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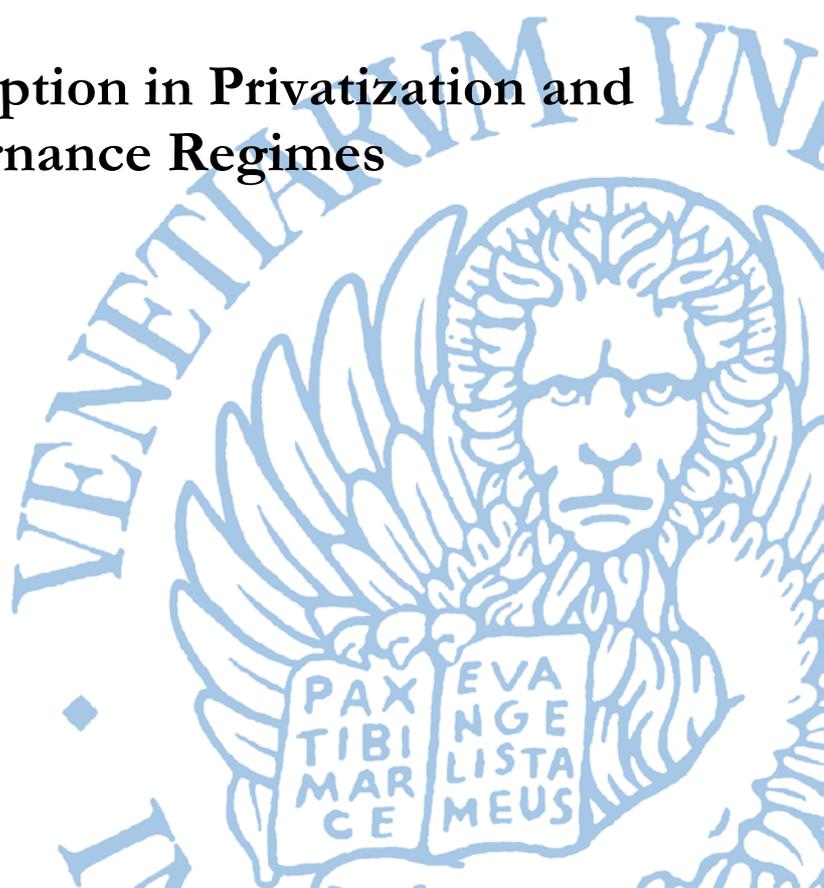
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**Corruption in Privatization and  
Governance Regimes**

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### Abstract

We consider the choice to privatize the provision of a public good in a hierarchical model with three layers: a Central Government, a decentralized agency and a (private or public) manager. In a good governance regime the privatization can be devolved upon the decentralized agency while it cannot when the governance is bad. There are two types of information asymmetries: managers are privately informed of their efficiency in reducing costs (and quality) and only the decentralized agency knows the social cost of a lower grade good.

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Governance regimes, Corruption, Privatization, Positive selection.

### JEL Codes

D73, H44, K42, L33.

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# Corruption in Privatization and Governance Regimes\*

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January 2012

## Abstract

We consider the choice to privatize the provision of a public good in a hierarchical model with three layers: a Central Government, a decentralized agency and a (private or public) manager. In a good governance regime the privatization can be devolved upon the decentralized agency while it cannot when the governance is bad. There are two types of information asymmetries: managers are privately informed of their efficiency in reducing costs (and quality) and only the decentralized agency knows the social cost of a lower grade good. We show that corruption is always detrimental to welfare when governance is good but it could be beneficial otherwise.

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# 1 Introduction

The effects of corruption on economic activity are generally thought to be negative: corruption may lead to an allocation of resources away from their most productive uses and may favor inefficient firms (Murphy et al 1993; Rose-Ackerman 1999, de la Croix and Delavallade 2009).<sup>1</sup> This conventional wisdom is backed by a large empirical literature that shows a negative relationship between corruption and growth (e.g. Mauro, 1995), FDI (e.g. Wei 2000), poverty (e.g. Gupta et al 2002) and other economic variables. (This literature is surveyed in Bardham 1997, and in Dreher and Herzfeld 2005).

