

Characteristics of Cartel Ringleaders: An Analysis of EU Commission Decisions

Eva van Leur
Supervisor: I. Bos

Abstract

This descriptive research paper provides an overview of the characteristics of identified cartel ringleaders that operated cartels within the EU between 2000 and 2011. By means of a three-level analysis, concerning general cartel information, types of agreement and the adjustment of imposed fines, the conditions under which a ringleader is likely to be present are examined. The findings suggest that size, the enforcement of cartel rules and the allocation of quantities all have an impact on the existence of a ringleader. Furthermore, fines are higher for ringleaders and the leniency notice is applied more often in cases with an identified ringleader.

Keywords: Cartels; Cartel Ringleaders; Commission Decisions; Leniency

1 Introduction

Ever since the European Union's revision of the guidelines for setting fines in competition cases in 2006, leniency programs have proven to be a successful tool in fighting unfair competition and in particular decreasing the sustainability of collusion (Herre & Rasch, 2009). Under these renewed guidelines, participants of cartels are facing much higher penalties and fines, but are also offered the opportunity to avoid or reduce fines by self-reporting and cooperation during the investigation. The European Commission states that *'companies involved in a cartel - which self-report and hand over evidence – either [are offered] total immunity from fines or a reduction of fines which the Commission would have otherwise imposed on them'* (European Commission Leniency Policy, 2012). Companies will only be granted full immunity if (1) they are the first one to inform the Commission of the unexposed cartel and (2) provide sufficient information to launch an official inspection (European Commission Leniency Policy, 2012). The European Commission's leniency

program shows many similarities with that of the U.S. department of Justice, however differs on one important aspect. Whereas in Europe all participants of cartels are eligible for immunity, including the so-called ringleaders, under U.S. jurisdiction ringleaders are – partially – excluded from leniency policies (Spagnolo, 2008).

Of course this raises the question: ‘when can a participant of a cartel be labelled a ringleader’? If under certain jurisdictions ringleaders can avoid fines, and in others they cannot, further clarification of this concept is necessary. Unfortunately literature concerning ringleaders is fairly limited. The U.S. guidelines for ringleader exclusion read that a firm is only eligible for amnesty when it “*did not coerce another party to participate in the illegal activity and clearly was not the leader in, or originator of the activity*” (U.S. Department of Justice, 1993). After the 2006 revision, the European Commission allows ringleaders to apply for immunity if they meet some pre-specified requirements. Eligibility for immunity depends on if the party at hand undertook steps to coerce others to join the cartel or to remain in it (European Commission, 2006). Given this explanation of the term ‘ringleader’, it is important to make the distinction between two types of ringleaders: the ‘instigators’ and the ‘leaders’. The European Commission characterizes the former as the orchestrator of the establishment and enlargement of the cartel, while the latter is rather defined as the ‘operator’ of the cartel (Bos & Wandschneider, 2012).

Although there is a growing amount of literature focused on the effectiveness of leniency programs, there is not much known about the behaviour and role of ringleaders within cartels. Since there still is widespread haziness about the nature of the cartel ringleaders, it is not surprising that in solely 14 of 75 known European competition cases ranging from 2001 until 2011, ringleaders were identified. Could it consequently be said that no ringleaders were present in all other cases? Or does this mean that there might have been a ringleader, yet because of a lacking framework of identification, these companies remained undetected? As a result it is also hard to study the effects of leniency programs and if ringleader inclusion (EU) actually significantly decreases sustainability of cartels relative to ringleader exclusion (U.S.). This research therefore focuses on further analysis of the concept ‘cartel ringleaders’

From the above-mentioned discussion of the term ‘cartel ringleader’ it becomes clear that further research into the topic is necessary. In the first place, because this has consequences for the immunity-policy, but as well because this makes it easier to analyse the effectiveness of ringleader inclusion, as applied within the European Union.

Furthermore, by studying the nature of ringleaders, it might become easier to detect thus far unexposed collusive agreements. Ergo, the main research question investigated will be “*what are the characteristics of identified cartel ringleaders in the antitrust cases of the EU during the last decade?*”. In order to answer this, first of all the characteristics of cartels with ringleaders will be investigated. Secondly, a comparison with the cartels without an identified ringleader will be made. The two conditions – cartels with and without leaders or instigators – will be compared on the basis of (1) general aspects of the cartel (size, duration, industry characteristics), (2) the types of agreement reached by the participants and (3) the adjustment of the imposed fines. This last point is especially relevant with regards to the effectiveness of leniency policies.

The analysis of these factors should give a better understanding of the concept ‘ringleader’ and give insight in the behaviour and characteristics of these leaders and instigators.

2 Methodology

2.1 Data Collection

Information used during the building of the dataset, has been obtained using the EUR-Lex (previously CELEX) website: the European Union’s online service that gives access to all EU legal texts. EUR-Lex offers *inter alia* antitrust legislation and case-laws of the European Commission and makes it possible to consult the official journal of the European Communities. Antitrust cases published in the official journal were taken as a basis of analysis because the European Commission is de facto the highest authority of competition policy enforcement in Europe and the only one to initiate regulations and modify existing antitrust law implementation (Carree et al., 2010). It was hence decided to use the Commission Decisions as published in the Official Journal of the European Communities to investigate the role of cartel ringleaders.

All Commission Decisions investigated relate at least to proceedings pursuant Article 81 (ex Article 85) of the EC Treaty. The participants of the cartels infringed the abovementioned article by limiting competition in one or more of the following manners (European Commission, 2013):

- (a) *Directly or indirectly fixing purchase or selling prices or any other trading conditions;*
- (b) *Limiting or controlling production, markets, technical development, or investment;*

(c) Sharing markets or sources of supply;

(d) Applying dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage; or

(e) Making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts.

To characterise cartel ringleaders' behaviour, three important features of cartels are scrutinised: *cartel information, type of agreement and adjustment of imposed fines*. An important advantage of the dataset used is that under Article 20 of 1/2003 the European Commission has the formal power to conduct so-called 'dawn raids' to collect valuable evidence (Slaughter & May, 2012). These unannounced inspection visits enable the Commission to examine all business records and company's books, giving them a good indication of the start and end date of the collusive agreement (Carree et al., 2010). However, of course this does not mean that the (oral) agreement was not in place before the earliest start date identified by the Commission. It is possible that participating companies started colluding before business records had even shown the existence of any anticompetitive practices, or on the contrary that after the end date companies continued to engage in anticompetitive behaviour. The durations indicated should therefore be treated with caution.

