

LOCAL PUBLIC-SERVICES PROVISION UNDER PUBLIC
PRIVATE PARTNERSHIPS:
CONTRACTUAL DESIGN AND CONTRACTING PARTIES
INCENTIVES

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ABSTRACT

This paper studies the incentives of the private provider, but also of the public authority, under various contractual forms of Public Private Partnerships (PPPs). A critical aspect of any PPP contract is the allocation of demand risk between the public authority and the private provider. I show that contracts in which the private provider bears demand risk motivate more the public authority from responding to customer needs. This is due to the fact that consumers are empowered when the private provider bears demand risk, i.e. they have the possibility to oust the private provider in case of non-satisfaction with the service provision, which provides procuring authorities with more credibility in side-trading and then more incentives to be responsive. However, contracts in which the private provider does not bear demand risk motivate more the private provider from investing in cost-reducing efforts. I highlight then a tradeoff in the allocation of demand risk between productive and allocative efficiency. The striking policy implication of this paper would be that the current trend towards a greater resort to contracts where private providers bear little or no demand risk may not be optimal. I apply these results to understanding three famous case studies.

Keywords: Incomplete Contracts, Local Public Service Delivery; Public-Private Partnerships; Political Accountability; Consumers Empowerment.

JEL Codes: D23, H1, L5, 017.

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1. Introduction

Reforming (local) public-service delivery occupies a central position in the current policy agenda in the world. Public Private Partnerships (PPPs), which are contracts between public and private sector to build and operate infrastructure for public-service provision, are considered as an alternative model to the traditional public provision for public services. Nevertheless, many concerns have been raised regarding this emerging organisational model (see Engel et al., 1997; Guasch, 2004; Chong et al., 2006; Estache, 2006; Martimort and Straub, 2006; Athias and Nunez, 2008; Guasch et al., 2008). The most stringent worries concern the *ex post* adaptation inflexibilities inherent to these long term contracts. Adaptation is important when consumers preferences change and improved policies or technologies are discovered. As the major feature of PPPs is that they are long-term service contracts, it is highly likely that contracting parties will be unable to write complete contracts that cover all contingencies, and numerous are the cases that offer good illustrations of the difficulties for procuring authorities to reaching an agreement with private public-service providers on contractually unanticipated service adaptations. It is often noted that '[a] key concern with long-term PPP contracts is the level of flexibility that they offer to authorities to make changes either to the use of assets or to the level and type of services offered' (PricewaterhouseCoopers, 2005: 33).

Except Ellman (2006), studies have always explained the *ex post* adaptation problems by the distorted incentives for the private public-service provider to invest in the research into innovative approaches to carrying out the service provision (Hart,

Shleifer and Vishny, 1997; Hart, 2003; Bennett and Iossa, 2006). None of them approach this issue from a political point of view; that is none of them give an active role to public authorities. However, it seems that public authorities have also an important role to play in the adaptation of private public-service provision over time for the following reasons. First, any PPP is between a public authority and a private public-service provider; that is there is no direct democracy (the public cannot vote directly to select and oust the private provider). Second, there is no market accountability of private providers, since the price applied to consumers, if any, is a regulated price, not a market price. Finally, public authorities, as elected delegates of consumers, are duty bound to discover adaptations and consumers preferences and to exercise pressure on the private provider to adapt the public service to satisfy the changes in the effective consumers demand. It seems then that political accountability, *i.e.* the responsiveness of public authorities to consumers concerns, has also to be considered when one aims to tackle the issue of the inefficient development of PPPs over time. In other words, public authorities have to be considered as active players instead of passive bystanders of the general efficiency of PPPs.

Ellman (2006) is the first to theoretically raise the question of the accountability of public authorities in the adaptation over time of the private provision of public services. In this paper, the author compares political accountability whether the public-service provision is public or private, boiling down to a control rights issue. However, it is now clear that the term PPP recovers a broad range of contractual agreements that differ in terms of risks allocation between the public authority and the private provider (Grout and Stevens, 2003; Athias and Saussier, 2007; Iossa and Martimort, 2008). As ‘the devil is in the details’, it seems at least as important to analyse political accountability according to the contractual design of PPPs. This is precisely what this article aims to do. In particular, a critical aspect of any PPP contract is the allocation of demand risk between the public authority (central or local) and the private provider. Broadly speaking there are two main contract types for delegating public services to private operators: contracts where private providers bear no demand risk, hereafter designated as availability contracts, and contracts where private providers bear all demand risk, hereafter designated as concession contracts.

To investigate how the allocation of demand risk between the public authority and the private provider affects politicians responsiveness to consumers concerns and the private provider’s incentives to reduce costs, I present a simple incomplete contract theory model in which (1) procuring authorities are involved in adaptation, *i.e.* exert non contractible effort to respond to consumers demands; (2) consumers may have the power to sanction private providers; (3) private providers exert non contractible efforts to cut costs. I show that contracts in which the private provider bears demand risk motivate more the public authority from responding to customer needs. This is due to the fact that under a concession contract consumers are empowered, *i.e.* have the possibility to oust the private provider, which provides procuring authorities with more credibility in side-trading and then more incentives to be responsive. As a consequence, I show that there is a lower matching with consumers preferences over time when demand risk is on the public authority rather than on the private provider. In other words, I show that contracts in which the private provider does not bear demand risk rule more out the accountability – regarding service adaptations – of procuring authorities. However, I show that contracts in which the private provider does not bear demand risk motivate more the private provider from investing in cost-reducing efforts. I highlight then a tradeoff in the allocation of demand risk between productive and

allocative efficiency. The striking policy implication of this paper would be that the current trend towards a greater resort to contracts where private providers bear little or no demand risk may not be optimal. I apply then these results to understanding three famous case studies.

