Arm's Length Delegation of Public Services*

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Abstract

Political decisions are often delegated: voters delegate to elected representatives, mayors or prime ministers delegate to subordinates. We analyze the effect of political delegation on public service provision and the choice between private or public providers when contracts are incomplete. We identify two important effects: The *incentive effect* increases the incentive part of service providers' remuneration and therefore delegation may substitute for an explicit complete incentive contract. The *bargaining effect* improves the bargaining position vis a vis a private firm with market power. In general, these effects imply that delegation improves public service provision.

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1 Introduction

Public services are fundamental aspects of modern democracies. Their provision is often subject to political debate and they claim a significant part of the budget of a modern welfare state. While many public services are produced in the public sector, private procurement has been very common in the last decades (see surveys by World Bank 1995, Shleifer 1998, and Megginson and Netter 2001). In this paper we analyze how political institutions in democracies influence public service provision. Political decisions are often subject to delegation, voters delegate to elected representatives, mayors or prime ministers delegate to subordinates. We analyze how such delegation influences public service provision and the choice between private or public procurement.

In many areas, such as health, child and elderly care, police or military service, where it is difficult to describe, monitor and contract upon quality, the outsourcing of public service provision involves a trade off between cost and quality[1]. Focusing on this case, we consider a simple framework where a *principal* delegates to a politically motivated *agent*. Our model is sufficiently general to cover both the case of representative democracy where voters (in effect the median voter) elect a politician to decide on the service provision and the case of a mayor or prime minister who delegates to a politically motivated subordinate. We show that delegation can be used strategically to provide service providers with better incentives and to counter private market power and that it therefore has important implications for the public budget and the effects of outsourcing.

We consider a world where contracts are necessarily incomplete as in Hart, Shleifer and Vishny (1997). This implies that a government faces a cost-quality trade off when it chooses between contracting with a public or a private service provider. In both cases, the incompleteness of contracts makes the service provider's incentives indirect and come through renegotiation of the contract. The incentives are therefore in general not optimal and typically stronger (for good and bad) in the private sector.

We identify two important effects of delegation: *The incentive and the bargaining effects.* The principal can influence the service provider's incentives by delegating the future renegotiation of the contract to an agent with different preferences. For instance, an agent who is more keen on cost reductions is willing to pay the public manager more for reducing cost. The public manager therefore has a larger incentive to spend effort on cost reductions when he foresees contract renegotiations with such an agent. The principal likes the stronger incentives, but dislikes the higher payment. However, when the manager is hired initially, the income from the renegotiation is taken into account and the fixed salary is lowered since the manager's total pay

[1] In other areas, like for instance, electricity provision or garbage collection, where quality is easy to contract upon ex ante and monitor ex post, outsourcing and/or privatization can imply cheaper service provision at a higher level of quality.

reflects the outside option the market for managers offers. *The incentive effect* of delegation, therefore, effectively shifts part of the fixed salary towards incentive based pay. Hence, *delegation essentially substitutes for an explicit incentive contract.*

Secondly, delegation may counter private market power through the *bargaining effect.* Assume that the principal prefers outsourcing because she focuses more on cost cutting than on quality. Then inhouse provision is not a real threat in the negotiation with a private firm, and if the firm has market power it will capture part of the surplus associated with outsourcing: The price will be relatively high. The principal can improve upon the bargaining situation by delegating to an agent, who is more reluctant to outsource since he worries more about quality. Facing a high price from the private firm, this agent will not outsource. This forces the firm to lower the price. The *bargaining effect* implies, therefore, that delegation is an effective tool for *achieving lower prices* from private service providers. The appointment of an agent reluctant to outsource forms a credible commitment to a tough stance in the bargaining.

The principal's ability to delegate depends on the institutional framework. In many countries, the law prescribes that certain services, such as policing and central services of the welfare state like elderly care or public medicare, should be provided by the public sector; from the perspective of municipalities, there is *mandatory inhouse provision.* Even though outsourcing is not an option, the principal may delegate the contracting with the public manager to an independent agent. In other situations, the legal framework implies that delegation will include both the outsourcing decision as well as the contracting authority. We denote this case *arm's length delegation.* A prominent case is representative democracy, where voters delegate these decisions to an elected representative. Other prominent cases are where a prime minister delegates to a department minister with full powers or where a government delegates to an NGO. We also consider *partial delegation*, where the principal decides on whether the service should be outsourced or not but delegates the authority to renegotiate midway with the service provider; this would be the case if a referendum on outsourcing was held among voters and an elected representative was in charge of the midway renegotiation with the service provider. Finally, we also consider, *double delegation,* where each decision is delegated to different independent agents.

We focus on the important basic case where cost reductions constitute the overwhelming motive and the important trade off related to outsourcing is that costs are lowered but so is quality. Here, the *incentive effect* is only present under inhouse provision. The opportunity to delegate makes inhouse provision more attractive through *the incentive effect* and outsourcing more attractive through *the bargaining effect* and the outsourcing choice will depend on the institutions for delegation, since they determine the relative strengths of these effects. A principal, who cares less about quality, will tend to prefer outsourcing and for her the *bargaining effect* makes delegation attractive, for this reason she prefers *arm's length delegation* (as well as *double delegation).* When she cares more about quality and tends to prefer inhouse provision,

arm's length delegation is still better than no delegation, since it allows the *incentive effect,* but *partial delegation* is even better in some cases, since the preferred agent may want to outsource itself under arm's length delegation. When the preferred agent prefers inhouse provision itself, partial and arm's length delegation are equally good for the principal as they both induce the *incentive effect.*

Considering democracies where public service provision is salient in referenda and elections, these results imply that representative democracy (where the median voter is the principal and the elected politician the agent) is better for the median voter than a hypothetical direct democracy, where she was to make both the outsourcing decision and conduct the subsequent midway renegotiation. However, the latter is hardly realistic. More interestingly, the median voter is better of if she herself can take the outsourcing decision and chose an elected representative to take care of the renegotiation, than if the elected representative also chooses the outsourcing decision. Hence, the results imply that there are situations where limiting the politicians' powers (i.e. *partial delegation*) is advantageous to the median voter. We also show that elections, where voters are concerned with public service provision, will tend to have voters vote for representatives who are more moderate than the voters themselves are. The reason is that a voter preferring inhouse provision, since she is adverse to the high cost reductions resulting from outsourcing, will realize that the public manager has weak incentives for cost cutting. She will therefore vote for a representative, who gives more incentives to the manager, i.e. a representative who is not so adverse to cost cutting. On the other hand, voters who are in favor of cost reduction prefer outsourcing and they will ideally vote for a representative, who is a the brink of preferring inhouse provision, since this representative is a very strong agent to send to the bargaining table with a private firm with market power. This implies that such voters vote for representatives, who are more adverse to cost reductions than the voters are themselves. In the end, voters tend to vote for more moderate representatives.