Lately, however, this general consensus has been challenged. First, there is the so-called East-Asian paradox: countries like China and Indonesia have witnessed steady economic growth despite their high level of corruption (Rock and Bonnet 2004; Gyimah-Brempong and de Camacho 2006; Vial and Hanoteau 2009; Blackburn and Forgues-Puccio 2009). Secondly, the evidence on the negative effects of corruption is called into question by some recent empirical work; for example, Egger and Winner (2005) find a clear positive relationship between corruption and FDI; Halkos and Tzeremes (2010) identify conditions under which corruption can be beneficial for economic efficiency; Dreher and Gassbender (2007) find that corruption seems to reduce the negative impact of regulations on firms entry, thus inducing a positive effect on welfare and Houston (2007) detects a positive effect of corruption on GDP per capita.

In an effort to reconcile this conflicting evidence, a recent strand of empirical literature has pointed out that the institutional setting of countries is important to assess the effects of corruption. These papers test the idea that the association of corruption with poor economic performance may hold on average, but corruption could still have expansionary economic effects on a subset of nations. In particular, it could be beneficial in countries where governance (political and economic) is defective because it may help overcome the distortions caused by ill-functioning institutions. In other words, the effects of corruption could be regime specific.

The approaches in testing this conjecture have been varied, because the notion of good institutional governance is not univocally tied to a single variable. For example, Aidt et al (2008) measure good governance as the

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<sup>1</sup> An alternative view of efficient corruption has also a long tradition in economics. See the survey by Aidt (2003) and the references therein.

ability to keep politicians accountable by removing them from office in case of misbehavior. On the basis of their estimations, the relationship between corruption and growth is regime specific: in countries with low quality institutions, corruption has no effect on growth, whereas in countries with high quality institutions it has a clear negative effect.

Li and Wu (2010) introduce the level of trust in the society as their relevant institutional variable. The choice of this variable is suggested by a comparison of two countries (China and the Philippines) with similar indexes of corruption but different rates of growth; Li and Wu test the hypothesis that lack of trust makes corruption more predatory. A regression on 65 countries, including trust among the explanatory variables, shows that for low level of trust corruption has a strong negative impact on growth but this negative effect is mitigated as the level of trust increases.

Méndez and Sepúlveda (2006) and Heckelman and Powell (2010) look at the role of freedom. In particular, Méndez and Sepúlveda look at political freedom and, quite surprisingly, find that corruption can be beneficial to growth only in free countries. To the contrary, Heckelman and Powell, using an index of economic freedom, find that corruption is growth enhancing where economic freedom is most limited. This effect, however, disappears as government size and the extent of regulation decrease.

Other works use indexes of the institutional setting based on more than one variable. For example, Méon and Weill (2010) adopt an index which includes, among others, quantitative measures of the quality of the bureaucracy, the independence of the civil servants from political pressure and the incidence of regulations hindering market performance. Using firm-level data on productivity, they find that corruption is less detrimental to efficiency in countries with weak institutional frameworks. Similarly, de Vaal and Ebben (2011) show that the effects of corruption on economic growth are ambiguous once we account for institutional features of the country such as political stability, property rights, and the political system. Finally, Méon and Sekkat (2005) find that corruption is most harmful for both growth and investment where governance is weak; this counterintuitive finding is likely to be explained by the fact that, in their model, corruption is positively correlated to the quality of institutions.

A major hurdle of this literature is, obviously, the need to choose reasonable variables to capture a multifaceted notion such as the quality of in-

stitutional governance; and some counterintuitive findings can probably be downsized by improving such measures. Still, the evidence is clear enough to suggest that studying corruption while ignoring its interdependence with how institutions works may lead to wrong inferences.

Despite these indications, only very few among the theoretical papers analyzing the channels by which corruption impacts on economic performance take into account the role of institutions. Notable exceptions are Ehrlich and Lui (1999), Aidt et al. (2008), Blackburn and Forgues-Puccio (2009) and de Vaal and Ebben (2011) which all share a dynamic macroeconomic perspective. Our analysis, instead, tries to uncover one of the (many) mechanisms by which the effects of corruption change with the average quality of a nation governance using a contract theory model.

