

Collusion in Fuel Oil Public Bidding
(An Analytical Case Studies in Japan and Korea)

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Abstract

In November, 1999, the Japanese Fair Trade Commission (JFTC) took a legal measure to participants in bids for oil delivery work ordered by the Self-Defense Forces. In September, 2000, the Korean Fair Trade Commission (KFTC) took a legal measure to participants in bids for oil delivery work ordered by the Korean Ministry of National Defense. Enactment of these measures was not related, though there is a similarity between the cases, which involve oil delivery companies obtaining special procurement privileges via security authorities. We researched these cases and speculated as to why the industry is conducive to collusion. We established three points of focus: (a) Not so large payoff in deviation than in collusion, (b) Larger payoff in bid rotation than in competition, and (c) Sufficiently large discount factor. Then we analyzed several measures in the plan for Japanese procurement reform. The implementation can clarify points of focus integral to eradicating the participants' collusion incentive.

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Competition and Cooperation in Fuel Oil Public Bidding

1. Introduction

In November, 1999, the Japanese Fair Trade Commission (JFTC) investigated participants making bids for oil delivery work ordered by the Self-Defense Forces based on the provisions of the Antimonopoly Act (AMA: Japanese Antitrust Law), and took a legal measure to eleven parties because, based on the provision of Subsection 2 of Section 48 of the Act, these companies were in violation of the provision of Section 3 (Prohibition of unreasonable restraint of trade) of the Act. In September, 2000, the Korean Fair Trade Commission (KFTC) investigated participants in bids for oil delivery work ordered by the Korean Ministry of National Defense based on the provisions of the Monopoly Regulation and Fair Trade Act (MRFTA: Korean Antitrust Law), and took a legal measure to five parties because the companies were in violation of the provision of Subsection 1 of Section 19 (Prohibition of Unfair Collaborative Acts) of the Act.

Enactment of these measures was not related, though there is a similarity between the cases, which involve oil delivery companies obtaining special procurement privileges via security authorities. We researched these cases and speculated as to why

the industry is conducive to collusion. Subsequently, we address theoretically how bid-rigging can be prevented and assess actual bidding reform principles.

This paper constructs as follows: Section two explains the Japanese case, section three the Korean case. Section four analyzes common and different points between these cases. Section five discusses model analysis of bidding firms and presents several points of bidding system reform to be kept in mind. Section six assesses the actual reform policies of procurement in relation to the points presented in section five. Section seven provides concluding remarks.

2. Japanese Case

2.1 The defense facilities administration agency case

On November 17, 1999, the JFTC issued a recommendation to eleven oil companies, which had engaged in bid-rigging in oil procurement by the defense facilities administration agency. The JFTC also requested the agency to maintain fair and free competition in its bidding for procurement including recurrence prevention such as reforming the monitoring system or securing bidding information, and to take measures to maintain adequate bidding enforcement.

The defense facilities administration agency orders almost all gasoline,

kerosene, diesel oil, crude oil, and jet fuel by means of designated competitive bidding. At that time, the agency designates bidding participants from qualified entities who registered the list with some qualification. The number of contracted procurements by the agency is six or seven in one fiscal year, and each designated competitive bidding session differentiates types of oil and locations of bases. The agency's procurement process is as follows: First, the agency makes designations of competitive bidding (low price competition, type by type, location by location). When no participant reaches the agency's estimated price for the contract, the bidding process is repeated (up to three times). Then the agency initiates negotiation with the participant who made the lowest bid in the last (third) round of bidding in order to reach the estimated price for the contract. If the agency cannot agree with the negotiating participant, the agency terminates the negotiation and establishes a new estimated price for the contract based on that negotiation. Thereafter, the agency initiates designated competitive bidding based on the new estimated price.