The paper is organized as follows. Section 2 presents the related literature. In Section 3, I present the basic model of contracting parties incentives under both types of PPP and solves it. In Section 4, I apply the model to understanding three famous case studies (British school catering, London Underground, and French Highway). Section 5 concludes.

2. Literature Background

Contractual Choices and Incentives

My work is linked to the incomplete contract literature, while focusing on the contractual design, instead of ownership structures¹. Hart et al. (1997) show that if assets are owned by the private sector, then cost-reducing changes can be introduced without renegotiation since the contract with the public sector is on services. Thus, the full benefit of such changes flows to the private owner and encourages efficiency. By contrast, benefits that improve service quality require renegotiation and the public body may be in a position to extract part of the benefit since the private owner has no alternative purchaser for the incremental gain. The effect is that the private owner receives less of the benefit of such changes and the incentives are weakened. As a consequence, Hart (2003) advocates that, where build contracts are easy to specify but service contracts are not, then it is useful to have a conventional provision (“unbundling” of the construction and operation stages). At the other extreme, where service contracts are easy to write and build contracts are difficult, the PPP approach may be particularly sensible. Bennett and Iossa (2006), in turn, show that PPPs will be optimal only when the innovation in the construction stage has a positive externality on operation and maintenance costs.

In contrast with these studies, I approach the issue of contractually unanticipated service adaptation not only from the point of view of the distorted incentives for the private public-service provider, but also from a political point of view. Ellman (2006) is the unique author to our knowledge that theoretically raises the question of the accountability of public authorities in private provision of public services. More precisely, in this paper, the author compares privatisation with public provision regarding political and public accountability. To this end, he relies on the framework of Hart, Shleifer and Vishny (1997) but considers that the government and the public are involved in service adaptation. He shows that privatisation can, first, demotivate the government from investigating and responding to public demands because privatisation allows the provider to hold up service adaptations, and, second, demotivate the public from mobilising to pressure for service adaptations, since providers indirectly hold up the public by inflating the government’s cost of implementing these adaptations. Thus, in this paper, the tradeoff is between public and private provision. By contrast, I consider in this paper private public-service provision under PPPs, which can take various contractual forms (Grout and Stevens, 2003; Athias and Saussier, 2007; Iossa and Martimort, 2008). In other words, I consider whether the various contractual forms

of PPPs impact on contracting parties incentives, and more specifically on accountability mechanism.

My work is also linked to the literature on the political economy of government responsiveness. For instance, Besley and Burgess's (2001 and 2002) model derives how governments become more responsive to people when people become more aware of how government actions affect them, which is determined by the freedom of the press. Also, Besley and Ghatak (2003) tackle the question of the best process by which service providers, consumers and procuring authorities come together to create an organization. This could be governed by choice, as when a parent picks a school for their child, or by government policy. The authors show, in a non-formalized way, that empowering consumers, by allowing them to choose between providers with different service provisions, is a potentially source of welfare improvements. They explain that empowering consumers means that the nature of the principal-agent problem changes. While the centralized model of public-service provision (illustrated in Figure 1) has two layers of agency problems: between consumers and elected officials and between the government and the service provider, the structure of the problem when consumers of public services are empowered (as shown in Figure 2), provides a closer link between them and service providers. Thus, empowering consumers can offer a better matching between consumers and providers, in other words a greater allocative efficiency.

Figure 1

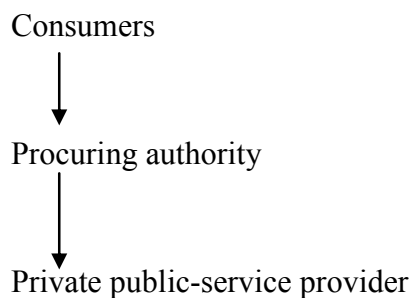
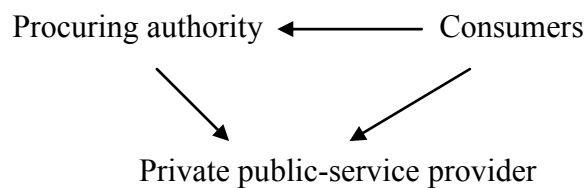


Figure 2



This approach underpins the representation developed in this paper of the accountability mechanism for service adaptations under the two differing contractual procedures. While the centralized model of public-service provision, illustrated in Figure 1, corresponds to the accountability structure implied by an availability contract, the model in which consumers are empowered (Figure 2) fits with the accountability structure of a concession contract (or more generally of models in which private providers bear demand risk, e.g. shadow toll contracts). As a matter of fact, under concession contracts, consumers are empowered to the extent that the remuneration of the private provider depends on the demand for the service. Thus, under such contracts, consumers have the power to oust the service provider by not using the service anymore and hence make the private provider go bankrupt. This is in line with what Hirschman (1970) calls "Exit". Making the private provider bear demand risk can then empower consumers, which can then lead to a better alignment on service provision preferences.