The scope of corruption is wide. In this paper we focus on its role in the process of privatization: the East European countries, Latin America and, more recently, China taught us that privatizing public or state enterprises offers great opportunities to engage in bribery (Kaufmann and Siegelbaum 1997; Chong and Lopez de Silanes 2004; Lu et al. 2008). However, the welfare implications are less univocal. Some argue that bribes can reproduce the efficiency consequences of a competitive bidding procedure: the most efficient producer has the largest surplus, therefore he can afford the largest bribe (Beck and Maher 1986; Buia and Molinari 2008); but most authors think that corruption is the source of large inefficiencies in privatization (for example, Tanzi 1998; Rose-Ackerman 1999; Bjorvatn and Soreide 2005).

Our analysis makes clear that both positions have some merit: corruption in privatization could be beneficial or detrimental to welfare depending on the type of governance. Our model views the type of governance and the existence of corruption as two different notions. Governance refers to the general institutional environment of a country. On the other hand, corruption is defined, as in most of the economic literature, as the misuse of public office for private gains by bureaucrats or politicians. Although bad governance is likely to be more conducive to corruption, the opportunity to distinguish the two levels is suggested by both anecdotal evidence and empirical studies that show that corruption is ubiquitous and that it may exist at all levels of government, regardless of the type of underlying economic and political institutions. (See, for example, Glaeser and Saks 2006; Lu et al. 2008; and the references therein). Therefore, in our model the

relationship between the type of governance and the existence of corruption is left open and the analysis is general enough to allow for a bribe-taking decentralized bureaucracy to co-exist with good governance and, on the other hand, to have honest decision makers even in countries characterized by bad governance.<sup>2</sup>

We consider the choice to privatize the provision of a public good in a hierarchical model with three layers: a Central Government, a decentralized agency and a (private or public) manager. This hierarchy is characterized by informational asymmetries. The first is between the managers and the two levels of Government: managers have private information on their ability to promote efficiency and reduce costs. The second is within the Government: only the decentralized agency knows the social cost, in terms of quality, of the managers' effort in reducing costs.

Because managers are heterogenous in their capacity to pursue efficiency, setting a privatization price produces a selection on the ability of the managers and, thus, it has an impact on welfare. We investigate the selection properties of two alternatives governance regimes: in the good one, due to the superior institutional framework of the country, the Central Government can delegate to the decentralized agency the decision whether to privatize and the choice of the privatization price. In the bad one this is not possible. Since the decentralized department has the same information as the Central Government on the managers' efficiency but has superior information on the social cost of the cost reductions, bad governance implies that less information can be used in the privatization decision.

In this setting we show that corruption is always detrimental to welfare when governance is good, but it could be beneficial otherwise. This occurs because under bad governance a honest but uninformed decision maker, in trying to take into account the social cost of the cost reducing activity (a variable he cannot observe) could make a worse selection than a corrupted decision maker who does not care about social welfare.

To the best of our knowledge, this is the first theoretical paper that shows a regime specific effect of corruption at the microeconomic level. The paper most closely related to the present one is Dhama and Al-Nowaihi (1997). They consider a principal-agent model between a regulator and a monopolist

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<sup>2</sup> For an analysis of the relationship between governance and corruption see Dreher et al. (2007), and Pellegrini and Gerlach (2008).

and they find conditions under which the welfare effects of corruption could be positive due to the tradeoff between bribery and efficiency. However, institutional features are not an issue in their paper.

The remainder of this paper is structured as follows. Section 2 presents a model of the tradeoff between public and private provision without corruption and with symmetric information. Section 3 introduces asymmetric information and a definition of governance regimes. In Section 4 we first make a general analysis of the sorting effects of privatization and then we apply it to the evaluation of social welfare with and without corruption under both types of governance regimes. Finally, Section 5 concludes.

