Transaction Costs for Design-Build-Finance-Maintain Contracts

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This paper gives insight in how transaction costs arise and how in theory transaction costs can be reduced. A comparison between theory and practice has been made.

A study of a case in the Netherlands, the Second Coentunnel showed how transaction costs in practice appear, in which stage of the purchasing process these cost arise and also how transaction costs can be reduced. Cost specifications, handed by the public and private parties, make clear that in every phase of the process the client makes expenses. The client spends the most money during the initiative phase. The private parties start making costs in the first phase of the tender (prequalification). For contractors the most expensive phase is the dialogue phase.

Taking all the costs in overview, noticeable is that all of the costs are related to the duration of the different phases of the process and required capacity of personnel. Success factors from theory and practice have been identified in the process in which transaction costs arise. Theory and practice have been compared and resulted in a list of twelve success factors. By implementing these success factors in future projects the expectation is that transaction costs will not be unnecessary high.

KEYWORDS: Transaction costs, Purchasing efficiency, Competitive dialogue, Interaction

INTRODUCTION

One of the goals of the Dutch government is to introduce and use Public Private Partnerships (PPP's) on a structural base. Since the year 2004 different projects PPP projects have been started (Rijkswaterstaat, 2004). One of the PPP contract forms is Design-Build-Finance-Maintain (DBFM) in which the contractor has to design, build and finance the project and after finishing has to maintain the project for several years.

In the year 2005 the former Taskforce PPS concluded that: Transaction costs within PPP's are a problem for the involved public and private parties. (Peijs, 2005) In the context of the research subject transaction costs are the costs that public and private parties make during the purchasing process until a contract is signed.

It is clear that making transaction costs should be minimized as far as possible. Both public and private parties would benefit from it.

The problem is that transaction costs are high, but none of the parties exactly know how high the total costs are.

The aim of this paper is to gain insight in how and where transaction costs arise and how they can be reduced.

Transaction costs

The Principal-Agent theory states that transaction costs arise in a hierarchical relation between a Principal (client) and Agent (contractor). It is a relationship in which the Principal hires an Agent for his expertise. In this relationship information asymmetry arises. To be sure that the Agent doesn't abuse this information asymmetry for his own strategic advantage (opportunistic behaviour) the Principal can implement so-called coordination mechanisms.

In the context of the Principal-Agent theory transaction costs are the costs for creating and managing these coordination mechanisms. These coordination mechanisms are (Welling, 2006):

- Contract

- Rewarding system

- Monitoring

- Bonding

- Phasing of the decision-making process

Purchasing

Purchasing theory can be used to define a good purchasing process in terms of organization and management. The theory describes how a good purchasing result can be achieved. Distinction has to be made between purchasing efficiency and purchasing effectiveness. Purchasing efficiency and purchasing effectiveness together determine the purchasing result. In the context of the research transaction costs can be reduced if the process is managed and organized more efficiently. To be able to use the theory, the purchasing process was set parallel to the construction industry/building process, according to Welling (2006). The research focus is on particular phases of this process (see Figure 1).
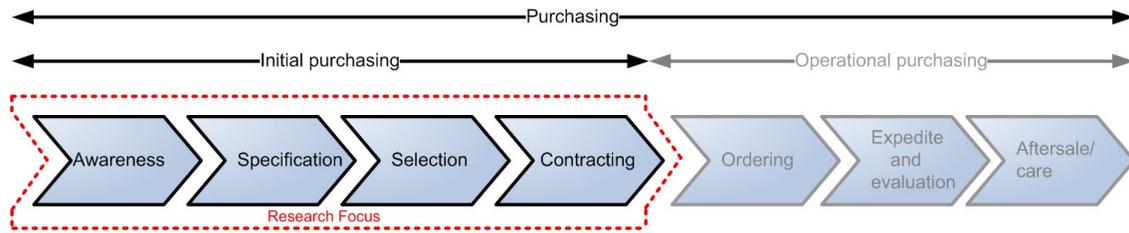
Figure 1: The purchasing process in the construction industry (Welling, 2006)

Literature study resulted in a list of success factors within the outsourcing and purchasing process. These factors from these two "different" processes have been compared with each other which resulted in a list with a total of fifteen success factors. Many of the success factors are related to the interaction between the buyer and supplier. Other factors are related to the goal and strategy of the buyer. In table 1, these success factors are shown.

Table 1: The Success Factors for the purchasing process

1	The motive and objective for the purchasing must match with the corporate strategy (Kamann, 2001);
2	The purchasing process must be made manageable (Van Weele, 2007) ;
3	The purchasing process can be made manageable by cutting it into several phases. The output of every phase must be determined in advance (Van Weele, 2007;Delen, 2004);
4	A team must be put together that is able to manage every aspect of the purchasing process and which the top-management supports (Van Weele, 2007);
5	Knowledge and awareness of the role of procurement and the factors influencing it;
6	Functional specifications have to be made in which performance has to be translated into objectively measurable indicators;
7	The specifications need to be supplier-neutral (Van Weele, 2007);
8	A decision methodology needs to be chosen in order to select the best supplier based on technical and managerial capacities (Van Weele, 2007);
9	Total Cost of Ownership is a good methodology to compare biddings (Kamann, 2001);
10	Performance-based contracts based on service-level-agreements have to be developed (Van Weele, 2007);
11	It is essential that firms have renegotiation option built into their contracts (Burdon & Bhalla (2005);
12	Openness and trust are important in the negotiating process (Jones, 1997) that need to be done by the key figures of the parties involved (Honess & Chance, 1996);
13	Communication among the parties involved needs to be done timely (Outsourcing institute, 1998);
14	Responsibilities and authority needs to be fixed (Outsourcing institute, 1998);
15	The process' progress needs to be registered (Outsourcing institute, 1998).