PPP contracts

This paper also contributes to a more applied literature that documents the efficiency of PPP contracts. In order to develop their infrastructure, public authorities (central or local

authorities) may decide to resort either to traditional procurement contracts or to PPPs. The key difference between PPPs and traditional procurement contracts is that under PPPs, the private sector delivers services for the duration of the contract, and not assets, although the provision of assets is often integral to the services concerned. They are therefore not only responsible for the delivery of assets, but also for the overall management of the project, its implementation, and its successful operation for several years thereafter. PPPs are thus complex long-term agreements that involve non-verifiable investments, usually for the delivery of complex services, or at least of services in which the degree of uncertainty is high.

Broadly speaking there are two main contract types for delegating public services to private operators: contracts where private providers bear no demand risk, hereafter designated as availability contracts, and contracts where private providers bear all demand risk, hereafter designated as concession contracts². Both are long-term, global contracts on the design, building, financing and operation of a public service and consist in output specifications systems. Both contracts can be considered as fixed-price contracts (the procuring authority offers the private provider a prespecified price for completing the project in both contracts). They do not differ in the magnitude of implication of the private operator, both contracting procedures formally delegate to the private provider sufficient residual control rights to provide the service free of interference. The main difference between these two contractual practices concerns demand risk, which is borne by private providers in the first case and by public authorities in the second case. Thus, under a concession contract, the private provider's remuneration depends on the demand for the public service whereas under an availability contract, it comes from service payments by the procuring authority according to performance criteria (the contract specifies penalties in case the performance and quality criteria are not met); there is therefore no link with the service demand.

The traditional model of PPPs in the world has been the concession contract. According to the World Bank's private participation in infrastructure database, between 1990 and 2000, overall 65 per cent of the projects in Latin America and the Caribbean were adjudicated as concessions. The concession contract is also the most common form of PPP in Europe except in the UK, where, even though concession contracts are used, the procuring authorities resort above all to availability contracts, designated by the acronym PFI 'the Private Finance Initiative' and its successor the Public Private Partnerships (PPP). But the concession contracting model has increasingly come under fire in recent times (Guasch, 2004; Estache, 2006; Athias and Nunez, 2008; Engel et al., 2009). The main criticisms are related with the high incidence of renegotiation observed under these contracts due mainly to the demand overestimation, strategic or not, by private providers in their bids. The trend has been then to not impose the demand risk on private providers anymore. Availability contracts are therefore increasingly being adopted around the world to move away from the concession model. This is particularly pronounced in Europe, where countries have recently promulgated guidelines so as to bring in the availability contract as an alternative to the concession contract, e.g. the June 2004 act in France instituting the new "contrats de partenariat".

While it is commonly thought that availability contracts are used when it is not possible to make users pay or when the services are not profitable, we observe in practice, on the one hand, that some contracts specify that the service provider is remunerated according to the service demand even if users do not pay (they are most

often known under the name of “shadow toll contracts”) and, on the other hand, that procuring authorities resort to availability contracts, and hence make the remuneration of the service provider dependent on continuity of service supply, while users pay a toll to the procuring authorities. Thus, it appears that the choice between a concession and an availability contract, that is to say between a contract in which the private provider bears demand risk and a contract in which it does not, depends neither on the ability to make users pay nor on the profitability of the service in question³.

3. The Model

I consider two actors, a procuring authority *PA* (e.g. a mayor, local government) and a private service provider *PM* (private manager), as well as a special third player, the users of the public service (the consumers) *C*, that can influence *PA* and *PM* but cannot negotiate contracts with them. More specifically, I assume in this model that consumers play a role only through their ability to sanction the private provider when the latter bears the demand risk. In other words, in this model, consumers are considered as a semi-player to the extent that I do not analyse the interactions between them and public authorities, assuming that public authorities always reflect consumers preferences. Such an assumption is motivated by the fact that I consider core public services, to which consumers are very sensitive, and hence the adaptations they require are most often politically salient.

PA organises the service provision on the consumers behalf and always delegates the service provision to a private manager (*PM*). *PA* can however choose between a contract in which the private provider does not bear demand risk (an availability contract) and a contract in which the private provider bears demand risk (e.g. a concession contract). As already mentioned, the main difference between these two contractual forms lies in the power conferred to consumers who, in case of dissatisfaction with the public service provision (e.g. non adaptation to their preferences), can sanction *PM* when *PM* bears demand risk. In fact, if consumers do not use the service, the remuneration of *PM* will be affected. Nevertheless, it is not a case of “direct democracy” in the sense that the contract remains between *PA* and *PM* only, neither about market accountability since the price (or toll if consumers pay) paid to *PM* for the provision of the public service is the price regulated by the contract (not a market price). Thus, under both types of contract, if an adaptation is required, not only the adaptation but also and above all the price adaptation will have to be negotiated between *PA* and *PM*. Service adaptation can therefore occur only if *PA* and *PM* reach an agreement on the adaptation and the price adaptation. The hope is then that *PA* will pressure *PM* to adapt the public service to satisfy the changes in the effective demand. The demand risk allocation matters because it affects payoffs in case of default of renegotiation.

Benchmark Model

At the start of their relationship, *PA* and *PM* negotiate a basic contract *X*, that imposes demand risk either on *PA* (availability contract) or on *PM* (a concession contract). I assume that *X* just compensates *PM* for standard costs of provision, whatever the contractual design.