## 2 Public vs. private provision

In this section we introduce a simple benchmark model of the trade-offs between public and private provision of goods such as hospital, school or prison services. The model is a special version of Hart *et al.* (1997) to which we refer for detailed proofs and motivation.<sup>3</sup>

The Government owns a facility (for example a school) that is necessary to provide a good. The difference between public and private provision hinges on the residual control rights of this facility under the hypothesis that contracts are incomplete.

### 2.1 Private provision

Private provision requires the facility to be privatized. The Government and a risk neutral private manager can write a long-term contract specifying two prices, one for the facility and the other for the public good, respectively denoted by  $P_F$  and  $P_0$ . This basic version of the good brings social benefit  $B_0$  at cost  $C_0$ , the latter to be borne by the private manager. Suppose that the price of the basic version exactly covers the cost, i.e.  $P_0 = C_0$ , and  $P_F$  is small enough that the private manager is willing to buy the facility.

After the contract is signed, the manager chooses effort  $e$ ; this effort lowers production costs by  $\sigma\sqrt{e}$ , where  $\sigma \in [0, 1]$  is a measure of the manager's cost reduction ability, but decreases welfare by  $\delta e$ ,  $\delta \in [0, 1]$ , due to lower

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<sup>3</sup> In particular, we consider the case  $b(e) = \delta e$ ,  $c(e) = \sigma\sqrt{e}$ ,  $\beta = 0$ ,  $\lambda = 1$ . See also Buia and Molinari (2008).

quality. Therefore,  $e$  modifies the basic version of the good in the direction of lower cost but also lower quality. Exerting effort costs the manager  $e$ .

Social welfare as a function of the manager's ability  $\sigma$  and his effort  $e$  is

$$W = B_0 - C_0 + \sigma\sqrt{e} - \delta e - e.$$

Effort, costs and benefits are not verifiable, so they cannot be specified ex-ante in the long-term contract. Since privatization gives the manager residual controls, the manager can implement any cost reduction he wishes without any need to obtain Government's approval. It follows that equilibrium effort under private provision, denoted by  $e_P$ , maximizes  $\sigma\sqrt{e} - e$ . Then

$$e_P = \frac{\sigma^2}{4} \tag{1}$$

and equilibrium welfare under private provision as a function of  $\sigma^2$  is

$$W_P(\sigma^2) = B_0 - C_0 + \frac{\sigma^2}{4}(1 - \delta).$$

## 2.2 Public provision

Consider now public provision. We assume that the description of the good is part of a contract between the Government and a risk neutral public employee and we interpret  $P_0$  as the wage the latter receives for providing (the basic version of) the good where, again,  $P_0 = C_0$ . Due to non verifiability,  $e$  cannot be specified by this contract.

When provision is done in-house, the public employee cannot implement cost reductions without Government approval because he does not have residual control rights on the facility; also, the cost reducing effort is embodied in the public employee's human capital, i.e. the Government cannot achieve cost reductions without the employee's participation. Therefore, cost reductions obtain as the result of renegotiating the initial contract between the Government and the employee, where gains are split according to the Nash bargaining solution.<sup>4</sup>

Since in the absence of an agreement only the basic good is produced, the employee's payoff after renegotiation is given by  $\frac{1}{2}(\sigma\sqrt{e} - \delta e) - e$ . It

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<sup>4</sup> We assume that gains are divided equally, but any asymmetric division where the public employee receives a share  $\alpha$  of the gains will lead to the same qualitatively results as long as  $0 < \alpha < 1$ .

follows that equilibrium effort under public provision, denoted by  $e_G$ , is

$$e_G = \frac{\sigma^2}{4(2 + \delta)^2} \quad (2)$$

and equilibrium social welfare when the good is provided in-house is

$$W_G(\sigma^2) = B_0 - C_0 + \frac{\sigma^2}{4} \frac{\delta + 3}{(2 + \delta)^2}.$$

