The Scale and Geography of Collusion in the European Market
A Longitudinal View

Buch-Hansen, Hubert; Levallois, Clement

Document Version
Accepted author manuscript

Published in:
Journal of Common Market Studies

DOI:
10.1111/jcms.12232

Publication date:
2015

License
Unspecified

Citation for published version (APA):
Buch-Hansen, H., & Levallois, C. (2015). The Scale and Geography of Collusion in the European Market: A Longitudinal View. *Journal of Common Market Studies*, *53*(4), 737-752. https://doi.org/10.1111/jcms.12232

The Scale and Geography of Collusion in the European Market: A Longitudinal View

Hubert Buch-Hansen and Clement Levallois

Journal article (Post print version)

The Scale and Geography of Collusion in the European Market: A Longitudinal View

Abstract. Europe has a long history of cartels, but the changes in the scale and geography of collusion in the European market from the post-war decades until the present have not been systematically investigated. Using network analysis methods and an original dataset based on decisions in EU cartel cases, this paper maps the developments in detected collusion in the European market from 1958 to 2008 and tentatively explains these developments. It appears that collusive activities increased during the 1960s and after the mid-1980s and that a long decline in the scale of collusion began in the mid-1990s. Moreover, the geographical spread of collusive activities in Europe increased considerably from 1969 to 1993. To facilitate an explanation of these and other findings, the paper presents a three-dimensional analytical framework that emphasises the importance of anti-cartel regulation, major changes in the business environment and the size of national economies.

Keywords: Cartels; Competition policy; Regulation; Network Analysis

1. Introduction

The European Commission was authorized to regulate cartels in the early 1960s, but especially from the late 1980s forward have cartels been prosecuted rigorously in the EU.[1] Anti-cartel policies are seen as instrumental to preserve a high level of competition in the European market. Such policies form part of a broader competition policy system, which also includes the regulation of mergers, state aid and abuse of dominant positions. Because the Commission and US antitrust authorities share the status as the world's leading anti-cartel regulators, the EU's activities in this area receive substantial attention in both the financial press and academic literature. Lawyers have produced in-depth studies on case law concerning cartels (e.g., Simonsson, 2010). Economists have considered, e.g., the economic rationale underlying EU competition regulation, optimum cartel fines and the determinants of cartel duration (e.g., Bishop & Walker, 2010; De, 2010; Motta, 2004). Historians have documented the origins of EU competition regulation (e.g., Patel & Schweitzer, 2013; Warlouzet & Witschke, 2012). Moreover, political scientists and political economists have analyzed the transformation and increasing importance of EU competition regulation and placed it in its wider political, regulatory and economic contexts (Aydin & Thomas, 2012; Buch-Hansen & Wigger, 2011; McGowan, 2010).

Existing research has successfully documented the evolution and operation of EU competition regulation, including its anti-cartel component. However, the literature sheds substantially less light on collusion and how collusion developed as a macro-phenomenon in the European market over time. That is, no attempt has been made to paint a broader picture of the scale and geography of collusion by considering the totality of known collusive activities at different stages. To be sure, in business history research,

[1] For simplicity's sake, this paper refers to both the European (Economic) Community and the European Union as the EU.

considerations of collusion as a macro-phenomenon can be found. According to Fear (2008: 275), there is consensus among business historians that '[c]artels boomed in the 1920s, peaked in the 1930s, reappeared strongly after 1945 before they gradually faded away, especially after the 1970s'. However, this consensus is not based on concrete data regarding developments in the overall scale of collusion after 1945. Indeed, whereas business historians have documented that cartels were an important and widespread phenomenon in Europe prior to the Second World War (e.g., Schröter, 1996), they have done little to illuminate the scale of collusion after the war and to the present day.

This paper's purpose is to help close this gap in existing research. More specifically, the analysis is guided by the following *research question*: how did the scale and geography of detected collusion in the European market develop over the past five decades, and how can these developments be explained? In this context, 'detected collusion' refers to cartel agreements that were discovered and prosecuted by the European Commission. The present paper uses a self-generated dataset that was developed by extracting information from decisions in EU cartel cases. We focus on these decisions because they target agreements relevant to the European market, and as they contain information regarding the duration and membership of each cartel, including the nationalities of member companies. Collusion is nonetheless a notoriously difficult phenomenon to study. Cartels have come to be prosecuted more rigorously than before as a result of which companies have become better at concealing collusive arrangements. The majority of cartels are most likely never discovered by authorities (see also Marshall & Marx, 2012), and the proportion of existing cartels that are detected by authorities is also unknown. Thus, a complete picture of collusion in the European market cannot be provided, but this is no valid reason

not to attempt to form as complete a picture as possible based on accessible information. This study uses network analysis methods to analyze and visualize the cartel data and is the first to provide visualizations of the changing scale and geography of detected collusion in the European market (or elsewhere).

Because the data in all likelihood reveal a picture that is far from complete, the second part of the research question can be broadly answered in two ways. First, the developments that we document can be seen to only reflect the – perhaps changing – success of the Commission in detecting a certain proportion of the (unknown) total number of actual cartels. If this is the case, no further explanation is necessary because our findings tell us nothing regarding developments in the scale and geography of actual collusion. The second response, on which we proceed here, is to assume that our findings reflect, albeit imperfectly, actual developments in the scale and geography of collusion and thus require us to identify factors that can explain them. To this end, a three-dimensional analytical framework is outlined that emphasises the importance of anti-cartel regulation, major changes in the business environment and the size of national economies.

In addition to this introduction and a conclusion, the paper is divided in four sections. Section 2 accounts for the data and methods used to answer the research question. In the next two sections, the analytical framework is outlined and the primary findings regarding the scale and geography of detected collusion are presented. In Section 5, these findings are analyzed using the framework.

