

The efficiency of the leniency program in European antitrust law

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1. Introduction

In 2007, the European Commissioner for Competition Neelie Kroes fined three Dutch brewers more than € 273 million for conspiring to fix prices within the Dutch beer market. Top management of Heineken, Grolsch and Bavaria used codes to arrange secret hotel and restaurant meetings. Belgian-Brazilian brewer InBev, best-known for the popular beer Stella Artois, was initially also a member of the cartel. However, it received full amnesty after disclosing key information which enabled the European Commission to uncover the group.¹

It has become widespread across different legal systems, for example the United States, the European Union and most advanced countries, to reduce fines in order to get incriminatory evidence on the existence of a cartel. These so called leniency programs are based on the principle that firms might report their illegal activities when given the right incentives. They are supposed to serve two purposes: in the short-run to facilitate the detection of cartels and in the long-run to discourage firms from cartel formation.

Leniency programs have potentially serious impacts on how efficient the legal system works. Moreover, besides the visible effect of more detected cartels, there are potential adverse effects on firms' behaviour enhancing collusion. Consequently, there is an increasing amount of economists trying to understand how these programs work and reveal their potential positive and negative effects. Furthermore, economic theorists try to discover as well how to improve them (Spagnolo, 2006).

This paper investigates the efficiency of leniency programs in the European Union by means of evaluating evidence found in economic literature on the subject. It is organised as follows. Section 2 describes a brief history on the evolution and main features of the legislation of leniency programs in the European Union. Section 3 evaluates economic analyses on the programs, continued by an evaluation of the, fewer existing, empirical and experimental results. In order to analyse the efficiency, different criteria will be set out in section 4. Section 5 summarizes and analyses the evidence. It concludes with a summary and a list of recommendations for further investigation.

2. Leniency programs in the European Union

¹ InBev revealed necessary information to start the investigation of a Dutch beer cartel in 2000. Because they were the first firm to report the fine of around €84 million was remitted.

This section discusses the recent evolution of leniency programs on cartel formation. It starts with a brief history of leniency programs, followed by a summary of the main features of the program in the European Union and its theoretical backgrounds.

2.1 Evolution of leniency programs

Detection of a cartel can occur from many sources, some are price related and come from customer complaints, others are unrelated to price and involve for example whistleblowers. Price-fixing is almost worldwide considered to reduce economic efficiency. Even though most laws forbid cartels, they continue to operate in a number of industries (Connor, 2004)². The problem is to find an efficient law detecting and enforcing prohibition of cartel formation.

The United States was the first country to adopt a leniency program which rewards whistleblowers. The Corporate Leniency Program was introduced in 1978 and was refined and extended years later. Important revisions were made on the scope of amnesty. Whenever there is no pre-existing investigation, full amnesty is automatic to the first firm to report. Moreover, amnesty is still possible when investigation has begun and incriminatory evidence is not yet available. In addition, also officers, directors and employees of the colluding firm can get amnesty when they cooperate with the antitrust authorities. The rate of cartels detected and amnesty applications increased enormously (Motchenkova 2004; Spagnolo 2006).

After the success in the United States, the European Union introduced its first law containing a leniency program in 1996. It was revised in 2002 to include the same full automatic amnesty as in the American legislation. In the period between 1996 and 2002 there were only 16 applications for leniency, of which three led to immunity (Van Barlingen, 2003). After its revision, in the period from 14 February 2002 until the end of 2005, this number increased to 167. Of these applicants, 87 requested for full amnesty and 80 for reduced fines.³ The average number of applicants a month over these years was 3 to 4.

In 2005, Commissioner Kroes announced the need to reflect on the handling of leniency within the European Competition Network. The ECN consists of the European Commission and the competition authorities of the 25 Member States. An expert group

² For more and current information on the different industries see the internet site of the European Commission of Competition, www.ec.europa.eu/comm/competition.