The importance of the incompletness of contracts differ among various services. For our results the important feature is that the public manager has insufficient incentives due to the contractual incompleteness. This lack of incentives stems from the feature that he may be fired in the renegotiation and that part of the surplus, which relates to his sunk effort, may be captured by the government anyway through employing a new manager, since his human capital is crucial. The more surplus that may be captured by the government, the weaker is his bargaining position and the weaker are his incentives therefore. This implies that the problems associated with public provision are most severe for services where the public manager's human capital is less important. One would expect this to be the case where the service involves less technical tasks, such as cleaning, while the opposite is the case if the service involves technically complicated tasks like weapons development or the like. Hence the effects we identify in this paper are likely to be more important in areas where the "technicality" is not so high.

As stated above the model has several interpretations, including delegation from an electorate to an elected representative. In such an interpretation, efficiency would include the utility of all voters. In other interpretations, like a government leader delegating to subordinates, this would not be the case. If we consider the utilities of the principal and the public manager only, we show that delegation dominates non-delegation and partial delegation is weakly better than any other institution for delegation except double delegation.[2] Although the principal does not directly internalize the service provider's utility, she indirectly internalizes it through the bargaining and incentive effects. This implies that her preferred institution for delegation is in fact second best.

While we only formally treat the case where cost-reductions is the overwhelmingly important objective, we have considered the case where quality improvements are important as well in a previous working paper version of this paper, see Bennedsen and Schultz (2008). The main results of the paper carries through to this more realistic (but also more complicated) case as long as there is a genuine trade-off related to outsourcing: it results in a cheaper service at a lower quality. The most important novelty compared with the case we treat in the present paper is that incentives for quality improvement are also insufficient in the private sector and the incentive effect therefore also becomes important in relation to the private firm. This implies that if the principal prefers outsourcing, it is not always optimal to delegate to an agent who is at the brink of preferring inhouse provision, since such an agent may provide too strong incentives for expensive quality improvement. Otherwise results bear over to the more general case.

The theoretical literature has focused on welfare consequences of privatization and outsourcing focusing on asymmetric information (Laffont and Tirole (1991), Schmidt (1996) and Shapiro and Willig (1993)), political failures (Shleifer and Vishny (1994) and Bennedsen (1999)) and incomplete contracting (Hart, Shleifer and Vishny, 1997). Besley and Ghatak (2001) study optimal ownership structures among two parties, governments or NGO's, that both care about and invest in public projects. Debande and Friebel (2004) analyze why governments engage in mass privatization; Börner (2006) studies why governments implement political reforms; and, Ellman (2006) focusses on when a government's loss of control reduces its responsiveness to public opinion which can reduce the public's political involvement. Contrary to these studies we consider strategic delegation in the sense of Vickers (1985) and Fershtman, Judd and Kalai (1987) in an incomplete contracting environment.[3]

A growing number of studies address local governments' outsourcing. Lopez de Silanaes et.al. (1997) document that political ideologies affect the outsourcing decision at the county level in US. Brown and Potoski (2003) and Levin and Tadelis (2005) show the importance of transaction costs in contracting when local governments decide on outsourcing of public services.

[2] *Double delegation* can mimick *arm's length delegation* (by delegating both decisions to the same type) and *partial delegation* (by delegating the outsourcing decision to a type identical to the principal). Thus, double delegation is always weakly better for the principal than the other two delegation modes.

[3] Our paper is also related to the large literature on central bank independency following Rogoff (1985). The focus in central bank delegation is on the ability to commit to a certain future policy.

The latter study develops a measure of contracting difficulty of different services and shows that it is strongly correlated with whether services are provided inhouse in US municipalities. This literature documents that political preferences, degree of contractual incompleteness and complexity of service provisions are all important factors in deciding the type of service provision. Our analysis highlights that delegation is a powerful instrument in such environments.

Our model focuses on the trade off between cost and quality of service provision. We believe that this trade off is essential in many kind of governmental services although not all. The *quality shading* hypothesis argues that quality may deteriorate when service production is transferred to the private sector (Jensen and Stonecash, 2005). Hartley (2004) and Fredland (2004) analyze provision of combat and support functions to sovereign governments by private companies. The studies conclude that there are substantial potential cost saving from outsourcing military activities but their economic role will be limited due to contractual hazards. There are a number of studies that link ownership structures of hospitals to the quality of the delivered health care (a.o. Sloan et al. 1998, Devereaux et.al. 2002 and Deber 2002) where the ultimate measure of quality is likelihood of death. Similarly, Crampton and Starfield (2004) discusses the quality effects of private provision of primary health service.[4] Many other empirical studies of privatization have focused on how increased competition has affected the cost of maintaining facilities and providing public and private services (see e.g. Vickers and Yarrow (1988), World Bank (1995) and (1997), and the survey by Megginson and Netter (1999)).

The structure of the paper is as follows: The basic framework with the benchmark case of no delegation is considered in section 2. The different kinds of delegation are analyzed in section 3, while the principal's ranking of these are discussed in section 4. Efficiency is discussed in section 5, while the extension to several kinds of effort is briefly touched upon in section 6. A few concluding remarks are offered in section 7.

2 The basic framework, no delegation

The government provides a service, which can be produced inhouse or outsourced. Apart from providing the service, the crucial task faced in service provision is a reduction of cost. The service provider - whether the public manager or the firm - performs cost reducing effort, e_c, at a private cost of $\frac{1}{2}e_c^2$ which results in plans. Effort is observable but non-contractible[5]. The total costs of producing the service consists of remuneration of the manager plus other costs. If the cost reduction plans are implemented, the non-managerial cost of producing the service is

[4] Some studies have investigated the quality effects of outsourcing garbage collection (a.o. McDavid (2002)) an area where outsourcing generally reduces cost and frequently increase quality.

