system GMM estimates of all specifications, leads us to be confident about our dynamic specification.

The results demonstrate that exposure to trade (*import* and *export*), market structure (*hhi*), and changes in market demand (*dgnp* and *growth*) do not have statistically significant effects on the price-cost margins of Dutch manufacturing industries under the new Competition act in any specification. Importantly, the coefficient on temporary antitrust immunity (*immunity*) enters positively and statistically significantly to the regression equation in all specifications. This result verifies our second maintained hypothesis stating that in industries where concerted practices are immune from antitrust law, the price-cost margins will be higher everything else being equal. However, one should bear in mind that concerted practices that were conferred immunity from antitrust law constituted a tiny fraction of all concerted practices for which exemption was sought. Thus, the industries where antitrust immunity was granted for some class of concerted practices form a very tiny share of our whole sample. Moreover, these concerted practices for which immunity was granted were not necessarily “dirty” agreements the Dutch Competition Authority overlooked. Besides, the selection of industries in which a subset of agreements would be immune from antitrust law might be

endogenous with respect to price-cost margins. That is, the NMa might have allowed concerted practices in industries where price-cost margins were already expected to be high.

Taking these caveats into account, we provide a discussion of the empirical findings in the next section.

## **6. Discussion and Conclusion**

One aspect of estimating the economic impact of competition policy enforcement regards the change in producer surplus. Controlling for other relevant factors, increased competitive pressures via enforcing stricter policies are expected to curb monopoly power and joint dominance of collusive practices. An indirect way of measuring this is to investigate the impact of the change in the competition law that serves as an invaluable natural experiment on price-cost margins. The institutional change in the Netherlands provides a unique example of such natural experiment. The transition from the old Economic Competition Act, which was based on the so-called “abuse system”, to the new Competition Act, which was based on “prohibition system” accompanied by the establishment of the new enforcement agency, the Nederlandse Mededingingsautoriteit (NMa), was clearly aimed at fostering competition and putting an end to “cartel paradise” era. Following this line of reasoning, we investigated the impact of the change in the competition policy enforcement in the Netherlands on the level of industry price-cost margins for manufacturing industries during the period 1993-2007. We tested our first hypothesis stating that a tougher competition policy reduces the ability of firms in any market to collude and, consequently, the price-cost margins will be lower, whilst controlling for other factors that are believed to affect the price-cost margins.

Furthermore, the possibility of granting temporary antitrust immunity for some class of concerted practices that were shown to have improved production/distribution or stimulated economic or technical progress, and, of which reasonable portion of the benefits accrued to consumers, enables us to assess a rarely touched research question. Our second maintained hypothesis was that in industries where concerted practices are immune from antitrust law, the price-cost margins will be higher everything else being equal. More specifically, we analyzed the impact of granting temporary antitrust immunity on industry price-cost margins in the aftermath of the institutional change mentioned above.

In order to test these two hypotheses, we employed a two-step dynamic panel data estimation technique following Holtz-Eakin et al. (1988), Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998). The first part of estimation results suggest that the change in the competition law in the Netherlands had a very small and negative, yet statistically insignificant deterrent effect on the price-cost margins. Might this finding be attributed to the proposition that the old Economic Competition Act that was based on "abuse system" had already disciplined Dutch manufacturing industries? Without a moment of hesitation, one can easily dismiss alternative explanations for this known-answer question. Might the introduction of new Competition Act have dissolved cost-reducing cartels? Since we cannot observe the whole population of Dutch cartels, we cannot convincingly defend this argument. Or were the sanctions not deterrent enough? Given the convergence between Dutch and European competition law, and strict attitude of European competition policy towards anti-competitive practices, this proposition is not persuasive, either. Finally, one should consider that the level of the analysis is highly aggregate. The deterrent impact, if any, of the new Competition Act might be different across Dutch manufacturing industries. It might have abolished a great majority of anti-competitive concerted practices in some industries, while it did not lead to any structural change in some others. This explanation is partially consistent with the finding of Creusen et al. (2006) revealing that the level of competition diverged widely in many Dutch industries during the period 1993-2001. In order to tackle this heterogeneity issue, we plan to conduct research on firm-level data in specific industries in our future research.

