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Transaction Costs in PPP Transport Infrastructure Projects:
Comparing Procurement Procedures
EIB University Research Sponsorship Programme

Literature Review

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LITERATURE REVIEW

1. The economics of transaction costs

In the "ideal world" of neoclassical economic theory, the one that uses the price mechanism, all the exchanges are easy or friction-free, which means people meet each other and exchange goods and services easily. Thus, they don't have any problems in fulfilling an agreement. Certainly, in this "ideal world" the transaction costs between people are just the costs of the item itself; the deal has no additional costs. However, in the "real world" the exchange of goods and services are neither easy nor expense-free. What is more, very often it is difficult to fulfil a deal.

Before a particular mutually beneficial trade can take place, at least one party must figure out that there may be someone with whom such a trade is potentially possible. Besides, the party must search for potential trade partners and inform them of the opportunity to trade and negotiate the terms of the exchange.

All of these activities involve opportunity costs in terms of time, energy and money. If the terms of trade were more complicated than simple "cash and carry", negotiations for such a detailed contract would take long and could be very costly in terms of time, travel expenses, lawyers' fees, among others. After a deal has been agreed upon, there may also be significant costs involved in monitoring or policing the other party to make sure it honours the terms of the agreement (and, if it does not, to take appropriate legal or other actions to make it do so).

The economics of transaction costs is a new approach used in economics which, in contrast to the 'standard neoclassical economics', it cannot yield a single unified and refined model but only a "wide" conceptual framework for organizing many different analytical models. This situation however, does not impede the use of the transaction costs approach to examine specific issues in economic policy-making.

The transaction costs approach is based on the idea that institutions (and organizations) seek to achieve efficiency, minimizing a comprehensive cost (including not merely the neoclassical production cost but also the transaction costs). Thus, institutions fulfil an economic function by reducing transaction costs and therefore ought to be treated as important variables inside the "economic model". Although, theoretically, institutions are designed to reduce transaction costs, in real life they often do not reduce them. Almost all different social activities of the human societies involve transaction costs, although they are not called as such. The social relations (economic and others) have emerged to fulfil a determined objective, subject to cultural, physical, legal and technological constraints. Therefore they have not been designed with the intention of minimizing the transaction costs.

The economics of transaction costs is concerned with the different economic systems and organizations, taking into account the comparative merits of alternative forms of economic organization and considering an integrated perspective of institutions, law and economics. Regarding this perspective, many economists ask themselves what kind of institutions (firms, markets, franchises, or other) minimizes the transaction costs of producing and distributing a particular good or service. Often these relationships are categorized by the kind of contract involved. The main point is seeking economic solutions to less hypothetical and more real-world problems, involving comparative assessment of potential and actual choices.

One of the first researchers who took transaction costs into account was Ronald Coase (1961) who referred to them as "the cost of using the price mechanism" or "the cost of carrying out a transaction by means of an exchange on the open market" As Coase explains, in order to carry out a market transaction it is necessary on the one hand, to discover who is willing to participate in the trading process and to inform potential traders that someone is willing to trade and the terms of trade. On the other, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, among other matters.

One of the main contributions made by Coase was his theorem, -which, in essence, states that in the absence of transaction costs, the outcome of bargaining a contract will be efficient, independently of the initial assignment of property rights. In economics relationships -trade, contracts, firms, and markets- the reasons for failure of the Coase theorem are "transaction costs," using the term in a very broad and generalized sense: anything that impedes the specification, monitoring, or enforcement of an economic transaction is a transaction cost.