I do not consider the cost of public funds because, in both contractual procedures, the remuneration of the private provider can stem either from users tolls or from public funds.

X generates a (net) payoff of b for PA and $w(e)$ for PM , where $w(e)$ is PM 's cost advantage (over a standard provider) from investing e in specialising to PA ⁴. In other words, I assume that this cost-reduction investment e by PM is fully relationship-specific, *i.e.* if PM does not provide some service for PA , neither PM nor PA gets any benefit from e .

The investment e is not contractible and nor is its payoff implication $w(e)$. The following regularity assumption guarantees sufficiency of first-order conditions.

ASSUMPTION 1. $w(0) = 0$, $w''(e) < 0 < w'(e) \forall e \geq 0$, $\lim_{e \rightarrow 0^+} w'(e) = \infty$, $\lim_{e \rightarrow \infty} w'(e) = 0$.

The overall payoffs for PM and PA do not depend on the contractual form. If t_0 is the payment that PM receives for the provision of the basic public service, PA and PM 's overall payoffs from X are:

$$u_{PA} = b - t_0$$

$$u_{PM} = t_0 + w(e) - e$$

Adaptation and Political Accountability

While PM invests e to cut costs, PA , for the various grounds mentioned above, invests effort i to discover what the consumers want and how to satisfy their demands.⁵ So i represents PA 's efforts to pay attention to consumers concerns about service quality. For instance, when there is a consumers demand for a concrete change, i raises the probability that PA recognises that the demand is serious and raises the probability that PA works out (in terms of pressure exercised on PM) how to satisfy consumers demands. This effort permits then PA and PM to adapt the basic contract X to changing consumers preferences.

I denote the corresponding adapted contract by Z , again with the non-contingent transfer set to just compensate the standard cost of provision. For simplicity, I assume that e helps PM to satisfy Z so that PM 's net payoff from enforcement of contract Z is again $w(e)$. In other words e reduces PM 's costs by the same amount whether providing the basic or the adapted service. PA 's additional surplus from Z is $v(i)$ where $v \geq 0$, increasing and concave in i , represents the net gain in consumers welfare from the adaptation. In other words, $v(i)$ measures PA 's success in identifying or discovering adaptations that are valued by consumers. So $v(i)$ can be interpreted as a measure of PA 's responsiveness to consumers demand – how likely it is that PA manages to please consumers. Attentiveness i raises PA 's ability and propensity to respond.

If PA pays PM subsequent transfers (or toll increases) t in case of adaptation, then, normalizing time discounting to zero, PA and PM 's overall payoffs from Z are:

$$u_{PA} = b - t_0 + v(i) - t - i$$

$$u_{PM} = t_0 + t + w(e) - e$$

The investment i is not contractible and nor is its payoff implications $v(i)$. The following regularity assumption guarantees sufficiency of first-order conditions:

ASSUMPTION2. $v(0) = 0$, $v''(i) < 0 < v'(i) \quad \forall i > 0$, $\lim_{i \rightarrow 0_+} v'(i) = \infty$, $\lim_{i \rightarrow \infty} v'(i) = 0 \quad \forall i \geq 0$.

Parties are risk-neutral and PA has rational expectation about the renegotiation process when it makes its investments, *i.e.* it can make correct calculations about the expected returns from any action. I assume information is symmetric and PM and PA negotiate a symmetric Nash bargain.⁶ Contractual design matters because it affects default outcomes in bargaining and hence the equilibrium choices of i and e . The timing of the model is as follows:

Stage 0: Demand risk is either on PA or on PM and contract X specifies the basic remuneration of the service provider t_0 .

Stage 1: PA and PM sink their investments i and e .

Stage 2: Renegotiation takes place to allow the adaptation to be implemented in the service provision: PA and PM negotiate over stage 3 the contract Z and additional transfer t (or toll increases).

Stage 3: PA and PM trade (jointly or with their market alternatives).

The remuneration t_0 agreed at stage 0 cannot depend on observed investments, for it is not possible to specify in advance the delivery of a specific adaptation. So it plays no role in determining investment efficiency. The subsequent transfer t , negotiated on top of contract Z at stage 2, is the share of PA 's adaptation surplus that PA in equilibrium has to give to PM , in excess of its adaptation costs. This share depends on the stage 2 default payoffs which in turn depend on the demand risk allocation, as I will show.

PM is assumed to maximize its profits. PA maximizes the social benefit, net of the payment to PM . In this setting, the first-best levels of investments (e^*, i^*) maximize $b + v(i) - i + w(e) - e$. Hence, they satisfy

$$i^* | v'(i^*) = 1, \quad e^* | w'(e^*) = 1 \quad \text{with } e^*, i^* > 0.$$

As both contracts are with a private provider, in default of renegotiation, I assume that PA is not able to exploit entirely investments i . This is due to the fact that under each type of contractual design, PA and PM commit to X at stage 0. PA cannot therefore switch to alternative trades (except in case of contract breach, which is prohibitively expensive). However PA might still engage in "side-trades" with another provider (private or public) PM' to provide the service adaptation, alongside the basic public service provided by PM (this might be possible either through the implementation of a new provider, or through the resort to already available alternative provisions).⁷ Nevertheless, this market access by PA is rarely so effective: (1) PA may not be able to credibly duplicate the basic service by buying the adapted service from PM' unless the additional value from adaptation is very high; (2) even when it is technologically feasible to have PM' provide the adaptation service without the basic service, this would waste the economies of scope from having a single party provide and coordinate them. To capture PA 's reduced market access in case of default of

renegotiation, I assume that PA only appropriates a fraction $(1-k)$ of the adaptation return $v(i)$ ⁸, where $k \in]0,1]$ captures the “market-shielding” effect of PPP. This actually boils down to an asset-specificity effect. In addition, PM ’s side-trading returns are independent of i and e , so I normalise PM ’s additional side-trade value to 0.