2. Data and methods

The EU's catalogue of cartel decisions, which is available at eur-lex.europa.eu/, constitutes a valuable resource for information on the development of collusive arrangements in the European market. Scholars who study collusion have used this resource to construct various datasets (see Connor, 2008; De, 2010; Hüschelrath & Smuda, 2013). For the purpose of the present study, the catalogue was used to produce an original dataset that is more comprehensive in scope and content than existing datasets (see also Buch-Hansen, 2014). In terms of scope, the dataset is based on all EU cartel cases where companies were found guilty of horizontal collusive activities – that is, all such cartel decisions issued between 1969 and the end of 2012 (144 cases).[2] In terms of content, firm-specific (not only cartel-specific) information is recorded. That is, in addition to listing entire cartels, the dataset records *pairs of companies that were members of the same cartel during a specific time period*. Thus, a cartel with four members, companies A, B, C and D, is recorded as six pairs: AB, AC, AD, BC, BD and CD. We denote the relation between each such pair a *collusive tie*. The dataset contains a total of approximately 7,600 collusive ties. For each of these ties information on the tie's duration (start and end years), sector and the nationalities of the two companies is recorded. In total, 39 different nationalities are recorded, albeit – unsurprisingly – most cartels predominantly or solely involved European companies. In the cases where subsidiaries were involved in collusion, the controlling entity and its nationality were registered in the database.[3]

[2] Cases that involved only industry associations and five re-adoptions were filtered out.

[3] In the vast majority of these cases the parent company was held either partly or fully responsible for the violation of the anti-cartel rules.

The dataset enables us to gain insights in the *scale* of (detected) collusion over time in two ways: in terms of the number of entire cartels that were active during a given year and in terms of the number of active collusive ties (pairs of companies). In addition, developments in the *geography* of collusion in the European market can be examined by calculating, for each year, the total number of ties existing between each combination of different nationalities (Belgium-Britain, Denmark-Germany etc.) and the number of ties existing between pairs of companies with the same nationality. In this respect, we distinguish between three types of collusive tie: *intra-national ties*, defined as pairs of same-nationality companies; *European ties*, which refers to pairs of companies headquartered in different European countries; and *international ties*, which denotes pairs of companies of which one or both are headquartered in a non-European country.

We use network analysis software (Gephi; see Bastian et al., 2009) to analyze and visualize the developments in intra-national and European collusive ties. To establish the centrality of the different European nationalities over time, we identify the number of these ties for each country in each year ('degree centrality'). Focusing on European ties, we also establish the *spread* of collusive *ties* by examining the number of country combinations (Belgium-Britain etc.) that existed at particular stages. The larger this number is, the larger the geographical spread of European collusive ties.

Using recent advances in the visual analysis of social interactions in small groups (Moody et al., 2005), the mapping of scientific fields in bibliometrics (Rafols et al., 2010) and the monitoring of financial transactions on interbank markets (Heijmans et al., 2014), we

produce maps that show intra-national and European collusive ties. We follow the conventions of the literature: a node (a dot of varying size on the map) represents intra-national ties. Nodes are positioned at the geographical centre of the country that they represent. A link between two nodes represents European ties, i.e., that companies located in these two countries are members of the same cartel.

In the online supplement (see Appendix 1), the colour of the link varies from yellow to red to reflect the number of companies from the two countries involved in common cartels (with yellow representing few ties and red representing many ties). Because the distribution of ties is skewed toward lower values, we use a spline interpolation to visually emphasize the differences among lower values. The number of intra-national ties is reflected in the size of the node: a larger node indicates a larger number of such ties in a particular country. We provide a synthetic view of the entire cartel dataset in the form of a 44-second video (available online as Appendix 2). In this video, the time dimension is represented by a moving time window of a one-year duration, which slides from 1948, the year the first cartel recorded in the dataset was initiated, to 2008, the year the last cartel recorded in the dataset was terminated. The colour of ties and the size of nodes are constantly updated to reflect the value of the parameters that they represent in the current time window.

3. The scale and geography of collusion: an analytical framework

Capitalist markets can only function properly if they are characterized by a certain level of competition. Competition applies downward pressures on the prices that businesses can receive for their products or services and creates uncertainty regarding future earnings. Under the right circumstances, a group of companies can decrease this uncertainty and maximize profits by, e.g., fixing prices, sharing markets and limiting outputs. The literature identifies a substantial number of factors that can affect whether a group of companies concludes such collusive arrangements. For example, economists have noted the importance of elasticity of demand, high economic concentration and high barriers to entry (e.g., Caves, 2007; Posner, 1974). Although relating such product and industry specific factors to (parts of) the cartel dataset would be interesting, this paper's focus on the totality of detected collusive ties makes it more relevant to consider explanatory factors at the macro-level. The analytical framework outlined below suggests that the overall scale and geography of collusion should be viewed in the context of the following three interrelated dimensions: (1) the nature of anti-cartel regulation, (2) major changes in the business environment and (3) the size of national economies.

A variety of theoretical studies focus on *regulation* and on the way regulation incentivises particular forms of business behaviour (Laffont & Tirole, 1993; Levi-faur, 2013). A logical implication of much of this literature is that anti-cartel rules and the way they are implemented are considered when companies contemplate establishing collusive ties; they weigh the benefits of higher profits against the likely punishment should they get caught (see also Connor, 2008). Major changes in cartel legislation and in the way such legislation is enforced are thus likely to affect the number of collusive ties subsequently formed or eliminated and thus the scale of collusion. The stricter and more efficient an

anti-cartel regime is, the smaller a scale of collusion is expected and vice versa. A case could be made for investigating cartel regulation at the member-state level. However, space only permits us to focus on the European Commission's anti-cartel policies which, as mentioned in the introduction, have in recent decades evolved into a centre piece of competition policy in the EU (e.g., Buch-Hansen & Wigger, 2011; LeClair, 2011; McGowan, 2010; Utton, 2011).