As to the impact of granting temporary antitrust immunity in the aftermath of the institutional change, we found that markups were higher in industries in which temporary antitrust immunity was granted for some class of coordinated actions. However, one should bear in mind that concerted practices that were conferred immunity from antitrust law constituted a tiny fraction of all concerted practices for which exemption was sought. Furthermore, these concerted practices for which immunity was granted were not necessarily "dirty" agreements the NMa overlooked. Plus, the selection of industries in which a subset of agreements would be immune from antitrust law might be endogenous with respect to price-cost margins. That is, the NMa might have allowed concerted practices in industries where price-cost margins were already expected to be high.

Obviously, the change in the competition law has impact not only on the price-cost margins but also on other components of economic structure. For instance, it might lead to a change in firms' incentives to innovate more, since a more competitive economic environment puts higher pressure on firms to survive and make profits. Thus, the question is whether the change in the competition law had impact on various innovation indicators in Dutch industries. In our further research, we plan to address this research question as well.

## References

- Arellano M, Bond S. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies* 1991;58; 277–297.
- Arellano M, Bover O. Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics* 1995;68; 29-51.
- Asbeek-Brusse W, Griffiths R 1998. Paradise Lost or Paradise Regained? Cartel Policy and Cartel Legislation in the Netherlands. In: Martin, S (Ed), *Competition Policies in Europe*, Series: Contributions to Economic Analysis. North-Holland: Amsterdam; 1998. p. 15-39.
- Bilotkach V. Price Effects of Airline Consolidation: Evidence from a Sample of Transatlantic Markets. *Empirical Economics* 2007;33; 427-448.
- Bilotkach V, Huschelrath K. Antitrust Immunity for Airline Alliances. *Journal of Competition Law and Economics* 2011; forthcoming.
- Block MK, Nold FC, and Sidak JG. The Deterrent Effect of Antitrust Enforcement. *Journal of Political Economy* 1981;89; 429-445.
- Block MK, Feinstein JS. The Spillover Effect of Antitrust Enforcement. *Review of Economics and Statistics* 1986;68; 122-131.
- Blundell R, Bond S. Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics* 1998;87; 115–143.
- Brueckner J. International Airfares in the Age of Alliances: The Effects of Codesharing and Antitrust Immunity. *Review of Economics and Statistics* 2003;85; 105-118.
- Brueckner J, Whalen T. The Price Effects of International Airline Alliances. *Journal of Law and Economics* 2000;43; 503-546.
- Carlton DW, Picker RC. Antitrust and Regulation. The National Bureau of Economic Research, Working Paper 2007.
- Clyde PS, Reitzes JD. The effectiveness of collusion under antitrust immunity: The case of liner shipping conferences. Washington, D.C.: Federal Trade Commission, Bureau of Economics Staff Report 1995.