2.2 Data Analysis

The European Commission has decided on 75 antitrust cases over the years 2000-2011. Of these 75 cases, 14 cases were identified as having one or more ringleaders. In order to answer the research questions formulated in the introduction, two groups are formed: cartels without ringleaders and cartels with ringleaders.

In the first section the general characteristics of both groups will be compared. Summary statistics such as the average number of companies, the average duration in months, the existence of a trade association and the frequency of meetings will be contrasted. Not only will this uncover common features and similarities of cartels in general, it will also help answer the question what differences there are in characteristics of cartels with and without cartel ringleaders. Statistical analysis should give insight into the existence of any relationship between these features and the presence of a cartel ringleader

Secondly, the types of agreements are analysed. Cartels can fix prices, allocate customers, allocate market shares, allocate quantities, allocate territories, engage in bid rigging, set up buy backs and compensation schemes and/or exchange information. Further research into the specific type of infringement might expose that certain agreements are more common in cartels that have identified ringleader(s). A logistic regression should identify commonalities among cartels with identified ringleaders and reveal if there is a type of agreement that has an impact on the likelihood of a ringleader being present within the infringement.

On a third level antitrust treatment will be looked at. Base and final fines will be compared. Under which circumstances are companies more likely to cooperate with the authorities to reduce fines and adhere to leniency programs? Aggravating or mitigating factors such as recidivism or coercion might form a factor that differs among cartels with and without ringleaders. Reviewing the fines will give insight into the question if leniency programs in fact work to detect ringleaders. For example: is full immunity granted more in cases where there is an identified ringleader?

This three-level analysis helps uncover the characteristics of both cartels with as well as without ringleaders during recent years. It furthermore reveals significant differences, which might assist the detection of even more cartels and ringleaders. Legal treatment is an important basis of analysis as well, as this might show the importance of leniency programs and effectiveness of reduction of fines in disclosing ringleaders.

3 Results

3.1 Cartel Information

In table 1 a descriptive overview is given of the general characteristics of Cartels without an identified ringleader. In total 18 randomly chosen antitrust cases were used out of the 61 cases without ringleader that took place between 1 January 2000 and 1 January 2011. The infringements at hand ranged from for example the banking industry (*Commissions Bancaires Allemagne*) or the airline industry (*SAS & Maersk Air*), to the beer industry (*Luxembourg Brewing Industry*). In terms of sizes the cartels differed significantly as well, with the smallest antitrust case having only one player (*Soda Ash - Solvay*) to the largest one having 16 participants (*Far East Trade Tariff & Surcharges Agreement*). Table 1 furthermore displays the number of relative importance categories identified by the

European Commission. This is important to note as it gives a perception of how market shares are divided among participants. When setting the base fines, an important determinant considered by the European Commission is the relative importance of the participants. Based on for example annual turnover within the EEA, different categories based on market share are set up in order for the Commission to apply differential treatment and set fines accordingly. The more categories there are, the more market shares are unequally divided between members and thus perceived economic power of parties involved differs. Logically, it can be concluded from the table that larger cartels (e.g. *Copper Plumbing Tubes*) also have more categories. However, sometimes a large cartel only has few categories: e.g. the *Reinforcing Bar Cartel* does not seem to have large discrepancies among the nine participants in terms of market share as there are only three categories.

Besides applying differential treatment, a second determinant of the base fine is the duration of the infringement. The Commission classifies cartels into three groups: infringements of short duration (less than one year), medium duration (one to five years) and long duration (more than five years). Fines of cartels that were of medium duration are increased by 50%, while infringements that last even longer get an additional increase of 10%. Most cases in the descriptive overview are of the last category, with eleven infringements being of long duration. It is therefore not surprising that the average duration was approximately 84 months (7 years). This seems quite long, but a longer duration also means more evidence for the Commission and as a result a higher chance of detection and legal action. Lastly, table 1 shows the existence of a trade association (which was the case for 10 out of 18 cartels), the involvement of top-level executives during meetings and the enforcement of cartel rules. With enforcement of rules the active monitoring and penalizing of deviation is meant. In three cases cartels either set up a penalty system or engaged in retaliating practices.

In table 2 the same factors were analysed, however now cartels with an identified ringleader were used. Of the 75 prohibitions between 2000 and 2001, 14 have a known ringleader. For this analysis 13 ringleader cases were used, the *Sodium Gluconate* cartel was left out of consideration because no English translation of the Commission Decision was available. One important property that should not go unnoticed is the fact that in most cartels there were at least two ringleaders present. Solely in the *Carbonless Paper* cartel, the *Viandes Bovines Françaises* cartel and the *Speciality Graphite* cartel there was only one cartel ringleader. Furthermore one can see that the number of ringleaders is not proportionate to the number of cartel members. For example the large *Carbonless*

Paper cartel has one ringleader and eleven members, while the small *Interbrew & Alken-Maes* cartel (four members) has two ringleaders. Special attention should be given to the *Gas Insulated Switch Gear* cartel: where Siemens, ALSTOM and AREVA concurrently acted as a ringleader. The average number of participants for cartels with one, two or three ringleaders (respectively 8.33, 7.22 and 11) seems a bit higher than that of the group without ringleader (average of 5 members). To see whether this difference in mean size is actually significant a one-way ANOVA test has been conducted. For the purpose of clarity the cases were actually divided into small (1 to 4 members), small to medium (5 to 8 members), medium to large (9 to 12 members) and large sized cartels (more than 12 members) – see table 3. Because of the small sample size, the Levene statistic showed a significant result and consequently the homogeneity of variances could not be assumed. Because of this violation, the Welch ANOVA was chosen as a method of analysis. The null hypothesis that there was no relationship between the size of the cartel and the presence of a ringleader could be rejected at a 95% confidence interval, with significance of $p = 0.047$.

The Post-Hoc Games-Howell test indicates that there is in fact a significant difference between the mean of small sized and small to medium sized cartels (see table 4). Ringleaders are more likely to be present in a small to medium cartel than they are in a small cartel (which is in line with the different averages of 5 and 7.77). This is surprising as it was expected that ringleaders would actually be more likely to be found in large cartels – as coordination among participants is needed more extensively in this situation. A possible explanation for the significant difference in means between small and small to medium, could be that in small cartels coordination of tasks and implementation of agreements is easy to organize, thereby making it unnecessary to have a ringleader. Coordination in medium to large and large cartels on the other hand is hard (ergo, the need for a ringleader is greater), however since many parties are involved it is not likely that there is a single market leader that could act as a ringleader and has significant power to persuade others to follow its lead. This could explain why ringleaders are especially present in cartels that have between five to eight participants (small to medium sized cartels).

