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Transaction Costs Associated with Japanese Public Construction Procurement

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Abstract
In public construction procurement in Japan, dango, a type of rotational and complementary bidding, had been a common practice and certainly had contributed to smooth implementation of many projects. To prevent illegal dango practices, the anti-monopoly law is recently strengthened. However, this law amendment is bringing side-effects: cut-throat and bottomless price competition. As a result, there is a deep concern on deterioration of quality of works. More careful risk management is now introduced; however, a new scheme is pushing up transaction costs drastically. It is now required to effectively do risk management at low transaction costs. Thus, the objectives of this paper are 1) to demonstrate that the transaction costs associated with dango practices are low and 2) to discuss a new direction of practices at low transaction costs. Achievement of the first objective is needed to move to the second objective because understanding strength and weakness of the current scheme is needed for its reform. The author first demonstrates that dango practices and the arrangement employed by De Beers to market gem-quality rough diamonds have very similar characteristics. The author second applies trust theory advocated in the field of socio-psychology, prescribing a way of minimizing the both transaction costs and opportunity costs.

Keywords
Dango, transaction costs, public construction procurement, De Beers, trust theory

1. Introduction

In public construction procurement in Japan, dango, a type of rotational and complementary bidding, has been a common practice. Dango certainly had contributed to smooth implementation of many public works. That is, its transaction costs seem low.

There is no question, however, that this practice is illegal. Thus, anti-monopoly law is recently strengthened. Its impact is dramatic: top four general contractors declared to stay away from dango. However, this law amendment is bringing side-effects: price competition becomes cut-throat and often bottomless. As a result, there is a deep concern on deterioration of quality of works.

To prevent the deterioration, more careful risk management is introduced. Its representative means is so-called comprehensive evaluation method, which evaluate and appraise not only price but also technical proposal in bidding. However, this scheme is pushing up transaction costs drastically. It is now required to effectively do risk management at low transaction costs.

Thus, the objectives of this paper are 1) to demonstrate that the transaction costs associated with dango practices are low and 2) to discuss a new direction of practices at low transaction costs. Achievement of

the first objective is needed to move to the second objective because understanding strength and weakness of the current scheme is needed for its reform.

To discuss the first objective, an attempt is made to compare dango practices with the arrangement employed by De Beers to market gem-quality rough diamonds whose viability is discussed by Kenney and Klein (Kenney and Klein, 1983). Then the author demonstrates that the both transactions have very similar characteristics and that dango practices have an economic viability when there is sufficient budget and massive construction is required. To discuss the second objective, the author applies trust theory advocated in the field of socio-psychology, prescribing a way of minimizing the both transaction costs and opportunity costs, which is required in the current reform of dango. An attempt is then made to analyze whether the current reform is in line with measures recommended by the trust theory and to identify where should be further strengthened.

2. Characteristics of the Marketing Arrangements by the De Beers Group

The Central Selling Organization (CSO) of the De Beers Group markets the largest number of gem-quality uncut diamond in the world. Main characteristics of the marketing arrangement employed by the De Beers are as follows (Kenny and Kelin, 1983):

- the CSO categorizes each rough diamond by shape, quality, color, and weight;
- only invited buyers are eligible to purchase stones; and
- the CSO assembles a single box (or "sight") of diamonds for each buyer which he/she wishes to purchase. There is no negotiation over the price or composition of the site. Buyers who reject the diamonds offered them are deleted from the list of invited customers.

The values of stones within each category are not the same, and actually their variance is substantial. The sales price can be said to be the average price in each category. Some stones may be undervalued, and other stones may be overvalued. If buyers are allowed to search for undervalued stones and only purchase them, overpriced stones are remained.

To avoid rejection of overpriced stones by buyers, the seller also needs to increase categorization efforts and price each stone more accurately. Since seller's and buyers' valuing criteria are similar; however, their evaluation efforts are duplicative and end up with creating social costs. Kenney and Klein label the attempt by buyers to obtain an informational advantage over the seller "oversearching." The arrangement by the De Beers has advantage to avoid the oversearching and to save costs of evaluating values of stones.

A part of saved evaluation costs is used as the premium, which is "added" to the sales price. "Addition" of the premium plays an important role in discouraging buyers to reject their assigned sights and completing sell and buy transactions smoothly.

3. Comparison Between the Two Approaches

3.1 Similarities between the Two Approaches

If we recognize the Japanese public clients and De Beers group as the client and contractors and buyers as trading partners of the clients, conventional public construction procurement practices in Japan and the arrangements by De Beers group have very similar characteristics.