[5] To be specific, we assume that the service provider's investment in cost reduction is observable but not verifiable to third parties, i.e. it cannot be written into contracts that are enforceable ex post. This is a standard assumption in the incomplete contracting literature (Hart 1995). For a discussion of this assumption we refer to Maskin and Tirole (1999) and Hart and Moore (1999).

lowered from $C_0 > 0$ to

$$C(e_c) = C_0 - e_c. \tag{1}$$

If the government produces inhouse, it bears the total costs. In case of outsourcing, the firm bears the cost. The firm is owned by its manager so it has no managerial wage cost.

If the cost reduction plans are implemented, the quality of the service will be reduced to

$$Q(e_c) = Q_0 - \theta e_c. \tag{2}$$

The parameter $\theta \geq 0$ reflects how severe the quality effect is. The principal cares about public service provision and likes quality, Q, but dislikes the government expenditure associated with paying the total costs of the service Y. Her utility is

$$v(Q, Y) = \phi_p Q - Y \tag{3}$$

where $\phi_p \geq 0$ is the weight she puts on quality. The gross surplus from cost reducing effort is therefore

$$s(e_c, \phi_p, \theta) = \left(1 - \theta\phi_p\right) e_c. \tag{4}$$

We first consider the benchmark case of no delegation. Here the principal is the decision maker for the government, both in relation to outsourcing as well as in the subsequent renegotiation with the chosen service provider midway. Under *inhouse provision,* the principal hires a manager at the market for managers at a fixed wage w. When hired, the manager spends effort, e_c. With total income I, and effort level, e_c, his utility is

$$u^m = I - \frac{1}{2} e_c^2. \tag{5}$$

Since effort is non-contractible, the manager's contract gives no direct incentive to perform it. However, after effort is performed, the plans are tangible and it is possible to write a contract specifying that he should implement them. The parties then renegotiate his contract. If negotiations break down, the principal can replace the manager, but only a fraction $1 - \lambda$ of the gross gains can be realized, since the new manager does not have the detailed knowledge and human capital of the old manager. The size of λ depends on how important the human capital of the manager is. One would expect this to be very important if the service is very complicated and technical, and cost reductions involve serious R&D, while it perhaps is smaller if the service is less complicated like for instance cleaning[6]. In the sequel, we will conceive of λ as reflecting the "technicality" of the task. As the government can recoup $1 - \lambda$ even without the public manager, the gains from renegotiation consist of the other fraction λ, which is split

[6]Notice, that one could conceive of situations where even in simple tasks like cleaning, human capital is important, e.g. because of good staff relations.

evenly so the manager's income is $w + \frac{\lambda}{2}s(e_c, \phi_p, \theta)$. The manager foresees this so his optimizing effort choice is

$$e_c^{in}\left(\phi_p, \theta, \lambda\right) = \left(1 - \theta\phi_p\right)\frac{\lambda}{2}, \tag{6}$$

if $\phi_p < 1/\theta$ and zero otherwise.

At the hiring stage, the parties foresee the upcoming renegotiation[7] and the wage w makes the manager indifferent between taking the job and going for his outside option, which we normalize to 0, so

$$w = 0 - \frac{\lambda}{2}s\left(e_c^{in}\left(\phi_p, \theta, \lambda\right), \phi_p, \theta\right) + \frac{1}{2}e_c^{in}\left(\phi_p, \theta, \lambda\right)^2.$$

The principal's total expenditure is

$$Y^{in}\left(\phi_p, \theta, \lambda\right) = C_0 - e_c^{in}\left(\phi_p, \theta, \lambda\right) + w + \frac{\lambda}{2}s\left(e_c^{in}\left(\phi_p, \theta, \lambda\right), \phi_p, \theta\right),$$

and her utility from in-house provision is

$$v^{in} = \phi_p\left(Q_0 - \theta e^{in}\left(\phi_p, \theta, \lambda\right)\right) - Y^{in}\left(\phi_p, \theta, \lambda\right). \tag{7}$$

The first best level of effort maximizes the net surplus between the manager and the principal, $N(e_c, \phi_p, \theta) = s(e_c, \phi_p, \theta) - \frac{1}{2}e_c^2$. For $\phi_p < 1/\theta$ it is

$$e_c^*\left(\phi_p, \theta\right) = 1 - \theta\phi_p, \tag{8}$$

otherwise it is zero. The contractual incompleteness lead to inefficiency: Since the renegotiation only gives the public manager part of the surplus generated by his effort, it provides him with too weak incentives and his effort level is too low.

Under *outsourcing*, the principal and a private firm conclude a contract stipulating that the firm produces the service for the price p_0 and bears the associated costs. The contract can be renegotiated, but it cannot be terminated prematurely. Then the firm exerts effort, e_c, on plans for cost reduction and the parties may then renegotiate the contract. The firm owns the plans so if negotiations break down it decides whether cost reductions will be implemented. This is the crucial difference to inhouse provision. Since the firm bears costs and is paid p_0 regardless of whether the plans are implemented or not, it will wish to implement the cost reductions.

[7] Hart, Shleifer and Vishny 1997 assume that the public manager receives a fixed wage weakly larger than his outside option. It is implicit in this formulation that the government does not foresee the renegotiation implying that the manager ends up with a total compensation strictly larger than his outside option. We believe that a rational government recognizes that it can lower the fixed part of the manager's remuneration below the relevant reservation wage, because both manager and government know that additional payment will follow in the renegotiation process.

Hart, Shleifer and Vishny briefly discuss the possibility that the manager offers the government some of his post contractual rent but catagorize such actions as corruption.

The firm's optimal choice is $e_c^o = 1$, and the principal's total expenditure is $Y^o = p_0$.[8]

The utilities to the firm and the principal from outsourcing are

$$u^f = p_0 - C_0 + \frac{1}{2}, \quad \text{and} \quad v^o = \phi_p Q_0 - \theta\phi_p - p_0. \tag{9}$$

Comparing (6), and (8) with $e_c^o = 1$, we have that

$$e_c^{in}\left(\phi_p, \theta, \lambda\right) \leq e_c^*\left(\phi_p, \theta\right) < e_c^o. \tag{10}$$

Cost reductions are larger under outsourcing. Contrary to the firm, the public manager has no direct interest in cost reductions and takes to some extent into account that they hurt the principal.