2.2 Brief of violation of conduct

Since at least April, 1995, the twelve companies¹ have been determining among

¹ In April, 1999, Nippon Oil and Mitsubishi Oil are merged. Then, twelve players change eleven players.

themselves who will be the successful bidder of the designated competitive bidding to the agency based on the actual quantity of each firm in previous years in an effort to stabilize their quantities and profits. The process is as follows:

(a) For every bidding, just prior to the designated bidding day, they hold a meeting to agree on who will be the successful bidder. They choose the successful bidder based on a plan to distribute the jet fuel bids among the firms made by a manager of Cosmo oil corporation (He is a fixer of this case). Regarding gasoline, kerosene, diesel oil, and crude oil, they reveal their primary interests to each other, which are their preferential base and items as well as their individual evaluation of the base and items. Then; (i) if a bidding involves only one firm, then the firm is the successful bidder; (ii) if bidding involves several firms, then the Cosmo manager decrees the champion based on the actual performance in the previous year; and (iii) if there are no firms bidding, then the Cosmo manager awards the contract to a firm².

(b) All of them have a consensus of ill usage of the procurement system and practice. First, the agency makes designated competitive bidding (type by type, location by location). The participants of twelve firms do not bid for the bidding to raise the price of oil. They offer an impossible price for the contract with the agency, then the

² However, the participants did not disclose their real cost structure but agreed the successful bidder and the price.

high-bidding is repeated three times. Any participants other than the planned successful bidder decline the non-planned bidding before the third round of bidding. Then the agency initiates negotiation with the planned successful participant who offers the lowest bid in the last (third) round of bidding. In the negotiation, the planned successful bidder does not agree with the agency to raise the price of oil. Finally, the agency establishes a new estimated price for the contract and another designated competitive bidding based on the new estimated price. The planned successful bidder accepts the new estimated price (which is suggested by the bidder), and other participants assist the designed competitive bidding. Twelve companies had been receiving almost every order from the agency in such a manner, respectively.

3. Korean Case

3.1 The Ministry of National Defense case

On September 27, 2000, the KFTC slapped five oil companies including SK, LG-Caltex, and S-Oil, with a lawsuit for 190.1 billion won (approximately \$150 million) in surcharges for conspiring on bids to supply oil to the military. The KFTC also turned its findings over to prosecutors and requested that they take legal action against the oil companies. The KFTC also requested that the Ministry reform portions of the bidding

system regarding acquisition and estimating for contract price, based on its investigation.

3.2 The oil bidding and acquisition system

Based on a request from each demanded military annually, the acquisition office of the Ministry of National Defense concludes oil acquisition contracts for each bidding company after the Ministry completes the designated competitive bidding. This bidding formality is of two types: First is unit price bidding. According to article 22 of the law³ regarding a contract in which one party is the government, when it is necessary to continue to supply something, this bidding involves competition in terms of unit price for a contract within the annual budget. The second is request quantity bidding. According to article 17 of the cabinet order of that law, when it is necessary to acquire many goods, this bidding involves competition in terms of unit price and ability to supply a specific quantity of the goods.

The office of the Ministry announces the year's bidding schedule in the beginning of the year, then collects bidding firms' application price for the Ministry of Commerce, Industry and Energy. The office estimates the price for a contract, then

³ Korean Accounting Law.

conducts bidding to acquire a winning bid. When no bidder meets the estimated contract price, then the office raises the contract estimate and announces a new round of bidding and the process is repeated.

3.3 A brief description of violation of conduct

The KFTC recognizes five companies for the following conduct: When they participate in oil acquisition bidding to the acquisition office of the Ministry of National Defense every year, before the bidding, executives of the firms meet at a restaurant in Seoul and agree on implementation of the agreement by working-level consultation without changes. Then the working-level consultation agree on who will be the successful bidder, price, and dummy price for all schedules of the military oil bidding and implement these things jointly⁴. This conduct was recognized for financial years 1998, 1999, and 2000.

4. Common / Different points

4.1 Points of difference

In the case of Japan, the participants decide on the successful bidder for every bidding

⁴ The participants collude with each others in their several sales condition, but the negotiation details (whether to disclose their cost one another or not) are not recognized

round before making their respective bids, and defeat any rise in the estimated price during the first stage of bidding. In the case of Korea, the participants decide on the successful bidder, price, and dummy price for all schedules of the military oil bidding before making their respective bids.

