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Use of Economic Evidence in Cartel Cases – Contribution from Korea

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Use of Economic Evidence in Cartel Cases

- Contribution from Korea -

1. Introduction

1. The Korea Fair Trade Commission (KFTC) takes strong action against cartel conducts under Article 40 of the Monopoly Regulation and Fair Trade Act (MRFTA), which sets out that “no business entity shall agree to engage in any of conduct that unfairly restricts competition jointly with other business entities through contract, agreement, resolution, or any other method.” The KFTC also provides the general principles for handling collusion cases in the Guidelines on the Review of Collaborations Among Competitors.

2. When detecting a cartel, priority should be given to detecting it through securing direct evidence, such as meetings or communication of companies suspected of the cartel. However, as companies' collusive activities are becoming covert, it is increasingly difficult to obtain direct evidence of cartel. For such reason, economic evidence is often used as circumstantial evidence for identifying collusion and the collusion effect on the market.

3. The KFTC utilizes, as appropriate, the econometric models to present circumstantial evidence of cartels and determine whether they limit competition.

4. However, given that the recent court decisions do not recognize economic circumstantial evidence as a critical element in finding the existence of cartel with the absence of direct evidence, the economic analysis of collusion is conducted, rather than by the KFTC during its deliberation stage, more often by defendants who wish to argue that (1) there was no agreement as we do not observe significant price increase or reduction in output or (2) even if there was an agreement, it was not implemented or its effect is negligible. The KFTC reviews those economic analyses of the defendants and determines their adequacy.

5. This paper introduces the economic analysis methodology the KFTC adopts in cartel cases and overviews a recent case involving seven poultry companies who used an economic analysis as their defense. Taking a look at the analysis and problems it poses, we will see what needs to be kept in mind when conducting economic analysis with time-series data.

2. Economic Analysis Methodology in Cartel Case

6. The basic idea of estimating the effects of collusion in cases is to compare a hypothetical competitive price (but-for price) that would have been formed were it not for collusion and a collusive price. The most common method is a dummy variable approach that compares data from allegedly collusive periods, firms or markets with their non-collusive counterparts. A collusion dummy variable is supposed to capture the collusion effect.

7. The dummy variable approach is divided into (1) yardstick approach, (2) before-and-after approach, and (3) difference-in-differences approach, depending on what hypothetical competitive market to be set for the comparison with the collusive market.

8. A yardstick approach sets a market not affected by cartel activities in a suspected collusion period as a yardstick market and assumes the price of the yardstick market as a competitive price. And it compares this price with the collusive market price. The approach is based on the premise that the yardstick market and the collusive market are identical, except for the collusion occurrence.

9. A before-and-after approach compares allegedly collusive periods and non-collusive periods. Prices during the non-collusive period are regarded as a hypothetical competitive price. The price difference between the two periods allows us to determine the size of price increase caused by collusion. A key task in applying the before-and-after approach is to control any other demand or supply factors that could have created systematic difference in prices between the two periods.

10. A difference-in-differences approach is proposed in an attempt to overcome some shortcomings of the yardstick and the before-and-after approaches for the better identification of the effects of collusion. The approach, as shown in <Figure 1>, estimates cartel overcharges by subtracting the difference between prices before and after the cartel in a yardstick market (D-C) from the difference between prices before and after the cartel occurred in a collusive market (B-A). It is more rigorous than the two approaches discussed above in that this approach addresses both cross-sectional (competitive market vs. collusive market) and over-time (before-and-after) variations so as to only consider the very collusion effects.