Effort when demand risk is on the public authority

When demand risk is on PA , PA ’s default payoff is:

$$b - t_0 + (1 - k)v(i) - i$$

Normalising PM ’s alternative payoff to 0, PM ’s default payoff is $t_0 + w(e) - e$. This is due to the fact that the contract protects PM ’s cost-reduction efforts since PA has to pay a fixed price for the basic service, provided that performance criteria are met. So PM appropriates the full cost reduction surplus $w(e)$.

PA ’s maximal gain from renegotiation is therefore $kv(i)$. PA and PM ’s renegotiation gains are $\frac{1}{2}$ of this sum. So PA chooses i to maximise

$$b - t_0 + (1 - k)v(i) + \frac{1}{2}[kv(i)] - i \tag{1}$$

and PM chooses e to maximise

$$t_0 + w(e) + \frac{1}{2}[kv(i)] - e \tag{2}$$

The first-order conditions are now

$$v'(i) = \frac{2}{2 - k} \quad w'(e) = 1 \tag{3}$$

Effort when demand risk is on the private provider

When the private provider bears demand risk, consumers are empowered to the extent that they can sanction the private provider in case of non-satisfaction with the service provision. The magnitude of this faculty depends mainly on the availability of alternative providers (in the case of a tramway, for instance, consumers could sanction the private provider by using the bus or taking the car).⁹ So I use the parameter λ to capture the impact of the pressure exercised by consumers on PM ’s remuneration, where $\lambda \in [0,1]$. Notice that for $\lambda = 0$, *i.e.* to make PM experience null or negative profits, it is not necessary that all consumers switch to an alternative provision. Indeed, the profitability of most concessions contracts is very sensitive to the demand, *i.e.* a marginal change of the demand can generate negative profits for the private provider. The case of $\lambda = 1$ corresponds to a contract in which demand risk is on the public authority (an availability contract).¹⁰

When PM bears demand risk, PA has more power and credibility to exploit investments i . For instance, if I consider that the number of consumers that switch to an alternative provider in case of default of renegotiation is such that $\lambda = 0$, implying no profits for PM and then bankruptcy, PA is then able to appropriate the full margin return $v(i)$ by negotiating with PM ’ (no market-shielding effect any more) because PA is able to switch – instead of side-trading – to alternative trading. Thus, if the impact of the pressure exercised by consumers on PM ’s remuneration is λ , PA ’s default payoff is

$$b - \lambda t_0 + (\lambda(1 - k) + (1 - \lambda))v(i) - i = b - \lambda t_0 + (1 - k\lambda)v(i) - i$$

In default of renegotiation, PM may not appropriate the full cost reduction $w(e)$, since the demand for the service can be reduced. PM 's default payoff when he bears demand risk is then

$$\lambda[t_0 + w(e)] - e$$

PA 's maximal gain from renegotiation is therefore

$$\lambda kv(i) + (1 - \lambda)w(e) .$$

The gain from renegotiation is shared between the parties through a Nash-bargaining solution, so PA chooses i to maximise

$$b - \lambda t_0 + (1 - k\lambda)v(i) + \frac{1}{2}[k\lambda v(i) + (1 - \lambda)w(e)] - i \quad (4)$$

and PM chooses e to maximise

$$\lambda[t_0 + w(e)] + \frac{1}{2}[k\lambda v(i) + (1 - \lambda)w(e)] - e \quad (5)$$

The first-order conditions are now

$$v'(i) = \frac{2}{2 - \lambda k} \quad w'(e) = \frac{2}{\lambda + 1} \quad (6)$$

Accountability and Incentives Comparisons

Political Accountability

The above first-order conditions demonstrate how a contract in which the private provider bears demand risk increases PA 's incentives to support adaptations from the marginal incentive $(2 - k)/2$ of $v'(i)$ in equation 3 to $(2 - \lambda k)/2$ of $v'(i)$ in equation 6. Thus, whether demand risk is on PA or on PM , PM is able to hold up part of the surplus generated by PA 's investments i because PA has a limited access to the market in case of default of renegotiation. But this PM 's hold up is function of λ when PM bears demand risk: the greater the impact of the pressure exercised by consumers on PM 's remuneration, *i.e.* the smaller λ , the smaller the renegotiation surplus for PA , so the smaller the holdup of PM of PA 's adaptation investments. In addition, in the case of $\lambda = 0$, PA 's incentives to support adaptations when the private provider bears demand risk, are equivalent to the first-best incentives level. Accordingly, $i^* \geq i^{ConcessionContract(CC),\lambda} \geq i^{AvailabilityContract(AC)}$ for any λ . The following proposition records these points.