### 2.3 Evaluation of ownership structure

To evaluate the efficiency of the two forms of provision we compare the two equilibrium efforts  $e_P$  of Equation (1) and  $e_G$  of Equation (2) with the first best effort  $e^*$  that maximizes social welfare  $B_0 - C_0 + \sigma\sqrt{e} - \delta e - e$ . Since

$$e^* = \frac{\sigma^2}{4(\delta + 1)^2},$$

we get that neither form of provision is first-best efficient as  $e_G < e^* < e_P$ . In particular,  $e^* < e_P$  because private provision gives too strong incentives to introduce cost reducing innovations. A private manager does not care about the negative externality that his effort has on social welfare; thus, his cost reducing effort is greater than the socially optimal one. On the other hand,  $e_G < e^*$ , i.e. the cost reducing effort under public provision is smaller than the first best effort, because a public manager gains only half of the benefits associated to his effort but he bears the whole cost; therefore, he has too little incentives to introduce cost reducing innovations.

Which form of provision is second-best efficient depends on the value of the parameters  $\sigma$  and  $\delta$ , i.e. on the relative efficiency in cost reduction of the private manager with respect to the public employee and on the social costs of the cost reducing effort.

In particular, when the two managers have the same  $\sigma$ , the equation  $W_P(\sigma) = W_G(\sigma)$  determines a threshold value  $\bar{\delta} = \sqrt{2} - 1 \simeq 0.4142$  such that private provision is better than public for  $\delta < \bar{\delta}$  and, conversely, public provision is preferable otherwise. In other words, when the two managers have the same cost reducing efficiency, private provision is preferable if the social cost of effort, which is disregarded by a private manager, is not too large.

When, instead, the private and the public manager have different efficiencies in cost reductions, denoted respectively by  $\sigma_P$  and  $\sigma_G$ , private

provision is better than public if

$$\sigma_P^2 > \frac{(\delta + 3)}{(1 - \delta)(2 + \delta)^2} \sigma_G^2. \quad (3)$$

Since the expression on the right is increasing in  $\delta$ , as  $\delta$  gets larger the private manager needs higher and higher efficiency, compared to the public employee, in order to compensate the negative externality of the cost reduction.

### 3 Governance regimes and corruption

In this section we introduce some more structure on the Government configuration and we distinguish between an upper level, denominated Central Government, and a lower one, represented by a public bureaucrat. We think of this lower level as a decentralized governmental agency or department with a more detailed knowledge of the specificities of the facility to be privatized. In particular, only the public bureaucrat knows the exact impact that the cost reducing effort has on welfare. We model this informational advantage over Central Government by assuming that the latter does not know  $\delta$  and that this parameter is observable only at the decentralized level.

This hierarchical structure is related to our notion of governance. A country institutional framework is determined by many things, for example the quality of the legal and economic systems, the existence of efficient administrative institutions in which decision makers are accountable for their choices, the transparency of the decision making processes and so on. These elements, taken together, hinge on the range of market and administrative instruments that the Government is able to use; for example, sound administrative procedures in the public sector may increase the ability to keep decision makers accountable and, thus, can make delegation safer and more efficient. Accordingly, we capture the grey-area scope of institutional framework by defining governance in terms of the Central Government's ability to delegate economic decisions to the lower (and more informed) level. In particular, bad governance is defined as the impossibility to devolve upon the public bureaucrat the decision whether to privatize and at what price  $P_F$ . On the other hand, with good governance the decision can be handled at the lower level. Therefore, given our informational assumptions, bad governance implies that  $P_F$  cannot depend on  $\delta$ .

The asymmetry of information between the Central Government and the decentralized agency is not the only one in the model. The other is between the Government (both at the central and decentralized level) and the (private or public) manager. We assume that only the managers know the actual value of their own cost reducing efficiency, while  $\sigma_P$  and  $\sigma_G$  are two independent random variables whose squared values  $\sigma_P^2$  and  $\sigma_G^2$  are both uniformly distributed in  $[0, 1]$ . It is important to stress that both levels of government share the same information on the private and public managers' efficiency; therefore, any result that welfare is higher when decisions are taken at the decentralized level is not driven by the assumption that an enhanced knowledge on the managers' cost reducing efficiency allows a more effective selection of managers.