The second body of work on transaction costs was developed by Williamson (1975, 1985). In his approach, transaction costs are used to understand the forms of economic organization and contractual arrangement in the capitalist society. What is important in this approach is the cost of conducting transactions in one organizational or contractual form relative to the others. This means that different ways to organize exchanges by different societies can be 'better' than others, in transaction costs terms; thus, transaction costs will be the comparative costs of planning, adapting, and monitoring task completion under alternative governance structures. The choice of the organizational structure for completing transactions lies on a continuum between markets and firms/hierarchies. The main difference between these two governance structures is the method of resource allocation. That is to say, while within markets resource allocation is effected through the 'price mechanism', within firms, resource allocation decisions are determined through the authority of senior managers or the administrative hierarchy.

From another point of view, North (1990) explains the transaction costs as "the costs of measuring the valuable attributes of what is being exchanged and the costs of protecting rights and policing and enforcing agreements". This author emphasizes the study of institutions which regulate economic transactions.

When he refers to 'institutions', he means "the rules of the game in a society, or, more formally, the humanly devised constraints that shape human interaction." In this definition, North includes both formal constraints (e.g., rules) and informal constraints (such as conventions, customs, traditions, and codes of behaviour- herein lies his incorporation of culture). Institutions are

different from organizations, insofar as organizations are created by groups of people for specific purposes that can themselves be agents of institutional change.

Therefore, Coase, Williamson, North and other authors have expressed that transaction costs may explain why impersonal competitive markets do not function as effectively as suggested by the neoclassical benchmark of the "economic standard theory". This explains the appearance of different mechanisms and institutions as devices that permit the participants to reduce or deal with the transaction costs. The transaction costs approach goes under the rubric of New Institutional Economics¹.

New areas have been added in recent studies. Furubotn and Richter (2000) have suggested that transaction costs must consider the cost of resources utilized for the creation, maintenance, and use and so on of institutions and organizations. On the other hand, Rao (2003) thinks that it is necessary to include opportunity costs of alternative forms of organization of a policy, programme or activity.

According to Dixit (2000) and Rao (2003), we can identify three main factors that lead to the existence of transactions costs:

A - Bounded rationality

Unlike neoclassical economics, which assumes that all individuals know the true model of the world and calculate their optimal actions costlessly, the transaction costs approach accepts that the possible states of the world are very complex and individuals' knowledge of how the world works is imperfect. This involves the actions of individuals as well as the transactions between them.

B - Opportunism

¹ Institutional Economics focuses on understanding the role of human-made institutions in shaping economic behavior, and focuses on the role of institutions in reducing transaction costs. Heterodox institutional economics emphasizes a broader study of institutions and views markets as a result of the complex interaction of these various institutions (e.g. individuals, firms, states, social norms).

Opportunism refers to the behavioural aspect that arises under the features of limited and asymmetric information, present in some economic relationships. This concept is divided into three different aspects:

- I. *Adverse Selection*: When one of the parties has a pre-contract informational advantage which leads to signalling and screening costs;
- II. *Moral Hazard*: In cases where the non-observability of one of the parties' action provokes costs of monitoring or incentive schemes; and
- III. *Non-verifiability of information to outsiders*: When it is difficult or expensive to audit a firm.

C - Asset Specificity

This situation occurs when in a contract between two parties to exploit a mutually profitable opportunity, at least one party must make an irreversible investment. Once it is made, it will become vulnerable to demands of the other party to renegotiate the contract and to get for itself a greater share of the profit, made under the threat of dissolving the whole relationship. This situation has been called in the academic literature as "the 'hold-up' problem".

Regarding the measurement of transaction costs in empirical studies, a direct measurement of transaction costs is simply the economic value of resources used in locating trading partners and executing transactions (Wallis and North 1986, De Soto 1989, Benham and Benham 2000). Another common measurement of transaction costs is the difference between the price paid by the buyer and the amount received by the seller. (Demsetz 1968, Bhardwaj and Brooks, 1992).

For this purpose, it is useful to establish a classification of transaction costs. A common classification is the following one:

- Search and information costs. These transactions costs are those incurred in determining that the required good is available on the market, which has the lowest price, and so on.