PROPOSITION 1. *Procuring authorities are more attentive and responsive to consumers demand when the private provider bears demand risk. This political accountability increases with the impact of the pressure exercised by consumers on PM 's remuneration (*i.e.* $\lambda \rightarrow 0$).*

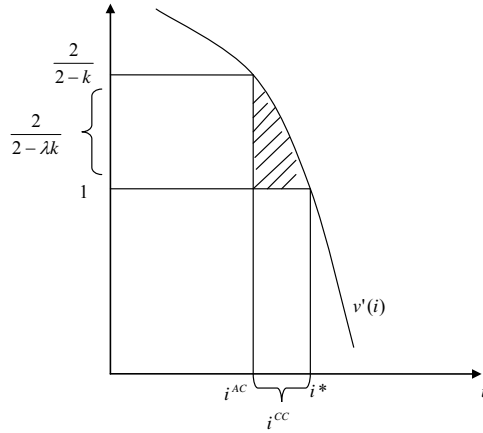
So, $i^{CC}(\lambda) > i^{AC} \forall \lambda < 1$, and $\frac{di^{CC}(\lambda)}{d\lambda} < 0 \forall \lambda > 0$.

Proof. See Appendix

The Proposition 1, illustrated by the following Figure 3, states that the model in which the private provider bears demand risk (like in concession contracts) always dominates the model in which the private provider does not bear any demand risk (like in availability contracts) regarding the political accountability, *i.e.* regarding the

incentives given to the procuring authority to invest efforts to pay attention to consumers changing demands. Intuition follows from the fact that when the private provider bears demand risk, the potential sanction from consumers increases the public authority's credibility in side-trading.

Figure 3: Illustration of equilibrium levels of political accountability



Private provider's cost-reducing incentives

The above first-order conditions also demonstrate that the allocation of demand risk on *PM* rather than on *PA* decreases *PM*'s cost-cutting incentives. As a matter of fact, the model shows that for λ equal to 1, *PM*'s cost-cutting incentives are equivalent and optimal whatever the demand risk allocation. However, when λ tends towards 0, *PM*'s cost-cutting incentives when he bears demand risk, e^{CC} , tend to be smaller than under an availability contract and under-optimal. So,

$e^* = e^{AvailabilityContract(AC)} \geq e^{ConcessionContract(CC),\lambda}$ for any λ . The following proposition records these points.

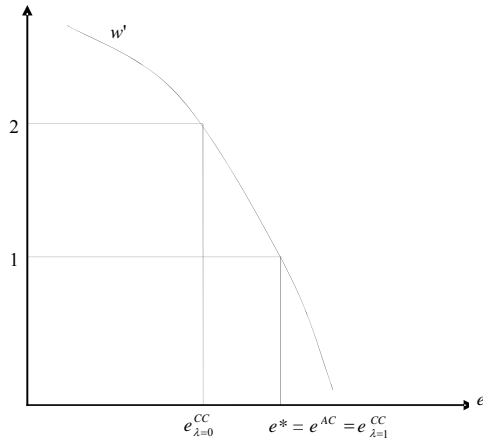
PROPOSITION 2. *Private provider's incentives to cut provision costs are more optimal when he does not bear demand risk. Increasing the impact of the pressure exercised by consumers on *PM*'s remuneration, i.e. a smaller λ , decreases the private provider's incentives to invest in cost-reducing efforts. So,*

$$e^{AC} > e^{CC}(\lambda) \quad \forall \lambda < 1, \text{ and } \frac{de(\lambda)^{CC}}{d\lambda} > 0 \quad \forall \lambda > 0.$$

Proof. See Appendix

Proposition 2 highlights the fact that the contract in which demand risk is on the public authority always dominates the contract in which demand risk is on the private provider regarding the private provider's incentives to cut costs, as illustrated by Figure 4.

Figure 4: Illustration of equilibrium levels of private providers' cost-reducing incentives



The model highlights then a tradeoff between productive efficiency (demand risk on the public authority) and allocative efficiency (demand risk on the private provider) in demand risk allocation. Thus, demand risk will be more likely on the private provider (a) when the benefits from adaptation are important (and when the sanction power of consumers is significant); (b) when the benefits from cost-reducing efforts are weak.

4. Case Studies

This section illustrates the underlying logic of the model in the context of three case studies.

The British School Catering Case

The recent experience of the British government with school dinners offers a good example of the incentives provided by an availability contract, *i.e.* a contract in which the private provider does not bear demand risk. According to Ellman (2006), ‘In the aftermath of a series of television reports on school dinners by celebrity chef Jamie Oliver in early 2005, the government rushed to quench mounting public discontent over low quality committing to make improvements. However, new schools locked into 25-year contracts through private finance initiatives (PFIs) are finding that they cannot rid their menus of junk food despite the government’s pledge’.

Note that PFI contracts are typical availability contracts. In this case, we can observe that the private provider, who does not bear demand risk, invested in cost reducing efforts whereas the procuring authority had very low power to make the private provider adapt the service according to the fundamental change in the consideration of healthy food by the public. This perfectly illustrates Propositions 1 and 2 of our model, which state that there is weak adaptation under an availability contract whereas the cost reducing efforts of the private provider are high.