Table 2 furthermore indicates that the average duration of cartels is much longer. Whereas cartels without ringleaders last around seven years, cartels with ringleaders exist 8.5 years (103.4 months). Under the classification policy of the European Commission however these averages would both fall under infringements of long duration. The One-Way ANOVA test conducted to see whether there is a relationship between duration and existence of a ringleader, does not give a significant result ($p = 0.693$). In other words, there is no

significant difference in means between short, medium and long infringements, and the existence of a ringleader (see table 5 & 6). For example the *Vitamins* cartel and the *Methylglucamine* cartel are of about the same duration (113 months and 109 months), however the former has a ringleader while the latter does not. Even for cartels of short duration, e.g. the *Viandes Bovines Françaises* cartel and the *Far East Trade Tariff and Surcharges Agreement* (respectively 2 and 3 months), the former does have a ringleader and the latter does not. Duration therefore does not have an impact on the likelihood of a ringleader being present.

Lastly, multiple chi-square tests of independence were conducted to detect relationships between on the one hand the existence of a ringleader and on the other hand the *existence of a trade association, the involvement of top-level management during meetings* and the *enforcement of cartel rules*. Table 2 indicates that in approximately 10 out of 18 (55%) antitrust cases without a ringleader a trade association was present in the industry, while in 6 out of 13 (46%) infringements with a ringleader this was the case. This small difference in mean value suggests that the presence of a trade association does not have an impact on the existence of a ringleader. Indeed, the cross tabulation of existence of trade association and the existence of a ringleader – see table 7 – shows that there is no significant difference (Pearson chi-square statistic of $p = 0.605$).

The chi-square test for the involvement of top management and the existence of a ringleader actually shows the same result, with the Pearson statistic being 0.739 (see table 8). In light of the relative means (top-level involvement happened in 44% of cases without ringleader and 38.5% with ringleader), this is logical. Top-level involvement and the presence of a trade association, therefore both do not have an impact on the likelihood of a ringleader existing within a cartel.

However, the chi-square test of independence that compares the enforcement of cartel rules and the existence of a cartel ringleader does show a significant result. Table 9 displays the observed and expected counts of ringleaders under the conditions of enforcement and no enforcement. With a Pearson chi-square statistic of $p < 0.001$, it can be said that there is in fact a relationship between the active enforcement of cartel rules and the likelihood of a ringleader being present. The descriptive overview in table 2 reveals that in 3 (16.67%) cases without a ringleader and 11 (85%) cases with ringleader, active enforcement of rules and penalizing of deviators occurred. Table 9 shows that there is a large disparity between expected and observed count in the ringleader column. It can therefore be said that stricter enforcement of rules is a common property of cartels

that have a ringleader. An explanation for this result is that ringleaders, as can be seen from table 2, are mostly the market leader of the industry. In ten out of thirteen cases at least one ringleader had the largest market share and as a result was classified in category 1 of relative importance. Large market shares logically result in greater economic power, making it easier to penalize participants that deviate from the agreed rules. For example in the *Interbrew & Alken-Maes* cartel, *Alken-Maes* (the ringleader) and its parent company *Danone* threatened to destroy *Interbrew* on the French beer market if they did not cooperate on the Belgian market. A similar event took place in the *Speciality Graphite* cartel, where European producers *SGL Carbon* (the ringleader) and *Le Carbone Lorraine* threatened to destroy *Toyo Tanso* and *GrafTech International* on the Japanese market if they did not stop their dumping practices on the European market.

In terms of general cartel information it can therefore be said that cartels with a ringleader are on average larger (7.77 members) and last longer (104 months). Ringleaders are found more often in cartels of small to medium size, than they are in small cartels. Statistical tests show furthermore that duration is not a good indicator of ringleader existence. The presence of a trade association and the involvement of high level executives do also not contribute to a higher likelihood of a ringleader being present. The enforcement of rules on the contrary is far more likely to be an indicator of ringleadership.

3.2 Type of Agreement

The second part of the analysis concerns the type of infringement agreed upon by the participants of the cartel. Table 10 distinguishes between eight types of agreements pursuant to article 81 of the EC treaty. These potentially inclusive types of agreements are *allocation of market shares*, *allocation of territories*, *allocation of quantities*, *allocation of customers*, *price fixing*, *bid rigging*, *buy-backs & compensation schemes* and *information exchange*. The Organisation for Economic Co-operation and Development (OECD) considers price-fixing, bid rigging, allocation of market shares and allocation of quantities conducts of so-called 'hard core cartels' and therefore views it as a priority policy objective (OECD, 2013).

Table 10 gives a descriptive overview of the types of agreements detected and fined by the European Commission. In 5 cases market shares were divided among participants, e.g. in the *Copper Plumbing Tubes* cartel the SANCO® producers allocated market shares as a stabilising measure. Allocation of territories only happened in the *SAS & MAERSK Air* case: flying routes were divided and new international routes could only be operated with specific request and approval. The allocation of quantities was found in four cartels. In

these cases participants discussed production volumes, allocating or reducing output or preventing new capacity from coming into the market. The allocation of customers seemed more common among the cartels without ringleaders, with 10 out of 18 cartels found implementing such anti-competitive agreements. Price-Fixing was the number one type of agreement, with 12 cartels (66.67%) having made agreements about target prices, minimum prices, rebates and other restricting price measures. Lastly, information exchange was found in 50% of cases. Logically, exchange of sensitive commercial information always occurred together with some other anti-competitive practice. It should be noted that in five cases there was solely one type of infringement found: four times it concerned allocation of customers (*Solvay*, *ICI*, *Commission Bancaires* and *Luxembourg Brewing Industry*) and once it concerned allocation of quantities (*French Beer Market*). In the *French Beer Market* cartel, the two members *Heineken* and *Danone* (and its subsidiaries *Heineken France* and *Kronenbourg*) came to an armistice agreement where they decided to balance the total volume of beer. Remarkably both parties did not actually implement the agreement, but continued to supplant the other's beer brand for their own.

