Cartel Leniency Program and Cartel Enforcement in South Korea

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Executive Summary

Korea Fair Trade Commission (KFTC) is in charge of competition and consumer protection policies in South Korea. Of these policies, the cartel leniency program is the most powerful enforcement tool to regulate cartel activities which expropriate consumer surplus and create social welfare deadweight loss. The cartel leniency program grants exemptions or reductions in penalties to firms involved in the cartel activities when they cooperate with the cartel investigation of a competition authority. The Korea cartel leniency program was first adopted in 1997 and considerably revised in 2004.

The cartel leniency program can enhance the cartel detection or discovery ability of a competition authority (detection effect). The cartel leniency program also can deter the formation of new cartels or can break up the existing cartels (deterrence effect). However, there exist criticisms of the cartel leniency program because the program can be against social justice or the program can be more favorable to the big conglomerate companies. Based on these criticisms, bills to revise the current program have been discussed in the Korea National Assembly.

My research shows that the cartel leniency program as revised in 2004 is a powerful cartel enforcement tool. The 2004 leniency program considerably enhanced the cartel detection ability of KFTC. The total cartel discoveries increased about 10 per year and the discoveries of the influential cartels increased about 9 per year after the adoption of the 2004 program. The total cartel fines and the average cartel fines per discovery also increased $215 million and $8 million respectively after the adoption of the 2004 program. The results are net of other variables that can affect the cartel discoveries and they are statistically significant. Considering the fact that the increasing ratio of the discoveries of the influential cartels was

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greater than that of the total cartel discoveries and the total and average cartel fines also increased considerably after the adoption of the 2004 program, it is hard to say that the program is more favorable to the big conglomerate companies. Although there was no statistically significant evidence in accordance with a deterrence effect, just focusing on the recent discovery numbers indicates that the deterrence effect may, in fact, be occurring and can be identified in the near future.

Therefore, leaders should be cautious about the revision of the current cartel leniency program. The revision of the current cartel leniency program should be based on the objective analysis on the effects of the current program. KFTC should advertise the program and its efficacy more aggressively to get support for the program from the public.

Background

Korea Fair Trade Commission (KFTC) is a South Korean government agency. KFTC mainly takes charge of competition and consumer protection policies. It plays similar roles to the Federal Trade Commission (FTC) and the Department of Justice (DOJ) Antitrust Division in the U.S. The purpose of competition policy is to maintain competition in the relevant market. Competition policies prevent one or a small number of companies from obtaining more market power[1] or exercising their existing market power. They eventually protect the interests of the consumers.

Regulation of cartel activities is one of the most important competition policies of KFTC. Cartel activities such as price fixing or control of the total market output not only lead consumers to pay more compared to a situation without these activities but also create social

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[1] Market power means the ability to set the price above the competitive level and this conduct induces the welfare loss of consumers (Carton & Perloff, 2005).

welfare deadweight loss. KFTC has adopted and implemented many policies to regulate these cartel activities. KFTC has increased the number of investigators and budget for the cartel activity investigations. The total number of investigators in KFTC was 167 in 1991 and it increased to 385 in 2013 (KFTC Organization Rule). The budget of KFTC also increased from $4.2 million in 1991 to $93.3 million in 2013 (The Korea National Assembly). KFTC increased the maximum cartel fine rate from 5 percent to 10 percent of the total sales in 2006. It also established the Cartel Investigation Division in 2007 (KFTC, 2010).

KFTC also adopted the cartel leniency program in 1997. The efficacy of the program was limited until the program was revised in 2004. There were just 7 program applications between 1997 and 2004 (KFTC, 2008). A lot of restrictions and uncertainty to be a recipient of the program were removed in the 2004 program revision. The number of program applicants increased considerably after the 2004 program revision (KFTC, 2008).

Cartel Leniency Program

A cartel leniency program grants exemptions or reductions (amnesties) in penalties to companies or individuals involved in the cartel activities when they cooperate with the cartel investigation of a competition authority (the U.S. DOJ). To get amnesties, the companies or individuals have to provide critical evidence on the cartel activities and have to contribute to the final verdict of guilty. Since the USDOJ adopted the cartel leniency program in 1978, other competition authorities such as the European Union (EU), Germany, the United Kingdom, Japan, or South Korea introduced similar programs (Miller, 2009 and Nahm & Kim, 2010).

Although the program of each country has the same theoretical bases, the specific program design of each country is somewhat different from each other. Whereas the U.S.

offers 100 percent amnesties only to the first cooperator, EU, Germany, and South Korea offer fractional amnesties even to the later cooperators up to 50 percent. The U.S., EU, and South Korea offer amnesties without discretion although the investigation is already ongoing. However, the United Kingdom and Japan offers discretionary amnesties to the cooperators when the investigation is underway. The EU and South Korea offer amnesties even to the cartel leaders but the U.S. and Germany do not offer amnesties to the cartel leaders (Nahm & Kim, 2010).