Major changes in the overall *business environment* may also influence the scale and geography of collusion. Such changes can result from political initiatives that contribute to intensify economic competition, thereby creating an increased incentive for businesses to collude. A range of such initiatives could be important, but we focus primarily on the establishment of the Customs Union and subsequently the Single European Market. Major changes in the business environment can also involve overall changes in the geographical scope of markets. Several studies note that whereas economic activity, including production and trade, in Europe was predominantly centred in national economies in the post-World War Two decades, it gradually became increasingly regional and subsequently global (e.g., Frieden, 2006). This development is due to the inherently expansionary nature of capitalism as an economic system (Robinson, 2004) and in the European context it should also be seen in the context of the various enlargements of the EU. Our expectation is that these enlargements combined with the general globalization process has meant that collusive ties have become decreasingly intra-national and increasingly European and international over time.

On the assumption that more businesses tend to be headquartered in countries with large economies than in smaller economies, we also expect a tendency for the geography of collusive ties in the European market to approximately reflect the *size of national economies*. We would, for example, expect more collusive ties to exist within and between Britain and Germany than within and between the Netherlands and Luxembourg. To establish whether the geography of detected collusion reflects economic size, we relate the size of Gross Domestic Product (GDP) to the number of detected intra-national and European collusive ties that companies of each nationality were involved in each year from 1960 to 2008.

The framework outlined above is not intended as a theory from which clear predictions regarding the scale and geography of collusion can be derived. The dimensions are interrelated contexts rather than clearly delineated independent variables, and the dimensions may affect collusion in contradictory ways. For example, the increased incentive for companies to collude because of a major political initiative may be counterbalanced by the existence of a strict anti-cartel regime. In the next two sections, the findings are presented and then interpreted in the light of the analytical framework.

4. Findings: the changing scale and geography of collusion

Developments in the scale of collusion can be examined in terms of the number of entire cartels and in terms of the number of detected collusive ties. The grey line in Figure 1 (cf. left axis) shows developments in the number of active cartels from 1958 to 2008. It

appears that the number of active cartels increased steadily from 1958 to 1973, when it reached 24, and then declined slightly until 1985, after which it increased strongly until 1996, when the all-time peak of 54 active cartels was reached. Subsequently, a period of steep decline followed. To account for the size, duration and sectors of these cartels falls outside the scope of this study. However, a few tendencies are worth mentioning. First, the average number of cartel members declined over time. The average cartel formed between 1958 and 1969 had 12.1 members, whereas the cartels formed during the 1970s and 1980s had 7.6 and 7.7 members, respectively. During the 1990s, the average number was 6.9, and during the 2000s, it further decreased to 5.1. Additionally, the average duration of detected cartels decreased over time. Cartels that were formed between 1958 and 1969 had an average duration of 11.2 years, whereas cartels that were formed during the 1990s on average lasted only 5.7 years.[4] As for the sectors where cartels were predominantly initiated, the chemicals sector stands out. In this sector, 39 cartels were formed over time. The second largest number of cartels was established in the industrials sector, where a total of 20 cartels were formed during the 1970s and 1980s.

Insert Figure 1 near here

One disadvantage of examining the scale of collusion in terms of entire cartels is that it cannot be taken into account that some cartels have few members whereas others have

[4] Several studies suggest that cartels with many members are difficult to manage (LeClair, 2011; Utton, 2011: 60). Consequently, cartels mainly exist in oligopolistic industries. Explanations for the decline in the average number of members in cartels could be increased economic concentration in many sectors and the fact that it is often only attractive for companies to get involved in cartels with relatively few members. As for the decline in the duration of detected cartels, this may be caused by the changes in the regulatory environment to which we return below.

many. Accordingly, the black line in Figure 1 (cf. right axis) shows the scale of detected collusion in the European market in terms of collusive ties. The number of collusive ties increased between 1958 and 1969, when it reached an all-time peak of 2,416 ties. The number then decreased to 1,230 in 1974 after a steep fall from 1971 to 1972, after which it increased again and reached 1,684 ties in 1980. Subsequently, another steep decline brought the number of active collusive ties to a low point of 435 in 1985. Then a period followed when the number increased strongly, reaching 1,624 in 1993 after which began what appears like a 14-year period of continuous decline. The trajectory of the black line in the figure differs from that of the grey line because of the uneven size (in terms of members) of cartels. Two exceptionally large cartels inflate the number of collusive ties during the first half of the period covered here. The first was a cement cartel that was initiated in 1956 among 45 companies of primarily German and also Dutch and Belgian origin (990 ties). The steep decline in 1971 reflects the termination of the cement cartel in that year. Much of the steep decline from 1980 to 1981 can be attributed to the termination of the only other cartel in the dataset of a similar size. This cartel existed among 43 Swedish, Finnish, American and Canadian wood pulp producers (934 ties) from approximately 1975 to 1981 (the entry and exit dates varied from company to company). The stippled line in Figure 1 represents the number of collusive ties in the absence of these two cartels and indicates that they alone significantly affected the recorded scale.

The steep decline in the number of active cartels after the mid-1990s (Figure 1) combined with the shorter average duration of cartels can be interpreted as evidence that cartels have become increasingly rare and short-lived, perhaps because of the efficiency of the EU anti-cartel regime. However, caution in making such assumptions is necessary.