Table 11 shows the type of agreements found in antitrust cases with an identified ringleader. At first glance one can already tell that agreements were far more widespread and also far more extensive in the cases with an identified ringleader. Whereas in the cases without a ringleader there were 41 counts of horizontal agreements restricting competition, in the sample with ringleaders there were 50 counts of infringements. Reasons for this notable difference could be that (a) in general the Commission has more evidence to hold against cartel members in the ringleader cases (b) ringleadership results in better coordination and enforcement, therefore making it easier to implement multiple agreements. In contrast to the sample without ringleaders, the sample with ringleaders does not show any case that only engaged in a single type of infringement. Similarly to table 6, price-fixing is again the most common practice found in the ringleader sample (13 cases). Allocation of quantities and information exchange are respectively in second and third place (10 and 9 counts). Once more, information exchange was not found as a single practice, but always in combination with other agreements. Allocation of market shares occurred 8 times, while allocation of territories and buy-backs & compensation schemes both took place 3 times. Bid-rigging, or collusive tendering, appeared twice: in the *Gas Insulated Switch Gear* cartel and the *Marine Hoses* cartel participants conspired to raise tenders in bidding processes. Attention should be given to the *Bitumen Spain* cartel where 6 types of agreements were discovered, merely bid rigging and the allocation of territories did not occur. Figure 1 and 2 expose the frequency of agreements in both cartels with and without ringleaders.

Figure 1:

Bar Chart Type of Agreements Antitrust Cases without Ringleader, 2000-2011

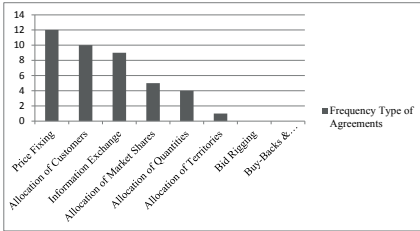
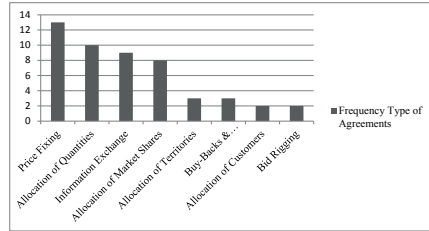


Figure 2:

Bar Chart Type of Agreements Antitrust Cases with Ringleader, 2000-2011



From the bar charts it can be derived that the allocation of customers is actually more common in cartels without ringleaders, than it is in cartels with a ringleader. On the contrary, allocation of quantities seems more popular as an anti-competitive practice amongst ringleader cartels than it is amongst cartels without a ringleader.

To see whether there is indeed a form of infringement that has a relationship with the existence of a ringleader, a binary logistic regression was conducted. Table 8 displays the variables in the regression and their estimated coefficients. From the significance column it can be concluded that none of the types of agreements are actually good predictors of the existence of a ringleader. Only at an 80% confidence level one could say that the allocation of quantities with $p=0,179$ is significant. This would mean that the allocation of quantities is more likely to be discovered as a practice of a cartel with a ringleader. However, since $\alpha=0.05$ gives more confidence and was therefore chosen as the significance level, it cannot be said that there is a relationship between the allocation of quantities and the existence of a ringleader. Perhaps a bigger sample than $N=31$ would indicate that there is indeed such a relationship between the two variables. Further research into the topic is therefore necessary.

To sum up the type of agreement section, it can be concluded that cartels with ringleaders engage in more anti-competitive practices than cartels without ringleaders do. The average count of agreements for the ringleader cartels was 3.85, whereas this mean value for cartels without ringleaders was 2.27. Possible explanations are that, because in order to fine ringleaders strong evidence is needed, evidence is greater for ringleader cartels. As a result more types of agreements can be proven in court and be fined. Secondly, it could be that ringleaders lead to a better coordination, making it easier to come to more agreements and to actually enforce the rules. In terms of relationships between the existence of a ringleader and a type of agreement, it cannot be said that any form of

infringement has a significant impact on the likelihood of a ringleader being present. It can however be concluded that the allocation of quantities is counted more in cartels with ringleaders, while allocation of customers took place more in cartels without ringleaders. A larger sample size could give a better understanding of the relationship.

3.3 Adjustment of Imposed Fines

In order to understand the adjustment of fines, it is important to comprehend the legal assessment procedure that the Commission carries out in their proceedings. When deciding the amount of base fines two main determining factors are considered by the Commission: nature and gravity of the infringement. If there are large disparities between market shares, the Commission may decide to apply differential treatment. After setting base fines, aggravating factors are taken into account. In case there is evidence of leadership or instigation, fines will be increased due to leadership. Other aggravating factors that can lead to an increase of the basic fine are recidivism and obstruction of the investigation. Attenuating circumstances, among others, could be the non-implementation of the agreements, the termination of the infringement upon the first intervention of the Commission or an exclusively passive 'follow-my-leader' role. Another example might be extraordinary incidents such as the mad cow disease, which was the case in the *Viandes Bovines Françaises* cartel where all members got a 60% reduction of fines.

Lastly, conspirators can apply for leniency. The commission considers the cooperation of members in the detection of thus far secret infringements of intrinsic value and therefore rewards decisive contributions by cartel participants (Official Journal of the European Communities, 2013). Cooperation with authorities might justify full immunity or a substantial reduction of fines, on the condition of certain requirements. To qualify for up to 100% reduction of fines, contributions by co-operators should enable the Commission to:

(a) carry out a targeted inspection in connection with the alleged cartel; or

(b) find an infringement of Article 81 EC in connection with the alleged cartel.

Furthermore, the Commission should not have already had sufficient evidence to adopt a decision regarding the cartel and the co-operator should have immediately ended participation in the agreement upon application under the leniency notice. If full or partial immunity is not granted, co-operators can still get a reduction of fines if their information contributes significant added value. The first undertaking to do so will get a reduction

of 30-50%, the second undertaking to provide information will get a reduction of 20-30% and subsequent undertakings that deliver information with added value can get a reduction of up to 20% (Official Journal of the European Communities, 2013).

As shown in table 12, most base fines were substantially adjusted. As this sample only contained cartels without an identified ringleader, base fines were not aggravated due to leadership but rather due to repeat infringement or obstruction. Out of the eighteen cases, eleven companies (participating in five cartels) saw their base fines doubled. For instance Degussa was given a 50% increase of its base fine in the *Methacrylates* case, because earlier it had also participated in anti-competitive practices in the *Methionine* cartel. Thirty-two companies, spread over seven cartels, on the contrary saw their fines decreased. Mitigating circumstances in these cases were the passive role played or the economic context. In eight cases the Commission rewarded cooperation that led to the detection of the cartel with full immunity. When compared to table 1, it can be said that all of these eight infringements were of long duration, with the exception of the *French Beer Market Cartel* that was never actually implemented. A 100% reduction therefore had substantial effects on the final amount of fines. Compared to table 1, there is no clear relationship between immunity and the count of agreements. The *Commission Bancaires* Cartel for example only fixed prices, while the *Hydrogen Peroxide & Perborate* cartel on the other hand engaged in allocation of market shares, allocation of quantities, allocation of customers, price fixing and exchange of commercial information.