The joint surplus of the principal and the firm from outsourcing is

$$\Omega\left(\phi_p, \theta, \lambda\right) = v^o + u^f - \left(v^{in} + 0\right)$$

where the zero is the value of the firm's outside option. Inserting gives

$$\Omega\left(\phi_p, \theta, \lambda\right) = \begin{cases} \frac{1}{8}\left(2 - \lambda\left(\left(1 - \phi_p\theta\right)\right)\right)\left(2 - \lambda - \left(4 - \lambda\right)\theta\phi_p\right) & \text{if} \quad \phi_p \leq \frac{1}{\theta}, \\ \frac{1}{2}\left(1 - 2\theta\phi_p\right) & \text{if} \quad \phi_p > \frac{1}{\theta}. \end{cases} \tag{11}$$

We envision outsourcing through a bidding process, where the lowest bidder wins the contract. The winning price depends on the competitive environment. If the government is a large buyer in a market with a competitive selling side, it is reasonable to assume that the price will equal the competitive price, where the government reaps the whole surplus from outsourcing.[9] If, however, competition is weak and the firms are able to collude the outcome will not be competitive. Suppose many local governments face a monopolistic firm, the firm then has significant bargaining power. If a local government invites tenders, the firm will only need to submit a bid, which exactly makes the principal indifferent between outsourcing and producing in-house. In this case the private monopoly will reap the surplus from outsourcing. The degree of market power, γ, determines the firm's share of the surplus. If $\gamma = 1$, the firm reaps all surplus - the monopoly case - if $\gamma = 0$ the principal reaps all surplus - the perfectly competitive case, for intermediate values of γ the surplus is shared. The principal's utility from outsourcing is therefore

$$v^o = \left(1 - \gamma\right)\Omega\left(\phi_p, \theta, \lambda\right) + v^{in}, \tag{12}$$

[8] One may wonder whether the principal would be interested in paying the firm for not implementing the cost reduction. If $\phi_p\theta < 1$, then although the principal is hurt, she is not willing to pay the firm the potential cost savings for not implementing the cost reduction. In this case, the renegotiation will have no effect and the firm will just implement the cost reduction. If $1 < \phi_p\theta$, the quality reduction hurts the principal so much that she is willing to pay more than the potential cost reduction in order to avoid it. Assuming - as above - that the parties split the bargaining surplus 50:50, then such a payment would imply that the firm in fact gets even larger benefit from effort directed at cost reductions, since now the marginal payoff is $1 + \frac{\phi_p\theta - 1}{2}$. The optimal choice of cost reducing effort would be $e_c = 1 + \frac{\phi_p\theta - 1}{2}$, and this would make outsourcing unattractive for the principal. Below we show that outsourcing is only chosen when $\theta\phi_p \leq \frac{3}{7}$ and we will therefore not pursue the case $\theta\phi_p > 1$ further.

[9] This will in principle also be the consequence if the principal holds some standard auction, for instance an English auction, and there are at least two bidders who do not coordinate their bids.

from which it is clear that the principal outsources when the joint surplus is positive. Let

$$G(\theta,\lambda) \equiv \frac{2-\lambda}{4-\lambda}\frac{1}{\theta}. \tag{13}$$

We then have

Proposition 1 *Under no delegation, a principal of type ϕ_p outsources if and only if her valuation of quality is lower than the threshold $G(\theta,\lambda)$, i.e. iff $\phi_p \leq G(\theta,\lambda)$.*

Outsourcing involves a trade-off. The private firm will spend more effort in order to reduce costs but this lowers quality. In face of this trade off principals who care less for quality outsource while principals who care more for quality do not. The higher is θ, the more severe is the trade-off and the smaller is the threshold value of $\phi_p, G(\theta,\lambda)$. The treshold also depends on λ, the share of the surplus which cannot be realized without the present public manager. The higher λ, the lower is the treshold and the less is the chance that a principal outsources. The reason is that a higher λ makes for better incentives for the public manager, so the disadvantage of inhouse production is reduced. Hence, Proposition 1 implies that one should see more outsourcing of less technical tasks like cleaning etc.

Furthermore, *the outsourcing decision is independent of the competitiveness of the market* - γ does not enter in condition in Proposition 1. While perhaps surprising at first sight, the reason is straightforward: Outsourcing takes place when the surplus from outsourcing is positive. Market power does not affect the existence of the surplus, it only affects how it is split.

The firm's payoff equals its outside option, zero, plus its share of the surplus. The firm pays the costs $C_0 - 1$ and has an effort cost equal to $1/2$. Hence the outsourcing price equals

$$p_0\left(\phi_p,\theta,\lambda\right) = C_0 - \frac{1}{2} + \gamma\Omega\left(\phi_p,\theta,\lambda\right). \tag{14}$$

As the surplus decreases in ϕ_p for $\phi_p \leq G(\theta,\lambda)$, the price does as well. Principals who value quality more are more hurt by the quality reductions from the private firm's cost reductions. *The principal's quality preference affects the outsourcing price.* When the principal is of type $\phi_p = G(\theta)$, she values quality so much that the outsourcing surplus is zero. Facing such a principal, regardless of the degree of market power, γ, the firm can only get a contract if $p_0 = C_0 - 1/2$.

3 Delegation

There are multiple decisions involved in contracting and negotiating with private and public service providers; thus, in theory there are multiple decisions that can be delegated independently of each other and to independent agents. To structure the analysis we divide all decisions into two categories: First, the *outsourcing-decision* covers the initial contracting and the choice between a

private or a public service provider. Second, *future contract* decisions cover future renegotiation with the chosen service provider.

We consider the four cases: Under *Mandatory inhouse provision,* outsourcing is not an option but the principal can delegate future contract decisions. Under *Partial delegation,* the principal decides on outsourcing and delegates the future contract decisions. Under *Arms' length delegation,* the principal delegates all decisions to *one* independent agent. Finally, under *double delegation,* the two decisions are delegated to *two* independent agents.

The principal can choose among politically motivated agents, who care about quality and cost; they have utility functions like (3), but have different weights on quality, ϕ_a. We will assume that potential agents are sufficiently heterogeneous so that for any positive ϕ_a, there is an agent with ϕ_a. We exclude the existence of malevolent agents, with $\phi_a < 0$, who benefit directly from low quality public service. It would, in fact, make the analysis simpler, if we did not impose this - reasonable - restriction.