- Creusen H, Minne B, van der Wiel H. Measuring and Analyzing Competition in the Netherlands. *De Economist* 2006;154; 429-441.
- de Jong HW. Nederland: Het Kartelparadijs van Europa?. *Economisch Statistische Berichten* 1990;14; 244-248.
- Drahos M. Convergence of competition laws and policies in the European Community: Germany Austria and the Netherlands. *Kluwer Law International: The Hague*; 2001.
- Dick AR. Are Export Cartels Efficiency-Enhancing or Monopoly-Promoting? Evidence from the Webb-Pomerene Experience. *Research in Law and Economics* 1992;15; 89-127.
- Holtz-Eakin D, Newey W, Rosen HS. Estimating vector autoregressions with panel data. *Econometrica* 1988;56; 1371–1395.
- Kamita R. Analyzing the effects of temporary antitrust immunity: The Aloha-Hawaiian immunity agreement. *Journal of Law and Economics* 2010;53; 239-261.
- Konings J, van Cayseele P, Warzynski F. The Dynamics of Industrial Mark-ups in Two Small Open Economies: Does National Competition Policy Matter? *International Journal of Industrial Organization* 2001;19; 841-859.
- MEA. Bijlage bij adviesaanvraag betreffende horizontale prijsregelingen 8 March 1989.
- MEA. Bijlage bij adviesaanvraag inzake marktverdelingskartels 7 April 1992.
- Mok MR. 20 Jaar WEM. Sociaal-Economische Wetgeving. *Tijdschrift voor Europees en economisch recht* 1978; 11: 737-760.
- OECD. *OECD Economic Surveys 1992-1993: Netherlands*. Paris; 1993.
- OECD. *Regulatory Reform in the Netherlands: The Role of Competition Policy In Regulatory Reform*. Paris; 1998.
- Oum T, Park J, Zhang A. The Effects of Airline Codesharing Agreements on Firm Conduct and International Air Fares. *Journal of Transport Economics and Policy* 1996;30; 187-202.
- Park J, Zhang A. An Empirical Analysis of Global Airline Alliances: Cases in the North Atlantic Markets. *Review of Industrial Organization* 2000;16; 367-384.
- Roodman D. A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics* 2009;71; 135-158.
- Sproul MF. Antitrust and Prices. *Journal of Political Economy* 1993;101; 741-754.
- Warzynski F. Did tough antitrust policy lead to lower mark-ups in the US manufacturing industry?. *Economics Letters* 2001;70; 139–144.

Windmeijer F. A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics* 2005; 126; 25–51.

Whalen Y. A Panel Data Analysis of Code Sharing Antitrust Immunity and Open Skies Treaties in International Aviation Markets. *Review of Industrial Organization* 2007;30; 39-61.

## Tables

**Table I: The Distribution of Provisions in the Horizontal Agreements of which Details were published by the MEA in 1989**

The Provision(s) in the Horizontal Agreement	Percentages
Joint tendering with no other provisions	24%
Joint tendering + Conditions criteria	4%
Joint tendering + Exclusivity clauses	7%
Price fixing with no other provisions	4%
Price fixing + Market sharing	17%
Price fixing + Production, sales or marketing quotas	14%
Price fixing + Conditions criteria	12%
Price fixing + Exclusivity clauses	8%
Price fixing + Centralized purchasing and sales agencies	8%

**Table II: Descriptive Statistics**

	Before 1999			After 1999			All		
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
pcm	570	-0.0005	0.1287	884	0.0330	0.0927	1454	0.0199	0.1094
growth	552	0.1350	0.7703	854	0.0668	0.4002	1406	0.0936	0.5754
hhi	570	0.1574	0.1814	884	0.1709	0.1724	1454	0.1656	0.1760
import	477	3.1132	0.8450	723	3.2434	0.7834	1200	3.1917	0.8106
export	555	2.6937	1.0372	859	2.7497	1.0617	1414	2.7277	1.0521
immunity	624	0.0000	0.0000	991	0.0101	0.1000	1615	0.0062	0.0785
dgdg	614	3.0511	1.1445	940	2.2872	1.4772	1554	2.5891	1.4057



