



Public–private partnerships versus traditional procurement: An experimental investigation[☆]

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ABSTRACT

A government agency wants an infrastructure-based public service to be provided. Our experimental study compares two different modes of provision. In a public–private partnership, the two tasks of building the infrastructure and operating it are delegated to one private contractor (a consortium), while under traditional procurement, these tasks are delegated to separate contractors. We find support for the theoretical prediction that, compared to traditional procurement, a public–private partnership provides stronger incentives to make cost-reducing investments (which may increase or decrease service quality). In two additional treatments, we study governance structures which explicitly take subcontracting within private consortia into account.

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1. Introduction

Over the last two decades, governments in a growing number of countries initiated public–private partnerships to let the private sector take over the responsibility for building an infrastructure and subsequently operating it to provide public goods or services. In industrialized countries as well as in emerging economies, public–private partnerships have been set up for large-scale projects in various sectors such as public transportation, health care, and education.¹

A key characteristic of public–private partnerships is that the two tasks of building a facility and subsequently operating it are bundled and delegated to a single private contractor, while under traditional procurement, separate contractors are in charge of these two tasks.² An argument often put forward in favor of public–private partnerships is that when the same

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¹ See Asian Development Bank (2008), Grimsey and Lewis (2004), OECD (2008) and Yescombe (2007). According to Henckel and McKibbin (2010, p. 5), public–private partnerships “have increased sevenfold in developing countries from 1990–1992 to 2006–2008 and sixfold in Europe during the same period.”

² See e.g. Grimsey and Lewis (2004, pp. 129, 222). See also Iossa et al. (2007, p. 17), who argue that the “bundling of project phases into a single contract is the main characteristic of PPP contracts.”

private contractor is responsible for construction as well as operation of a public facility, then he will be inclined to invest more during the construction phase in order to reduce the costs incurred in the subsequent operating stage.³

Hart (2003) demonstrates that the incomplete contracting approach offers a very useful framework to theoretically investigate how the incentives to make cost-reducing investments differ between public–private partnerships and traditional procurement. In his model, there are two stages. In the first stage, a public infrastructure is built, while in the second stage, the infrastructure is operated to provide a public service. In the first stage, the builder can make investments that reduce the operating costs in the second stage. In line with the above-mentioned argument, Hart (2003) finds that given a public–private partnership, the private contractor has strong incentives to make investments, since they reduce the operating costs that he will have to incur in the operating stage. In contrast, under traditional procurement, the builder has no incentives to invest in cutting the operating costs, since another private party will have to bear these costs.

Whether a public–private partnership or traditional procurement is preferable depends on the effects that the cost-reducing investments have on the service quality. In particular, Hart (2003) assumes that two different kinds of investments can be made. Investment i not only reduces the operating costs, but it also increases the service quality. In contrast, while investment e also reduces the operating costs, it does so at the expense of a reduced service quality. Hence, investment i is socially desirable, while investment e might be socially undesirable if the negative side effect on the service quality is sufficiently strong.

In line with Hart (2003), we consider a situation in which in a first-best world (i.e., if the investments were contractible), a high level of investment i , but a low level of investment e would be chosen. In a second-best world (i.e., if the investments are non-contractible), we are then confronted with the following trade-off. In a public–private partnership, high levels of both kinds of investments are induced. Hence, there is overinvestment with regard to e , while the first-best level of investment i is chosen. In contrast, under traditional procurement, there are no incentives to make high investments. Thus, there is underinvestment regarding i , while the first-best level of investment e is chosen.

It is an important research question to investigate whether the trade-off between strong investment incentives in a public–private partnership and weak investment incentives under traditional procurement as identified by Hart (2003) is of empirical relevance. As a first step in that direction, we have conducted a large-scale public procurement experiment in the laboratory.

Specifically, we conducted two main treatments, a public–private partnership (PPP) treatment and a traditional procurement (TP) treatment. We have implemented a parameter constellation where encouraging the desirable investment i is more important than preventing the undesirable investment e , so that according to the theoretical analysis, a public–private partnership is preferable to traditional procurement. The experimental data largely corroborates the theoretical analysis. In the PPP treatment, subjects chose the high levels of both kinds of investments significantly more often than in the TP treatment. As a consequence, also the total surplus generated in the PPP treatment was significantly larger than the total surplus in the TP treatment.

However, modelling the private contractor in a public–private partnership as a single decision maker might be seen as an analytical shortcut. In practice, different skills are needed in the building and operating stages. Thus, it is important to take a closer look at different subcontracting arrangements. For this reason, we have conducted two further treatments. In one treatment (Sub I), the builder is the main contractor and subcontracts with an operator. As has already been pointed out by Hart (2003), in theory this setting induces the same investment behavior as the simple PPP setting (since the main contractor must reimburse the subcontractor for his operating costs, the main contractor internalizes these costs). In another treatment (Sub II), the operator is the main contractor and subcontracts with a builder. In theory, this setting leads to the same investment behavior as traditional procurement (since the subcontractor disregards the operating costs, he has no incentives to invest). Also in the subcontracting treatments, it turns out that the observed behavior in the laboratory is mostly in line with the theoretical predictions.

In recent years, the theoretical literature on public–private partnerships has grown steadily. Building on Hart (2003), several contributions have investigated the implications of bundling the building and operating stages in public procurement projects.⁴ Bennett and Iossa (2006a, 2006b) and Chen and Chiu (2010) explore how different ownership structures interact with the choice between a public–private partnership and traditional procurement.⁵ Martimort and Pouyet (2008) analyze a model that includes both traditional agency problems and property rights and they find that the most relevant question is not who owns the assets, but instead whether the tasks are bundled or not. Iossa and Martimort (2008, 2009) discuss extensions and applications of this framework. Also focusing on the externalities between the tasks of building and operating a public project, Li and Yu (2010) investigate whether these tasks should be auctioned off separately or bundled. Nishimura (2011)

³ See Yescombe (2007, p. 21). Moreover, Grimsey and Lewis (2004, p. 92) argue that a public–private partnership provides the private contractor with incentives “to plan beyond the bounds of the construction phase and incorporate features that will facilitate operations.”

⁴ While most papers in this literature consider incomplete contracts, Bentz et al. (2004) study related questions in a complete contracting framework. On the pros and cons of bundling sequential tasks when complete contracts can be written, see also Schmitz (2005).

⁵ Hart et al. (1997) have developed the leading model to study the effects of public and private ownership on investment incentives, building on the property rights approach based on incomplete contracting (Grossman and Hart, 1986; Hart, 1995; Hart and Moore, 1990). See also Hoppe and Schmitz (2010a), who extend their framework by considering a richer set of contractual arrangements. Moreover, Besley and Ghatak (2001); Francesconi and Muthoo (2006), and Halonen-Akatwijuka and Pafilis (2009) build on the property rights approach to analyze whether non-governmental organizations should own public goods.

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