Successful cartels operate for several years. Additionally, a period of time elapses before a detected cartel is punished. In the 144 cases contained in the dataset, the time gap between the termination of cartels and the Commission's decision was from zero to ten years long, with the average gap being 3.22 years. Moreover, because of the success of the so-called leniency programme (see below), there is a considerable backlog of cases at the Commission, i.e., cases where companies have admitted collusive activities but have not yet been prosecuted (Utton, 2011: 152). For obvious reasons, these cases are not recorded in the dataset. In other words, the figures for the 2000s will increase considerably in the years to come.

Regarding the geographical distribution of the detected ties, Figure 2 shows the six nationalities that were most frequently involved in intra-national and European ties over time. German companies were involved in a larger number of ties than companies of any other nationality nearly throughout the entire period. Indeed, the centrality of German companies is underscored by the striking similarity between the development in the scale of German ties and the scale of all collusive ties as visualized in Figure 1. As was the case with German companies, the ties of most of the other nationalities declined during the 1970s and increased again after the mid-1980s. However, British companies became increasingly involved in collusive activities from 1960 to 1980.

Insert Figure 2 near here

Table 1 shows the nature of detected collusive ties and their spread (in terms of European country combinations) in four selected years. In 1969 (the all-time peak, cf. Figure 1), 62

percent of the ties were intra-national, whereas 38 percent were European. Mainly because of the aforementioned cement cartel, intra-national ties were predominantly German. At this stage, international ties were rare, accounting for only 0.5 per cent of all collusive ties. The strongest European ties were between German and Belgian companies (247 ties) followed by German-Dutch (128) and German-French (117) ties.

By 1980 (the second peak), this picture had changed considerably. Of the 1,684 ties, only 33 percent were intra-national, and the highest number of these ties existed in Belgium (218) and the Netherlands (184). 30 percent of the ties in 1980 were international and primarily connected European companies to American, Canadian and Japanese firms. At 37 percent, the proportion of European ties was similar to the 1969 level, but the geographical spread of these ties had increased: in 1969, the number of country combinations was 45; in 1980, it was 63.

Insert Table 1 near here

In 1993 (the third and last peak), 11 percent of the ties were intra-national. The largest number of these ties existed in Italy (47) and Germany (40). The proportion of international ties, which now involved nine non-European nationalities, was approximately the same as in 1980, whereas the number and proportion of European ties were considerably larger. In Europe, the largest number of ties existed between German and Italian (53) and German and French (50) companies. Of the selected years, 1993 was the peak in terms of the geographical spread of European collusive ties with 133 country combinations.

To bring the analysis closer, but not too close, to the present day the final selected year is 2002.[5] Whereas the overall number of all three types of tie was lower in this year than in 1993, the proportion of intra- and international ties increased. The largest number of intra-national ties existed in the Netherlands (36) and Germany (34). Regarding international ties, Japanese and Korean companies were most strongly represented, with 84 and 37 ties, respectively. The proportion of European ties was considerably smaller than in 1993, with the largest number of ties being German-Italian (46) and Italian-Spanish (24). The number of European country combinations had decreased sharply to 55.

The geography of collusion in Europe in 1969, 1980, 1993 and 2002 is shown in Figure 3. For a colour version of the figure and a video that visualizes the entire 1948-2008 period, cf. online Appendixes 1 and 2.

Insert Figure 3 near here

5. Explaining the changing scale and geography of collusion

In the following section, we interpret the changing scale and geography of collusion using the analytical framework developed in Section 3.

1. Anti-cartel regulation

[5] As accounted for above, the data become increasingly incomplete towards the end of the time period covered here.

The European Commission's DG Competition was established in 1960 and given powers to enforce the competition provisions of the 1957 Treaty of Rome, including its rules on cartels (Article 85 [now Article 101]). Albeit allowing for considerable enforcement flexibility (Buch-Hansen & Wigger, 2011), these rules prohibited agreements between companies that would restrict or distort competition in the Common Market. The Commission was authorized to search the premises of companies and to impose fines of up to ten percent of annual turnover on companies that infringed the Treaty's cartel provisions. The underlying idea was (and is) to use the threat of large fines to deter businesses from colluding. McGowan (2010: 125) notes that the Commission initially focused on vertical business agreements, whereas the effects of horizontal cartels only gradually became a concern toward the end of the 1960s. The Commission's first two decisions on horizontal cartels date from 1969. Thus, from 1958, when the Treaty of Rome entered into force, and throughout the 1960s, companies that contemplated collusive activities in the Common Market were given little reason to fear sanctions from the Commission. The increase in the number of active cartels and collusive ties during this period (Figure 1) should be viewed against the background of this regulatory environment.

In response to the economic crisis that followed the first oil shock in 1973, the member states increasingly turned away from the EU, opting instead for national solutions to the crisis. Competition policy was deeply affected by this turn of events. Cini and McGowan (2009: 27) note that by the mid-1970s the DG Competition was faced by 'an ever-rising tide of restrictive agreements, concentrations and protectionist national subsidies, all of which made a mockery of attempts […] to implement its policy effectively'. Even so, the Commission issued no fewer than 52 decisions against companies that were involved in

horizontal collusive agreements between 1970 and 1985.[6] This change in the regulatory environment may contribute to explain the overall decrease in the number of collusive ties during the 1970s until the mid-1980s.