³ From the site of the European Commission of Competition, Frequently asked questions in press releases.

developed a Model Leniency Programme to address the issue of multiple reporting's within the ECN. The new law went into force on the 8th of December in 2006 and provides more guidance to applicants and increases the transparency of the procedure. In 2007 the European Union received over €3 billion in fines.⁴

2.2 Economic theory and features of the European leniency program

Leniency programs allow authorities to grant full immunity or a reduction in the penalties that would otherwise have been imposed on a participant in a cartel, in exchange for voluntary information on the cartel formation. The transparency is requisite for the principal aims of the program; first, facilitating the detection of cartels by getting information from the cartel members, and second, deterring firms from abusing antitrust laws by reducing trust among potential cartel members. Besides, self-reporting firms provide insider information with richer evidence which help antitrust authorities to reduce costs and time of investigation, which provides further benefits to society (Spagnolo, 2006).

Even though the legislation in the European Union copied the full automatic amnesty in case of no pre-investigation, in reality, usually, only partial amnesty is granted. Moreover, the European Union developed a significant different policy. To obtain immunity, the first reporter should reveal sufficient evidence for investigation. If investigation has already been started, the self-reporting firm can never get more than a 50% fine reduction. In addition, the legislation allows for fine reduction for multiple applicants. Theoretically, immunity or a fine reduction for the first firm to inform the European Commission, with high fines for other cartel members, induces the incentive to be the first to come forward with information. The threat of not being the first-reporter puts high pressure on corporations. However, in the European style, the different values of their reports can be taken into account, potentially enhancing the willingness to provide evidence even though one firm has already self-reported (Feess and Walzl, 2003, p.4). When firms provide evidence which represents significant value, the first company can obtain a 30 to 50% reduction, the second 20 to 30% and

⁴ Not corrected for court judgements with amount as imposed by the Commission. Neither corrected for changes following judgments of the CFI an ECJ and only considering cartel infringements under Article 81 (previously Article 85) of the Treaty. These record numbers are also due to increased fines. While the US has a maximum fine of US \$100 million, the highest cartel undertaking in the European Union, ThyssenKrupp, was almost €480 million. (www.ec.europa.eu)

subsequent companies up to 20%.⁵ Moreover, individual conspirators are not liable for penalties and imprisonment in the European Union. (Feess and Walzl, 2003; Spagnolo, 2006)

Leniency programs are closely related to the Prisoner's Dilemma. The dilemma refers to the situation whereby the criminal is already detected and put under investigation and the authorities seek cooperation in order to facilitate prosecution. In case of leniency programs in cartel situations, reduced fines may induce the violator to confess and prove guilty his partner in crime (Feess and Walzl, 2003).

3. Evaluation of economic analyses

This paragraph provides a theoretical evaluation of the economic literature on leniency programs in the European Union. The first subsection will shed more light on the advantageous results of leniency programs. The second subsection focuses on the negative effects.

Most models analyze optimal policies for the deterrence of violations of the antitrust laws in the presence of leniency programs. Others on the influence on cartel stability and its duration or the incentives firms and individuals face to self-report. It is useful to distinguish between two stages containing the leniency program in the European Union; granted leniency in case of no investigation and in the post-existing case.

3.1 Advantages of leniency programs

Kaplow and Shavell (1994) were one of the first to identify the potential benefits of schemes which give reductions to self-reporting violators. They developed a model in which individuals could apply for leniency when self-reporting a crime committed. They consider individual violators, rather than a group of violators like with cartels, who are given a benefit once. Thus, their conclusions apply to leniency programs in general.

Their main result is that self-reporting may reduce enforcement costs and improve risk-sharing as risk-averse violators face risk-less alternatives. They show that whenever a fine is significantly smaller when they cooperate than when they are detected, all violators prefer self-reporting. Moreover, the evidence antitrust authorities collect with the cooperation

⁵ For more information on the details of the European law see www.ec.europa.eu

may be socially desirable. The information provided is richer and investigation costs can be saved as no scarce resources have to be used.