Table 1. Comparison of yardstick, before-and-after, and difference-in-differences approaches

	Before Collusion (period 0)	After Collusion (period 1)
Collusive Market	A	B
Yardstick Market (Competitive Market)	C	D

Notes: (1) Yardstick Approach : The difference between the collusive market and the yardstick market during the period 1 = B-D

(2) Before-and-After Approach : The difference in the collusive market between period 1 and period 0 = B-A

(3) Difference-in-Differences Approach : (The difference between prices before and after the cartel in the collusive market) - (The difference between prices before and after the cartel occurred in a competitive market) = (B-A)-(D-C)

11. However, apart from the pros and cons of the approaches, securing necessary data is a priority for any analysis to be performed. Since it is not easy to secure data on a comparable yardstick or non-collusive market in actual cases, the before-and-after approach is the most used as it requires only time series data that is gathered before and after collusion from the companies suspected of collusion.

3. Economic Analysis Case: Cartel among Seven Poultry Companies (2021)

3.1. Case Overview

12. In August 2021, the KFTC imposed corrective orders and a total fine of 25.1 billion won on seven poultry companies for colluding to fix prices and supplies of broiler chicken meat. The seven companies agreed on prices and supplies of their broiler chicken meat sold from July 2011 to July 2017 and carried out the agreement, with the intent to maintain or raise the price of the meat as they wanted. Broiler chicken meat is produced by slaughtering

chickens raised on farms, removing the internal organs, and then processing them to be ready for cooking. It is used as a main ingredient in Korean ginseng chicken soup (Sam-Gye-Tang). The chicken meat is supplied to franchise restaurants or large distribution channels that use chicken as an ingredient. Chicken is the third most consumed meat in South Korea after pork and beef, and the seven companies that supply broiler chicken meat account for most of the total market.

13. The price of chicken meat is determined by discounting a certain amount from the chicken meat market price, which is surveyed and announced three times a week by the Korea Broiler Council (KBC). It can be expressed in a formula: (final sale price) = (price announced by the KBC) - (discount amount). The defendants were all members of the KBC and the subject of the KBC's market survey. Taking advantage of the situation, they colluded to artificially raise and maintain market prices for higher profits and lower losses. The companies also agreed on the upper limit or the range of discount amount, or sometimes an increase in the final price that should have been independently decided by each company.

3.2. The Defendants' Economic Analysis and Issues

14. In this case, the defendants argued that there was no anti-competitive effect from collusion. The main issue in their economic analysis was determining whether the final price (or percentage price discount) shows statistically significant changes during the alleged collusive period than the period thereafter.

15. The defendants collected monthly transaction data from February 2012 to June 2020, including the collusive period (66 months) from February 2012 to July 2017 as well as the non-collusive period (35 months) from August 2017 to June 2020. The following regression model was estimated using the data. A dependent variable is the monthly average percentage price discount (P_t), and independent variables include the dummy variable that indicates the suspected collusive period (D_t), the month dummy variable (M_t), the year dummy variables (T_t), and other control variables that may affect prices (the size of chickens, climate, etc., X_t).

$$P_t = \alpha D_t + \beta M_t + \gamma T_t + X_t \delta + e_t$$

16. The economic analysis by the defendants includes a collusion dummy together with a series of year dummy variables, which results in a multicollinearity problem between two dummies. A collusion dummy takes a value of one during the collusive period and zero in other periods. So, if we include year dummy variables, the only variation that allows us to identify the coefficient on collusion dummy comes from the comparison between the periods during and after the cartel in the year of cartel breakup (2017). Hence, the estimated collusion effect is highly likely to be biased unless the collusion effect is constant over time.

17. Specifically, when including the yearly-fixed effect in the model and performing a regression analysis, the estimated coefficient of the collusion dummy variable would be the same as the average price difference between the first half of 2017 (collusive) and the second half of 2017 (non-collusive) excluding the information from 2012 to 2016 (years with collusion only) and from 2018 to 2020 (years with non-collusion only).