These two cases differ in the following points:

- (a) The number of participants. The Japanese case involves twelve participants, the Korean case five.
- (b) The cost and benefit of each participant. Each firm in Japan and in Korea has an independent and different cost and benefit function.
- (c) The formality of the bidding. The Japanese style of bidding is complicated; the Korean style is repeat bidding.
- (d) The content of the bidding. Japanese bidding is segmented base-by-base and oil-by-oil; Korean bidding is unit price bidding.

4.2 Points of commonality

The two cases have substantially common points, as follows:

- (a) The purchaser is the only governmental entity involved; In Japan, this entity is the defense facilities administration agency. In Korea, it is the acquisition office of the

Ministry of National Defense. Generally, the cost-consciousness and incentive of the government is not stronger than that of the private sector.

(b) The goods are homogenous, difficult to differentiate, difficult to reserve, and market-priced; Japan goods are gasoline, kerosene, diesel oil, crude oil, and jet fuel.

Korean goods are medium and high thion-diesel oil including jet fuel (JP-8).

(c) The participants are fixed; Japan is almost all of twelve firms, and Korea is all five of five.

(d) The bidding is scheduled every quarter or more frequent of the year (in Japan) or annually (in Korea), and the bidding and successful bidder is open without delay (an announcement is issued to each participant).

(e) Violations of conduct are decided with great circumstances ex ante; in the case of Japan, the participants defeat a rise in the estimated price in the first stage of bidding then the successful firm, according to plan, wins the bid. In the case of Korea, the participants decide on the successful bidder, price, and dummy price for all schedules of the military oil bidding before making their respective bids.

(f) After the investigation had been completed and measures had been taken, the competition authority made requests on the procurement side; The JFTC requested the agency to maintain fair and free competition in its bidding for procurement; to seek to

prevent recurrences by, for example, reforming the monitoring system or securing bidding information; and to take measures to maintain adequate bidding enforcement. The KFTC based on its investigation, requested the Ministry to reform the acquisition and estimation for contract price portions of its bidding system.

5. Model Application

5.1 Previous studies

We can apply a model to the two cases. Of course each case has unique reason to practice such violation; we can however abstract many factors such as the number of participants, market structure (share, regulation, etc.), cost and benefit function of each firm, and formality of the bidding. In this regard, we can suppose that a firm is a symmetric, homogenous, independent, no-market power.

This type of bid-rigging is similar to cartel conduct in an oligopoly situation. The type of cartel in repeated games has attracted a great deal of attention among economists, especially after the breakthrough paper by Friedman (1971). Friedman's paper introduces trigger strategy equilibria as well as folk theorem. Also, there are many papers on topics such as imperfect observation (Green and Porter, 1984) and perfect monitoring (Rotemberg and Saloner, 1986). Our case analysis is analogous to the

Rotemberg and Saloner type; in particular, the point of similarity is that demand shifts are observable.

Further, there have been several auction collusion analysis studies. McAfee and McMillan (1992) deal with bidding coordination with or without side-payments in a one-shot game. Several works tackle case studies, such as Japanese price-fixing conspiracies (McMillan; 1991), highway construction bid rigging (Porter and Zona; 1993), forest service timber sales' bidding collusion (Baldwin, et al.; 1997), and school milk cartel bidding (Pesendorfer; 2000)⁵. Aoyagi (2003) extended this framework to repeated games. That paper shows that collusion is possible through intertemporal payoff transfer even if there is no side payment in infinitely repeated auctions. His model has a few good features, including: (i) the assumption that the auctioneer uses the same auction format every period; (ii) the two-bidders model, the qualitative conclusions of which would be applicable to three or more bidders; and (iii) the bidders' private signals are independent across periods.

We apply his model to the cases in Japan and Korea. Note that the participants in bidding are twelve or five. However, as long as attention is restricted to collusion by grand coalition, we can adopt this scheme. In these cases, bidder communication is

⁵ Fabra (2003) deals with repeated auctions from a uniform and discriminatory viewpoint of tacit collusion. Klemperer (2004) surveys comprehensive literatures. Baba (200) is also a useful reading.

explicit in the sense that reporting of private signals is done separately from bidding in the stage auction. Then, we can apply the conduct of the cases into the dynamic bid rotation scheme in Aoyagi's Theorem 2 of section four in Aoyagi (2003) .

