



## Public–private partnerships and the privatization of financing: An incomplete contracts approach<sup>☆</sup>

Jean-Etienne de Bettignies<sup>a</sup>, Thomas W. Ross<sup>b,\*</sup>

<sup>a</sup> Queen's School of Business, Queen's University, Kingston, ON, Canada K7L 3N6

<sup>b</sup> Sauder School of Business, University of British Columbia, Vancouver, BC, Canada V6T 1Z2

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### ABSTRACT

Governments have begun to embrace public–private partnerships (P3s) as vehicles for providing public services. This paper considers the controversial question of when private financing of public projects is optimal. Private development can dominate public financing through more efficient termination decisions for bad projects, resolving soft budget constraint problems. Due to contractual incompleteness and externalities, on the other hand, private developers cannot commit to large debt repayments, and hence can finance only a subset of valuable projects. Public developers, who do not face the same commitment problems, can finance a larger set of projects.

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### 1. Introduction

Over the last fifteen years, governments around the world have embraced public–private partnerships (P3s) as vehicles for the delivery of a wide variety of public services in major areas such as education, transportation, health care and corrections. Pioneered by the United Kingdom with its Private Finance Initiative of the early 1990s, the P3 approach is being adopted in countries of all wealth levels and on all continents.<sup>1</sup>

To economists, P3s may be seen as a simple extension of vertical disintegration or contracting out by governments. Rather than simply contracting out the construction of a new bridge for a fixed price, for example, a government may contract for the provision of “bridge services” including the design, construction, operation, maintenance and even the financing of the bridge. The idea behind such projects is

most often expressed in general language as harnessing the efficiencies and innovativeness associated with a competitive private sector to help government achieve its public service goals at lower cost.

Our aim is to be more precise about some of the tradeoffs involved. In our view (de Bettignies and Ross, 2004), two features of modern P3s set them apart from simple contracting out. First, the number of tasks that are contracted out to the same party or consortium is larger, as in the bridge example just given. Second, the privatization of the finance function – i.e. the delegation of the financing responsibility to a private firm or consortium – at one time extremely rare, has more recently become a central feature of P3 projects.

In this paper we focus on the second and most controversial feature of P3s – the privatization of the finance function.<sup>2</sup> Incorporating elements of industrial organization and corporate finance theory in a *normative* public policy analysis, we analyze the conditions under

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\* Corresponding author.

E-mail addresses: [jdebettignies@business.queensu.ca](mailto:jdebettignies@business.queensu.ca) (J.-E. de Bettignies), [thomas.ross@sauder.ubc.ca](mailto:thomas.ross@sauder.ubc.ca) (T.W. Ross).

<sup>1</sup> See, e.g. de Bettignies and Ross (forthcoming), and Vining et al. (2005), for examples of countries, industries and projects in which P3s were used.

<sup>2</sup> Opponents of P3s (e.g. public sector labor unions) argue that governments are capable of raising debt at a lower rate of interest than private borrowers, and, for that reason, that the financing function – at a minimum – should remain with the government. Though not directly relevant for the cases we explore here, it is worth noting that the argument that governments are more reliable borrowers does not hold for all governments. For example, governments in developing countries may be less credit-worthy than the companies with which they might partner in P3s. At the same time, the ability to draw outside finance to develop popular projects without adding to politically sensitive levels of public debt is the very feature that many governments find most attractive about P3s. P3-type projects have been promoted by (among others) the World Bank for developing countries, in part because they may have no other way to fund important infrastructure.

which either public or private finance *ought* to be preferred over the other. The model also sheds light on the *positive* question of when governments *will* choose private over public finance.

The model considers a particular project, the construction and operation of a bridge, for example, which can be financed and developed by a private firm/consortium, or by a government agency. Whoever undertakes the project, private or public developer, must secure the initial capital required from an investor. We draw from the incomplete contracts frameworks<sup>3</sup> of Bolton and Scharfstein (1990, 1996), and Hart and Moore (1998) to determine the optimal (debt) contract between the developer and the investor; and derive several key results:

With private development, two issues arise. The first issue is related to contractual incompleteness: the possibility of strategic default by the developer caps the debt repayment that she<sup>4</sup> can commit to make, and limits the amount a lender is willing to provide to the developer in the first place. Accordingly, contractual incompleteness under private development leads to fewer projects being financed relative to the first-best benchmark. The second issue results from the private developer maximizing profits rather than social surplus, and thus ignoring the impact of her decisions on consumer surplus. This has two consequences here: 1) The private developer might make profit maximizing but socially inefficient decisions. This lowers the social surplus relative to the first-best benchmark. In turn, it has a negative impact on the debt repayments that can be made to the investor and on the number of projects that can be financed in the first place. 2) Of that social surplus generated, the private developer extracts profits, but does not internalize the consumer surplus, and this also lowers the size of the debt repayments she is willing to make and the number of projects financed. Thus, contractual incompleteness and externalities both make private development *ex ante* inefficient by limiting the number of projects being financed. Externalities also yield an *ex post* inefficiency in reducing surplus generated by the projects that are indeed financed. We show, however, that government intervention may help mitigate these concerns: Through simple contract design and co-financing, the government can eliminate all externality-related inefficiencies.