The first similarity is that the both clients have been monopolistically conducting a great amount of transactions. In 1977 fiscal year when the number of ordered public works was the highest in Japan, more

than 550,000 public works were ordered. One of the highest concerns for the both clients is smooth completion of transactions.

The second similarity is that the both clients efficiently estimate mean values or statistical average of stones or construction service of which they would like to conduct transaction and set those values as the upper limit of the transaction price. In Japanese public works through field surveys of material price, labor price, and depreciation of machine and broad survey of quantity-per-unit, the ceiling price is derived. The engineer's estimate obtained in the above-mentioned process seems more exhaustive than those in foreign countries. In deriving this ceiling price, however, all construction conditions of each work are not necessarily incorporated. Thus, this price is still considered average price of the works given conditions.

The third similarity is that the both clients set the upper limit of the transaction prices and do not accept negotiations for price change in principle. In the Japanese public works the ceiling price strictly becomes the upper limit. If all bid prices exceed the ceiling price, contractors are asked to re-bid. In this case, the ceiling price is not changed.

Furthermore, in the current standard covenants of public works, there is no article prescribing equal rights of the contractor to make claims against the client. Some change in contract value should be decided through negotiations between the client and the contractor in principle. However, it has been pointed out for a long time that "contract issues are often left up to the client and the contractor is apt to be in a weaker position." The public clients often determine the change in contract value by themselves.

The fourth similarity is that the client does not substantially accept an offer from the partner to withdraw from this transaction even though the client determines the transaction price in a one-sided manner. Under the conventional practices, the designated contractor cannot refuse the participation in the bid. Moreover the contractor who is agreed to win the contract among designated contractors must win the contract no matter how low the ceiling price is set for that particular project. If all bid prices are higher than the ceiling price, the public client would lose his/her face. Furthermore, in practice, some public client requests the contractor to do various types of service which are not specified in the contract. The contractor cannot refuse to do these jobs either.

The fifth similarity is that the averaged price of the actual transaction price seems to be set higher than the estimated market price. Comparing the prices of public and private building construction in which their direct comparison is possible, the price of public works is considered higher than that of similar private building. Under recession, especially, difference in price between the public and private buildings becomes even larger.

Regarding the design document change, not a few indeterminate factors exist, which is often criticized by contractors. Nonetheless, it has been often pointed out by the client that the design document change is actually high return business for the contractor.

Here by adopting the concept by Kenny and Klein, we define the premium as the difference in the awarded price of public works and its real market price. There are some projects whose execution would only bring deficit; however, the averaged premium among projects executed by each contractor is generally considered a high value. A high positive premium has played an important role in realizing smooth and secured implementation of public works.

The sixth similarity is that the client only does business with selected partners. Under the designated competitive bidding, the designated bidders can only bid. In dango initiated or led by the public client, whose existence is recently revealed, the client determines the "winner" contractor for a project called for a bid. Selecting partners has played an important role in achieving the certainty of results.

3.2 Summary of the Common Characteristics

In the two types of transactions with the six similarities, the expectation bared by each client towards buyers or contractors is considered the assurance defined by Yamagishi (Yamagishi, 1998). The both clients are very much concerned with smooth completion of many transactions. Therefore, the social uncertainty is potentially high for the both clients.

A situation with the social uncertainty is defined as the situation in which one has a loss if the other acts selfishly (Yamagishi, 1998). One way to deal with high social uncertainty is to develop a long-term commitment relationship. By forming this commitment the both parties judge each other that the other has no reason to exploit oneself. Yamagishi claims that the "assurance" is developed from judging that the social uncertainty does not exist (Yamagishi, 1998).

There is a view that pricing gem-quality uncut diamond is very much subjective or even "virtual." In this sense the two transactions are very different. However, the both clients had been conducting his/her business with potentially high social uncertainty successfully for a long time. In order for the both clients to deal with the high social uncertainty, they create assurance by selecting certain business partners, having a long term business relationship with them, and adding premium to the market price and making the transaction price higher. The clients remove the social uncertainty by developing a framework that selected partners gains much profit as long as they stay in the business relationship.

In the next section, the above-mentioned characteristics of the conventional public construction procurement in Japan are explained through transaction economics approach, and their economic viability is comprehensively discussed.

4. Economic Viability of Japanese Procurement Practices

4.1 Transaction Costs in Construction

Transaction costs are defined as costs which should be shouldered by those who participate in transaction of goods or service.