As mentioned in the Introduction, the framework is general enough to have several interpretations. In *bureaucratic delegation* the principal is the government and the agent is an independent government agent. Alternatively, one could conceive of the agent as a *department minister* with independent powers or a politically motivated NGO. Another interpretation is *representative democracy.* Imagine, for instance, local elections where a municipality's outsourcing of the core services of the welfare state like elderly or health services is a salient issue. The median voter is the principal. ϕ_p, who chooses between politicians with different ϕ_a. Assuming that a politician cannot commit to a policy before the election political promises are cheap talk. An elected politician is going to maximize his utility and voters realize this. [10]

3.1 Delegation under mandatory inhouse provision

Here outsourcing is not an option, but the principal may delegate the authority to contract and renegotiate with the public manager. Mandatory inhouse provision occurs for instance when the law prescribes that municipalities cannot outsource primary school provision, hospital services or elderly care. Principal $\phi_p's$ utility when agent ϕ_a negotiates with the public manager is

$$v^{in}\left(\phi_a|\phi_p,\theta,\lambda\right)=\phi_p\left(Q_0-\theta e_c^{in}\left(\phi_a,\theta,\lambda\right)\right)-Y^{in}\left(\phi_a,\theta,\lambda\right), \tag{15}$$

The principal's preferred agent, $\phi_a^{mi}\left(\phi_p,\theta,\lambda\right)$, maximizes $v^{in}\left(\phi_a|\phi_p,\theta,\lambda\right)$ over $\phi_a \geq 0$.[11] This gives

$$\phi_a^{mi}\left(\phi_p,\theta,\lambda\right)=\begin{cases} 0 & \text{if} \quad 0\leq\phi_p\leq\left(1-\frac{\lambda}{2}\right)\frac{1}{\theta}, \\ \frac{2\phi_p}{\lambda}-\frac{2-\lambda}{\theta\lambda} & \text{if} \quad \left(1-\frac{\lambda}{2}\right)\frac{1}{\theta}\leq\phi_p\leq\frac{1}{\theta}, \\ \text{any } \phi_a>\frac{1}{\theta} & \text{if} \quad \frac{1}{\theta}<\phi_p. \end{cases} \tag{16}$$

[10] As is seen below, the median voter is well-defined.

[11] Here and in the sequel, it is straightforward to check that the second order condition for maximum is fulfilled.

Proposition 2 *Under mandatory inhouse provision, the principal takes advantage of the incentive effect. Her preferred agent is given by (16). The optimal agent values quality less than the principal:* $\phi_a^{mi}\left(\phi_p,\theta\right) < \phi_p$ *if* $\phi_p < 1/\theta$.

The principal takes advantage of the *incentive effect* of delegation. She bears in mind that too little effort is spent by the public manager on cost reductions, since he only internalizes $\lambda/2$ of the gross surplus, cf. (6) and (8). This problem is countered by choosing an agent who cares less about quality than the principal. This agent is more favorable to cost reductions, so the surplus from cost reductions is higher when the public manager renegotiates with the agent than with the principal. The manager receives part of the surplus, so his marginal pay from putting more effort into cost reductions is higher and he responds by making more effort. While the principal likes the higher effort, she dislikes the increased pay to the manager. However, this is partly offset in the initial contracting. The public manager is hired at the competitive market for managers, so his total pay will cover his effort cost plus his outside option. When signing the initial contract with the agent, he rationally foresees the income from the renegotiation and is willing to accept a lower base wage. Hence, the principal only ends up covering the manager's extra effort cost. The *incentive effect* implies that a larger fraction of the manager's pay is related to incentives. Delegation, therefore, substitutes for a formal incentive contract.[12]

The preferred agent values quality more, the more severe the quality effects of cost reductions are. The preferred agent also values quality more, when λ is higher. In this case, the incentive problem faced by the public manager is less, and hence the principal does not need to rely so heavily on the incentive effect. In fact, it is quick to check that the principal's gain in utility from delegating is decreasing in λ. Hence, we would expect the incentive effect and the delegation to be more important for less technical tasks.

The incentive effect improves efficiency. In fact, we have that

$$e_c^{in}\left(\ \phi_a^{mi}\left(\phi_p,\theta,\lambda\right),\theta\right) = e_c^*\left(\phi_p,\theta\right),$$

for $\left(1-\frac{\lambda}{2}\right)\frac{1}{\theta} \leq \phi_p$, i.e. for interior solutions. When $\phi_a \geq 0$ does not bind, delegation can offset all distortions following from contractual incompleteness under mandatory inhouse provision. Delegation perfectly substitutes for a complete incentive contract in this environment of incomplete contracts. Principals with lower ϕ_p would prefer to delegate to extreme types $\phi_a < 0$, who cannot be found in the population. For such principals, delegation improves the situation without removing all distortions.

[12] Notice, it is crucial for delegation to work that the renegotiation outcome is foreseen at the time of the initial contracting with the service provider. As noticed above this is the main difference between our approach and the HSV97 analysis. In their framework, delegation would not improve ressource allocation because the service providers renumeration does not include the expected pay from renegotiation. Whereas delegation could improve incentives in their analysis it would be too costly for the principal and she will choose not to delegate.

3.2 Arm's Length Delegation

As discussed in the Introduction, delegation can be an institutional choice as in the case of representative democracy. However, it can also be the only feasible arrangement, since political leaders necessarily have to delegate many tasks to subordinates, including decisions on service provision. In these cases the principal delegates to an agent, who both decides on outsourcing, the hiring of and the recontracting with the service provider. Under arm's length delegation, the principal is aware that agents with $0 \leq \phi_a \leq G(\theta, \lambda)$ will outsource, while those with $G(\theta, \lambda) \leq \phi_a$ will choose inhouse provision.