It is commonly argued that the cartel leniency program makes the cartel activities unstable because the program gives incentives to the cartel participants to cheat on each other and to apply for the program (Miller, 2009). However, there are other theories that argue the cartel leniency program can rather stabilize the cartels or encourage forming new cartels. For example, Motta and Polo (2003) showed that the cartel leniency program can encourage forming new cartels because the participants can expect smaller penalties when their cartel activities are discovered.

The effects of the cartel leniency program can be explained by two concepts: detection effect and deterrence effect (Miller, 2009). The cartel leniency program can enhance the cartel detection or discovery ability of a competition authority (detection effect). By increased confessions and cooperation of the firms belonging to cartels, competition authorities can detect more cartels after the adoption of the program. The cartel leniency program also can deter the formation of new cartels or can break up the existing cartels (deterrence effect) because the program increases the probability of the cartel detections and that decreases the expected benefits from the cartels (Miller, 2009)

Because the cartel leniency program enhances the detection ability of a competition

authority, the number of discoveries will increase right after the adoption of the cartel

leniency program. Since the cartel leniency program deters or breaks up the cartels, the

detection numbers will decrease gradually after some time period of the program adoption.

When the cartel leniency program has both enhanced detection and deterrence effects, the

number of cartel discoveries will have the shape of Panel C in Figure 1. The discovery

number will increase right after the program adoption. However, as time passes, the

discovery number will fall below the pre-program adoption level because the detection effect

will be overwhelmed by the deterrence effect (Miller, 2009).

Figure 1. Expected Number of Cartel Discoveries by Period
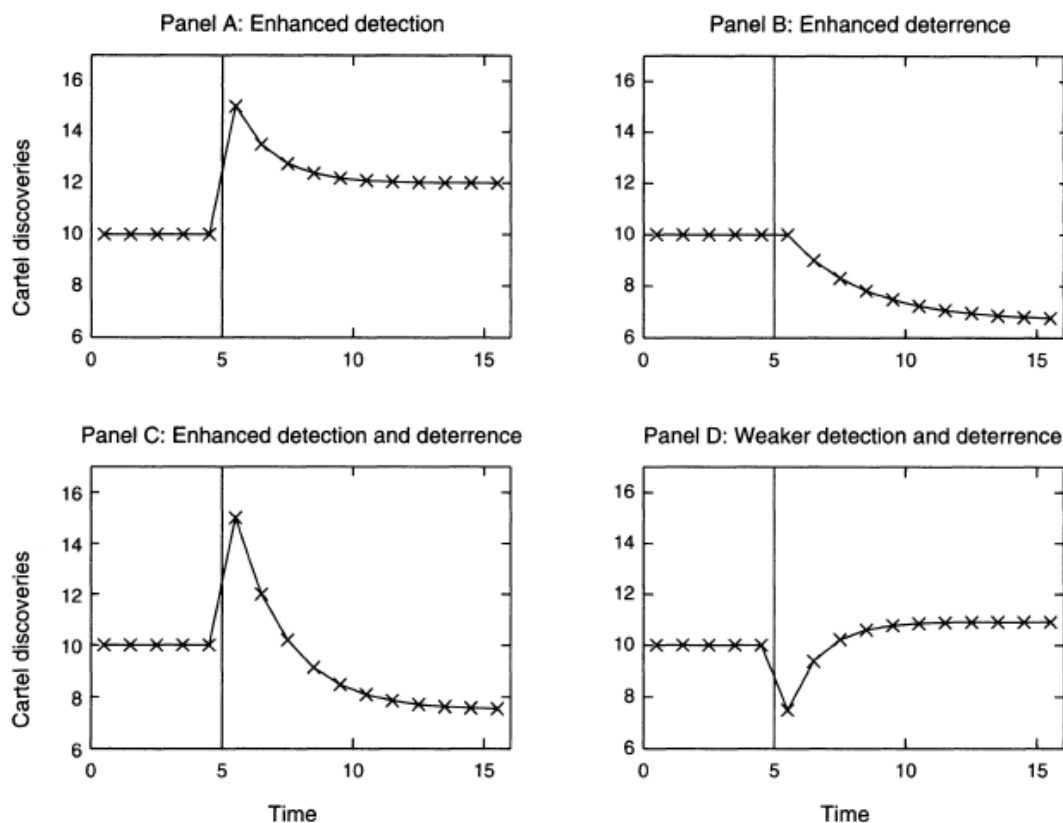
Source: Miller, N.H. (2009) "Strategic Leniency and Cartel Enforcement", America Economic
Review 99 (3): 756

Problems and Research Questions

KFTC has been arguing that the cartel leniency program became the most important and effective cartel enforcement tool in South Korea after the 2004 program revision (KFTC, 2008). However, there exist criticisms of the cartel leniency program. Critics argue that the program is against social justice because the firms and individuals who should be punished can receive exemptions or reductions in penalties just for the reason that they confess their crimes or cooperate with the investigations. Critics also say that the program is unfair because conglomerate companies can receive bigger cartel fine reductions. Based on these criticisms, the Korea National Assembly has discussed bills to reduce the scope of the recipients of the program. For example, one bill suggested excluding big conglomerate companies from the recipients of the program (Song, 2013).