Another thirty-six companies were granted a reduction of their fines, ranging from 10% (*Far East Trade Tariff & Surcharges Agreement*) to 50% (*Copper Plumbing Tubes*). Because the leniency notice was applied in eleven of eighteen cartel cases, and because attenuating circumstances were taken into account seven times, in total final fines were on average significantly lower than base fines. The mean base fine over all eighteen cases was EUR 34 270 000, while the final fine only averages EUR 24 400 000. This is consistent with the 'difference base & final fines' column of table 12, that indicates that only in three cases the final fine was higher than the base fine. In two of these cases the reason for this was the lack of cooperation and therefore lack of leniency discounts.

When comparing the abovementioned average base and final fines with those in table 13, the mean values are both higher. In the sample containing cartels with identified ringleaders the average base fine was set at EUR 38 260 000, which is EUR 3 390 000 higher. A possible reason for this discrepancy is the higher mean count of agreements

reached, as found in tables 10 and 11. As the main determinant of the base fine is gravity, an average of 3.8 types of agreements will logically lead to a higher base fine. Surprisingly the difference between average final fines is smaller, only EUR 3 100 000. Whereas companies participating in a non-ringleader cartel on average receive a final fine of EUR 24 400 000, firms with a ringleader in their cartel get fined EUR 27 500 000. In other words, both samples saw their base fines decreased –i.e. leniency discounts and attenuating circumstances preponderated the aggravating circumstances, but this negative difference was larger for the sample with ringleaders (EUR -10 760 000). The reason for this larger discrepancy is the application of the leniency notice. When reviewing the ‘due to leniency’ column of table 13, one can see that full immunity was granted in all cases besides *Graphite Electrodes*, *Amino Acids & Citric Acid*. The leniency notice therefore seems to be applied more in the ringleader cartel cases. The explanation for this relationship is that, in order for the Commission to legitimately fine cartel ringleaders, it needs significant evidence, cooperation of cartel conspirators will provide them with otherwise unknown information and give them a much stronger position in court. The leniency notice therefore has a positive effect on the detection of ringleaders. Further research is necessary to investigate the deterrence effect of ringleader inclusion versus exclusion.

Table 14, lastly, outlines the base and final fines for the 24 ringleaders fined in the 13 ringleader cases. As at least one of the members of all these cartels acted either as leader or instigator, on average the base fine was increased with 42,5% due to leadership. *SGL Carbon* and *UCAR International*, ringleaders of the *Graphite Electrodes* cartel, even saw their base fines increased by 85% and 60%. Because in the majority of cases at least one of the ringleaders was the market leader, base fines were on average much higher: EUR 103 400 000. In three cases aggravating circumstances such as recidivism (*Bitumen Nederland* and *Sorbates*) and physical coercion (*Viandes Bovines Françaises*) led to increases of fines on top of the leadership increase. Contrary to table 13, the difference between base and final fines for ringleaders was not solely negative. Eleven firms had higher final fines than base fine because leniency discounts were not granted or because the leniency discount was smaller than the increase due to leadership. The relative difference between the average base and final fine of -6,55% compared to a decrease of -28,12% (see table 13) is also much smaller. Members of ringleader cartels are in other words rewarded substantially for their helping hand in gathering evidence against ringleaders.

All in all, base fines are on average much higher for cartels with ringleaders. Reason for this is the more extensive agreements practised and hence higher gravity perceived by

the Commission. Besides, there is a larger negative difference between base and final fines for cartels with an identified ringleader. However, this does not hold true for ringleaders, their fines are reduced relatively less. The leniency notice causes firms in cartels with a ringleader to cooperate more extensively, resulting in lower fines and also the detection of ringleaders. Because the Commission has more evidence against ringleaders, fines are on average three times as high and most of the times doubled because of leadership. Further research into the functioning of the leniency notice and the deterrence effect that it possibly has would therefore be very beneficial.

4 Conclusion

This study sought to identify the characteristics of ringleaders by analysing a descriptive survey of European Commission prohibition decisions pursuant article 81 of the EC Treaty. By means of a three level analysis of the cartel information, the types of agreements and the adjustment of imposed fines, the aim of this research was to find out if there was any relationship between these factors and the existence of a ringleader within the cartel.

In terms of cartel information it was found that cartels with ringleaders are on average larger and that ringleaders are found more often in small to medium (5 to 8 members) than in small cartels (less than 4 members). Considering the fact that coordination is harder when cartels are larger, it is logical that the need for a ringleader is higher when the cartel contains more members. Besides, there was no relationship found between the existence of a ringleader and the large to medium or large cartels. As the chance of detection is much higher for larger cartels, and because larger cartels will also lead to more discussion because more players are involved, it might be hard for a ringleader to take on coordination and persuade the other members to follow its lead. Furthermore, larger cartels possibly indicate lower barriers to entry and perhaps no single market leader being present. With no one possessing a significant greater economic power in larger cartels, it is hard for a possible ringleader to threaten or punish deviators. Additionally, the enforcement of rules has a positive relationship with the existence of a ringleader. As ringleaders are mostly in the number one category of relative importance and have the largest market share, it is relatively easy for them to take retaliating action against participants deviating from the agreement.

Secondly, the analysis of types of agreements found that price fixing is the most popular type of anti-competitive agreement made in both cartels with as well as without ringleaders. The allocation of quantities, moreover, seems to have a relationship with the existence of a ringleader. However, one can only be 80% confident that there is such a relationship; hence a larger sample size is needed to review any possible correlation. Besides, cartels with ringleaders limit competition more extensively by applying on average 3.8 types of agreements (whereas this mean value is 2.3 for cartels without a ringleader). Coordination by one or two ringleaders – or even three in case of the *Gas Insulated Switch Gear* cartel – and the stricter enforcement of rules makes multiple anti-competitive agreements more manageable.

Thirdly and lastly, the adjustment of imposed fines differs substantially among cartels with and without ringleaders. Base fines are significantly higher for cartels with ringleader; however this is consistent with the finding that on average cartels with ringleaders practice more types of infringements. Base fines are even higher for ringleader companies (EUR 103 400 000), with increases due to leadership ranging between 30% and 85%. For both samples it was found that the final fines were lower than the base fines. In fact, aggravating circumstances were weighted lower than were leniency and attenuating circumstances. The relative difference between base and final fines was moreover lower for ringleaders than the average difference in the sample of cartels with ringleaders. The application of the leniency notice ergo seems to assist the Commission in their goal to identify ringleaders.