Motta en Polo (2003) focus on both stages of the leniency program. Moreover, in their analytical framework, they analyze the effects of leniency programs on the deterrence and the desistence of cartels. This infinitely repeated game is played with perfectly symmetric firms and industries. The leniency program reduces fines to those who cooperate in the investigation by delivering incriminatory evidence. The strategies of the firms are made consistent with the theory that firms tend to coordinate their actions as long as they are not forced to deter on their cooperative actions. The antitrust authority is assumed to have a fixed budget which can be allocated to detection and prosecutions of cartels and so has fixed enforcement costs

Motta and Polo's (2003) article shows that only allowing fine reductions to firms which report to antitrust authorities when no investigation exists, is inferior to allowing firms discounts on their fines when revealing information during the investigation. Allowing a lenient treatment to firms under prosecution tends to increase future deterrence and makes prosecution more effective, reducing costs for the antitrust authority and thereby raising social welfare. In addition, no distinction should be made between the order of applications, the same treatment should be offered to all applicants. However, if the budget of the antitrust authority was sufficient, leniency program should not be introduced. It is still a second-best option (Motta and Polo, 2003, p. 375).

Feess and Walzl (2003) developed a model to analyze and compare leniency programs in the European Union and the United States. The stage-game contains two self-reporting stages, and assumes heterogeneous types, which means they differ in degree of evidence they can provide (a low and high evidence provider). By solving the model backwards they came to the following result regarding the European legislation.

Self-reporting schemes are much more efficient for criminal teams than for single violators, since strategic interactions between team members lead to increased expected fines, and reduce the frequency of violations. Moreover, fines in the stage of investigation should be higher than in the pre-detection stage for the one who provides evidence. Programs in which fines are more reduced when given significantly better information are more appealing. Hence, their evidence supports the European program (Feess and Walzl, 2003, p.21 and 22). However, full amnesty to the first-reporter in the pre-detection stage can never be optimal for the low evidence provider.

Motchenkova (2004) investigates the effect of leniency programs on the stability of cartels under two different regimes of fines; one where penalties are fixed and one with proportional fines. In order to do so, she uses optimal stopping and timing games. The key variable in the model is the accumulated gains of criminal offences and it considers two symmetric firms in the industry. Therefore, they have equal weight and gains in the cartel and it can be assumed that they have the same strategies. It offers full amnesty to the first company who reports and no reduction to the other(s). However, if the second firm cooperates, the first firm will get a reduction of the fine instead of leniency. If firms self-report simultaneously, they pay a reduced fine. She compares the situation whereby, as in European law⁶, application is kept confidential and so simultaneous reaction is not possible to one with less strict rules.

The comparison of the leniency program to a situation without, suggests that introducing the program is more efficient. However, strict leniency programs⁷ are more efficient, because of the impossibility of simultaneous reactions which increase expected losses in case the cartel is revealed. This happens because the second reporter can not get a reduction from fines due to simultaneous self-reporting (Motchenkova, 2003, p. 21).

Chen en Harrington (2005) explore the impact of leniency programs using a oligopolistic model, based on the prisoners dilemma, where the penalty and probability of detection are exogenous. They examine the effect on deterrence and the impact of the antitrust authorities on the price path. This price game is played for an infinite number of periods and assumes perfect monitoring, in other words, firms' prices over the periods are common knowledge. In the numerical analysis, the probability of detection is made a function of the prices firms charge.

The results show that the introduction of a strict leniency programs where only the first reporter gets the reduction makes collusion harder. Second, a more lenient program, i.e. where reductions are also available to other firms, provides different cartel members with stronger incentives to cheat. Because they can avoid penalties by simultaneous applications for leniency when some undercuts prices, the incentive induces cartel prices to lower. So even when leniency does not provide more deterrence of cartel formation, it is able to reduce the prices in cartels.