In spite of these criticisms, there are theoretical bases and empirical evidences to support the cartel leniency program. The cartel leniency program can enhance the cartel detections and deter the formation of cartels or break up the existing cartels. The program eventually can enhance the consumer welfare and remove social deadweight loss through those mechanisms. However, it is not easy to find research which analyzes the objective efficacy of the cartel leniency program in South Korea.

My research is mainly aimed to analyze the objective efficacy of the cartel leniency program in South Korea. My research will examine whether there have been detection and deterrence effects. In that process, the effects of a few other cartel policies also will additionally be analyzed. Therefore, my research question is broken into two parts:

1. Did the 2004 cartel leniency program in South Korea have detection effect and deterrence effect? If so, how big were the effects?

2. What other factors and cartel policies had effects on the cartel enforcement in South Korea?

Relevant Literatures

Miller (2009) examined the efficacy of the U.S. cartel leniency program revised in 1993. He analyzed the number of cartel discoveries between 1985 and 2005 and examined whether the 1993 U.S. cartel leniency program had detection and deterrence effects. According to his research, the 1993 cartel leniency program had both detection and deterrence effects. Right after the 1993 program adoption, the detection number increased sharply but as time passed, the number started to decrease and fell below the pre-program level as shown in Figure 2.

Figure 2. The Estimated Number of Cartel Discoveries in the U.S.
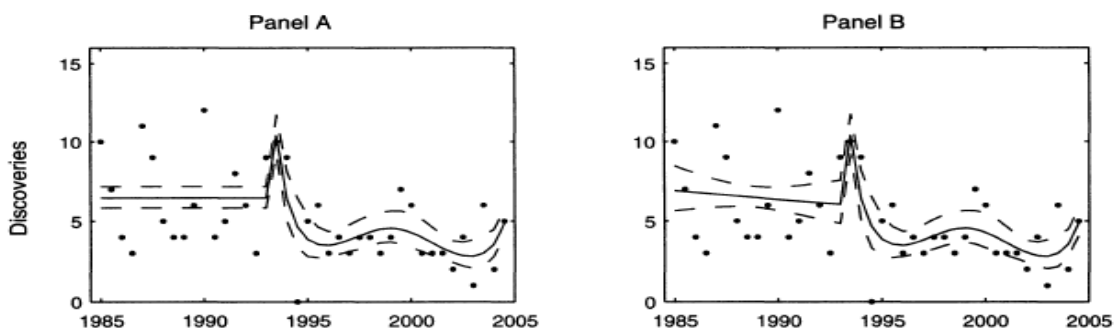
The solid lines are estimated conditional means and the dashed lines bound 95 percent confidence intervals with a reduced-form Poisson regression model. Panel A and B used different polynomials.

Source: Miller, N.H. (2009) "Strategic Leniency and Cartel Enforcement", America Economic Review 99 (3): 763

Miller (2009) included the DOJ Antitrust Division Budget allocation and total corporate fines issued by the DOJ Antitrust Division during the previous year as explanatory variables and examined the effects of those variables on the number of cartel discoveries. He

expected that the budget allocation would have a positive impact on the discovery numbers and the fines issued in the previous year would have negative impact on the discovery numbers. However, he could not find any statistically significant relationship between those variables and the discovery numbers.

Brenner (2009) examined the efficacy of the EU cartel leniency program adopted in 1996. He analyzed 61 cartel cases which were prosecuted and decided by the European Commission between 1990 and 2003. He mainly analyzed two effects of the cartel leniency program.

First, Brenner conjectured that the amount of the revealed cartel information would have increased if the cartel leniency program were effective. The increased information would have enhanced the efficiency of the cartel enforcement by EU. To test this, he examined whether the cartel fines increased and whether the duration of cartel investigation declined after the adoption of the program. He found that the level of cartel fines per firm increased statistically significantly by €31 million after the program adoption. He also found that the duration of cartel investigations declined statistically significantly by 1.5 years.

Second, Brenner also examined whether the EU cartel leniency program had a deterrence effect. He had thought that the cartel leniency program could destabilize and deter future cartel activities. However, he could not find the evidence that the EU cartel leniency program had a deterrence effect.