With regards to these findings it can be said that ringleaders are most likely to be found in cartels that are consisting of around five to eight members, where retaliation and strict enforcement of rules is applied and possibly where allocation of quantities is one of the types of agreements practiced. The analysis of imposed fines supports the positive functioning of the leniency notice as applied by the European Commission, because members of ringleader cartels are more eager to cooperate with authorities and provide evidence against their leaders. However to see whether the inclusion of ringleaders significantly increases the deterrence effect, further research is necessary.

5 Limitations

The data presented might be biased on several aspects, and should therefore be reviewed with caution. Firstly, it is important to acknowledge that although the Commission has been very successful in the fight against anticompetitive agreements across many diverse industries, and has clearly bared down the deterrence effect of price fixing and other types of infringement upon the EC treaty (Riley, 2010), it is still very likely that the Commission Decisions used in this research are not a good representation of the unknown pool of cartels (Bos & Wandschneider, 2012).

Secondly, as leadership has significant monetary and legal consequences for the companies fined (e.g. fines can be increased by fifty per cent), the Commission will only lay claims of a leadership role when it has a sufficient amount of evidence to win an appeal in court (Bos & Wandschneider, 2012). In other words, sometimes there might be signs that a ringleader is coordinating a cartel, however as the case holds not enough evidence in court, the Commission does not refer to the company as a ringleader. For this reason the used sample has a lower bound, as many times the Commission did not increase base fines however did see actions that indicated a leader.

Thirdly, although randomly chosen, the sample size of this research is rather small. Only 31 of 75 known antitrust cases were used. Of the ringleader cases 13 out of 14 were analysed, while only 18 out of 61 non-ringleader cases were reviewed. In order to have a more precise indication of ringleader characteristics, as compared to cartels without a ringleader, it would be beneficial to conduct the statistical tests with a larger sample. Especially the relationship between the allocation of quantities and the existence of a ringleader ($p=0,179$), might give more significant results when a larger sample would be used.

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Appendices

Table 1

Cartel Characteristics European Antitrust Cases without Ringleaders, 2000-2011

Case	Cartel Characteristics						
	Number of Cartel Members	Number of Relative Importance Categories	Duration in months	Number of Meetings Per Annum	Name of Trade Association	Top-Level Involvement Meetings	Enforcement of Cartel Rules
34018 - Far East Trade Tariff & Surcharges Agreement	16	4	3	3	FEFC		
37027 - Zinc Phosphate	6	2	49	1	ZIPHO, V&MI, EMZP		
37444 - SAS & Maersk Air	2	2	29	?	n/a		
37519 - Methionine	3	2	154	1	n/a		
37671 - Food Flavour Enhancers	4	2	114	2	n/a		
37750 - French Beer Market	2	2	n/a	2	ABF		
37766 - Netherlands Beer Market	4	3	44	?	CBK		
37800 - Luxembourg Brewing Industry	4	3	185	2	LBF		
37919 - Commissions Bancaires - Allemagne	5	2	57	6	n/a		
37956 - Reinforcing Bars	9	3	127	?	FISI		
37978 - Methylglucamine	3	2	109	1	n/a		
38069 - Copper Plumbing Tubes	9	4	153	?	IWCC		
38620 - Hydrogen Peroxide & Perborate	8	4	82	2	CEFC		
38638 - Butadiene Rubber & Emulsion Styrene	6	5	78	4	ESRA		
38645 - Methacrylates	5	2	67	2	CEFC		
39003 - Soda Ash: Solvay, CFK/ 33.133-B	2	2	24	1	n/a		
39004 - Soda Ash: Solvay/33.133-C	1	n/a	84	n/a	n/a	n/a	n/a
39046 - Soda Ash: ICI/33.133-D	1	n/a	72	n/a	n/a	n/a	n/a
Average/Total	5	2,75	84,18		10	8	3

Table 2

Cartel Characteristics European Antitrust Cases with Ringleaders, 2000-2011

Case	Identified Ringleader	Cartel Characteristics						
		Number of Companies	Relative Importance Category Ringleader	Duration in months	Number of Meetings Per Annum	Name of Trade Association	Top-Level Involvement Meetings	Enforcement of Cartel Rules
36212 - Carbonless Paper	Arjo Wiggins Appleton Ltd.	11	#1	44	6	AEMCP		
36490 - Graphite Electrodes	SGL Carbon, UCAR International	8	#1, #1	70	1 to 3	n/a		
36545 - Amino Acids	Archer Daniels Midland, Ajinomoto	5	#1, #2	60	2 to 4	Fefana		
36604 - Citre Acid	Archer Daniels Midland, F. Hoffman-La Roche	5	#2, #2	50	5	ECAMA		
37270 - Sorbitates	Hoechst, Dated Chemical Industries	5	#1, #2	214	2	JCTA		
37614 - Interbrew & Arken Maes	Interbrew, Arken-Maes	4	#2, #2	9	4	CBB		
37614 - Vitamins	F. Hoffman-La Roche, BASF	13	#1, #2	113	8	n/a		
37667 - Speciality Graphite	SGL Carbon	8	#1	55	5	n/a		
38279 - Vandes Bovines Francaises	Federation Nationale Bovine	6	n/a	2	?	FNB, FNCB, FNICGV, FNPL, FNSEA, JA	n/a	
38456 - Bitumen Nederland	Shell, Koninklijke Vloker Westels Stevin	14	#1, #1	96	5	n/a		
38710 - Bitumen Spain	Repsol, Productos Asfálticos	5	#1, #1	139	?	n/a		
38899 - Gas Insulated Switch Gear	Siemens, ALSTOM, AREVA	11	#1, #3	193	26	n/a		
39406 - Marine Hoses	Bridgestone, Parker ITR	6	#1, #5	253	?	n/a		
Average		7,77		99,85		6	5	11

Table 3

Descriptives Size of the Cartel

	N	Mean	Std.	SE
Small sized	11	0,91	0,302	0,091
Small to Medium Sized	13	0,38	0,506	0,14
Large to Medium Sized	4	0,5	0,577	0,289
Large Sized	3	0,33	0,577	0,3333
Total	31	0,58	0,502	0,09