Principal $\phi_p's$ utility when agent ϕ_a outsources is

$$v^{out}\left(\phi_a|\phi_p, \theta, \lambda\right) = \phi_p\left(Q_0 - \theta\right) - p_0\left(\phi_a, \theta\right) \tag{17}$$

and the most preferred agent maximizes this among those who outsource. The most preferred among those who prefer inhouse provision maximizes $v^{in}\left(\phi_a|\phi_p, \theta, \lambda\right)$ (as given in (15)). The preferred agent $\phi_a^{al}\left(\phi_p, \theta, \lambda\right)$ is given by

$$\phi_a^{al}\left(\phi_p, \theta, \lambda\right) = \begin{cases} G(\theta, \lambda)^- & \text{if} \quad 0 \leq \phi_p \leq G(\theta, \lambda), \\ G(\theta)^+ & \text{if} \quad G(\theta, \lambda) \leq \phi_p \leq 2G(\theta, \lambda), \\ \frac{2\phi_p}{\lambda} - \frac{2-\lambda}{\theta\lambda} & \text{if} \quad 2G(\theta, \lambda) \leq \phi_p \leq 1/\theta, \\ \text{any } \phi_a > \frac{1}{\theta} & \text{if} \quad \frac{1}{\theta} < \phi_p. \end{cases} \tag{18}$$

where $\phi_a^{al}\left(\phi_p, \theta, \lambda\right) = G(\theta, \lambda)^-$ denotes that the agent chooses outsourcing and $\phi_a^{al}\left(\phi_p, \theta, \lambda\right) = G(\theta, \lambda)^+$ that he chooses inhouse provision[13].

Proposition 3 *Under arm's length delegation, the principal delegates to an agent who takes the same outsourcing decision as she would herself. Principal $\phi_p's$ preferred agent, $\phi_a^{al}\left(\phi_p, \theta, \lambda\right)$, is given by* (18)*. If the principal prefers outsourcing, she chooses an agent, who is at the brink of choosing inhouse provision. If she prefers inhouse provision, she chooses an agent who cares less about quality than herself.*

Principals with low preference for quality, who prefer outsourcing, take advantage of the *bargaining effect* and delegate to an agent of type $\phi_a = G(\theta, \lambda)^-$. This agent cares more about quality than the principal and is at the brink of preferring inhouse provision and is therefore a tough negotiator with the firm. With this agent the outsourcing surplus is zero, and the outsourcing price is therefore as low as possible. The *incentive effect* plays no role here, since the firm will just implement the cost savings without further renegotiation.

Principals, who prefer inhouse provision, take advantage of the *incentive effect,* just as under mandatory inhouse provision. They delegate to agents, who care less about quality. However,

[13] An agency with $\phi_a = G(\theta)$ is indifferent between inhouse provision and outsourcing. We assume that in this case the agency chooses the principal's most preferred option. Otherwise, the principal could delegate to a type $G(\theta) - \varepsilon$ if she preferred outsourcing and type $G(\theta) + \varepsilon$ if she preferred inhouse provision, where ε is vanishingly small.

principals with intermediate valuations of quality, where $G(\theta,\lambda) \leq \phi_p \leq 2G(\theta,\lambda)$, encounter the problem that the preferred agent under mandatory inhouse provision wishes to outsource. Hence, the principal modifies the choice of agent to a type who just chooses inhouse provision. This still gives some incentive effect. Principals with even higher preference for quality do not encounter this problem, their most preferred agent also prefers inhouse provision.

Arm's length delegation does not change the outsourcing decision: Principals delegate to an agent, who makes the same decision on outsourcing as the principal would herself. The reason is that the *bargaining effect* and the *incentive effect* go in different directions: The bargaining effect induces the principal to choose an agent who values quality more than herself, the incentive effect induces her to choose an agent who values quality less. Consider a principal of type $G(\theta,\lambda)+\varepsilon$, where ε is very small. Even though she could get (almost) as good a bargain with the private firm as agent $G(\theta,\lambda)^-$, she prefers inhouse provision under no delegation. When she delegates, she will, therefore, not be interested in delegating to agent $G(\theta,\lambda)^-$ who outsources. Similarly, principal $G(\theta,\lambda)-\varepsilon$ prefers outsourcing under no delegation even though she herself would induce (almost) as strong incentives for the public manager as the lowest type agent, who chooses inhouse production, type $G(\theta,\lambda)^+$. Type $G(\theta,\lambda)-\varepsilon$ will therefore not be interested in delegating to an agent, who chooses inhouse provision.

Since the *bargaining effect* and the *incentive effect* go in opposite directions, principals prefer agents, who are closer to being indifferent between outsourcing and inhouse provision than the principal herself is. In the context of representative democracy, this implies that voters vote for politicians who are more moderate than themselves. The principal's optimal agent has preferences different from the principal for almost all principals (if $\phi_p < 1/\theta$). Voters prefer politicians with different preferences than themselves to take decisions here, this implies that representative democracy is better for the median principal than direct democracy. As a principal's preferred agent is weakly increasing in ϕ_p it follows that if different voters in the electorate have different ϕ_p, the preferred agent of the voter with the median value of ϕ_p is a Condorcet winner.

3.3 Partial delegation

Under arm's length delegation the principal may encounter the problem that the preferred agent under - say - inhouse provision itself prefers to outsource. This limits the principal's options and the principal has to choose a second best agent of type $\phi_a = G(\theta,\lambda)$. The principal can avoid this problem by taking the outsourcing decision herself.

When the private market is characterized by some market power it is not an option for the principal to specify that the agent shall outsource and leave the price negotiations to the agent - at least this is a very bad option. If the agent is forced to outsource, the outsourcing surplus is infinite and the price undetermined as the model is specified. This reflects that in reality the agent would fall prey to the monopoly power of the firm(s). We therefore consider the case

where the principal herself conducts negotiations with the firm if outsourcing is chosen. Both parties understand that the alternative for the principal is to choose inhouse provision. When the mode of provision is chosen - and the initial contract is signed - the principal chooses the best agent to conduct the renegotiation. The best agent then depends on the chosen mode of provision. In the price negotiations with the private firm both parties realize this.