Table 2. Meaning of the coefficient of collusion dummy variable when year dummy variable is excluded or included

From 2012 to 2016	2017		From 2018 to 2020
	From Jan to Jul	From Aug to Dec	
	Collusive period (D=1)		Non-collusive period (D=0)
Year Dummy	Meaning of the coefficient of collusion dummy variable		
When excluded	Average price during a collusive period - Average price during a non-collusive period		
When included	Average price during the collusive period in 2017 - Average price during the non-collusive period in 2017 (any periods out of 2017 are excluded as they are considered yearly-fixed effects)		

18. So, it is necessary to look for some economic variables that can capture the overall market change, provided that these variables are not affected by cartel activities, instead of simply adding year dummy variables. For example, if there is data on annual per capita consumption of chicken, changes in the overall demand can be controlled with the inclusion of the variable.

19. In order to address the issues stated above, the KFTC modified the defendant's regression model while using the same data. Result 1 is the estimation result from the defendants' analysis while others are the results from the KFTC. The year dummy variables are excluded as seen in the Result 2. Result 3 and 4 use the log of price level as a dependent variable, instead of percentage price discount. In addition, the annual per capita consumption of chicken is added as a proxy for aggregate demand changes to control the overall market change. As shown in <Table 2> below, the defendants argued that the results of the economic analysis with the year dummy variables show that the percentage price discount of chicken actually increased during the collusive period, leading to the reduction in prices. However, the results of the KFTC's analysis show that the percentage price discount dropped and prices rose during the collusive periods, suggesting the anti-competitive effect of cartel.

Table 3. Comparison of results between the defendant's analysis and the KFTC's analysis

	Defendants	The KFTC's Revised Analysis		
	Monthly average percentage price discount	Monthly average percentage price discount	Log of average monthly price	Log of average monthly price
	(1)	(2)	(3)	(4)
Collusion dummy	0.0XXX*	-0.0175***	0.0630***	0.0851***
Year dummy	Included	-	-	-
Month dummy	Included	Included	Included	Included
log of annual per capita consumption of chicken	-	-	-	Included

Note: 1) ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively Source:

4. Conclusion

20. Collusive agreements are established primarily by direct evidence, but also by indirect circumstantial evidence, including the economic analysis that aims to determine whether the unlawful agreement has been present and implemented and whether it restricts competition. Recently, as the defendants frequently use economic analysis to prove that their agreements had no anticompetitive effect, the related empirical methodology has become an issue in the KFTC's deliberation. Accordingly, we are making efforts to closely review the suitability of econometric models and estimation methods that can identify the effects of collusion.

21. The use of economic analysis in the cartel cases before the KFTC shows significant increase in terms of the frequency and scope. Among the final decisions by the KFTC on cartels with imposed fines between 2015 and 2016, only one case (collusion) reflected the results of economic analysis in the written resolution. By contrast, as shown in <Table 3>, there have been diverse cartel cases since October 2020, in which economic analyses were conducted.

Table 4. Cartel cases for which economic analysis was performed since October 2020

Cartel	Date of Deliberation	Economic Analysis
Steel scrap	2021. 1	Market definition, Anti-competitiveness
Wonju Gangneung Railway Bidding	2021. 3	Co-movement of prices
PHC file	2021. 3	Co-movement of prices
Broiler chicken meat for Samgyetang	2021. 8	Anti-competitiveness
Ice cream	2021. 12	Anti-competitiveness
shipping/Southeast Asian routes	2022. 1	Anti-competitiveness
Broiler chicken meat	2022. 2	Anti-competitiveness
German car	2023. 1	Market definition, Anti-competitiveness

22. As explained above, the economic analysis is mainly conducted to identify cartel impact on prices, but it is also used in various contexts, such as defining a relevant market and determining whether the market outcome could be observed with competition, for example, whether the degree of co-movement of prices is the level that is hard to be achieved without cartel agreements. In particular, with the recent total amendment to the MRFTA (effective as of December 30, 2021), information exchange was included as a condition for presuming an explicit agreement. Accordingly, economic analysis on the anti-competitiveness of information exchange is expected to increase.