Our situation to be applied to the theorem involves the repeated stage-auction, first-price sealed-bidding, independent private values, and a sufficiently large discount factor. In this situation, we can obtain strictly higher payoff by means of a bid rotation scheme.

5.2 Application to the known facts

Several analytical case descriptions are as follows:

(a) Not so large payoff in deviation than in collusion

For a firm, the structure of the slope of the cost function is increasing escalated. We can assume that every periods' cost structure of the firms are similar ones. In fact, fuel oil cost of each firm is mainly decided by international commodity market. Costs in economics terms (other than that from commodity market) can be considered as constant during the periods. This type of cost structure is similar to that of repeated game explanation so far (see, Rotemberg and Saloner (1986)). And this case can be applied in context of these explanations.

In this situation, if a firm deviates a stage and obtains a contract to supply a large quantity of oil products, then it is difficult for the firm to obtain so many benefits due to the resulting cost problem (for example, the delivery site is located in a distant or remote part of the country.). Thus, one deviation's benefit is not so larger than that achieved by repeated cooperation.

In addition, the participants of the repeated auction stage are fixed during the periods. The authority does not include any new entrants. And the information of the successful bidder and the price of the bidder is announced for all the participants quickly after the bidding. These factors lead all the participants other than a deviator to impose a penalty right after the deviation. There is almost no room to think unobservable deviation problem. Therefore, a deviator cannot obtain large benefits under the desk.

In the information exchange stage, in fact, they reveal their intimate information (their preferential base and items as well as their individual evaluation of the base and items). Indeed each firm may have an incentive to provide false information (to assert larger demand to get larger bids), however the long-time quota for every firms are managed in the participants. Participants can not provide false information.

(b) Larger payoff in bid rotation than in competition

One difference between competitive bidding and rotating bidding is that pricing oil products with collusion can obtain larger payoffs not only in terms of monetary benefits but also stabilized supply of certain of quality with a foreseeable price in the market-priced product. If payoffs between in bid rotation and in competition are in similar ones, a firm might not collude others under the antitrust penalty risk.

Even a firm recognizes its illegal situation in itself, the firm conduct collusion for the purpose of the expected larger payoff in bid rotation including penalty probability.

(c) Sufficiently large discount factor

Before the initiation of the competition authority's investigation, participants in both cases were not aware of any problems in their practices, and did not anticipate that these practices would be terminated. These circumstances allowed them to expect a large discount factor.

Additionally, in the Japanese case, the initiation of collusion occurred directly after the oil shock (in 1973). Although the discount factor is not linked directly to the interest rate, the interest rate's rapid depletion is likely to have some relationship to the occurrence of collusion due to recognition of increase in the discount factor.

5.3 Procurement side's (ineffective) measure

The procurement sides make a guess in order to make it difficult for participants to collude in bidding. First, they establish a complicated bidding system; for example, first the agency sets up designated competitive bidding (type by type, location by location), and when no participant reaches the agency's estimated price for the contract, there is another round of bidding up to three rounds, etc. These processes are needed with some effort of bidders, but the measures do not induce competition to each participant. The complex processes lead the participants to make detailed arrangements.

Second, they make every possible effort to come up with a precise estimate price. Indeed, the estimate price is one of the focal points of the bidding or negotiation, and collusive participants confer about how to raise the estimate price by deceptively acting so as to induce the agency to terminate the negotiation and establish a new (higher) estimated price for the contract.

6. Reform assessment

6.1 The points of the system to be reformed

The application of the model to the facts of both cases indicates several general things

to be kept in mind in reform of the bidding system.

(a) Larger payoff in deviation than in collusion

We should consider what factors increase the benefit of deviation from collusion. For example, financial incentive might induce a firm to deviate in order to increase its share of the procurement or to decrease the rate of mark-up. And also, a deviator cannot be paid any penalty from the deviation, for example a successful bidder would not be announced for every participant. Further, one unit or term of bidding can be made higher in order to allow a more significant difference between the winner and the losers.