**Table III: Arellano-Bond Dynamic Panel Data Estimations (Difference GMM) for Price-Cost Margins during 1993-2007**

Dep. Var.: pcm	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Lagged Dependent Variable</b>							
lag_pcm	0.4983 *** (0.0930)	0.4672 *** (0.0882)	0.4642 *** (0.0945)	0.4218 *** (0.0864)	0.4410 *** (0.0942)	0.3641 *** (0.0988)	0.3650 *** (0.1003)
<b>Variable for the Impact of the Competition Act (Mededingingswet)</b>							
law	-0.0046 (0.0077)	-0.0028 (0.0083)	-0.0039 (0.0087)	-0.0022 (0.0075)	-0.0080 (0.0079)	-0.0085 (0.0083)	-0.0112 (0.0147)
<b>Proxies for the Change in Market Demand</b>							
dgnp	-0.0017 (0.0021)	-0.0021 (0.0020)	-0.0023 (0.0024)	-0.0025 (0.0022)	-0.0026 (0.0023)	-0.0029 (0.0024)	-0.0029 (0.0021)
growth			-0.0025 (0.0097)	0.0020 (0.0112)	0.0191 (0.0245)	0.0216 (0.0286)	0.0133 (0.0249)
<b>Market Structure Variable</b>							
hhi		0.0710 (0.0878)		0.0941 (0.1031)		0.0809 (0.0634)	0.0359 (0.0606)
<b>Proxies for Exposure to Trade</b>							
import					0.0021 (0.0095)	0.0075 (0.0096)	0.0081 (0.0098)
export					-0.0133 ** (0.0063)	-0.0119 (0.0074)	-0.0113 (0.0074)
<b>Interaction Term</b>							
lawXhhi							0.0194 (0.0799)
constant	0.0165 (0.0112)	0.0048 (0.0172)	0.0172 (0.0126)	0.0053 (0.0189)	0.0498 (0.0377)	0.0213 (0.0388)	0.0227 (0.0416)
TIME	YES	YES	YES	YES	YES	YES	YES
Nr. Of Industries	100	100	96	96	81	81	81
Observations	1200	1200	1169	1169	1013	1013	1013
Arellano-Bond test for AR(1)	z = -4.195, p = 0.000	z = -4.264, p = 0.000	z = -4.110, p = 0.000	z = -4.141, p = 0.000	z = -3.957, p = 0.000	z = -3.710, p = 0.000	z = -3.702, p = 0.000
Arellano-Bond test for AR(2)	z = -0.456, p = 0.649	z = -0.581, p = 0.561	z = -0.527, p = 0.599	z = -0.726, p = 0.468	z = 0.027, p = 0.978	z = -0.284, p = 0.777	z = -0.278, p = 0.781
Sargan Test (p-value)	0.3056	0.2582	0.2571	0.5610	0.4173	0.8229	0.8485
Nr. Of Instruments	90	94	94	100	77	91	92
Wald Test of Joint Significance (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

- Windmeijer (2005) bias-corrected robust standard errors are in parenthesis.
- \*: Significant at 10 % level, \*\*: significant at 5 % level, \*\*\*: significant at 1 % level.

**Table IV: Arellano-Bover/Blundell-Bond Dynamic Panel Data Estimations (System GMM) for Price-Cost Margins during 1993-2007**

Dep. Var.: pcm	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Lagged Dependent Variable</b>							
lag_pcm	0.4830 *** (0.0752)	0.4359 *** (0.0750)	0.4343 *** (0.0674)	0.4346 *** (0.0713)	0.4038 *** (0.0777)	0.3794 *** (0.0738)	0.3986 *** (0.0594)
<b>Variable for the Impact of the Competition Act (Mededingingswet)</b>							
law	-0.0022 (0.0085)	-0.0010 (0.0072)	-0.0072 (0.0082)	-0.0030 (0.0086)	-0.0055 (0.0094)	-0.0072 (0.0095)	-0.0136 (0.0097)
<b>Proxies for the Change in Market Demand</b>							
dgnp	-0.0012 (0.0023)	-0.0023 (0.0021)	-0.0036 * (0.0021)	-0.0033 (0.0024)	-0.0021 (0.0025)	-0.0026 (0.0024)	-0.0019 (0.0023)
growth			0.0048 (0.0108)	0.0059 (0.0095)	0.0205 (0.0301)	0.0194 (0.0278)	0.0132 (0.0213)
<b>Market Structure Variable</b>							
hhi		-0.0263 (0.0563)		0.0142 (0.0632)		0.0636 (0.0717)	0.0528 (0.0540)
<b>Proxies for Exposure to Trade</b>							
import					0.0080 (0.0084)	0.0068 (0.0087)	0.0102 (0.0080)
export					-0.0056 (0.0055)	-0.0050 (0.0046)	-0.0062 (0.0042)
<b>Interaction Term</b>							
lawXhhi							0.0316 (0.0623)
constant	0.0136 (0.0118)	0.0205 (0.0118)	0.0240 (0.0105)	0.0173 (0.0135)	0.0070 (0.0368)	0.0046 (0.0345)	-0.0034 (0.0282)
TIME	YES	YES	YES	YES	YES	YES	YES
Nr. Of Industries	100	100	99	99	81	81	81
Observations	1318	1318	1283	1283	1102	1102	1102
Arellano-Bond test for AR(1)	z = -4.449, p = 0.000	z = -4.416, p = 0.000	z = -4.484, p = 0.000	z = -4.403, p = 0.000	z = -4.158, p = 0.000	z = -4.122, p = 0.000	z = -4.392, p = 0.000
Arellano-Bond test for AR(2)	z = -0.477, p = 0.633	z = -0.595, p = 0.552	z = -0.666, p = 0.505	z = -0.677, p = 0.499	z = -0.097, p = 0.923	z = -0.213, p = 0.832	z = -0.204, p = 0.839
Sargan Test (p-value)	0.3107	0.4469	0.3077	0.3748	0.5318	0.9415	0.9885
Nr. Of Instruments	90	90	90	104	80	106	107
Wald Test of Joint Significance (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