In this setting, corruption corresponds to the request to the private manager to pay a bribe  $B$ , in addition to the official price  $P_F$ , as a condition to get the facility. We assume that the request for a bribe is take-it-or-leave-it: if the manager refuses to pay, the good is provided by a public manager; if, instead, the bribe is paid, the facility is sold at price  $P_F$  and provision is contracted out. Only a dishonest decision maker, who cares uniquely about the bribe he can pocket, will ask for a bribe. Therefore, corruption can occur both at the centralized or decentralized level and this is independent of the type of governance but only depends on the morality of the decision maker.

## 4 Privatization and its welfare effects

Let  $T$  be the total amount of money that the private manager has to pay to get the public facility. This transfer includes the price of the facility and, possibly, a bribe  $B$ , i.e.  $T = P_F + B$ .

If  $T$  is smaller than the profit that the private manager can extract by providing the good, i.e. if:

$$\sigma\sqrt{e} - e \geq T,$$

the private manager accepts to pay it and privatization occurs. Since the optimal effort for the private manager is  $e_P = \frac{\sigma^2}{4}$ , the above condition is equivalent to  $\sigma^2 \geq 4T$ . If, instead,  $T$  is too large, the good is provided by a public employee. Therefore social welfare, as a function of the private

manager's efficiency, is given by:

$$\begin{cases} W_P(\sigma) & \text{if } \sigma^2 \geq 4T \\ W_G(\sigma_G) & \text{if } \sigma^2 < 4T \end{cases}$$

In particular, if  $T \leq \frac{1}{4}$ , the good is produced in-house for low values of the private manager's efficiency and outsourced otherwise. Therefore, expected social welfare as a function of  $T$ , denoted by  $\overline{W}(T)$ , is equal to:

$$\begin{aligned} \overline{W}(T) &= \int_0^{4T} \int_0^1 W_G(\sigma_G^2) d\sigma_G^2 d\sigma_P + \int_{4T}^1 W_P(\sigma_P) d\sigma_P = \\ &= B_0 - C_0 + \frac{1}{8} (1 - \delta) - 2T^2(1 - \delta) + \frac{\delta + 3}{2(2 + \delta)^2} T. \end{aligned}$$

If instead  $T > \frac{1}{4}$ , privatization never occurs and provision of the good is public. In this case expected social welfare is:

$$\overline{W}(T) = \int_0^1 W_G(\sigma_G^2) d\sigma_G^2 = B_0 - C_0 + \frac{1}{8} \frac{\delta + 3}{(2 + \delta)^2}.$$

Notice that the Government, by setting a transfer  $T$ , can indirectly make a (positive) selection on the type of private manager even if he cannot observe the value of  $\sigma_P$ : since less efficient private managers are less willing to pay in order to get the facility, any strictly positive transfer will exclude less efficient managers from the outsourcing contract. This positive selection has a beneficial effect on welfare.

In what follows we find the equilibrium values of the price of the facility  $P_F$  and the bribe  $B$  with and without corruption under the two governance regimes. The resulting four alternative situations will be labelled by a pair of small letter subscripts where  $g$  and  $b$  refer to good and bad governance, respectively, and  $h$  and  $c$  to honest and corrupt decision maker.

### Good governance with a honest bureaucrat

This is the case in which the decision to privatize is delegated to a honest decentralized bureaucrat; therefore  $B^{gh} = 0$  and the price of the facility  $P_F^{gh}$ , which can depend on  $\delta$ , is set in order to maximize expected social welfare  $\overline{W}(T)$ . Then

$$P_F^{gh} = \frac{\delta + 3}{8(1 - \delta)(2 + \delta)^2}.$$

Notice that the equilibrium price  $P_F^{gh}$  is increasing in  $\delta$ : the price paid by the private manager accounts for the social damages he produces as a result of cost cutting. In other words, the selection made by a honest bureaucrat under good governance is made both on the manager's capacity to reduce cost (and to generate personal profits) and on the consequences that the reduction in costs has on the quality of the good.