- Bargaining costs are the costs required to reach an acceptable agreement with the other party of the transaction, drawing up an appropriate contract.
- Policing and enforcement costs. These are the costs for making sure the other party fulfils the terms of the contract and for taking appropriate action (often through the legal system) if this turns out not to be the case.

2.- The Economics of incomplete contracts

Economists on transaction costs tend to view contracts more as devices (institutions) for structuring the social/economic life in society than as a legal document. From this perspective, a company, a market, a constitution or even governance relations are understood as 'contracts'.

The theory of incomplete contracts in economics is a specific part of the economics of transaction costs, and it describes how economic actors use particular contractual arrangements to deal with information asymmetries, knowledge gaps and missing provisions in the contract. For Tirole (1988) a 'complete contract' is a contract in which the relevant decisions (specific transactions, resources flows and so on) depend on verifiable factors, including information revelation by the parties involved; an "a priori" incomplete contract also qualifies as a complete contract if it yields the parties the same pay-offs as the optimal complete contract.

Considering the above definition, we may define a contract as incomplete if:

- i. It has contractual gaps from ex-ante design, or in its interpretation ex-post;
- ii. It does not cover most of the contracting possibilities that could ideally be anticipated in the contracting stage.

Although a contract may be legally 'complete' in the sense that it does not hold any breach, it could be called 'incomplete' in economic terms if it neglects to offer a set of duties and responsibilities in each possible state of the world. If we have a set of feasible contracts for a

particular purpose, incomplete contracts will be defined as a specific restriction of the whole (Tirole, 1999).

For Rao (2003) "Complete contracts, if these exist, can only be accomplished at a high cost. Among other extremes of the alternatives is informal (unwritten) agreement with contract costs at the lowest level."

According to the literature, incomplete contracts arise when transaction costs exist. For instance, according to Tirole (1999), the reasons for the existence of incomplete contracts are the following:

A. Impossibility to determine the future

Stakeholders can not determine in advance the future contingencies that may come (or events that may be possible) in the future, so they have to satisfy signing a contract which does not explicitly refer to all eventualities; or signing no contract at all.

B. Costly design of a "complete contract"

Although we could anticipate all the contingencies, they would be so numerous that it would be very expensive to identify them all in a contract.

C. Legal framework

A legal authority must be able to interpret the terms of the contract and corroborate the eventual situation or act, and be able to enforce the contract.

D. Contract enforcement

Verification and enforcement of the terms of the contract and/or revision of the contract at a later date is costly, and might warrant litigation or other third party enforcement, where in some cases the reliability of the quality of the outcome might not be certain.

One of the most important contributions of the economic contract theory is the systematic incorporation of renegotiation and its feedback effects into the analysis of contracting. Contract theory examines the strategies of the promisor vis à vis three options: performance, breach or renegotiation. From this perspective, a contract sets the field for future renegotiation of the terms of exchange after uncertainty has been resolved. The challenge for parties designing contracts is to

preordain or at least constrain the course of future renegotiation so as to yield both ex-ante and ex-post efficiency.

The costs of making a 'better' contract may be distinguished according to a two-stage contracting process:

A. Front-end stage

In this stage, contracting parties have to bear the cost of writing a contract that anticipates the future contingencies and that gives the details of a result for each one. These are considered ex-ante transaction costs.

B. Back-end stage

At this level, contracting parties have to bear the cost of looking for and establishing the existence (or non-existence) of any crucial fact once a problem has been resolved. These are all ex-post transaction costs.

Both ex-ante and ex-post contracting costs, impede contracting parties to write complete contracts and bring about what in economic science is called the problem of incomplete contracts.

3. Incomplete Contracts and Transaction Costs in PPP Projects

Since the transaction costs approach take into account the governance structure, a PPP project will be neither a completely public nor a completely private firm; it lies between the two extremes of the private sector (the market) and the government (hierarchy) because it engages the private sector to deliver services under the competitive bidding model yet it allows the government to retain an ongoing interest in the delivery of public services. Therefore PPPs can be referred to as a "hybrid" governance structure.