⁶ For more details on the confidentiality in European law see www.ec.europa.eu

⁷ This means that only the first firm which formally self-reports is eligible for complete amnesty from the fine. The second firm bears the full fine (even it is several seconds later to self-report than the first one), and the application procedure is strictly confidential (Motchenkova, 2004, p.11)

Spagnolo (2005) is a revision on earlier papers on the optimal leniency program. The model allows for a positive expected fine for agents that reveal sufficient incriminatory information on their cartel. It considers a society with many potential criminal organizations who are represented by a discounted infinitely repeated (oligopolistic or criminal) game between a number of risk neutral agents. First the antitrust authority sets its parameters where after firms start interacting. It is based on a generous leniency program, such as in the European Union, with reduced fines and no rewards.

The optimal leniency program is one which restricts full amnesty to the first-reporting firm. It strictly dominates the perceived risk with multiple fine reductions. Leniency programs that only reduce fines have only a deterrence effect when repeated offenders are subject to higher expected sanctions, sustained by a two-phase punishment regime. This is what Spagnolo calls the protection from fines effect. Second, a more generous program can have a deterrence effect when reduced fines are below the expected fine of a detecting agent that does not report. The cartel deterrence is present through a protection from fines effect. Moreover, leniency programs which do not pay rewards also have a deterrence effect because entering any given agreement is more risky. Whenever a firm decides to deviate from the agreement, other firms will find it convenient to punish it by reporting information. This riskiness increases even further when only the first reporter is eligible in the program.

3.2 Disadvantages of leniency program

Motta en Polo (2003) also note that reducing sanctions for firms that cooperate with the antitrust authorities during investigation, can have a negative effect. Post investigation leniency may provide incentives to collude because the expected fines are reduced and tends to reduce deterrence. Nevertheless, as already indicated, it makes prosecution more effective.

Hinloopen (2002) finds an identical mechanism that leniency programs can lead to more collusive behaviour. In his model he theoretically analyzes the European style leniency programs and focuses on the effectiveness regarding defection and repentance. It uses a lower bound on the fine of the program, which is considered to be proportional to gross annual sales of a firm, and an upper bound which is given by law and is typically 10% of gross annual revenues. It finds that penalties should be unrealistically high in order to individual cartel members to self-report. The expected cost of collusion is just not high enough.

Hinloopen suggests that the threat of fining the firm, instead of individuals, is not enough. Moreover, an important result is that the longer the period of prosecution of cartel

members after detection, the less likely firms will defect from their cartel agreement during this period. In European law, authorities are allowed to prosecute illegal cartels up to five years after their last existence.

Chen and Harrington (2005) also point out that less generous leniency programs may even enforce the stabilization of collusion. Partial leniency programs, in case when some penalties are waived, are then used as a reaction after a defection and raise expected penalties when a firm cheats. This reduces the payoff to cheating, allows cartels to set higher prices and even enforces the attractiveness of forming a cartel (Chen and Harrington, 2003, p17).

Spagnolo (2000) studies the effects of leniency programs when information is durable and self-reporting can be used as a threat against defections today and reports the same concerning counter effect of leniency programs. They can enforce collusive agreements in one-shot or infrequently repeated games and stabilize those cartels that they could not deter. However, there are possibilities to eliminate this effect. For example, sufficiently high rewards paid to the first reporting firm(s) from fines paid by the other violators, increases cartel deterrence. Moreover, this undermines the underlying trust between the colluding firms. Besides, increasing sanctions sufficiently making collusion too risky is obviously a good way of eliminating the counter effect as well.

Motchenkova (2004, p.18) also comments that when penalties and rate of law enforcement are low, it can facilitate collusion. Considering a fixed penalty scheme, the effect on deterrence only depends on the amount of fines and the probability of law enforcement.