Given this price, privatization occurs only when

$$\sigma_P^2 \geq \frac{\delta + 3}{2(1 - \delta)(2 + \delta)^2},$$

i.e. it is less likely to occur for larger values of  $\delta$  and it never occurs when  $\delta$  is greater than a threshold value  $\bar{\delta} = 0.7523$ .

As Equation (3) reveals, this is the first best privatization decision since the expected value of the public employee's efficiency  $\sigma_G$  is equal to  $1/2$ . Therefore, a honest bureaucrat under good governance achieves the highest social welfare conditional on the Government's lack of information on the cost reducing efficiencies  $(\sigma_P, \sigma_G)$ .

### Good governance with corruption

If the decision to privatize is delegated to a decentralized bureaucrat who is dishonest, the transfer requested to the private manager is  $T = P_F + B$  and privatization occurs only when  $\sigma_P^2$  is greater than  $4T$ .

Taking into account this decision by the private manager, a corrupt politician who maximizes his expected revenue

$$\int_{4(B+P_F)}^1 B d\sigma^2$$

sets  $P_F^{gc} = 0$  and  $B^{gc} = \frac{1}{8}$ .

Notice that, even if the bureaucrat knows the social cost of having a lower quality good  $\delta$ , he ignores his information and asks for a fixed transfer  $T = \frac{1}{8}$ .

In this case, for  $\sigma_P^2 < \frac{1}{2}$  the private manager refuses to pay the bribe and provision is public; when instead  $\sigma_P^2 \geq \frac{1}{2}$ , the bribe is paid and the service is contracted out. Therefore expected social welfare is

$$\bar{W}\left(\frac{1}{8}\right) = \int_0^{\frac{1}{2}} \int_0^1 W_G(\sigma_G^2) d\sigma_G^2 d\sigma_P^2 + \int_{\frac{1}{2}}^1 W_P(\sigma_P^2) d\sigma_P^2.$$

Thus, a dishonest bureaucrat, asking for a bribe, enacts a positive selection on the cost reducing efficiency of the private manager: only the 50% more efficient private managers pay the bribe. However, unlike the selection obtained by a honest bureaucrat, the bribe screens out private managers who get low benefits from implementing cost reductions, regardless of the social cost of privatizing (as measured by  $\delta$ ). This is why corruption is never beneficial under good governance, as stated by the following proposition.

**Proposition 1** *Under good governance, for any value of  $\delta$  expected social welfare is higher without corruption.*

*Proof:* It is enough to show that  $\overline{W}(T^{gh}) \geq \overline{W}(\frac{1}{8})$  for any value of  $\delta$ . We consider two cases:

1. for  $\delta \geq \overline{\delta}$ ,  $P^{gh} \geq \frac{1}{4}$  and

$$\overline{W}(T^{gh}) = B_0 - C_0 + \frac{1}{8} \frac{\delta + 3}{(2 + \delta)^2} > \overline{W}(\frac{1}{8});$$

2. for  $\delta < \overline{\delta}$ ,  $P^{gh} < \frac{1}{4}$  and  $\overline{W}(T)$  is strictly increasing for  $T < T^{gh}$  and decreasing otherwise. Therefore  $\overline{W}(T)$  reaches its overall maximum in  $T = T^{gh}$ .

□

### Bad governance with corruption

This is the case in which  $P_F$  cannot depend on  $\delta$  because of bad governance and the decision maker is dishonest. Bad governance in this case is inconsequential because, as we have seen in the previous case, a dishonest decision maker is not going to use his information on  $\delta$ . Therefore, under corruption the equilibrium values of the price of the facility and the bribe do not depend on the governance regime; thus,  $P_F^{bc} = 0$  and  $B^{bc} = \frac{1}{8}$ , as in the case of good governance.

### Bad governance with a honest Central Government

Under bad governance the bureaucrat is not allowed to set the privatizing price and this is chosen by the Central Government without knowing  $\delta$ . So

far we have assumed that Central Government has an informational disadvantage with respect to the decentralized department but we have not been specific about what the Government knows. Any assumption on the Government uncertainty about  $\delta$ , represented by a probability distribution, will lead to some government's decision on the price of the facility. Here, in order to avoid unnecessary technicalities, we take this decision as exogenously given and we compare expected social welfare, with and without corruption, for any possible value of  $P_F^{bh}$ . Obviously  $B^{bh} = 0$ , since there is no corruption.