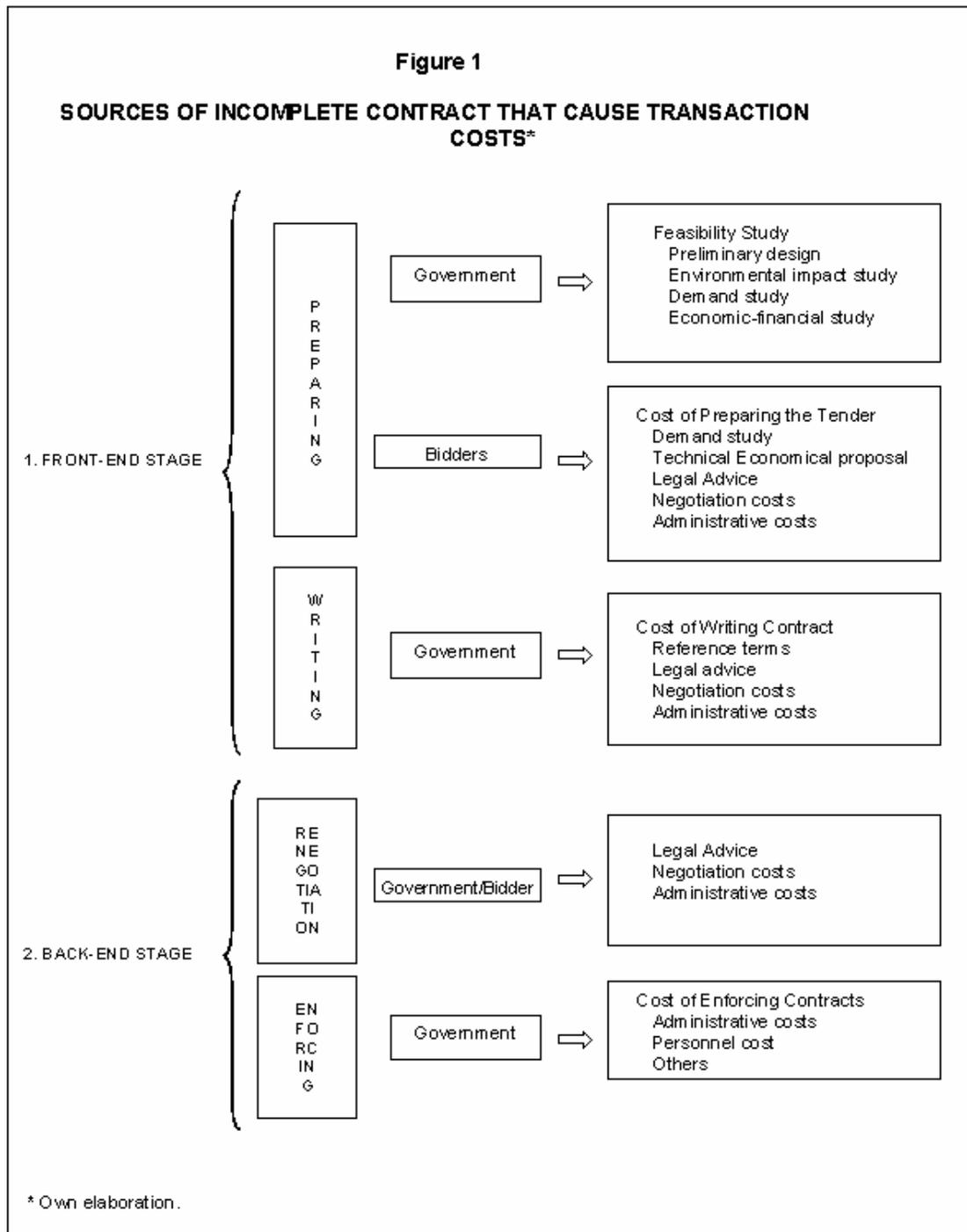
Transaction costs theory suggests that the optimal organisational structure for a particular exchange depends on a set of human and transactional factors. The main human factors are bounded rationality, opportunistic behaviour and trust. If one organisational structure is more costly than another, the latter will be "better" in transactional costs terms, therefore, a PPP structure for a transport infrastructure project will be "right" only when it is cheaper than other organisational structures.