Leliefeld and Motchenkova (2007) consider a set of two asymmetrical firms, which means that they differ in market shares and so have diverse revenues from cartel formation. This implies that unless the antitrust authority can eliminate any asymmetry in accumulated profits, the firms with greater market shares have a strategic advantage. This company can for example use predatory pricing to punish firms that deviate from the cartel. Again, in this model, only the first reporter can get complete exemption from fines. There are three different parts of the game. The small firm can decide in stage one whether to deviate from the agreement and makes this decision in light of the expected reaction of the bigger firm. The bigger firm has therefore two games. If the small company decides to inform the authority, it can choose to predate or not on its former partner. For the smaller firm, predatory pricing seems like a bigger punishment, because than it will be driven out of the market.

The results of the game suggest that the leniency program, regardless of the size of the firms, facilitates cartel formation in certain industries. This is mainly due to the fact that the leniency program can not eliminate the threat of punishment by former partners after self-

reporting. Even though the removal of trust among cartel members is a principal aim of the leniency program, it can actually provide means to stabilize cartels. It implies that the effectiveness of the programs depends on the environment of the industry (Leliefeld and Motchenkova, 2007, p.22-24)

Aubert, Kovacic and Rey (2004) conclude that applying leniency programs only to companies is not powerful enough to deter anticompetitive behaviour. They developed a model that is open to incentives for individuals to report the collusive behaviour of the firm and cash rewards. It considers the costs and benefits of creating an agency problem between firms and their employees.

It shows that allowing employees to inform authorities over the illegal agreement, increases the number of potential whistle blowers that colluding firms must persuade or keep silent in order to continue the activity. It can complement the corporate leniency program as it makes defection and reporting more attractive (see also Hammond, 2004). Moreover, rewards to individuals enforce incentives to store incriminating evidence. This is because firms may be tempted to store information if they think the others do so too and fear of a defection of the collusion. So companies may be attracted to keep the evidence in order to profit from the leniency in case a partner defects (Aubert et al., 2004, p. 35, 36)

4. Evaluation of experimental and empirical analyses

This section summarizes the experimental and empirical evidence found in the economic literature on leniency programs in the European Union. As in the previous section, results of the studies on leniency programs are separated into, respectively, positive and negative effects. Empirical literature, however, is very limited. It is troublesome as only information on detected cartels is available. Moreover, not the whole population of cartels can be observed. More research has been done in the laboratory.

4.1 Advantages of leniency program

Apestequia, Dufwemberg and Selten (2004) analyze the effects of deterrence in the presence of a leniency program in the laboratory, based on the classic one-shot Bertrand model of price competition. Four modifications of the model capture different antitrust legislations: in the framework Ideal, no antitrust law is present and cartel formation is not forbidden. Standard captures the essence of the law prior to leniency clauses. Firms face a fine of 10% of their

revenues and no reduction when they report. The Leniency framework offers a fixed percentage reduction of penalties when information is given, which is shared between all the reporting companies. It differs from the European program. There is no distinction in the order of applications for leniency. The Bonus scheme entitles firms reporting to earn a reward equal to the fines paid by non-reporting firms.

The experimental results show that the Leniency schemes provide significantly lower market prices than the Ideal system. Moreover, it indeed showed a deterrent effect on cartel formation, given the lowest number of cartels formed in comparison to the other three modifications. However, repeated interactions were not included in the game, probably influencing the actions made by the agents.⁸ This can also be seen in the, surprising, result under the Bonus system. In this scheme, individuals showed the highest percentage of cartels formed (Apesteguja et al., 2004 p.16-18).

Hinloopen en Soetevents (2005) design of their oligopoly game is related to the previous described model. However, this Bertrand pricing model allows for at least 20 periods as opposed to the one-shot game of Apesteguja et. al (2004) making analysis on the effects of leniency programs on cartel formation and recidivism possible. They address questions concerning the duration of cartels and the re-establishment of cartels after their detection. Moreover, the order in which applicants apply for leniency matters.⁹ The game contains four treatments. In Benchmark no cartel formation is possible. Communication allows agents the possibility of cooperation, but it will never lead to fines. In Antitrust, subjects face the probability to get caught and pay a fine which is dependent on their turnover. Finally, Leniency allows for the possibility to cooperate with the antitrust authority in exchange for a fine reduction in the pre-detection stage. The first reporting firm receives full immunity, the second a 50% reduction.