Song (2013) examined the effects of the Korea cartel leniency program revised in 2004. She used the data revealed in the KFTC decision papers from January, 1998 to July, 2012. She mainly compared the relevant discovery numbers before and after the 2004 program revision. She found that the discoveries of the national level cartels increased more

than the regional level cartels and the formations of national level cartels decreased more than the regional level cartels after the 2004 program revision. Song also found that the formations of cartels involved by the biggest conglomerate companies decreased after the adoption of the 2004 program.

Research Design and Data

In attempting to answer my research questions, I mainly used 23 years of observation data on the cartel discoveries and penalties. The data from 1996 to 2013 was gathered from the KFTC annual case handling statistics published in 2014. The data from 1991 to 1995 was gathered from KFTC decision papers published on the KFTC website.

KFTC can impose different types of penalties to the firms involved in the cartel activities according to the influence of the cartels. The influence of a cartel can be measured by the degree of consumer damages induced by a cartel. The influence of a cartel can increase when the cartel raises the price more, the cartel affects more consumers, or the cartel exists longer. If the influence is small or normal, KFTC just issue warnings or correction orders to the firms involved in the cartel activities. However, if the influence of the cartel is huge, KFTC impose cartel fines or require the prosecutor's office to impose criminal penalties (Korea Antitrust Law). Therefore, the number of cartels which are imposed cartel fines can be used as a proxy for the influential cartels.

Detection Effect

To examine the detection effect, I used a linear regression model. A reduced-form Poisson model used in Miller's research (2009) can be considered because the cartel discoveries are relatively small counts. However, the cartel discoveries in South Korea had a

growing pattern and the range of change in discoveries was also considerable. Therefore, the reduced-form Poisson model is not appropriate to analyze the South Korea cartel leniency program.

Table 1. Base Regression Model

$$\triangle\text{Discoveries (or }\triangle\text{Fines)} = \beta_0 + \beta_1\triangle\text{Leniency} + \beta_2\triangle\text{Budget} + \beta_3\triangle\text{PreFine} + \beta_4\triangle\text{GDP} + \beta_5\triangle\text{MarketCR} + \varepsilon$$

The main complication in my Base Regression Model is that Total Discoveries, Fine Numbers, Total Fines, and Average Fines, all increase over time, as do Budget, PreFine, GDP, and MarketCR, so that the data might show correlations which only indicate that growth in one variable is associated with growth in another variable. This problem is called spurious correlation or spurious regression. The problem is avoided by using annual differences of Total Discoveries, Fine Numbers, Total Fines, Average Fines, Budget, PreFine, GDP, MarketCR, and the leniency program. Then the growth over time in all the variables is eliminated from the model. The lack of inflation adjustment in the measures is also not a problem because this strategy eliminates any spurious correlations in monetary amounts due to inflation. Therefore, I used a regression model which relates Total Discoveries, Fine Numbers, Total Fines, Average Fines, or more precisely the changes in these, to Budget, PreFine, GDP, MarketCR, and the leniency program, again in change form rather than level form.

I used 4 dependent variables to examine the detection effect. I used the total number of cartel discoveries (Total Discoveries) as one dependent variable. Then to examine the effect of the cartel leniency program on the influential cartel discoveries, I used the number of cartels which were imposed cartel fines (Fine Numbers) as another dependent variable. I

also used the amount of total cartel fines (Total Fines) and average cartel fines per discovery (Average Fines) to examine whether the cartel leniency program increased the amount of cartel fines.

Leniency is the policy explanatory dummy variable which equals one if the year postdates the 2004 program revision and zero otherwise. Even though the cartel leniency program in South Korea was first introduced in 1997, the effect of the first program was very limited until the 2004 program revision. There were just 7 program applications before the 2004 program revision (KFTC, 2008). Therefore, I analyzed the effect of the 2004 program revision.

Budget is an explanatory variable which can control the effect of the leniency program. It can be expected that when the cartel investigation budget increases, the number of cartel detections or KFTC caseload will increase. When the budget increases, KFTC can use more resources to investigate cartel activities. The budget also can reflect the number of investigators which can investigate cartel activities. Ghosal and Gallo (2001) also suggested the cartel caseload of the DOJ may have a positive relationship with the DOJ Antitrust Division budget allocation. It is more suitable to use the direct cartel enforcement budget for this analysis purpose. However, it was difficult to identify the budget spent on the direct cartel enforcement from the KFTC total budget allocation. Therefore I used the KFTC total budget allocation as a proxy for the cartel enforcement budget.

PreFine is another explanatory variable which can control the effect of the leniency program. PreFine represents the total amount of cartel fines imposed by KFTC in the previous year. It can be expected that when the amount of the previous year cartel fines increases, the number of cartel detections or KFTC caseload will decrease in that year. Firms

will be more cautious about the cartel activities when the amount of the previous year cartel fines increases. Ghosal and Gallo (2001) also suggested the cartel caseload of DOJ may have negative relationship with the amount of cartel fines imposed in the previous year.