Table 4

Games-Howell Post Hoc Test Size of the Cartel

(I) Size of the Cartel	(J) Size of the Cartel	Difference (I-J)	SE	Sig.
Small	Small to Medium	0,542*	0,167	0,025
	Medium to Large	0,409	0,303	0,587
	Large	0,576	0,346	0,49
Small to Medium	Small	-0,524*	0,167	0,025
	Medium to Large	-0,115	0,321	0,982
	Large	0,051	0,362	0,999
Medium to Large	Small	-0,409	0,303	0,587
	Small to Medium	0,115	0,321	0,982
	Large	0,167	0,441	0,979
Large	Small	-0,576	0,346	0,49
	Small to Medium	-0,051	0,362	0,999
	Medium to Large	-0,167	0,441	0,979

Table 5

Descriptives Duration of the Infringement

	N	Mean	Std.	SE
Short Duration	3	0,67	0,577	0,333
Medium Duration	9	0,56	0,527	0,176
Long Duration	19	0,58	0,507	0,116
Total	31	0,58	0,502	0,09

Table 6

ANOVA Duration of the Infringement

	Sum of Square	df	Mean Square	F	Sign.
Between Groups	0,028	2	0,014	0,052	0,949
Within Groups	7,52	28	0,269		
Total	7,548	30			

Table 7

Chi-Square Test of Independence: Existence of Trade Association and the Existence of a Ringleader within the Cartel

		Existence of Ringleader Within the Cartel		Total
		<i>Ringleader</i>	<i>No Ringleader</i>	
Existence of Trade Association	<i>Trade Association</i>	Count	6	16
		Expected Count	6,7	9,3
	<i>No Trade Association</i>	Count	7	8
		Expected Count	6,3	8,7
Total	Count	13	18	31
	Expected Count	13	18	31

Table 8

Chi-Square Test of Independence: Top-Level Involvement during Meetings and the Existence of a Ringleader within the Cartel

		Existence of Ringleader Within the Cartel		Total
		<i>Ringleader</i>	<i>No Ringleader</i>	
Existence of Trade Association	<i>Trade Association</i>	Count	5	13
		Expected Count	5,5	7,5
	<i>No Trade Association</i>	Count	8	18
		Expected Count	7,5	10,5
Total	Count	13	18	31
	Expected Count	13	18	31

Table 9

Chi-Square Test of Independence: Enforcement of Cartel Rules and the Existence of a Ringleader within the Cartel

		Existence of Ringleader Within the Cartel		Total
		<i>Ringleader</i>	<i>No Ringleader</i>	
Enforcement of Cartel Rules	<i>Enforcement of Cartel Rules</i>	Count	11	14
		Expected Count	5,9	8,1
	<i>No Enforcement of Cartel Rules</i>	Count	2	15
		Expected Count	7,1	9,9
Total	Count	13	18	31
	Expected Count	13	18	31

Table 10

Nature of Infringement European Antitrust Cases without Ringleader, 2000-2011

Case	Number of Cartel Members	Type of Agreement							
		Allocation of Market Shares	Allocation of Territories	Allocation of Quantities	Allocation of Customers	Price Fixing	Bid Rigging	Buy-Backs & Compensation Schemes	Information Exchange
34018 - Far East Trade Tariff & Surcharges Agreement	16								
37027 - Zinc Phosphate	6								
37444 - SAS & Maersk Air	2								
37519 - Methionine	3								
37671 - Food Flavour Enhancers	4								
37750 - French Beer Market	2								
37766 - Netherlands Beer Market	4								
37800 - Luxembourg Brewing Industry	4								
37919 - Commissions Bancaires - Allemagne	5								
37956 - Reinforcing Bars	9								
37978 - Methylglucamine	3								
38069 - Copper Plumbing Tubes	9								
38620 - Hydrogen Peroxide & Perborate	8								
38638 - Butadiene Rubber & Emulsion Styrene	6								
38645 - Methacrylates	5								
39003 - Soda Ash: Solvay, CFK/ 33.133-B	2								
39004 - Soda Ash: Solvay/33.133-C	1								
39046 - Soda Ash: ICI/33.133-D	1								
Average/Total	5	5	1	4	10	12	0	0	9

Table 11

Nature of Infringement European Antitrust Cases with Ringleader, 2000-2011

Case	Identified Ringleaders	Number of Cartel Members	Type of Agreement																
			Allocation of Market Shares	Allocation of Territories	Allocation of Quantities	Allocation of Customers	Price Fixing	Bid Rigging	Buy-Backs & Compensation Schemes	Information Exchange									
36212 - Carbonless Paper	Arjo Wiggins Appleton Ltd.	11																	
36490 - Graphite Electrodes	SGL Carbon, UCAR International	8																	
36545 - Amino Acids	Acher Daniels Midland, Ajinomoto	5																	
36604 - Citric Acid	Acher Daniels Midland, F. Hoffmann-La Roche	5																	
37370 - Sorbitates	Hoechst, Dancol Chemical Industries	5																	
37614 - Interbrew & AlkenMaes	Interbrew, AlkenMaes	4																	
37614 - Vitamins	F. Hoffmann-La Roche, BASF	13																	
37667 - Specialty Graphite	SGL Carbon	6																	
38279 - Viandas Bovines Francaises	Fédération Nationale Bovine	6																	
38456 - Blunten Nederland	Shell, Koninklijke Volker Wessels Stevin	14																	
38710 - Blunten Spain	Repsol, Productos Asfalticos	5																	
38899 - Gas Insulated Switch Gear	Siemens, ALSTOM, AIREVA	11																	
39406 - Marine Hoses	Bridgestone, Parker ITR	6																	
Average/Total		7,77	8	3	10	2	13	2	3	2	2	3	2	2	3	2	3	3	9

Table 12

Average Fines Imposed European Antitrust Cases without Cartel Ringleaders 2000-2011