Since PPP projects tend to be based on contracts that extend over a long period of time, e.g. 25 years or more, the contracts are inevitably incomplete in many relevant respects. During the term of the contract, unforeseeable events will occur (e.g. technical advances) and many of these events will be unverifiable (e.g., a contractor's effort to improve safety cannot be easily verified). Road projects, for example, can involve a fair amount of uncertainty about the final good that will be produced. This problem is aggravated due to the opportunism of the individual parties to the contract. Therefore, in the presence of bounded rationality and opportunism, one could expect that undertaking a project through a hierarchical structure will result, in principle, in lower transaction costs, (and therefore, fewer incomplete contracts) because the parties to the transactions will behave more cooperatively than under market conditions. Thus, when a hybrid mode of governance such as PPP is utilised government will need to limit the scope for opportunistic behaviour.

These circumstances result in transaction costs to the PPP projects in many senses, including the procurement phase. Taking into account the previous sections, any PPP project could have transaction costs linked to:

- Cost of preparing the tender
- Cost of writing contracts
- Renegotiation
- Cost of enforcing contracts

See Figure 1, for an overview.



Nowadays, there is a growing interest in PPP projects, thus the European Investment Bank has developed some studies, analysing different aspects of this kind of projects. These studies have shown the different consequences of PPP projects in the European Union countries. See, for instance, Väilä (2005), Dewatripont and Legros (2005) and Grout (2005).

The study by Blanc-Brude et al. (2006) , compared the construction costs between PPP and traditional procurement projects in the European Countries using more than 200 EIB-financed road projects between 1990 and 2005. They found that the *ex-ante* construction costs of PPP road projects are, on average, 24% more expensive than a traditionally procured road, other things being equal. They suggest that it could be because the private investor has greater incentives to make investment in the construction phase to lower subsequent operation and maintenance costs. In addition, they suggest that the transfer of the construction risk to the private partner should be explicitly priced in a PPP project.

An original approach to the evaluation of transaction costs in PPP projects was made by Dudkin & Väilä (2005). They assessed the transaction costs related to the procurement phase in different PPP projects in the European countries and found that this kind of costs could be on average well above 10 percent of the capital value of the project. The costs are shared by the public sector, the winning bidder and the losing bidders. These costs can vary between countries (legal systems) and sectors, and they are significantly higher in small projects (below £25 million) and in projects that take long (over 50 months) to procure. In addition to this, they found that neither experience in setting up partnerships nor the number of bidders affect the costs of the public sector and of the winning bidder.

Few studies have used the incomplete contracts approach to analyse PPP projects. One of them was made by Oliver Hart (2002). He used the incomplete contract theory to analyse PPP projects and made some important findings: the right choice between PPPs and conventional provision depends on whether it is easier to write contracts on service provisions than on building (or infrastructure) provision. He expresses that the government must use the "conventional provision" or "unbundling" system if the quality of the construction can be well specified, whereas the quality of the service cannot be. However, PPP should be preferred if quality of the service can be well specified in the initial contract, whereas the quality of the construction cannot be. The key point in

his view is that, even policy makers frequently argue that PPPs are a cheaper source of financing than the public sector, the central issue about PPP projects is their (relative) contracting costs.

However, not enough empirical evidence is available to compare transaction costs in PPPs projects with traditional public procurement projects. Nor empirical evidence exist on the possible influence of the procurement mechanism on transaction costs in PPPs projects, which is the specific objective of this paper.

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