GDP is also an explanatory variable. GDP represents the annual South Korea gross domestic product. The annual South Korea GDP reflects the general economic condition of South Korea. This general economic condition can influence the effect of the cartel leniency program on the cartel discoveries or KFTC caseload. For example, when the economic condition deteriorates, the incentives for firms to participate in cartel activities can increase.

I also included a market concentration ratio (MarketCR) as another explanatory variable. MarketCR can be measured in different ways. For example, CR3 represents the sales share of the 3 biggest companies in the relevant market. I used CR100 as a MarketCR proxy. CR100 represents the sales share of the 100 biggest companies in the manufacturing industries. I gathered the data from the Market Economy Research institute (form 1991 to 2007) and the Korea Development Institute (from 2008 to 2011). I inferred the data on 2012 and 2013 with a simple regression model because the data have not been produced yet. It can be generally expected that when the market concentration ratio increases, the number of cartel detections or KFTC caseload will increase. Firms can be more easily involved in the cartel activities when the market concentration ratio increases because there are fewer companies to collude. Ellis and Wilson (2003) also suggested that the effect of the cartel leniency program can be affected by the market concentration ratio.

Deterrence Effect

To examine the deterrence effects, it should be tested whether the total number of cartels existing in South Korea declined after some time period of the 2004 program revision.

The problem is that the total number of cartels existing in South Korea cannot be directly observed because cartel activities are by definition secret collusions. However, the total number of cartels existing in South Korea can be inferred from the detected number of cartels. Although there are some limitations, it can be supposed that the detected cartels can represent the total number of cartels in some fashion. Miller's research (2009) was also based on this assumption. He assumed that the U.S. DOJ discovered all the cartels with the same probability. Brenner (2009) also concluded that there was no structural difference in the composition of the detected cartels after the adoption of the cartel leniency program. Therefore, I also assumed that the detected cartels can represent the total cartels existing in South Korea.

I used the same Base Regression Model used in the analysis of the detection effect and added some time polynomials adopted in Miller's research (2009) to examine whether the KFTC discoveries or case numbers had a declining pattern after some time period of the 2004 program revision. I also used some descriptive statistics to examine the probable deterrence effect in recent years.
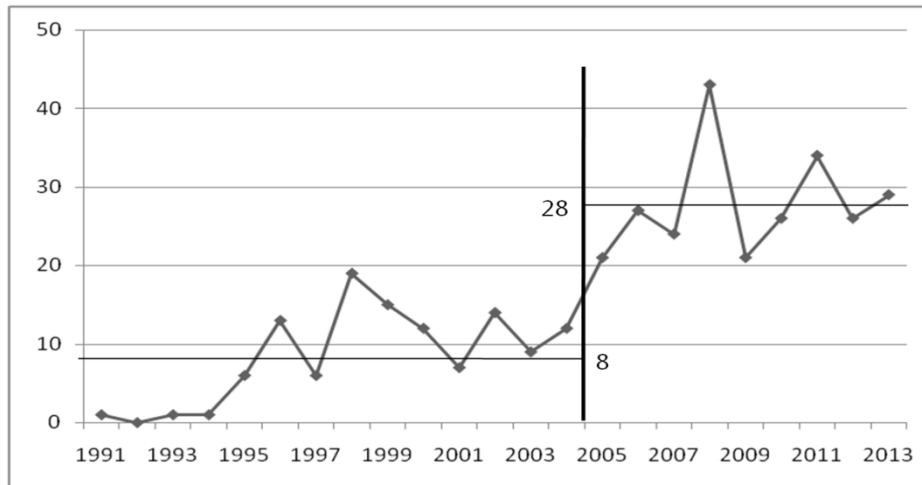
Analysis and Findings

Figure 3. Total Discoveries
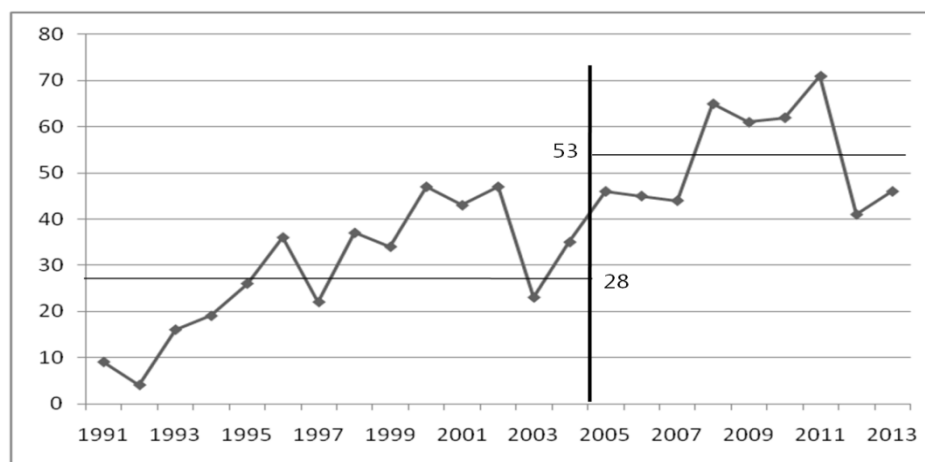
Notes: The vertical bar marks the 2004 program revision. The horizontal bars mark the averages before and after the 2004 program revison.