If I now consider the features of this case in light of our theoretical model, the socially preferable contractual design would be to make the private provider bear demand risk. As a matter of fact, it can be considered that the social gain to have a school catering of good quality is very high. The main argument relies on public health

considerations as junk food is now considered as a main cause of health disease. This means that the benefits from adaptation are high and that it is preferable that the private provider, rather than the public authority, bears demand risk. In addition, there are alternative possibilities for parents to get their children lunch (*e.g.* lunch at home or home-made lunch at school). If demand risk would have been on the private provider, our model predicts that adaptation would have been more likely implemented. However, it is important to note that in the case of universities, I can speculate that putting demand on the private provider would be less likely socially preferable. This is due to the fact that the considerations of healthy consequences of junk food on the growing of students would be less important.

This logic also applies in the following case of the London Underground Public Private Partnership.

London Underground PPP

The London Underground Public Private Partnership is a long-term PFI contract that provides for maintenance and upgrading work of the London underground (trains, tracks, signalling and stations). This is a thirty-year, £30bn contract between London Underground Limited and the main private service provider Metronet. Metronet holds two of the three thirty-year contracts to maintain track and trains covering the London underground network. One contract covers the Bakerloo, Central, Victoria and Waterloo & City deep-level Tube lines; the other covers the Metropolitan, District, Circle and other sub-surface lines that run in shallow tunnels. The service provider took over responsibility for the lines in April 2003. It followed a competitive process whereby the contract was awarded to the qualified bidder offering the specified service at the lowest price (availability charge). Monthly payment to Metronet derives from a performance adjusted Infrastructure Service Charge (ISC). In other words, the payment to Metronet, for the first period of the contract (the contract is divided in 4 periods of 7,5 years), is composed of a fixed ISC (94,6 per cent of the revenues determined for the first period) and of performance revenues (that account for 5,4 per cent of the revenues determined for the first period of the contract). The performance revenues depend on the execution of the renewal works. They are determined according to the statistics of incidents and performance of the two last years preceding the contract. There are four criteria:

(+) Capability: technical capability of the lines, maximal capacity to reduce the durations of the trips;

(+) Availability: time lost by users (trains speed reduction);

(+) Ambience: global service quality perceived by, assessed by independent surveys;

(-) Service points and Specific Projects: penalties are applied in case of failure to meet the specified standards (regarding mainly trains delayed).

75 per cent of the performance revenues stem from technical improvements (Capability).

Moreover, in case of disputes, the contract specifies the intervention of an independent “Statutory Arbiter”, designated by the Secretary of State.

The extent of Metronet's problems has been clear since November 2006, when the arbiter of the PPP contract said he expected the company to overspend by £750m in the first 7½ years of its contract, up to October 2010. Mr Livingstone, London’s Mayor, has for long assumed that London Underground would end up paying none of the £750m of

overspending. Yet, Metronet is moving closer to initiating a formal independent review to decide who pays for a projected £750m cost overrun. Andrew Lezala, of Metronet Rail, went on: 'I respect the fact that there are large sums involved here and we are quite prepared to go through the extraordinary review process, and that's quite likely' (Robert Wright, April 25 2007).

Whereas the grounds of this overspending are not clear, this case however highlights the fact that, in the framework of availability contracts, when there are problems regarding the service provision (not only regarding contractually unanticipated service adaptation), it is very difficult for the procuring authority to reach an agreement with the private provider (in line with Proposition 2 of the model). *In this particular case, the private provider is not afraid to face a long settlement of dispute and huge costs.* I could however imagine that if demand risk was on Metronet, users would have been able to sanction Metronet for delivering a service of bad quality (the availability of alternative providers is significant for urban local transport), and hence empowered London Underground in the negotiation process.

These two cases well illustrate the consequences of a contract in which demand risk is on the public authority on incentives. However, as they are failures, our predictions regarding the socially preferable contract remain speculative. In the following subsection, I will consider a success story, though it does not concern a local public service, that will allow us to compare our theoretical predictions with the observed contractual choice.

The Highway Case: The Episode of the 'Shipwrecked Men of the Road'

In France, the provision of highways is made through concession contracts. On January 4, 2003, the French Weather-Forecaster underestimated the extent of the falls of snow which will fall down on the French North and Centre. As a consequence, the concerned private provider did not take all the necessary measures to preserve the viability of the base joint of two highways. Thus, when plates of glaze appeared on this base joint, already dense circulation became completely blocked. The absence of measures such as the diversion of traffic and information of the users by the private provider increased the number of users blocked out of 60 km. After this event, there was a public discontent about the lack of suitable means in case of considerable falls of snow. As a consequence, as required by the French government, the private provider invested in less heavy salting vehicles as well as in automatic salting systems located in crucial points.

Thus, in contrast with the former cases, this case study highlights the fact that under a concession contract, in case of changing public demand or problems, service adaptation can occur. This is in line with Proposition 1 ($i^{CC} > i^{AC}$). In addition, in the case of highways, the potential sanction power of consumers is large, as there are always alternative providers and as - and this is particularly true for the road sector - a marginal variation in the demand can be sufficient to generate negative profits for the private provider.

Note that in all the case studies presented here, either benefits from adaptation are important or benefits from cost-reducing efforts are weak, so that it is in all situations socially preferable to design a contract in which demand risk is on the private provider. Again, this does not imply that the model of the concession contract is always optimal, as speculated in the case of universities catering.