The increase in the number of collusive ties between 1974 and 1980 (Figure 1) may be related to the economic recession after 1973. Several cartels that were formed during the 1970s, for example in the European chemical industry, involved companies that were suffering from excess capacity and lower profits because of the economic downturn. In fact, the downturn was to a certain extent considered in the regulation of cartels. Initially, the Commission lowered fines or dispensed with fines altogether in cases involving collusion in industries that were severely affected by the recession. As the recession continued, from the late 1970s, the Commission allowed for temporary 'crisis cartels' in certain industries (Goyder, 1993; Wigger & Buch-Hansen, 2014). The crisis cartels are not contained in the dataset, but the Commission's permissive stance towards these cartels may have encouraged others to initiate collusive arrangements with the expectation that they would not be severely punished.

From the mid-1980s, against the backdrop of the re-launch of the European integration process (see below) and the incremental turn to neoliberalism, EU competition regulation gained momentum (Buch-Hansen and Wigger, 2011). During this period, particularly from the late 1980s, the Commission intensified its war against cartels, which was primarily reflected in the magnitude of the fines that were imposed on colluding companies (McGowan, 2010: 138–139). In 1996, the Commission acquired a new, powerful weapon

[6] In comparison, the Commission decided 50 cases from 1990 to 2004, a period during which it is held to have been more proactive in its prosecution of cartels than prior to 1985.

against cartels with the introduction of its leniency programme (revised leniency notices were adopted in 2002 and 2006). This weapon enabled the Commission to grant exemptions from – or substantial reductions in – fines to companies that provided it with decisive evidence of a cartel before the Commission had undertaken an investigation (for details, see Utton, 2011: 134-146). Particularly after 2000, fines became heavy (Commission, 2013), and steps were taken to introduce a US-inspired private litigation system to ensure that the victims of cartels could be compensated (Wigger & Nölke, 2007). The combination of increasingly serious sanctions and the promise of full or partial immunity prompted several companies to report collusive arrangements to the Commission.

In this context, the internationalization of regulation is another development. From the early 1990s onwards cooperation between the Commission and US authorities in the field of competition regulation increased. These two leading competition regulators were decisive to the launch of the International Competition Network (ICN) in 2001 (see Damro, 2006). Eventually comprised of over 100 competition authorities, the ICN was formed among other reasons to enhance the worldwide coordination and enforcement of anti-cartel policies. Within Europe, cooperation between the Commission and the national competition authorities (NCAs) of the member states was strengthened in 2004, when it became compulsory for the NCAs to apply the EU Treaty's cartel provisions. To facilitate the efficient operation of the system, the European Competition Network – comprised by the Commission and the NCAs – was established.

In sum, the regulatory barriers to collusive behaviour that were erected from the mid-1990s onwards were unprecedented and contributed to the decline in the number of active cartels or collusive ties that appears to have begun at this juncture. The prior explosion in the number of active cartels/collusive ties (Figure 1) can only be explained by the regulatory environment insofar as the explosion reflects not an increase in actual collusive activities but in the proportion of the (unknown) total number of actual cartels being detected.

2. The business environment

Several major changes in the overall business environment also contribute to explain the developments in the scale and geography of collusion. The increases in the number of collusive ties or cartels during the 1960s and after the mid-1980s can be seen in the context of changes caused by two political initiatives. The first of these initiatives was the establishment of the Customs Union in 1968. The prospect of the Customs Tariff provided companies that exported to EU countries an extra incentive to establish a commercial base in the EU. As a result, a large number of American companies in particular were drawn to the European market prior to 1968 (Servan-Schreiber, 1968). It is conceivable that European companies formed intra-national and European collusive ties to ease the pressures of foreign competition and to prepare for the Customs Union. The Commission's dawning interest in horizontal cartels in the late 1960s (see above) should also be seen in the context of the Customs Union: widespread collusive arrangements were perceived to potentially undermine the expected advantages of removing trade barriers among the member states (McGowan, 2010: 9).

The second political initiative leading to major changes in the business environment was the decision in the mid-1980s to establish the Single European Market (SEM). The prospect of an SEM meant that many European companies could foresee considerably tougher competition than they had been used to. In many cases, these companies opted to restructure to strengthen their market position, resulting in a rapid increase in the number of cross-border mergers from the mid-1980s until 1990 (Commission, 1989: 221). In addition, the prospect of intensified competition appears to have resulted in a considerable increase in the scale of collusion, despite a regulatory environment that was becoming increasingly hostile toward cartels.

Changes in the business environment also impacted the geography of collusion. During the 1960s, ties among European and non-European companies were few. This situation, coupled with the high proportion of intra-national ties (mainly because of the exceptionally large cement cartel that involved primarily German companies), probably reflected that economic activity at this time remained predominantly oriented toward national markets. The increase in the number of European country combinations from 1969 to 1980 and from 1980 to 1993 (Table 1) suggests that markets became increasingly integrated.

The successive enlargements of the EU increased the spread of collusive ties. For example, in 1985, Spanish companies were barely represented, whereas by 1986 (the year of Spain's accession), several ties had been established with primarily French, German and Italian companies. Similarly, the accession of Finland and Austria to the EU in 1995 increased the number of ties involving companies with these nationalities for several years. However, no similar tendency can (yet) be observed in the case of the central and

eastern European countries that entered the EU in 2004 and 2007. There is no evidence to suggest that companies in the older member states formed ties with companies from the central and eastern European countries to any significant extent before or after their accession to the EU. There can be different reasons for this fact, one reason being that companies from these accession countries generally do not constitute a major competitive threat to the larger companies based in the older member states.

In addition to the increased geographical spread of ties in Europe, it is also worth noting that a larger proportion of international collusive ties existed in 2002 than in any of the previous (selected) years (Table 1). This phenomenon is explained by the continued globalization of the markets where European companies operated. Indeed, this is also the context in which the aforementioned increased transatlantic cooperation in anti-cartel regulation and the establishment of the ICN should be seen. The low number of country combinations in 2002 most likely reflects the relatively low number of (detected) ties that were active at this time rather than a reversal of the transnationalization of collusion.