Grunberg and Eve classify transaction costs for those who procure construction service as follows (Grunberg and Eve, 2000):

- *Search costs are the costs of finding out information about who is offering what products or services and at what prices.*
- Product or service specification costs are the costs of specifying t*he product or service to be supplied in order to obtain the desired quantity and quality.*
- *Contract selection, contract design, and negotiation costs are the costs of finding or creating forms and conditions of contract that are suitable to the particular needs of the buyer in the particular transaction in question.*
- *Supplier selection costs occur if the product or service to be purchased does not have a single, uniform market price, as is the case in construction. Normally a price competition will have to be organized between potential suppliers, with the contract awarded to the lowest priced tenderer.*
- *Contract performance monitoring costs are transaction costs incurred due to the need to measure and control performance in terms of its price, timing and quality.*
- *Contract enforcement costs are the cost of legal bills and delays.*

Comprehensive costs associated with construction service are the addition of costs needed for construction and transaction costs mentioned above. Hereafter this addition is referred as comprehensive construction costs. The comprehensive costs consist of the following components:

- construction production costs (pure production and finance costs);
- advanced transaction costs (search, product or service specification, contract selection, contract design, and negotiation, and supplier selection costs);
- interim transaction costs (contract performance monitoring costs); and
- posteriori transaction costs (contract enforcement costs)

Efficiency of procurement of construction service is not solely represented with construction production costs. For example, the British market which has attempted to minimize the production costs through market is criticized against its inefficiency. Overall efficiency of procurement is partly represented with the comprehensive construction costs. A goal of designing procurement systems of public works is to find and implement advanced and interim transaction processes such that the comprehensive construction costs are minimized.

4.2 Level of transaction costs associated with conventional schemes

Level of transaction costs associated with conventional schemes is discussed as follows.

Search costs are considered low. The first factor is nature of competition as pointed out by Kunishima and Shoji (Kunishima and Shoji, 1994). That is, the conventional competitive bidding in Japan has been "controlled competition among contractors with the same business type and rank in the same region." The second factor is an efficient way of ranking contractors based on scores of the business evaluation.

Product or service specification costs are also considered low. Characteristics to lower these costs are as follows:

- in not a few projects, scope of works are undetermined, and precision of design drawing is low;
- the ceiling price is efficiently estimated through obtaining the statistically averaged price of each project based on the records of past projects; and
- in many types of works, standard rate of productivity is specified, and cost estimation manual is published. These enable public client to do cost estimation easily.

Regarding contract selection, contract design, and negotiation costs, one component pushes up them, but the other components lower them. The former component is slicing and packaging contracts, which has been employed to achieve equal sharing among contractors. The latter components are no room for price negotiation, which avoids oversearching, and existence of assurance, which removes the social uncertainty and minimizes the role of contracts.

Supplier selection costs are also low because the winner is basically determined through the dango among contractors or the dango initiated and led by public client.

It is not straightforward to estimate contract performance monitoring costs because role sharing of site management and monitoring are often unclear among related parties. It is reported, however, that "under the term of "responsible construction," which is often used by construction parties but not specified in the contract, the client often requests contractors to do works out of project scope." This report hints that the contract performance monitoring costs are also low.

It should be noted, however, that in many Japanese public works payment from the client to contractors is generally made at the beginning and completion of projects. Thus, many monitoring works and their related costs concentrate at the end of project.

Contract enforcement costs are low because there has been hardly dispute between the client and the contractor in Japanese public works.

Thus, advance, interim, and posteriori transaction costs associated with conventional public construction procurement practices are considered low.

5. A Direction of Reform of Dango Systems

5.1 Current Reform of Dango Systems

Although the Dango systems had been contributing to smooth implementation of many projects, there is no question that this behavior is illegal. Recently the anti-monopoly law is strengthened, and much higher penalty associated with the dango is prescribed.

Strengthening of the anti-monopoly law is bringing two changes: one is to change from the conventional designated competitive bidding method to the general competitive bidding method. The other is to enact law for promoting quality assurance of public works and to introduce the comprehensive evaluation method, in which not only price bust also technical proposal is evaluated and appraised in bidding. The comprehensive evaluation method is mainly introduced by the Ministry of land, infrastructure, and transport (MLIT). Many local governments were first reluctant to introduce the new method. In 2006, however, three governors of Fukushima, Wakayama, and Miyazaki prefectures were arrested for bribery associated with bidding. Responding to these disgraceful incidents, all Japan governor association recommends introduction of the general competitive bidding and the comprehensive evaluation method for a project at the contract value of more than 10 million Japanese Yen.

5.2 A Direction of Reform of Dango Systems

Change from designated competitive bidding into general competitive bidding has two significances: The first one is a reason for this change: it is that the opportunity costs are perceived to be high. The second one is its result: quality deterioration is apprehended. That is, the social uncertainty increases. The comprehensive evaluation method is a means to deal with the social uncertainty.