METHODOLOGY

In order to find the transaction costs in real projects, a case study has been performed. The case study is based on literature, interviews and project documents from public and private parties. The study has been done on a big tunnelling project in The Netherlands. The client of this project is The Ministry of Transport, Public Works and Water management in The Netherlands. The project will be executed in a DBFM contract and the tendering method is the Competitive Dialogue. There are multiple consortia involved in the tendering stage. The contract sum is around EURO 480.000.000,-.

RESULTS

As stated before the Principal Agent has been used as a base for finding transaction costs in the case study. Within the project the purchasing process has been analyzed. Cost specifications were handed by the public and private parties which made clear that in every phase of the process the client makes expenses. The client spends the most money in the Initiative phase. The private parties start with making cost in the first phase of the tender (prequalification). For contractors the most expensive phase is the dialogue phase (see Figure 2).

Phase:	Initiative	Prequalification			Plan of approach			Consultation			Dialogue			Supply contract
CL — IC	1.479	520			1.468			1.468			2.038			3.416
CL — EC	6.371	2.933			2.680			893			2.215			1.281
CO — IC		20	0	0	182	80	570	278	500	1.920	711	900	2.100	
CO — EC		0	0	0	226	100	30	421	100	780	765	1.600	2.100	
CO — DC		0	0	0	351	600	0	1.026	1.800	2.500	2.708	2.300	0	
		X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z	
CL + CO	7.850	3.474			6.287			8.219			16.704			8.897

CL/CO = Client/Contractor
IC = Internal Costs
EC = External Costs
DC = Design Costs

Costs: € x1000

X, Y, Z = the three consortia; Internal costs: costs made by the own personnel; External costs: costs made by hired staff

Figure 2: The actual expenses made in the tendering process

This makes a total of transaction costs € 51.4 million. In this context it's relevant to notice that the total contract sum for the project is €480 million. Which makes the transaction costs more than 10% of the contract sum.
The client also gives contractors compensation from the amount of €7.4 million (in total); this amount is not taken in account in the transaction costs.
Taking all the costs in overview noticeable is that all the costs are related to the duration of the different phases of the process and the required capacity of personnel.

After the analysis of the transaction costs, interviews have been held with experts that had been involved in the tendering process of this tunnelling project. The statements made by the interviewees, have been compared with the success factors from literature (see table 2). This

comparison generated a list of 12 success factors which have a positive influence on reducing transaction cost. These success factors are:

Table 2: Success Factors

1	The process has to be cut into phases and has to be managed as a process. The process should be standardized as far as possible
2	The client needs to put together a team that is able to manage every aspect of the purchasing process and which the top-management supports
3	Functional specifications have to be made. The consortium has to given room for putting his own creativity in the design of the project
4	The specifications must be communicated clearly to the consortium
5	More projects on order to gain experience for both parties
6	Not all risks to the consortium
7	Reduce the number of consortiums that take part in the tendering process faster.
8	The consortium needs to get better and quicker understanding of the client's needs.
9	Openness and trust are important in the negotiating process that need to be done by the key figures of the parties involved
10	Communication among the parties involved needs to be done timely
11	The client should be aware of the costs that the consortia have to make
12	Try to hire as less as possible legal and financial advisors

As stated before all most all of the costs are related to the duration of the different phases of the process and required capacity of personal. More focus on the the twelve success factors will lead to a decrease of lead time.

DISCUSSION

Many theories can be used for analyzing phenomena in the construction industry. The two perspectives of the theories used in this research showed to be effective. The Principal-Agent theory from economic perspective can provide a good and solid framework for assessing the phenomena of transaction costs in the construction industry.

The project case that was analyzed encloses four out of the five mechanisms from the Principal Agent theory. Only costs for the monitoring mechanism weren't found in the case study. According to the theory these costs appear ex-ante. This means that these costs emerge after signing a contract. The contract is not yet signed which can explain why these costs were not found.

Purchasing theory from industrial industries describes how a good purchasing result can be achieved. Comparing some success factors which have been found in this theoretical framework with success factors that were mentioned during the interviews (practice) showed that the theory and practice have corresponding success factors. The case study showed also some factors which were not found in the (purchasing) theory.

CONCLUSION

This research shows that transaction costs in DBFM tenders are still high. The analyzed purchasing process which the public and private follow is not very efficient. This research made a first important step in making transaction costs, in a specific research subject, more transparent. It made clear that almost every cost component is related to the duration of the process. For next projects clients such as the Dutch Ministry of Transport, Public Works and Water Management should realize that it's a key issue to prevent that the process in time overruns the original planned process. The research resulted in a list of twelve success factors that should be used in future projects. Future research should focus on the success factors that were mentioned during interviews and were not found in the literature.

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