3. Economic size

Companies headquartered in the four largest economies of the EU, in addition to Belgium and the Netherlands, were the companies that were the most involved in collusive ties over time (Figure 2). This finding supports our expectation that economic size is significant concerning the geographical distribution of collusive ties. This finding is not entirely surprising as larger economies offer numerically more chances for a collusive tie to form. To control for this size effect, we relate the centrality of the different nationalities over time

to the size of their GDPs. For each of the years 1960 to 2008, we discount the centrality of a country (as its share in all collusive ties) by its GDP (as its share in the sum of the GDPs of the European countries that appear in the cartel dataset). Figure 4 shows the result for the six nationalities involved in the largest number of collusive activities over time (see also Figure 2). It can be seen that Belgian and Dutch companies were for most of the period involved in a larger number of ties than the size of their national economies would suggest. The same was the case for other smaller economies that are not shown in the figure, most notably Luxembourg. For British, French, German and Italian companies, once we control for GDP, we find an approximate correspondence between the number of ties and the size of their economies, at least for the period from the mid-1970s to the early 2000s. This difference could suggest that smaller economies such as Belgium and the Netherlands, characterized by a greater degree of openness to trade and investment, would create relatively more opportunities for the formation of international cartels.

Insert Figure 4 near here

6. Conclusion

The scale of detected collusion in the European market fluctuated considerably over time, but was generally larger prior to the 1980s than after. The long decline in the number of collusive ties that began in 1993 should be viewed in the context of a regulatory

environment characterised by more serious sanctions combined with the introduction of the leniency programme. However, the actual decline is undoubtedly considerably less steep than it appears, owing to the particularly incomplete figures for the 2000s.

The two largest increases in the number of collusive ties occurred from 1958-1969 and from 1985-1993. The increase from 1958-1969 could be interpreted as support for business historians' assumption that the number of cartels increased in the immediate post-World War Two decades. The increase from 1985-1993 contradicts the suggestion that cartels gradually faded out after the 1970s. It was suggested that these increases were related to the political decisions to create the Customs Union and the SEM. The succession of EU enlargements and economic globalization increased the geographical spread of European collusive ties, at least until the 1990s, and increased the overall proportion of international ties. Finally, it was found that economic size mattered for the distribution of European and intra-national collusive ties, although companies from certain smaller nations were involved in a larger proportion of ties than their economic size would suggest.

It is still too soon to determine if the current crisis will lead to a surge in the scale of collusion. The Commission has made it very clear that it, unlike under the crisis of the 1970s, is not tolerating the formation of "crisis cartels" in sectors that are hit hard by the economic downturn in the wake of the 2008 financial crisis (Commission, 2011). It can be noted that also after 2012 (the last year for which cartel case decisions were recorded), the Commission has imposed fines on several cartelists in various sectors, most notably a € 953 million fine on producers of car and truck bearings and a € 1.71 billion fine on the

members of a cartel in the interest rate derivatives industry. Despite the apparent long-term decline in the scale of collusion since the mid-1990s, these developments suggest that cartelization is by no means a phenomenon in terminal decline.

Acknowledgements

We are grateful to Jana Racková for excellent research assistance as well as to the anonymous reviewers, Lasse Folke Henriksen, Sine Nørholm Just and the other participants in the 2013 DBP paper seminar for many insightful comments and suggestions. The usual disclaimer applies.

References

Aydin, U., & Thomas, K. P. (2012). The Challenges and Trajectories of EU Competition Policy in the Twenty-first Century. *Journal of European Integration*, *34*(6), 531–47.

Bastian, M., Heymann, S., & Jacomy, M. (2009). Gephi: an open source software for exploring and manipulating networks. *International AAAI Conference on Weblogs and Social Media*.

Bishop, S., & Walker, M. (2010). *The Economics of EC Competition Law: Concepts, Application and Measurement*. Andover: Sweet & Maxwell.

Buch-Hansen, H. (2014). Interlocking directorates and collusion: an empirical analysis. *International Sociology*, *29*(3), 249–267.

Buch-Hansen, H., & Wigger, A. (2011). *The Politics of European Competition Regulation. A Critical Political Economy Perspective*. London & New York: Routledge.

Caves, R. E. (2007). *Multinational Enterprise and Economic Analysis* (third edit.). Cambridge: Cambridge University Press.

Cini, M., & McGowan, L. (2009). *Competition Policy in the European Union, 2nd edition*. New York: Palgrave.

Commission. (1989). *Eighteenth Report on Competition Policy*. Brussels and Luxembourg: Commission of the European Communities.

Commission. (2011). *Crisis Cartels*. Contribution to the Global Forum on Competition.

Commission. (2013). *Cartel statistics: situation as of 10 July 2013*. Retrieved from <http://ec.europa.eu/

Connor, J. M. (2007). *Global Price Fixing, 2nd edition*. Berlin: Springer.

Damro, C. (2006). *Cooperation on Competition in Transatlantic Economic Relations. The Politics of Dispute Prevention*. New York: Palgrave.

De, O. (2010). Analysis of Cartel Duration: Evidence from EC Prosecuted Cartels. *International Journal of the Economics of Business*, *17*(1), 33–65.

Fear, J. (2008). Cartels. In G. Jones & J. Zeitlin (Eds.), *The Oxford Handbook of Business History* (Vol. 1, pp. 268–292). Oxford: Oxford University Press.

Frieden, J. A. (2006). *Global Capitalism: Its Fall and Rise in the Twentieth Century*. London and New York: W.W. Norton & Company.

Goyder, D. G. (1993). *EC Competition Law*. Oxford: Clarendon Press.