Watanabe applies structural theory of trust to discussions of reform of bidding and contract systems in Japanese public works (Watanabe, 2004). He proposes that when the both social uncertainty and the opportunity costs are high, reform for the public client implied from the trust theory are that they should a) enhance their trustworthiness, b) deal with bidders with trust and confidence, and c) develop the “social intelligence” to assess trustworthiness of bidders. Here trust is defined as “one’s expectation that the other does not have an intension to exploit oneself based on one’s evaluation of the other’s personality and the other’s emotion toward oneself when the social uncertainty exists” (Yamagishi, 1998).

Introduction of the comprehensive evaluation method corresponds to c). The social intelligence is applicable to three stages: advanced construction or bidding stage, interim construction stage, and completion and posteriori stage. Examples of the social intelligence at the advance construction stage are registration, ranking, and bidding proposal appraisal. Those at the interim construction stage are supervision, monitoring, and intermediate inspection. Those at the completion and posteriori stage are final inspection and performance evaluation. In addition to introduction of the comprehensive evaluation method, enhancement or development of other types of the social intelligence is discussed and attempted.

For the time being, the next step in the reform should be to a) enhance their trustworthiness of public clients though development of the social intelligence is insufficient yet. The issue of trustworthiness has been actually discussed in the topic of fulfilling the client responsibility. However, this responsibility is not necessarily seriously taken by many public clients.

This weak fulfillment is caused by insufficient understanding of real necessity of enhancing or maintaining the trustworthiness. The client responsibility has been defined as the responsibility of achieving timely completion of projects with good quality and reasonable costs. The client responsibility is an effect rather than a cause of trustworthiness; thus, many clients understand that there are other means to fulfill the client responsibility than enhancing their trustworthiness such as introducing comprehensive evaluation method. Raising slogan of fulfilling the client responsibility has not motivated many clients to enhance or maintain their own trustworthiness.

The first necessity of trustworthiness lies in that trustworthiness towards public client is lowering. The source of trustworthiness has been high premium, that is, sufficient payment supported by “deep pocket.” Due to severe financial constraint, however, achievement of sufficient payment is recently becoming difficult.

The second necessity of trustworthiness lies in that the opportunity costs become higher for contractors, too. That is, projects and public clients are also selected by contractors. In fact, the number of unsuccessful bids is recently increasing. Under general competitive bidding, contractors can “stay away” from a project with poor profit margin expected. This was impossible under the designated competitive bidding because contractors staying away from unattractive projects are “retaliated,” that is, would never be designated from clients in future. Under the general competitive bidding, not only clients but also contractors can select their business partner. To be selected by contractors, enhancing or maintaining trustworthiness is a fundamental condition.

An important measure to enhance or maintain the client’s trustworthiness is to change conventional contract management. Under conventional contract management, a project is often put on a tender with a design document at insufficient precision. When discrepancy is found during construction between construction conditions specified in the design document and actual contract conditions, necessary modification is made at the initiative of public client. Construction is continued, and additional payment accompanied by the design document change is generally made at the end of construction. This management is suitable to meeting implementation of a large number of projects with deep pocket.

In some recent projects especially ordered by local governments, however, this conventional management does not work properly. As mentioned before, the number of unsuccessful bids is increasing. In other projects additional budget request accompanied by design document changes were not approved by local diets.

This suggests necessity of changing conventional contract management: to increase precision of design documents and enhance consistency of design document change process are important. As a foundation to improve the client’s behavior, introduction of progress payment method is indispensable.

5.3 Transaction Costs Associated with New Method

Introduction of comprehensive evaluation method has already increased the transaction costs sharply. Many public clients apprehend this sharp cost increase. Application of new contract management proposed in the previous section further increases the transaction costs.

Watanabe defined a conventional bidding rule in Japanese public works as “selection of the contractor to minimize the transaction costs for the client to fulfill the client’s requirement” (Watanabe, 2004).

Transaction costs are costs to deal with uncertainty. The conventional bidding rule had been working well because the social uncertainty was substantially zero by forming the assurance. Such a client's attitude of bearing minimum transaction costs had potentially obliged contractors to take unsound risk. Under the assurance systems, contractors were willing to take those risks because they had obtained sufficient return. When the assurance is not maintained, other methods must be used to deal with the social uncertainty.

It is true, however, that the transaction costs can increase endlessly especially under shrinking construction market and cutthroat bidding competition. The cycle that the client develops new measures and the contractor "masters the game," that is, responds to client's measures can be repeated continuously.

Thus, it is important to carefully find a most desirable level of transaction costs. It is needed to estimate damage or loss incurred by various types of risks given each level of transaction costs. Such estimation would be a foundation to find a new bidding rule and contract management to desirably minimize the damage costs and transaction costs.

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