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The Total Discoveries had an increasing trend as shown in Figure 3. It was just 9 in 1991 and increased to 47 in 2000. Then it decreased to 23 in 2003 but it again increased to 46 in 2005 and it peaked in 2011. The average Total Discoveries between 1991 and 2004 was 28 and it increased to 53 after 2005.

Figure 4. Fine Numbers

Notes: The vertical bar marks the 2004 program revision. The horizontal bars mark the averages before and after the 2004 program revison.

The Fine Numbers also had an increasing trend as shown in Figure 4. It was just 1 in 1991 and increased to 19 in 1998. Then it decreased to 7 in 2001 but it again increased to 43 in 2005 and it peaked in 2008. The average Fine Numbers between 1991 and 2004 was 8 and it increased to 28 after 2005.

Detection Effect

The regression results in Table 2 show that the 2004 cartel leniency program had a positive effect on the Total Discoveries. That was statistically significant at the 5 percent level. After the 2004 program revision, the Total Discoveries increased about 10 per year. The other explanatory variables didn't have any statistically significant effects on the Total Discoveries.

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The regression results in Table 2 also show that the 2004 cartel leniency program had a positive effect on the Fine Numbers. That was statistically significant at the 5 percent level. After the 2004 program revision, the Fine Numbers increased about 9 per year. The other explanatory variables also didn't have any statistically significant effects on the number of cases imposed cartel fines.

Table 2. Regression Results (Total Discoveries and Fine Numbers)

	△Total Discoveries	△Fine Numbers
△Leniency	10.095** (3.760)	9.156** (3.835)
△Budget	0.482 (0.448)	0.268 (0.426)
△PreFine	0.007 (0.007)	0.012 (0.010)
△GDP	0.44 (1.255)	0.093 (0.91)
△MarketCR	0.951 (2.413)	1.149 (1.866)
Constant	-3.585 (9.411)	-1.616 (6.635)

Notes: The annual GDP growth rate is used as △GDP

*** 1 percent significance level   ** 5 percent level   * 10 percent level

The regression results in Table 3 show that the 2004 cartel leniency program also had a positive effect on the Total Fines and the Average Fines. Those were statistically significant at the 1 percent level. After the 2004 program revision, the Total Fines increased about $215 million per year and the Average Fines also increased $8 million per year respectively. The Budget had a negative effect on the Average Fines contrary to the theoretical expectations. That was statistically significant at the 10 percent level. The PreFine had a negative effect on the Average Fines. That was statistically significant at the 5 percent level. The other

explanatory variables didn't have any statistically significant effects on the Total and Average Fines.

Table 3. Regression Results (Total Fines and Average Fines)

	$\triangle$Total Fines	$\triangle$Average Fines
$\triangle$Leniency	215.275*** (45.242)	8.284*** (1.94)
$\triangle$Budget	-8.672 (5.572)	-0.402* (0.227)
$\triangle$PreFine	-0.280 (0.228)	-0.02** (0.009)
$\triangle$GDP	8.019 (5.36)	0.286 (0.291)
$\triangle$MarketCR	20.915 (22.59)	0.599 (1.276)
Constant	-4.909 (63.701)	0.62 (2.853)

Notes: The annual GDP growth rate is used as $\triangle$GDP

*** 1 percent significance level   ** 5 percent level   * 10 percent level

The increase of Total Discoveries was 10 per year and the increase of Fine Numbers was 9 per year after the 2004 program revision. However, considering the fact that the average Total Discoveries and the average Fine Numbers were 28 and 8 respectively before the 2004 program revision as shown in Figure 3 and 4, the increasing ratio of the Fine Numbers was greater than that of the Total Discoveries. Moreover, the Total and Average Fines also increased considerably after the 2004 program revision. Therefore, it can be said that the 2004 cartel leniency program increased the detections of more influential cartels and contributed to the stricter cartel enforcement.