Heijmans, R., Heuver, R., Levallois, C., & van Lelyveld, I. (2014). *Dynamic visualization of large transaction networks: the daily Dutch overnight money market*. *DNB Working Papers*. Netherlands Central Bank, Research Department.

Hüschelrath, K., & Smuda, F. (2013). Do Cartel Breakdowns Induce Mergers? Evidence from EC Cartel Cases. *European Competition Journal*, *9*(2), 407–429.

Laffont, J. J., & Tirole, J. (1993). *A Theory of Incentives in Procurement and Regulation*. Cambridge, Massachusetts: MIT Press.

LeClair, M. (2011). *Cartelization, Antitrust and Globalization in the US and Europe*. London & New York: Routledge.

Levi-faur, D. (2013). The Odyssey of the Regulatory State : From a " Thin " Monomorphic Concept to a " Thick " and Polymorphic Concept. *Law & Policy*, *35*(1-2), 29–50.

Marshall, R. C., & Marx, L. M. (2012). *The Economics of Collusion. Cartels and Bidding Rings*. Cambridge, Massachusetts: MIT press.

McGowan, L. (2010). *The Antitrust Revolution in Europe: Exploring the European Commission's Cartel Policy*. Cheltenham: Edward Elgar.

Moody, J., McFarland, D. A., & Bender-DeMoll, S. (2005). Dynamic Network Visualization: Methods for Meaning with Longitudinal Network Movies. *American Journal of Sociology*, *110*, 1206–1241.

Motta, M. (2004). *Competition Policy. Theory and Practice*. Cambridge: Cambridge University Press.

Patel, K. K., & Schweitzer, H. (Eds.). (2013). *The Historical Foundations of EU Competition Law*. Oxford: Oxford University Press.

Posner, R. A. (1974). Theories of regulation. *NBER Working Paper No. 41*.

Rafols, I., Porter, A. L., & Leydesdorff, L. (2010). Science overlay maps: a new tool for research policy and library management. *Journal of the American Society for Information Science & Technology*, *61*(9), 1871–1887.

Robinson, W. I. (2004). *A Theory of Global Capitalism. Production, Class, and State in a Transnational World*. London: Johns Hopkins University Press.

Schröter, H. G. (1996). Cartelization and Decartelization in Europe, 1870-1995: Rise and Decline of an Economic Institution. *The Journal of European Economic History*, *25*(1), 129–153.

Servan-Schreiber, J. J. (1968). *The American Challenge*. London: Hamish Hamilton.

Simonsson, I. (2010). *Legitimacy in EU Cartel Control*. Portland: Hart Publishing.

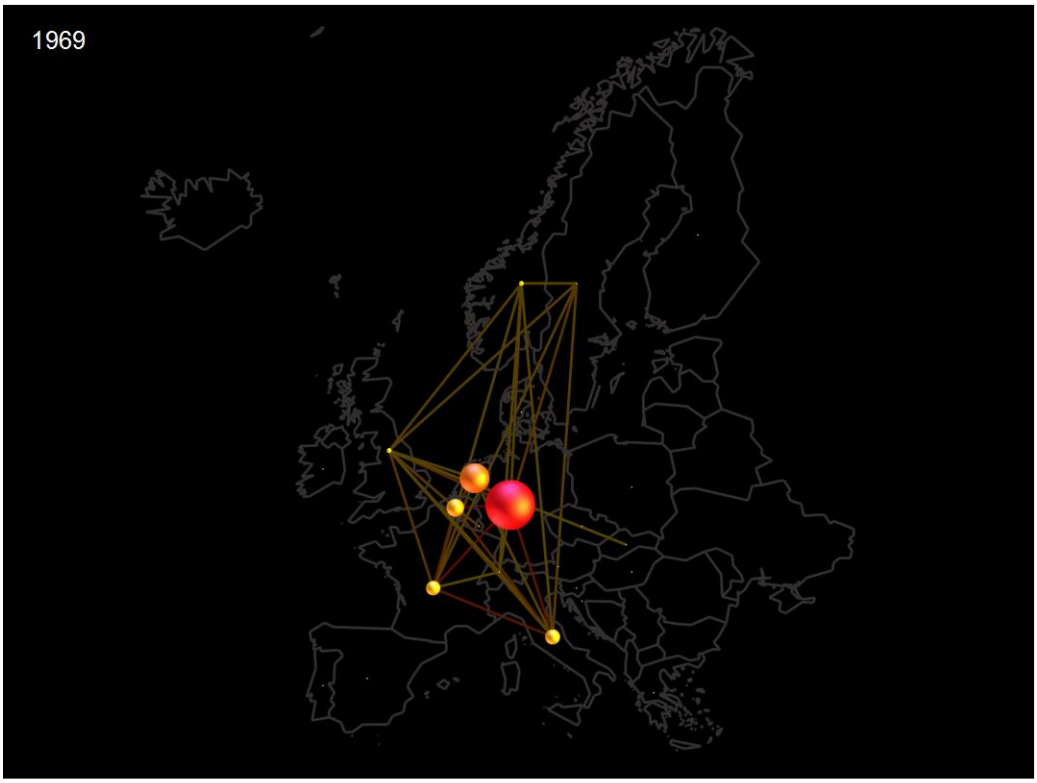
Utton, M. A. (2011). *Cartels and Economic Collusion: The Persistence of Corporate Conspiracies*. Cheltenham: Edward Elgar.