From Proposition 2 we know that if the principal chooses inhouse provision and $\phi_p \leq \left(1-\frac{\lambda}{2}\right)\frac{1}{\theta}$, then $\phi_a = 0$ and $e_c = 1$ and the principal's utility is $v^{in}\left(0|\phi_p,\theta,\lambda\right)$. If outsourcing is chosen, then $e_c = 1$, and the utility to the principal and the firm respectively is given by v^o and u^f as given in (9). Hence, for principals $\phi_p \leq \left(1-\frac{\lambda}{2}\right)\frac{1}{\theta}$ the outsourcing surplus is

$$\hat{\Omega}\left(\phi_p,\theta,\lambda\right) = v^o + u^f - \left(v^{in}\left(0|\phi_p,\theta,\lambda\right)+0\right) = \frac{1}{8}\left(2-\lambda\right)\left(2-\lambda-4\theta\phi_p\right). \tag{19}$$

This is positive if[14]

$$\phi_p \leq H\left(\theta,\lambda\right) \equiv \frac{2-\lambda}{4}\frac{1}{\theta}.$$

Proposition 4 *Under partial delegation, the principal chooses outsourcing if and only if* $\phi_p \leq H\left(\theta,\lambda\right)$. *If outsourcing is chosen, any agent is optimal for the principal. If inhouse provision is chosen, the principal prefers an agent of type* $\phi_a^{mi}\left(\phi_p,\theta,\lambda\right)$ *as given in (16).*

Under partial delegation outsourcing is less likely than under no delegation and arm's length delegation, since $H\left(\theta\right) < G\left(\theta\right)$. Partial delegation enables principals of types close to $G\left(\theta\right)$ to specify inhouse provision and choose an agent who gives an optimal incentive effect. This agent would outsource if he had the opportunity and is therefore not attractive to the principal under arm's length delegation. The bargaining effect, on the other hand, vanishes under partial delegation since the initial contracting with the firm is done by the principal herself. Still the improved prospects under inhouse provision makes the principal herself a better negotiator with the firm although not as good as the agent, who is at the brink of choosing inhouse provision. All in all outsourcing is a less attractive option for principals with ϕ_p close to $G\left(\theta\right)$.

3.4 Double-delegation

Under *double-delegation*, the principal delegates the outsourcing decision and the initial contracting to agent a_1 and the authority to recontract to another agent, a_2.

For agent a_1, the principal's choice of agent a_2 is then given, and if he chooses inhouse provision his utility is $v^{in}\left(\phi_{a_2}|\phi_{a_1},\theta,\lambda\right)$ (as given in (15)), while the utility if he chooses outsourcing is $v^{out}\left(\phi_{a_2}|\phi_{a_1},\theta,\lambda\right)$ (from (17)). Inserting, we find that inhouse provision is chosen by a_1 if

$$\phi_{a_1} \geq \frac{2-\lambda\left(1-\theta\phi_{a_2}\right)}{4\theta} \tag{20}$$

[14] For $\phi_p \geq \left(1-\frac{\lambda}{2}\right)\frac{1}{\theta}$ the optimal agency under inhouse provision is not $\phi_a = 0$, but it is straightforward to check that the outsourcing surplus is negative in this case.

If a_1 and a_2 are chosen such that (20) is fulfilled with equality, the outsourcing surplus between the firm and a_1 is zero, and the outsourcing price therefore equals zero. If the principal wishes to outsource, she should take advantage of this, and her utility from outsourcing will be (cf. 17)

$$\tilde{v}^{out}\left(\phi_p, \theta\right) = \phi_p\left(Q_0 - \theta\right) - \left(C_0 - \frac{1}{2}\right).$$

If inhouse provision is chosen, the optimal choice of agent a_2 maximizes $v^{in}\left(\phi_{a_2}|\phi_p, \theta, \lambda\right)$. The solution is $\phi_a^{mi}\left(\phi_p, \theta, \lambda\right)$ (from 16). Comparing $\tilde{v}^{out}\left(\phi_p, \theta\right)$ and $v^{in}\left(\phi_a^{mi}\left(\phi_p, \theta, \lambda\right)|\phi_p, \theta, \lambda\right)$ gives

Proposition 5 *Under double delegation, the principal chooses an agent a_1 who outsources if and only if $\phi_p \leq H\left(\theta, \lambda\right)$. In this case, the principal chooses a_1 and a_2 fulfilling (20) with equality and reaps all outsourcing surplus. Otherwise, the principal chooses an agent a_1 who chooses inhouse provision and an agent a_2 of type $\phi_a^{mi}\left(\phi_p, \theta, \lambda\right)$ as given in (16).*

Hence, the outsourcing decision and the delegation under inhouse provision are the same under *double-delegation* and *partial delegation.* When outsourcing is chose, the principal uses the double delegation to take full advantage of the bargaining effect.

4 The principal's ranking

Suppose the principal could choose the delegation institution, which one would she choose? It it straightforward that any type of delegation is (weakly) better for the principal than non-delegation: She could choose a type equal to herself, thus mimicking non-delegation. Whenever she does something else, it is because it gives her higher utility. Similarly, *double delegation* must be weakly preferred to other kinds of delegation and *partial delegation* is (weakly) better for the principal than *mandatory inhouse provision.*[15] The comparison between *partial delegation* and *arm's length delegation* is more involved. *Partial delegation* has the advantage that the principal needs not worry that the agent may outsource so she can take full advantage of the *incentive effect. Arm's length delegation* has the advantage she can use the *bargaining effect* and reap the whole surplus from outsourcing. From Proposition 4 it is clear that outsourcing is better for the principal than inhouse provision even with the agent giving the optimal incentive effect when $\phi_p \leq H\left(\theta, \lambda\right)$. From Proposition 2 and Proposition 3, we know that the choice of agent is the same under *arm's length delegation* and *partial delegation* when $2G\left(\theta, \lambda\right) \leq \phi_p$ and that all modes are equally good if $\frac{1}{\theta} \leq \phi_p$. Summarizing the discussion, we have:

Proposition 6 *The principal's most preferred institution for allocation of authority are:*

If $0 \leq \phi_p \leq H\left(\theta, \lambda\right)$: *Arm's length and double delegation.*

[15] Remember from footnote 3 that *Double delegation* can mimick both *arm's length delegation* and *partial delegation. Partial delegation* mimicks *mandatory inhouse* provision whenever the principal decides not to outsource.

If $H(\theta,\lambda) \leq \phi_p \leq 2G(\theta,\lambda)$: *Partial and double delegation and mandatory inhouse provision.*

If $2G(\theta,\lambda) \leq \phi_p$: *all modes.*

5 Efficiency between the principal and the service provider

In this section we consider the utilities of the principal and the service provider. The principal does not directly internalize the effort cost of the service provider, so her preferred institution is not necessarily maximizing their joint surplus. We focus below on efficiency, i.e. the sum of utility of the principal and the service provider, the net surplus. The first best level of effort maximizes the net surplus and is $e_c^* = 1 - \theta\phi_p$, for $\phi_p \leq 1/\theta$ cf (8).