The main result of the experiment is that introduction of leniency programs leads to lower prices because fewer cartels were formed. There is a direct effect on the deterrence of cartels before investigation has opened. Moreover, cartels which were not deterred had a shorter duration. However, repeated offenders are common in all treatments, so the rate of recidivism is not influenced by the leniency program (Hinloopen and Soetevent, 2005, p. 18, 20)

⁸ Either lack of knowledge or because agents don't have to worry about future cooperation and so don't have to maintain a good relationship with their competitors, the leniency and bonus schemes are less likely to find collusion to be sustainable.

⁹ And so it resembles the European program more.

Hamaguchi and Kawagoe (2005) use a two-person prisoner's dilemma repeated game that represents a simple oligopoly market. It considers two different group sizes, the number of cartel members is either two or seven. Either only the first reporter is given a reduction, or all colluding firms. The effect of changing the amount of fines was not taken into account. Four sessions were conducted, one with two players and three with seven players. All subjects were restricted to collude, making analyses on the formation, deterrence and recidivism impossible.

The experimental results showed that the large size cartel face more difficulties in maintaining a cartel. In real life, firms form a cartel with on average six members, and so leniency programs can be an effective policy. A more striking result is that the schedule of leniency, whether just only the first reporter or all firms can get leniency, does not affect the effectiveness of the program (Hamaguchi and Kawagoe, 2005, p. 16 and 17).

4.2 Disadvantages of leniency program

Brenner (2005) examines the efficiency of the EU Leniency Program over the period of 1990 to 2003. It analyzes econometrically the relationship between the leniency program and the size of imposed fines and the duration of the investigation. The sample uses data of 245 firms which were involved in 53 cartel cases investigated by the European Commission. It therefore can analyze the impact of the first legislation with a leniency program established in 1996. The program promises a 75%-100% reduction of fines to the first reporter before investigation has started. When a firm cooperates with the antitrust authority during investigation it can receive a 50%-75% discount. Further confessing firms are eligible to reductions of 10 - 50%. To assess the efficiency, Brenner focuses on short term benefits by revelation of information, reducing investigation and prosecution costs, enhancing welfare by detection collusive behaviour and long term effect of deterrence of collusive behaviour.

Regarding short term effects, it finds that the program did help by eliciting information from cartel members to the extent that the level of fines reflects evidence. However, not to the point that helps to increase deterrence as the effect of information revelation was not sufficiently strong. He tested for the amount of fines in leniency programs, expecting them to be higher. However, fines were higher in cases where cartel members cooperated under the leniency program, but not much higher (Brenner, 2005, p.15 and 34), hence having no impact on deterrence. The sharp rise in the number of cartels convicted, as no significant evidence was found, can therefore not be related to the leniency program. Moreover, there was no

statistically relevant relationship found between investigation duration and cooperation, nor that leniency programs have on the expected life time of cartels.

5. Statement on criteria for efficiency

This section will set out the judgment criteria to draw a conclusion on the efficiency of leniency programs in the European Union. In order to analyze its efficiency, we need to consider a variety of effects the program implicates on social welfare. Besides we need to determine what is considered a success in law enforcement.

Obviously, because cartels shield their participants from competition, they charge higher prices and remove the pressure to improve the products they sell or find more efficient ways in which to produce them. It involves a redistribution of wealth from consumers to suppliers and therefore high social costs. Detection and prosecution of cartel members, however, impose high costs on society as well.¹⁰ Introducing a program which accomplishes a reduction on these costs is more efficient.