- Windmeijer (2005) bias-corrected robust standard errors are in parenthesis.
- \*: Significant at 10 % level, \*\*: significant at 5 % level, \*\*\*: significant at 1 % level.

**Table V: Arellano-Bond Dynamic Panel Data Estimations (Difference GMM) for Price-Cost Margins after the Change in the Competition Law**

Dep. Var.: pcm	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Lagged Dependent Variable</b>							
lag_pcm	0.4509 *** (0.0931)	0.4347 *** (0.0944)	0.4146 *** (0.0927)	0.3727 *** (0.0948)	0.4267 *** (0.1024)	0.4319 *** (0.0883)	0.4472 *** (0.0901)
<b>Variable for Antitrust Immunity</b>							
immunity	0.0380 *** (0.0146)	0.0351 *** (0.0126)	0.0339 *** (0.0097)	0.0351 *** (0.0096)	0.0353 *** (0.0113)	0.0247 *** (0.0104)	0.0319 *** (0.0125)
<b>Proxies for the Change in Market Demand</b>							
dgnp	-0.0019 (0.0020)	-0.0022 (0.0021)	-0.0025 (0.0022)	-0.0031 (0.0021)	-0.0023 (0.0024)	-0.0021 (0.0023)	-0.0023 (0.0024)
growth			0.0079 (0.0082)	0.0106 (0.0113)	0.0288 (0.0296)	0.0388 (0.0424)	0.0365 (0.0447)
<b>Market Structure Variable</b>							
hhi		-0.0475 (0.0965)		-0.0539 (0.0826)		-0.0220 (0.1467)	-0.0736 (0.1007)
<b>Proxies for Exposure to Trade</b>							
import					0.0077 (0.0097)	0.0045 (0.0078)	0.0006 (0.0088)
export					-0.0089 (0.0068)	-0.0115 (0.0073)	-0.0102 (0.0080)
constant	0.0137 (0.0085)	0.0222 (0.0180)	0.0161 * (0.0097)	0.0260 (0.0163)	0.0114 (0.0395)	0.0296 (0.0327)	0.0444 (0.0419)
TIME	YES	YES	YES	YES	YES	YES	YES
Nr. Of Industries	100	100	96	96	81	81	81
Observations	848	848	825	825	710	710	710
Arellano-Bond test for AR(1)	z = -3.517, p = 0.000	z = -3.510, p = 0.000	z = -3.452, p = 0.000	z = -3.371, p = 0.000	z = -3.229, p = 0.000	z = -3.329, p = 0.000	z = -3.370, p = 0.000
Arellano-Bond test for AR(2)	z = -0.032, p = 0.975	z = -0.020, p = 0.984	z = -0.210, p = 0.834	z = -0.304, p = 0.761	z = -0.234, p = 0.815	z = -0.198, p = 0.843	z = -0.089, p = 0.929
Sargan Test (p-value)	0.2288	0.3522	0.3803	0.5325	0.4172	0.7288	0.6061
Nr. Of Instruments	92	95	95	100	76	85	86
Wald Test of Joint Significance (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