Figure 1 illustrates Proposition 7 below and depicts the net surplus as a function of ϕ_p for the case where $\theta = 1,\ \lambda = 1/2$ and $\gamma = 1/2$. The Figure shows that *arm's length*, *partial* and *double delegation* (weakly) dominate *no delegation*, and are strictly better when the service is produced inhouse. When the service is outsourced, the effort level is chosen by the firm without regard to any renegotiation and does therefore not depend on delegation. Under inhouse provision there is delegation to an agent, who cares less about quality, which yields stronger incentives for the public manager and this increases the joint surplus.

The Figure also demonstrates that *partial* and *double delegation* are the most efficient modes. They have the advantage over mandatory inhouse provision that the benefits from outsourcing are reaped for low ϕ_p and they allow the principal to take full advantage of the incentive effect for higher ϕ_p contrary to arm's length delegation. Full efficiency is only achieved for high ϕ_p. Such principals can delegate to agents who care sufficiently little about quality (but still have $\phi_a \geq 0$) to induce the public manager to choose the first best level of effort.

Calculating the net surplus under each institution and comparing give:

Proposition 7 *a) Delegation improves efficiency: If* $G(\theta,\lambda) < \phi_p < \frac{1}{\theta}$ *all types of delegation dominate no delegation, if* $\phi_p \leq G(\theta,\lambda)$, *arm's length, partial and double delegation does.*

b) If $H(\theta,\lambda) < \phi_p \leq 2G(\theta,\lambda)$ *partial and double delegation and mandatory inhouse provision strictly dominate no delegation and arm's length delegation.*

c) For $\phi_p \leq H(\theta,\lambda)$ *all institutions except mandatory inhouse provision are equally good.*

d) First best cannot be achieved if $2H(\theta,\lambda) \leq \phi_p$. *First best is achieved by: Partial and double delegation and mandatory inhouse provision if* $2H(\theta,\lambda) \leq \phi_p < 2G(\theta,\lambda)$*; any type of delegation if* $2G(\theta,\lambda) \leq \phi_p$*; all institutions if* $\frac{1}{\theta} \leq \phi_p$.

Proposition 7 shows that delegation typically improves efficiency measured by the netsurplus of the transaction. Comparing Propositions 6 and 7 we see that although the principal does not directly internalize the service provider's utility, her choice of institution is in fact second

best. The reason is that she indirectly internalizes the service provider's utility through the bargaining and incentive effects.

6 Extensions

We have considered the case where the overwhelmingly important objective for the service provider is to cut costs. However, often improvement of the quality and development of the service is in focus. For instance in military procurement, it often appears that quality is a more important objective than cost, viz. e.g. the development of the Stealth fighter. Consider therefore the case where the service provider has two tasks: Cost reductions and improvement of the service, e_q. The quality then becomes

$$Q\left(e_c, e_q\right) = Q_0 + e_q - \theta e_c.$$

Imagine, for simplicity that the effort cost is separable in the tasks, equal to $(1/2)\, e_c^2$ and $(1/2)\, e_q^2$, respectively. For simplicity also fix $\lambda = 1/2$. From the previous sections we know that when cost reductions are crucial, principals, who value quality less, outsource. When quality improvements is the overwhelmingly important objective, one can show that the stronger incentives in the private sector make outsourcing optimal for any type of principal. The general case is a mixture of the two simple cases and the general results will depend on which objective is dominant. In a previous working paper version of this paper, Bennedsen and Schultz (2008), we consider the case where cost-reductions are not a minor concern and the outsourcing decision still involves the cost-quality trade off even though both kinds of effort are important.

The basic results of delegation from the cost-reduction case bear over to this more general case. The most important difference is that although the private firm has stronger incentives than the public manager for making quality improvements it still have insufficient incentives. The reason is that even though it owns the plans, and therefore does not have to fear that it will be replaced by another firm who can take advantage of the plans (as the case is with the public manager), implementation of the plans requires that the government is willing to pay. The renegotiation is therefore important also in relation to the private firm and it only receives half of the surplus from quality improving effort, which implies its incentives are insufficient. Therefore *the incentive effect* becomes important also in relation to the private firm. It also implies that a principal, who favors outsourcing, is not necessarily interested in delegating to an agent, who is at the brink of preferring inhouse provision. Such an agent is willing to give the private firm too strong incentives for quality improvement - in the eye of the principal - and this costs in the renegotiation. Therefore the delegation takes this into account, and the principal delegates to a type closer to herself. Furthermore, the optimal delegation depends on the market power, since this (indirectly through the incentive effect) affects the payment to the

firm stemming from the renegotiation. Apart from this feature, the main qualitative results derived above carries over to this more general formulation.

7 Conclusion

Most public service provision is done in environments where it is difficult to contract upon on all future contingences. This paper has identified two core effects - the *incentive* and the *bargaining* effects - that makes delegation an important feature in public service provision: First by strategically delegating the right to hire and negotiate with a service provider, the principal can manipulate the service provider's incentive. Strategic delegation essentially becomes a substitute for explicit incentive contracts. Second, by delegating the right to outsource to an agent that is indifferent between provision modes, the *bargaining* power of private firms is lowered implying that delegation can reduce the price of private provision of public service.

The analysis gave a number of important results: First, the decision to outsource does not depend on the degree of competition among private service providers. If there is a joint surplus from outsourcing the outsourcing price will be adjusted so that outsourcing takes place. Second, we showed that two empirical relevant ways of delegating the outsourcing decision - *arm's length* and *partial* delegation create more efficient resource allocation than no delegation. Third, *partial* delegation is better than *arm's length* delegation at creating efficiency when the service is produced inhouse.

In representative democracies, most delegation will be *arm's length* where the electorate chooses a politician to be responsible for both the outsourcing decision and the negotiation with a private service provider. The results indicate that representative democracy is a better institution than a very hypothetical direct democracy where voters decide both on outsourcing and renegotiation. More interestingly *partial delegation* represents a case of direct referendum, where the electorate votes on outsourcing and delegates the implementation of the result to an elected politician. When voters prefer inhouse provision, this institution may be better for them than representative democracy. Our analysis thus shows that the institutions of democracy are important for provision of public services in modern democratic welfare states.

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