Case	Number of Cartel Members	Average Base Fine*	Adjustment Imposed Fine				Average Final Fine*	Difference Base & Final Fines
			Due to Aggravating Factors	Due to Attenuating Factors	Due to Leniency	Due to Customers		
34018 - Far East Trade Tariff & Surcharges Agreement	16	0.74	-	(16) -20%	(16) -10%	0.43	-	
37027 - Zinc Phosphate	6	14.12	-	-50%	-40%	1.99	-	
37444 - SAS & Miacros Air	2	30.63	-	-2.5%	-10%	26.25	-	
37519 - Methionine	3	111	-	-	-100%	42.38	-	
37671 - Food Flavours Enhancers	4	10.17	-	-	-100%	5.14	-	
37750 - French Beer Market	2	1	50%	-	-	1.25	+	
37766 - Netherlands Beer Market	4	90.11	-	(4) -20%	(1) -100%	68.44	-	
37800 - Luxembourg Brewing Industry	4	0.89	-	-	(1) -100%	0.11	-	
37919 - Commissions Bancaires - Allemagne	5	8.4	-	-	-	20.16	+	
37956 - Reinforcing Bars	9	9.36	50%	-	-	9.45	+	
37978 - Methylcellulose	3	6.33	-	-	-	1.9	+	
38069 - Copper Plumbing Tubes	9	?	-	-10%	-40%	28.7	?	
38620 - Hydrogen Peroxide & Peroborate	8	55.54	(3) +50%	-100%	-50%	48.64	-	
38638 - Butadiene Rubber & Emulsion Styrene	6	92.59	(3) +50%	(2) -35%	(2) -15%	86.51	-	
38645 - Methacrylates	5	118.65	(3) +50%	(2) -100%	-40%	68.91	-	
39003 - Soda Ash; Solvay, CFK/33.133-B	2	3	-	-50%	-100%	3	n/a	
39004 - Soda Ash; Solvay/33.133-C	1	20	-	-	-	20	n/a	
39046 - Soda Ash; ICI/33.133-D	1	10	-	-	-	10	n/a	
Average	5	34.27	-	-	-	24.40	-	

*Average fines are in millions of Euros

Table 13

Average Fines Imposed European Antitrust Cases with Cartel Ringleaders 2000-2011

Case	Number of Cartel Members	Identified Ringleader	Adjustment Imposed Fine				Average Final Fine*	Difference Base & Final Fines
			Due to Leadership	Due to Aggravating Factors	Due to Attenuating Factors	Due to Leniency		
36212 - Carbonless Paper	11	Arjo Wiggins Appleton Ltd.	50%	-	-	-100%, -50%, -35%, -20%, (3) -10%	28.52	-
36490 - Graphite Electrodes	8	SGL Carbon, UCAR International	+85%, +60%	(4) +10%	-40%	-70%, -40%, -30%, (2) -30%, (3) -10%	27.35	-
36545 - Amino Acids	5	Archer Daniels Midland, Ammonium	+30%, +35%	-	-50%, (4) -10%	0%, (2) -50%, -20%	21.98	-
36559 - Amino Acids	5	Archer Daniels Midland, Ammonium	+30%, +35%	-	-	-90%, -50%, -40%, -30%, -20%	21.98	-
37720 - Sorbitols	5	Hoechst, Dael Chemical Industries	+30%, +30%	50%	-	-100%, -50%, -40%, -30%, -25%	27.68	-
37614 - Interbrew & Alken Mies	4	Interbrew, Alken-Maes	+50%, +35%	-	-	(2) -50%, -100%, (3) -10%	65.79	-
37667 - Specialty Graphite	13	F. Hoffmann-La Roche, BASF	50%	-	-50%	(2) -50%, -100%, (3) -35%, -30%, -15%	65.79	-
38677 - Vanilles Francaises	8	SGL Carbon	(3) +30%, (6) +20%	-	-40%	-100%, -30%	21.85	-
38710 - Blumen Spain	4	Spain Union National Distribute	+50%, +30%	-	-	-100%, -40%, -25%	21.85	-
38456 - Blumen Nederland	14	Shell, Koninklijke Völker Wessels Steyn	+50%, +30%	-50%, -10%	-	-100%, -40%, -25%	36.24	-
38710 - Blumen Spain	5	Rensol, Productos Asfihicos	+30%, +30%	-	-	-100%, -40%, -25%	36.24	-
38899 - Gas Insulated Switch Gear	11	Siemens, ALSTOM, AREVA	+50%, +30%, +30%	50%	-	-100%, -30%	68.25	-
39406 - Maiale Hoesse	6	Budgestans, Parker ITR	+30%, +30%	-	-	-100%, -30%	21.92	-
Average	7.77		42.5				27.50	

*Fines are in millions of Euros

Table 14

Fines Imposed European Antitrust Cases with Cartel Ringleaders 2000-2011

Case	Number of Cartel Members	Identified Ringleader	Adjustment Base Fines Ringleader				Final Fine Ringleader*	Difference Base & Final Fines
			Due to Leadership	Due to Aggravating Factors	Due to Attenuating Factors	Due to Leniency		
36212 - Carbonless Paper	11	Arjo Wiggins Appleton Ltd.	50%	-	-	-35%	184.27	-
36490 - Graphite Electrodes	8	SGL Carbon, UCAR International	+85%, +60%	-	-	-30%, -40%	80.2 & 50.4	+/-
36545 - Amino Acids	5	Archer Daniels Midland, Ammonium	+35%, +35%	-	-10%	n/a, -20%	99.8 & 43.5	+/-
36559 - Amino Acids	5	Archer Daniels Midland, Ammonium	+35%, +35%	-	-	-50%, -30%	39.69 & 31.5	+/-
37720 - Sorbitols	5	Hoechst, Dael Chemical Industries	+30%, +30%	-	-	-50%, -30%	99 & 16.6	+/-
37614 - Interbrew & Alken Mies	4	Interbrew, Alken-Maes	+50%, +30%	+50%, n/a	-	-50%, -10%	0.812 & 0.585	+/-
37667 - Specialty Graphite	13	F. Hoffmann-La Roche, BASF	+50%, +35%	-	-	-50%, -50%	462 & 296.16	+/-
38677 - Vanilles Francaises	8	SGL Carbon	50%	-	-	-35%	27.75	-
38710 - Blumen Spain	4	Spain Union National Distribute	+50%, +30%	-	-	-	1.44	-
38456 - Blumen Nederland	14	Shell, Koninklijke Völker Wessels Steyn	+50%, +30%	+50%, +10%	-	-40%, -25%	108 & 27.36	+/-
38710 - Blumen Spain	5	Rensol, Productos Asfihicos	+50%, +30%	-	-	-	80.5 & 83.85	+/-
38899 - Gas Insulated Switch Gear	11	Siemens, ALSTOM, AREVA	+50%, +30%, +35.7	+50%, +50%	-	-	418.01 & 65.03 & 53.55	+/-/+
39406 - Maiale Hoesse	6	Budgestans, Parker ITR	+30%, +30%	-	-	-	106.6 & 3.93	+/-
Average	7.77		42.5				96.62571	

*Fines are in millions of Euros