- Windmeijer (2005) bias-corrected robust standard errors are in parenthesis.
- \*: Significant at 10 % level, \*\*: significant at 5 % level, \*\*\*: significant at 1 % level.

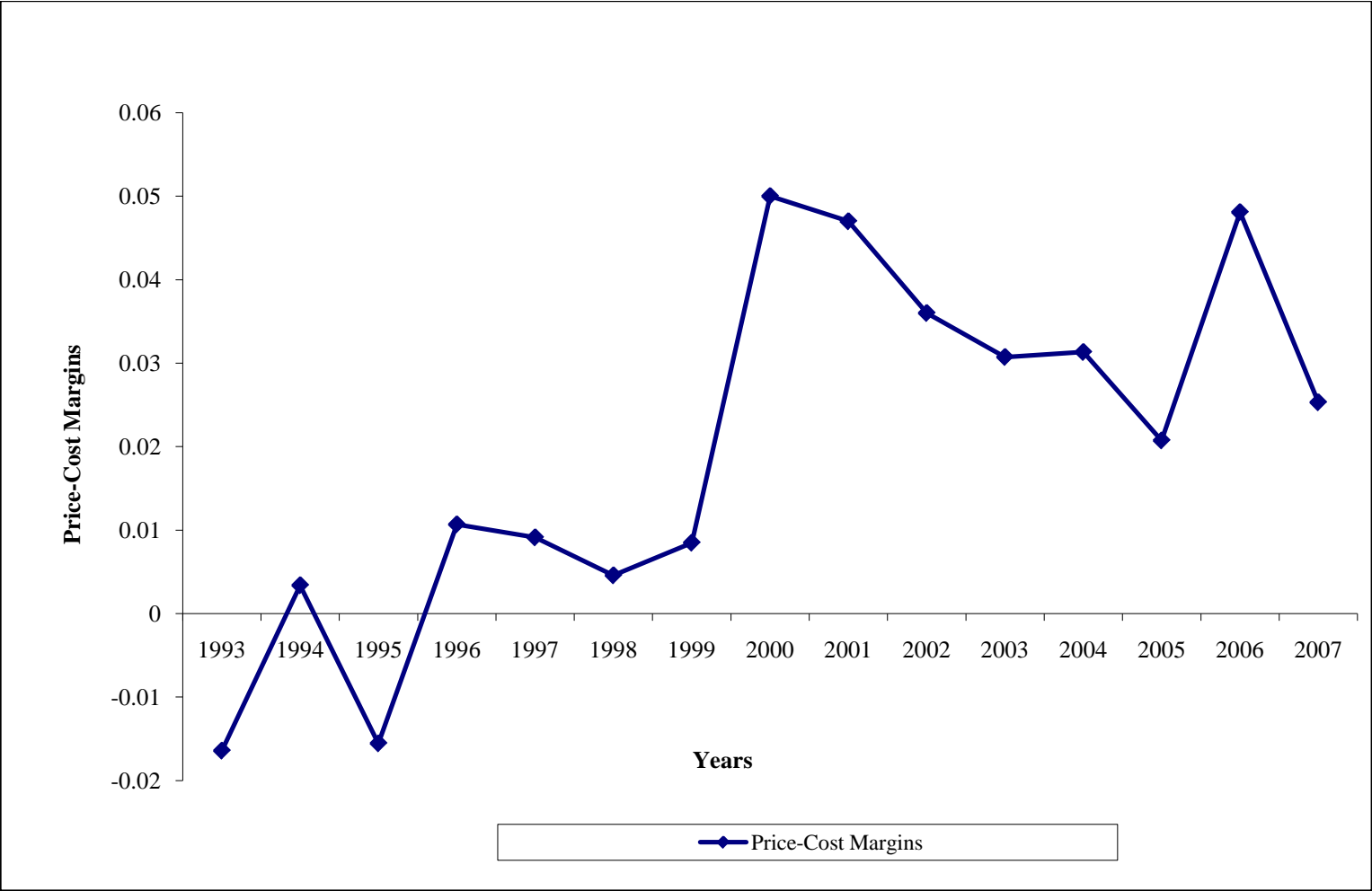
**Table VI: Arellano-Bover/Blundell-Bond Dynamic Panel Data Estimations (System GMM) for Price-Cost Margins after the Change in the Competition Law**