5. Conclusion

In this paper, I have studied the effects of demand risk allocation on the accountability of procuring authorities regarding consumers changing demands, as well as on the cost-reducing effort incentives of the private public-service provider. Thus, not only private providers, but also public authorities, can be expropriated ex post of a part of the surplus generated by their efforts.

The model shows that the contract form in which the private provider bears demand risk always dominates the one in which it does not bear demand risk regarding the incentives given to procuring authorities to be responsive to consumers concerns.

As for the incentives given to the private provider to reduce costs, it is in turn the contract form in which the private provider does not bear demand risk that always dominates. A tradeoff occurs then between imposing demand risk on the private provider to raise the accountability of procuring authorities, and not imposing demand risk on the private provider to raise his cost-cutting incentives. Thus, contracts in which the private provider bears demand risk are more likely to be preferred (a) the greater the benefits from adaptation (and the greater the potential impact of the consumers pressure on the private provider's remuneration); (b) the weaker the positive effect of cost-reducing efforts.

The contribution of the paper is twofold. First, it puts the emphasis on the political accountability, so far neglected, in the alignment on service provision preferences. It sheds some insights on the impact of the contractual design of Public Private Partnerships on this accountability mechanism and questions the trend towards the greater resort to contracts where firms bear little or no demand risk around the world. Second, it contributes to the broader literature on the political economy of government responsiveness. It is in fact related to the literature on voucher provision of public services and demonstrates that empowering consumers of public services strengthens incentives for governments to be responsive.

Notes

¹ The contract is assumed to be incomplete in the sense that the builder can modify the nature of the infrastructure services in various ways, without violating the contract (Hart 2003).

² Iossa and Martimort (2008) distinguish three types of PPP contract, depending on whether the payment is based on (i) user charges, (ii) usage, or on (iii) availability. In the first case, the private provider bears all demand risk. In the second case, the allocation of demand risk depends on the relationship between the payment and the actual usage level. In the third case, the public authority retains all demand risk. It is in fact contractually possible to restrict the demand risk imposed on the private provider within a concession contract (Athias and Saussier, 2007), and, as a consequence, public authorities do not face a binary choice of contracts but a continuum choice. Whereas in this paper I focus only on the two extreme contractual forms, considering a continuum choice of contracts does not question the results I obtained to the extent that the weaker the extent to which the private provider bears demand risk, the weaker the potential impact of the consumers pressure on its remuneration, everything else being equal.

³ There is one exception with the case of prisons where the private provider obviously cannot bear demand risk.

⁴ Since in both contractual designs, *PM* has control rights over the service provision, *e* will be implemented unilaterally.

⁵ I assume in this paper that the private provider has no private gains from implementing the adaptation, *i.e.* the private provider's adaptation incentives would not vary with the contractual design structures I analyse.

⁶ Thus, following Hart-Shleifer-Vishny (1997), I assume that the public authority does not maximize the global surplus during renegotiations: its utility function is given by the welfare of the rest of society, excluding the private operator. A justification for this is that the political process aligns the public authority's and society's interests (since the private operator has negligible voting power, his interests receive negligible weight). Of course, if the government placed the same weight on the private operator's utility as on the rest of society, the first-best could be achieved.

⁷ I assume that PM' 's additional cost of providing the adapted service is the same as for PM . Furthermore, I assume competition is such that PA needs only to compensate PM' 's costs.

⁸ Recall that $v(i)$ is PA 's net benefit, *i.e.* entails the provider's costs of adaptation.

⁹ Note that it is not necessary that the alternative provisions are adapted to consumers preferences. Consumers can in fact decide to switch to an alternative provision that can even less match their preferences, so as to sanction PM .

¹⁰ I abstract from the transaction costs of designing an availability contract compared to a concession contract, which when $\lambda = 1$ would favour the concession contract.

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APPENDIX

A. Proof of Proposition 1

The first-order condition when the private provider bears the demand risk is

$$v'(i) = \frac{2}{2 - \lambda k}, \text{ or, equivalently, } (2 - \lambda k)v'(i(\lambda)) = 2.$$

Taking the derivative with respect to λ yields $(2 - \lambda k)v''(i(\lambda))i'(\lambda) - kv'(i(\lambda)) = 0$

Rearranging and solving for $i'(\lambda)$:

$$i'(\lambda) = \frac{kv'(i(\lambda))}{(2 - \lambda k)v''(i(\lambda))}$$

Since v is concave as well as $0 \leq \lambda \leq 1$ and $0 < k \leq 1$, the denominator is always negative and the numerator is always positive. Therefore, $i'(\lambda)$ is always negative.

B. Proof of Proposition 2

The first-order condition when the private provider bears the demand risk is

$$w'(e) = \frac{2}{\lambda + 1}, \text{ or, equivalently, } (\lambda + 1)w'(e(\lambda)) = 2.$$

Taking the derivative with respect to λ yields $(\lambda + 1)w''(e(\lambda))e'(\lambda) + w'(e(\lambda)) = 0$

Rearranging and solving for $e'(\lambda)$:

$$e'(\lambda) = \frac{-w'(e(\lambda))}{(\lambda + 1)w''(e(\lambda))}$$

Since w is concave as well as $0 \leq \lambda \leq 1$, the denominator is always negative and the numerator is always negative. Therefore, $e'(\lambda)$ is always positive.

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