In addition, the fact that the Budget had a positive effect on the discovery numbers but a negative effect on the amount of fines can imply that KFTC detected smaller cartels

more when the budget increased. It is probable that KFTC expanded the number of investigations rather than focusing on the investigations of the more influential cartels with the increased budget. The fact that the PreFine had a positive effect on the discovery numbers but a negative effect on the amount of cartel fines can imply that the bigger cartels were more cautious about the KFTC cartel enforcements.

Deterrence Effect

I examined the deterrence effect by introducing some time polynomials in the Base Regression Model. However, I could not find that there was any deterrence effect after the adoption of the 2004 program. This result is different from the result of Miller's research (2009). The cartel discovery number in the U.S. and South Korea basically had different patterns as shown in Figure 5. The discovery number in the U.S. had the declining trend before the 1993 cartel leniency program. The number increased right after the program adoption then it fell again below the previous level. However, the discovery number in South Korea had an overall increasing trend.

Figure 5. Comparison between the U.S. and South Korea Discovery Numbers

Panel A. The U.S. Cartel Discoveries   Panel B. South Korea Cartel Discoveries
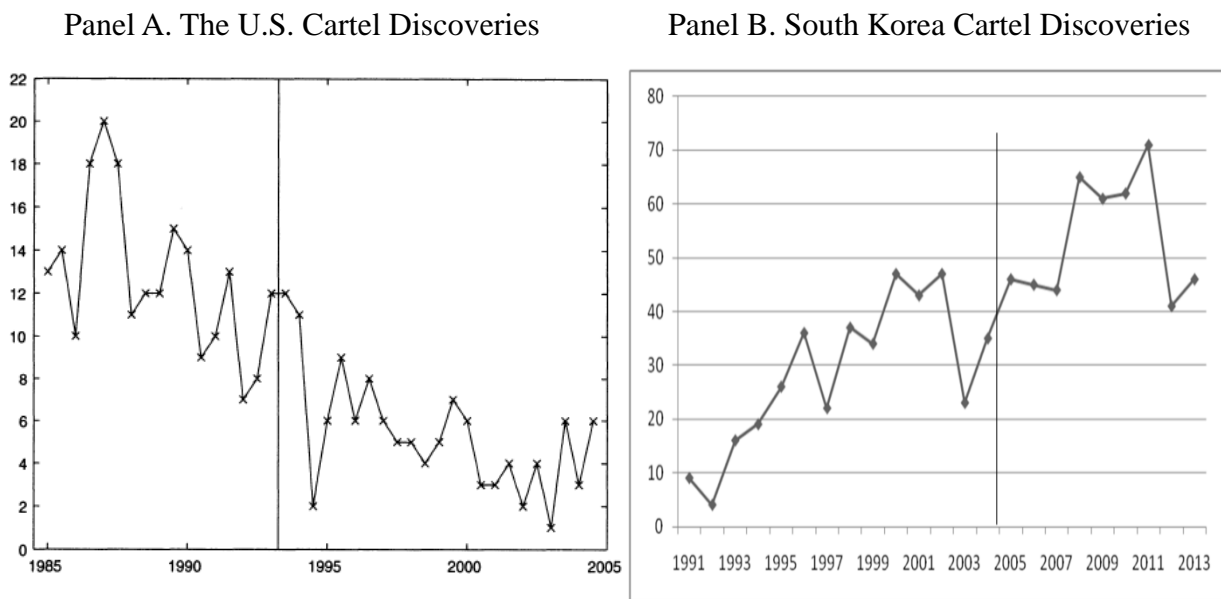
Notes: The vertical bars mark the 1993 U.S. program and 2004 South Korea program respectively.
Source of the U.S. Cartel Discoveries: Miller, N.H. (2009) "Strategic Leniency and Cartel Enforcement", America Economic Review 99 (3): 758

Even though there was no statistically significant deterrence effect, it can be said that the deterrence effect may be occurring and can be identified in the near future. When just focusing on the recent discovery numbers, the discovery numbers has been maintained below its peak level as shown in Figure 6.