Dep. Var.: pcm	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Lagged Dependent Variable</b>							
lag_pcm	0.5025 *** (0.0827)	0.4963 *** (0.0854)	0.4810 *** (0.0930)	0.4893 *** (0.0805)	0.4367 *** (0.0967)	0.4085 *** (0.0867)	0.4227 *** (0.0848)
<b>Variable for Antitrust Immunity</b>							
immunity	0.0325 *** (0.0103)	0.0370 ** (0.0158)	0.0380 *** (0.0097)	0.0335 ** (0.0151)	0.0276 ** (0.0131)	0.0320 ** (0.0149)	0.0359 ** (0.0146)
<b>Proxies for the Change in Market Demand</b>							
dgnp	-0.0016 (0.0022)	-0.0024 (0.0021)	-0.0025 (0.0024)	-0.0026 (0.0023)	-0.0031 (0.0032)	-0.0031 (0.0027)	-0.0030 (0.0029)
growth			0.0025 (0.0112)	0.0093 (0.0093)	0.0556 (0.0407)	0.0462 (0.0369)	0.0335 (0.0391)
<b>Market Structure Variable</b>							
hhi		-0.0781 (0.1018)		-0.0465 (0.0915)		0.0632 (0.0636)	-0.0133 (0.0713)
<b>Proxies for Exposure to Trade</b>							
import					0.0042 (0.0085)	0.0082 (0.0076)	0.0099 (0.0079)
export					-0.0046 (0.0059)	-0.0055 (0.0065)	-0.0048 (0.0070)
constant	0.0115 (0.0089)	0.0251 (0.0194)	0.0153 (0.0099)	0.0208 (0.0173)	0.0126 (0.0330)	-0.0042 (0.0324)	-0.0052 (0.0279)
TIME	YES	YES	YES	YES	YES	YES	YES
Nr. Of Industries	100	100	98	98	81	81	81
Observations	863	863	840	840	715	715	715
Arellano-Bond test for AR(1)	z = -3.719, p = 0.000	z = -3.722, p = 0.000	z = -3.563, p = 0.000	z = -3.720, p = 0.000	z = -3.342, p = 0.000	z = -3.349, p = 0.000	z = -3.376, p = 0.000
Arellano-Bond test for AR(2)	z = -0.086, p = 0.931	z = 0.148, p = 0.883	z = -0.002, p = 0.998	z = 0.002, p = 0.999	z = -0.199, p = 0.842	z = -0.350, p = 0.727	z = -0.245, p = 0.807
Sargan Test (p-value)	0.3556	0.4367	0.2462	0.4254	0.2441	0.8018	0.7036
Nr. Of Instruments	101	100	92	101	76	94	95
Wald Test of Joint Significance (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000

- Windmeijer (2005) bias-corrected robust standard errors are in parenthesis.
- \*: Significant at 10 % level, \*\*: significant at 5 % level, \*\*\*: significant at 1 % level.

**Figures**

**Figure I: The Evolution of Price-Cost Margins in Dutch Manufacturing Industries between 1993-2007**



**Figure II: The Overview of Changes in the Price-Cost Margins in Dutch Manufacturing Industries under the Old Economic Competition Act and the New Competition Act**