The main objective of an antitrust law is the deterrence of cartel formation. Prevention of collusion avoids social, investigation and prosecution costs. The threat of detection should be high enough in order to defect firms of colluding in the first place. A second objective is the effectiveness in the detection of cartels. The leniency program should induce violators to self-report so that cartels not detected do not sustain and offenders are prosecuted. However, this objective is inferior to deterrence as prosecution costs are socially undesirable. Besides, prosecution should be such a threat that convicted violators do not re-establish their cartel after detection and so has a deterrence effect on potential criminal actions.

After the introduction of the leniency program in the United States, the antitrust authorities detected and prosecuted successfully more cartels. Even though more detection of cartels could plausibly be produced by the leniency program, it is important to note that it is also possible because of more cartel formation. Moreover, in case of complete success, detection of cartels should not increase but decrease (Spagnolo, 2006, p. 10).

6. Analysis on the efficiency of leniency program

¹⁰ Prosecution costs include for example costs for courts, i.e. lawyers and experts, and agencies. Distortionary taxes levied to acquire financing the process and the social costs of Type I errors, (Spagnolo 2006)

This section provides in chronological order an analysis on the criteria of efficiency set out in the previous section.

Leniency programs have proven to reduce social costs. By accomplishing a cessation of collusive behaviour, leniency programs can improve welfare by shortening the existence of society. Moreover, leniency programs further benefits society as it accomplishes to reduce investigation and prosecution costs. Self-reporting of illegal activities leads to richer information and saves the authorities the use scarce resources. The presence of leniency programs tempts cartel members to store incriminatory evidence in case a partner breaks down of the agreement. Prosecution will be less costly in these cases. However, administrative costs by increasing applications for fine reductions can potentially outweigh the benefits in the investigation phase (Kaplow and Shavell, 1994).

Even though leniency programs are a second best option, if the authorities would have enough funding they should not introduce it, it has positive effects on deterrence and detection. In case of no investigation, only the first reporter can get full amnesty. Economic analyses suggest that it provides higher expected cost of fines for firms which are detected, making entering any collusion more risky. Moreover, its perceived risk is even more increased when only the first reporter is eligible to amnesty. It reduces the overall trust among cartel members and cartel deterrence is present. The fact that applications are kept confidential provides the impossibility of simultaneous reactions. However cooperation after detection is still possible when the firm provides significant incriminating evidence. The European law takes account of the different information colluding firms provide, facilitating prosecution even more.

A possible drawback of multiple filings is due to lower the expected fines as even though another firm has already self-reported, fines can still be reduced. Moreover, there exists some scepticism on the effects of leniency programs when expected fines are not high enough. In order to self-report and prevent collusion, penalties should be sufficiently high. Otherwise it can even enforce collusion. European law does not allow for individual applications, which may complement the program and put higher pressure on firms to self report. Besides, the European program can not prevent cartel members from punishing each other after defection. The program works less effectively in case of asymmetric industries where predatory pricing can enforce the stabilization of the cartel. Finally, it is not proven that the leniency program works efficiently in preventing re-establishment of cartels.

7. Conclusion and recommendations for further investigation

The leniency program in the European Union works efficiently in the way that it reduces costs imposed on society by means of a reduction in investigation and prosecution costs. Besides it provides richer information. It imposes mistrust among cartel members because of the threat of self-reporting. Effective prosecution and higher risks of detection provides better deterrence of cartel formation.

However, because of the lack of empirical evidence, the increased detections and prosecutions have not been significantly related to the leniency program, and so it is not (yet) possible to conclude for certain that the European program works efficiently in preventing cartel formation. It is inevitably that more empirical and experimental research needs to be done on the leniency program. There is also a need for more research on the optimal amount of sanctions with leniency as is proven that too low fines can facilitate collusion. For the European program, it is useful to consider the introduction of individual applications for leniency, as has been done in the US and is proven to be successful. Moreover, there is need for analysis on the incentives that should be provided to firms in asymmetrical industries in order to self-report. If these smaller firms do report, attention should be paid to prevent them from being pushed out of the market by its former partners as a punishment strategy.

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