Figure 6. Recent Trend of Discovery Numbers

Panel A. Total Discoveries   Panel B. Fine Numbers
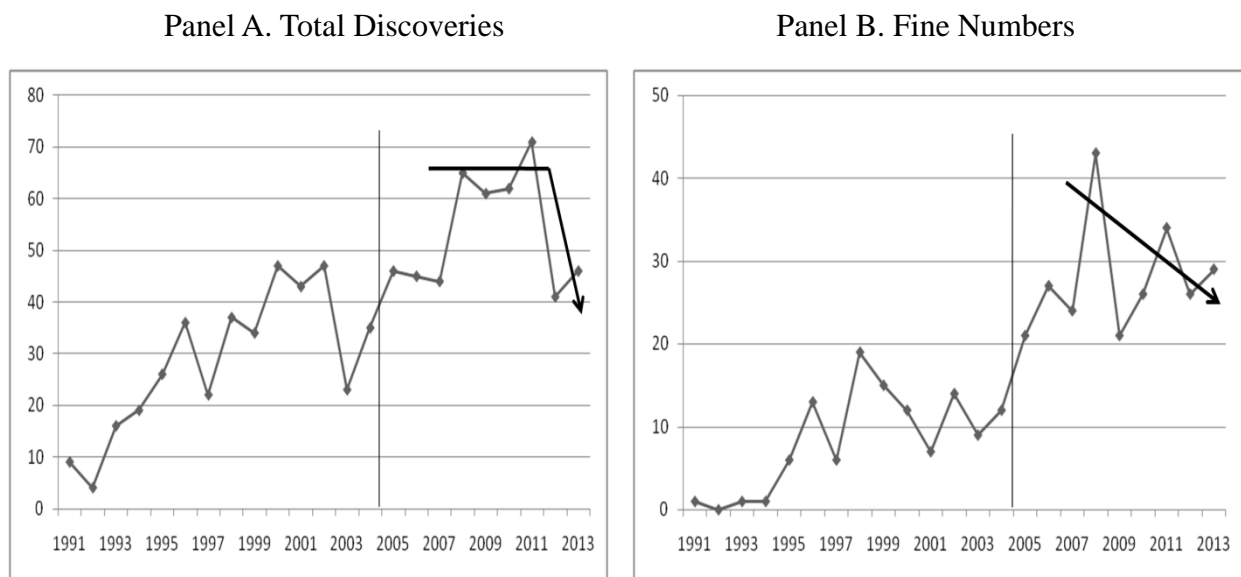
Notes: vertical bars mark the 2004 program revison. I added arbitrary arrow marks to show probable recent deterrence effect explained in the below paragraph.

The average Total Discoveries of recent two years was 43.6 whereas the average of the previous 4 years was 64.75. That corresponds to 33 percent reduction. Since the Fine Numbers marked its peak in 2008, the numbers has been maintained below that level. The average Fine Numbers in the recent 5 years was 27.2. That corresponds to 37 percent reduction compared to its peak in 2008. Song (2013) found that the formations of national level cartels decreased more than the regional level cartels after the 2004 program revision. She also found that the formations of cartels involved by the biggest conglomerate companies decreased after the program revision in 2004. Therefore, it can be said that the deterrence effect may be occurring and can be identified in the near future.

Policy Recommendations

Despite the criticisms of the cartel leniency program that the program is against social justice and it is favorable to the conglomerate companies, leaders should be cautious about the revision of the current cartel leniency program. The current cartel leniency program is definitely contributing to increase cartel discoveries and to impose stricter penalties to cartel participants. Moreover, in my research, there were no other factors and cartel policies which influenced consistently on the cartel enforcements except the cartel leniency program.

Considering the facts that the increasing ratio of the Fine Numbers was greater than that of the Total Discoveries and the Total and Average Fines also increased considerably after the 2004 program revision, it is hard to say that the cartel leniency program is more favorable to the conglomerate companies. These facts can rather imply that the cartel leniency program had more unfavorable effects on the conglomerate companies because the conglomerate companies generally participate in the more influential cartels. Therefore, the criticism that the cartel leniency program is favorable to the conglomerate companies does not have a sound basis.

To overcome the criticisms of the cartel leniency program, KFTC needs to advertise more aggressively about the effects of the cartel leniency program. Although the Korea Antitrust Law prohibits KFTC from revealing concrete information on the applications of the program, KFTC can publish the result of the statistical analysis and can more aggressively defend the current program. This effort eventually can change the emotions or feelings of the public on the cartel leniency program more favorably.

Conclusions

The 2004 cartel leniency program enhanced the cartel detection ability of KFTC. The total cartel discoveries increased about 10 per year and the influential cartel discoveries also increased about 9 per year after the 2004 program revision. Moreover, the cartel fines also increased considerably after the 2004 program revision. Although there was no statistically significant evidence, it may be that the deterrence effect may be occurring and can be discovered with the passage of more time.

It is not strange that many Korea people criticize that the program is against social justice and it is more favorable to the conglomerate companies. However, considering the effects of the current cartel leniency program, it is definitely true that the cartel leniency program is contributing to improving consumer surplus and removing social welfare deadweight losses. It is also hard to say that the cartel leniency program is more favorable to the conglomerate companies because the influential cartels were detected more and the cartel fines increased significantly after the 2004 program revision. Moreover, the cartel leniency program was the only policy which influenced consistently on the cartel enforcement. Other factors and cartel policies didn't have consistent and statistically significant effects on the cartel enforcement.

Therefore, leaders should be cautious about the revision of the current cartel leniency program. The revision of the current cartel leniency program should be based on the objective analysis on the effects of the current program. KFTC should advertise the program and its efficacy more aggressively to get support for the program from the public.

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