**Proposition 2** *Under bad governance, for any value of  $\delta$  expected social welfare could be lower without corruption.*

*Proof:* It is enough to show that, for any  $\delta$ , there are values  $P_F^{bh}$  such that  $\overline{W}(P^{bh}) < \overline{W}(\frac{1}{8})$ . The function  $\overline{W}(T)$  is a concave parabola for  $T \leq \frac{1}{4}$  and a constant horizontal line for  $T \geq \frac{1}{4}$ ; it has a maximum in  $T = P_F^{gh}$  if  $\delta \leq \overline{\delta}$  and a continuum of maxima for  $T \geq \frac{1}{4}$  otherwise. Also,  $P_F^{gh}$  is increasing in  $\delta$  and is equal to  $\frac{1}{8}$  when  $\delta = \overline{\delta}$ . We consider two cases:

- (i) if  $\delta \geq \overline{\delta}$  then  $P_F^{gh} \geq \frac{1}{8}$  and  $\overline{W}(T)$  is strictly increasing on the interval  $[0, \frac{1}{8}]$ . Therefore any  $P_F^{bh} < \frac{1}{8}$  leads to an expected social welfare lower than the one obtained with corruption.

Notice that for  $\delta < \overline{\delta}$  expected welfare is lower than the one with corruption also for any  $P_F^{bh} > 2P_F^{gh} - \frac{1}{8}$  (the parabola is symmetric around its maximum).

- (ii) if  $\delta < \overline{\delta}$  then  $P_F^{gh} \leq \frac{1}{8}$  and  $\overline{W}(T)$  is strictly decreasing on the interval  $[\frac{1}{8}, \frac{1}{4}]$  and constant for  $T \geq \frac{1}{4}$ . Therefore any  $P_F^{bh} > \frac{1}{8}$  leads to an expected social welfare lower than the one obtained with corruption. Expected social welfare without corruption is also lower than the one obtained by a self-interested decision maker for any  $P_F^{bh} < 2P_F^{gh} - \frac{1}{8}$ .

□

The intuition of this result is the following: the first best decision on the price of the facility would require to set a different price for any value  $\delta$  of the social cost due to reduced quality. If the Government does not know  $\delta$ , by using the wrong price, it can erroneously select among the private managers. The selection is detrimental to welfare both when the first best

price is larger than the bribe but the Government chooses, instead, a very low price for the facility (or, for  $\delta < \bar{\delta}$ , a price way too large) and when the first best price is smaller than the bribe and the Government chooses instead a price larger than the bribe (or a price very close to zero.)

Notice, also, that is difficult for an uninformed Government to avoid such mistakes because any price  $P_F$  larger than  $\frac{3}{32}$  (where  $P_F^{gh} = \frac{3}{32}$  is the lowest price that an informed honest Government would ever choose and it corresponds to  $\delta = 0$ ) could be reasonable for some value of  $\delta$ : sometimes the Government can decrease welfare by setting the price too high, but the same effect may also follow with a low privatization price.

## 5 Conclusion

In this paper we model the trade-off, in terms of cost and quality, of public or private supply of a public good and we introduce the possibility that the authority entrusted of the privatization gives his assent to the contracting out conditional on the payment of a bribe. In this setting, we compare social welfare obtained with and without corruption under two alternative governance regimes and we show that corruption has a negative impact in countries with high quality institutions, while it can be beneficial in weaker institutional frameworks. This occurs because a bribe could make a selection of the most efficient producers (who are also those more capable to pay it) which is better than the one made by a honest Government who lacks the institutional instruments to set the right privatization price.

Obviously, the intent of the paper is not to hint that institutional weak countries should let their corruption grow but, instead, to illustrate one of the mechanisms through which corruption could counteract other institutional shortcomings and, thus, help to explain some of the puzzles of the recent empirical literature we presented in the introduction.

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