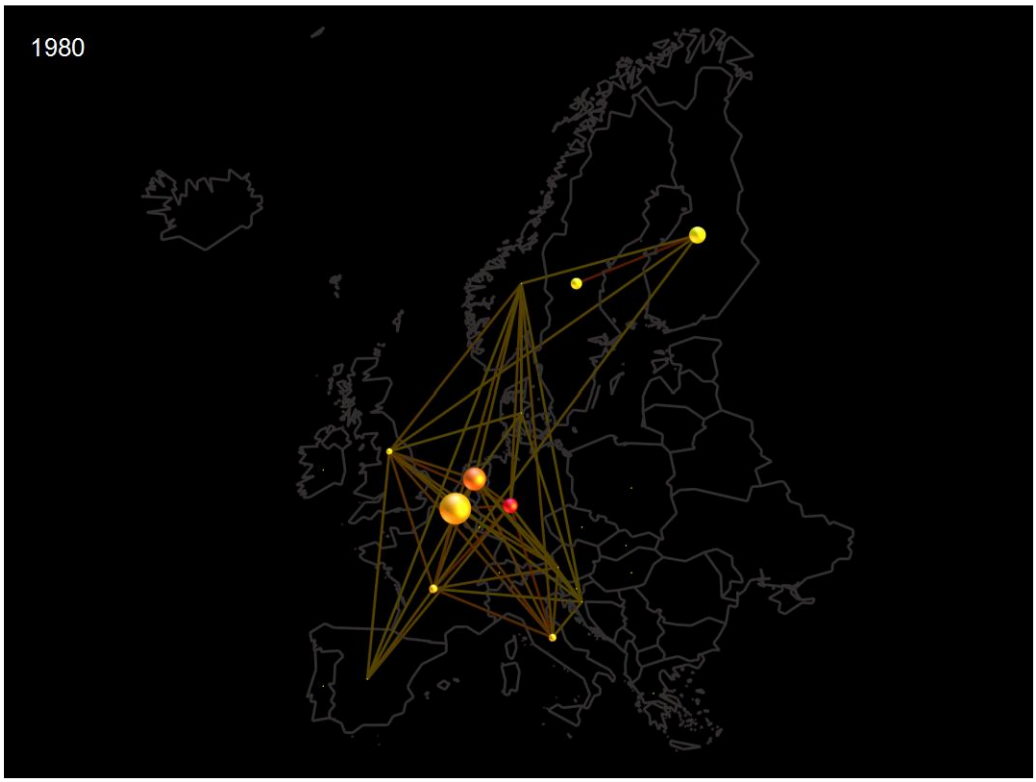
Warlouzet, L., & Witschke, T. (2012). The Difficult Path to an Economic Rule of Law: European Competition Policy, 1950–91. *Contemporary European History*, *21*(03), 437–455.

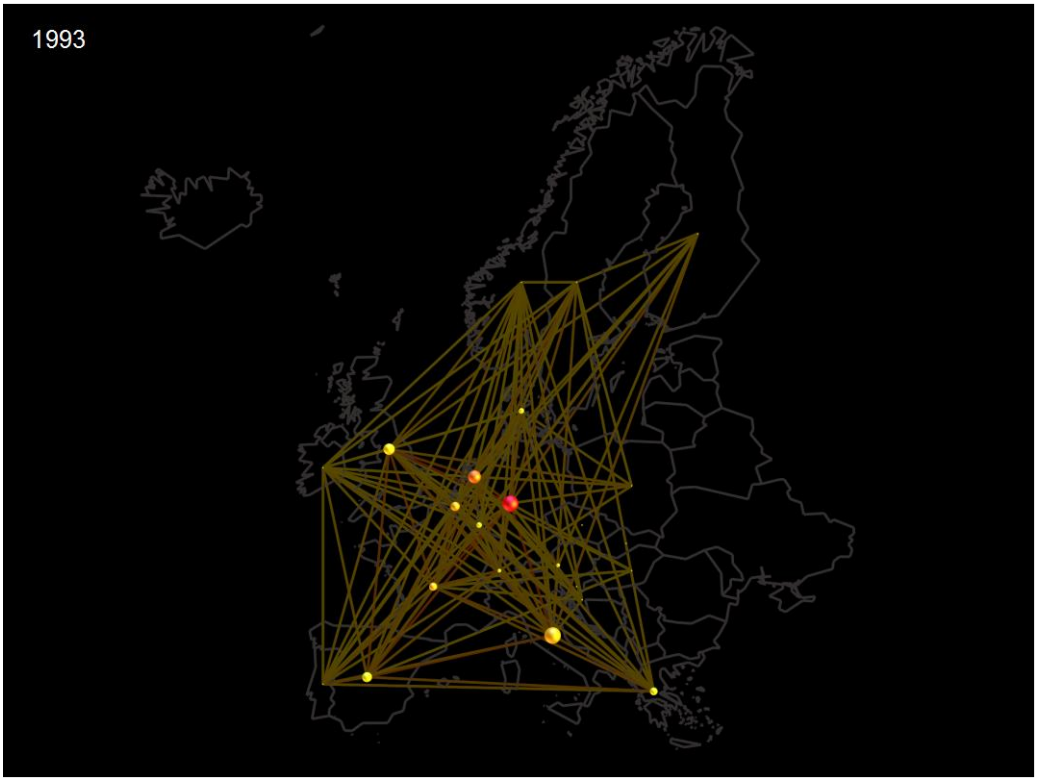
Wigger, A., & Buch-Hansen, H. (2014). Explaining (Missing) Regulatory Paradigm Shifts. EU Competition Regulation in Times of Economic Crisis. *New Political Economy*, *19*(1), 113–137.

Wigger, A., & Nölke, A. (2007). Enhanced roles of private actors in EU business regulation and the erosion of Rhenish capitalism: the case of antitrust enforcement. *Journal of Common Market Studies*, *45*(2), 487–513.

Appendix 1






1993


2002