With public development – when the government does the borrowing – the problem is different. To the extent that the electorate can use the public developer's observable actions to infer information about the government's underlying quality, the public developer may take actions that are socially inefficient, in an attempt to manipulate the electorate's beliefs about government quality, and improve reelection prospects. We show that these attempts also lead to both *ex post* and *ex ante* inefficiencies.

Comparing private and public financing from both *ex ante* and *ex post* standpoints, we find that – when both types of financing are available – private development may be preferred, as it gets around the belief manipulation problem faced by the public developer. On the other hand, private developers can only commit to smaller debt repayments, and hence can only find lenders for a subset of socially valuable projects. Indeed, some projects can only be financed by public developers, who do not have the same commitment problems.

From a methodological standpoint, our model is most closely related to the incomplete contracts papers mentioned above; and indeed the possibility of strategic default under private development was identified in that literature previously. However we do depart from that line of

research in placing issues of social welfare, as well as the role of government, at the forefront of the analysis; and believe the other key results of our model to be novel.

In the P3 literature, the focus so far has been on the trade-off between public and private provision, without particular attention to financing (Schmidt, 1996; Hart et al., 1997; Shleifer, 1998; Besley and Ghatak, 2001), and on the “bundled” outsourcing of both construction and operation to a private consortium (King and Pitchford, 2000; Bentz et al., 2002; Bennett and Iossa, 2003; Hart, 2003; Iossa and Martimort, 2008). Our contribution here is in examining a different characteristic of P3s – private financing – and in analyzing the trade-off between private and public development through a modern corporate finance lens.

Our modeling of public development is also related to the literature on the “soft budget constraint” (SBC), pioneered by Kornai (1979, 1980, 1986), and formalized more recently by Dewatripont and Maskin (1995) and others.<sup>5</sup> This literature attempts to explain why governments tend to bail-out or continue projects that should be terminated. This tendency is central to our modeling of public financing, and here reflects an attempt by governments to manipulate the electorate's belief about their intrinsic quality, and hence to increase their reelection probability.<sup>6</sup> The hypothesized implications of such soft budget constraints for the continuation of weak projects have been documented by many researchers.<sup>7</sup>

The two papers on the efficiencies of government spending that come closest to ours are those by Dewatripont and Seabright (2006) and Coate and Morris (1995). Both papers model governments that make “inefficient” decisions in order to improve their chances at reelection. Like the present paper, both consider that governments can be either “good” or “bad” in terms of their talents or true objectives and that they will take actions consistent with making voters believe they are good. Coate and Morris focus on decisions to redistribute resources toward groups favoured by the government (but not voters), while Dewatripont and Seabright consider decisions governments may take to proceed with projects (even those that may be wasteful) so as to be seen by voters to be working hard. Importantly, however, neither paper examines how to deliver public projects as a choice – considered here – between private and public developers.

The paper is organized as follows: Section 2 sets up the basic model. Sections 3 and 4 examine private development. Section 5 focuses on public development. Section 6 compares the two types of financing from both normative and positive standpoints. Finally, Section 7 discusses key assumptions of the model and concludes. Proofs are in the Appendix A.

## 2. A model of project financing

We consider a positive net present value (NPV) project which, if undertaken at date 0, requires an investment outlay of  $k$ , and lasts for two periods, with no discounting. The project can be developed in one of

<sup>5</sup> See Kornai et al. (2003) for an excellent review of that literature.

<sup>6</sup> Under their list of possible motives for the inefficient continuation of failed enterprises, Kornai et al. (2003, p. 1009), referring also to Shleifer and Vishny (1994), suggests that “Politicians [...] may be politically motivated to obtain subsidies for firms in financial difficulty [...] to save jobs so as to increase their popularity and political influence, and improve their chance of reelection.”

<sup>7</sup> See Boardman et al. (1993, p. 544) on this point: “There may be strong political support for continuation of a venture even though it may not be justifiable on efficiency grounds [...]. The classic example is the Tellico Dam in Tennessee where [...] the social costs of completion exceeded the social benefits. Nonetheless, Congress decided to complete the project.” On the same idea, see also Vining et al. (2005); and Osborne and Gaebler (1992), particularly at pp. 287, 345 and 347. Finally, an interesting related case study of the “escalation problem” in which governments are reluctant to terminate projects, even in the face of rapidly escalating costs (and in which reelection issues loomed large) is found in Ross and Staw's (1986) analysis of the cost overruns associated with Expo 86 in Vancouver, Canada.

<sup>3</sup> That contracts might be incomplete seems reasonable in the context of P3s. The difficulty in negotiating P3 contracts is, in part, due to the typical length of these agreements – 20 to 30 years is not uncommon when large facilities are involved – and in part it is due to a wide variety of risks that can have an impact on the value obtained in the partnership. These risks can include engineering risk, construction risk, regulatory risk, demand risk and environmental risk. Attempts to allocate these risks in the most efficient manner and to anticipate all important shocks over many years will undoubtedly leave gaps that can be exploited opportunistically.

<sup>4</sup> Throughout the paper we treat the project developer as female and the investor as male.

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