(b) Smaller payoff in bid rotation than in competition

The differences in payoff between bid rotation and competitive bidding should be decreased. For example, the expected price can be estimated more conservatively. Once the procurement office commits to calculate severe estimated price, even the payoff in bid rotation is not so large. Then the firm should consider whether to collude or not including smaller payoff as well as antitrust penalty. It causes to shrink the incentive of antitrust collusion with small payoff.

Additionally, the standard of the product could be reformed from special standard to commercial base standard in order to go along with market price fluctuation. Further, a bonus could be given to firms supplying market-based pricing (assuming a

standard was established).

(c) Small discount factor

A small discount factor should be made systematically. For example, the framework of the bidding system can be drastically changed every five or ten years, with system changes announced beforehand. Further, if a designated competitive bidding system is chosen in the future and duly announced, the participants of the bidding would be reshuffled. These changes as well as the announcement make participants to promote an opportunistic conduct. When the procurement authority changes a bidding system next stage, a firm should deviate out of collusion so far because this stages deviation would not be punished internally in next stage. This method affects discount factor to become small.

In addition, new entrants that are supported authority would be created from wholesale trading firms with a commission (that is, whose firm has an incentive to economize margins) in order to create brand-new participants de novo. The new bidding system creation (as well as the announcement) including forced new entrants is a kind of regular reshuffle in order to make small discount factor.

6.2 Japanese reform assessment

We consider the reform program made by the heads of the procurement reform in the defense facilities administration agency. The heads issued a “Definite Plan of Procurement Reform” in April 1999. The agency implements the plan in the overall procurement system.

In the plan, there are several items to be enforced for systematic reform:

- (i) Procurement system reform (to strengthen the competitive mechanism, to reduce the life cycle cost of supplied equipment, to stimulate cost-cutting incentives (including financial incentives) for the firm side),
- (ii) Procurement organization reform (to reform central procurement of the defense facilities administration agency, to reexamine the structure of the organization and the job rotation system, to arrange the monitoring system so that monitoring is conducted by a third party, to reinforce education and offer training courses with regard to procurement businesses), and
- (iii) Review the Self-Defense official’s reemployment (to change the administrative process).

Although this plan applies not only to fuel oil procurement but also overall procurement of Self-Defense facilities and equipment, we can briefly evaluate the plan in light of the implications of the model analysis. For example, the financial incentive

for cost-cut schemes in procurement of oil has a beneficial effect because the incentive contract is fitted to the countermeasure against the incentive compatibility condition for truth-telling of our analysis. In addition, the plan for reforming from special standard to the commercial standard is attractive to new entrants, and gaining new entrants will lead to a smaller payoff in bid rotation than in competition.

7. Concluding remarks

This paper focuses on the antitrust case of fuel oil procurement by a defense agency in Japan in 1999 and in Korea, in 2000, and applies a bidding collusion model to consider the conditions and countermeasures. As a matter of course, both cases have unique and special factors, but we abstract some details of the respective situations to analyze. Our results provide three realistic points to keep in mind: (a) Not so large payoff in deviation than in collusion, (b) Larger payoff in bid rotation than in competition, and (c) Sufficiently large discount factor. Then we consider measures that could be taken to implement Japanese procurement reform. The goal of reform is to eradicate the collusion incentive. This paper contributes applications of the model to real cases and clarifies collusion incentives and countermeasures in layman's language.

Our important extension of application of the model is to accumulate case

studies based on the economic framework, especially recent leniency programs' effect such as Motta and Polo (2003), Hinlopen (2003). It is necessary to establish a collusion-free system design, to which end additional studies such as cases of bid rigging in the construction industry (called "dango") are needed⁶. Moreover, the experimental approach (e.g., Nihashi et al. 2000) is also useful. The main conclusion of the experiments in Nihashi et al. (2000) was that an outsider, a subject who is not allowed to communicate with other subjects, has a robust effect to prevent other subjects from colluding and to decrease the winning price considerably. This is an interesting result when we consider ways in which to reform the bidding system. We can and should build up an effective and realistic bidding system by applying theoretical result and findings from additional studies.

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