Living With Corruption: Threshold Effects in Red Tape and Rent Seeking

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Abstract

We present a simple model of public procurement in which government officials (bureaucrats) are delegated the task of acquiring some privately-manufactured input for use in the production of a final public good or service. Asymmetric information about the quality of this input leads to an optimal procurement contract that allows firms to make positive profits which bureaucrats can appropriate through the substitution of bribe payments for costly rules and regulations. We establish the existence of a critical, or threshold, level of such red tape, below (above) which public good provision is unaffected (reduced) by rent-seeking. We contend that this threshold is more likely to be higher for lesser developed economies, implying that such economies are more able to absorb a higher amount of red tape and corruption without compromising the objectives of public procurement.

1 Introduction

In many areas of economic activity, private individuals must comply with a range of official rules and regulations that are costly in terms of time, effort and resources. These institutional hurdles - the red tape of bureaucracy -

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provide an opportunity for rent-seeking by public adminstrators who may offer individuals the option of side-stepping formal procedures in return for various kickbacks. This is one of the most common forms of public sector corruption and its implications can be far-reaching. In this paper we study the implications of, and interactions between, red tape and rent-seeking in a simple model of public procurement.

Recent years have witnessed a burgeoning literature on the economics of corruption.[1] This has been motivated by a growing appreciation of the importance of governance in determining the functioning of society's public institutions.[2] Defined generally as the abuse of authority by public offcials for personal gains, corruption can occur on various scales, in many shapes and forms and at all levels within these institutions. One of its manifestations is when state-appointed bureaucrats exploit their powers of discretion, delegated to them by the government, to further their own interests by extorting bribes and other illicit favours.[3] At a partial equilibrium level, much research has been devoted towards understanding the microfoundations of such behaviour and the implications for efficiency and welfare (e.g., Banerjee 1997; Carrillo 2000; Klitgaard 1988, 1990; Rose-Ackerman 1975, 1978, 1999; Shleifer and Vishny 1993). At a general equilibrium level, other research has been directed towards analysing the macroeconomics of misgovernance, including the relationship between bureaucratic malfeasance and economic development (e.g., Acemoglu and Verdier 1998, 2000; Blackburn *et al.* 2006; Blackburn and Forgues-Puccio 2007; Ehrlich and Lui 1999; Sarte 2000). There has also been a flurry of empirical work on corruption, inspired largely by the publication of several cross-country datasets that are widely regarded as providing reliable measures of corrupt activity. These datasets, or corruption perception indices, have been used to produce valuable evidence on the extent to which such activity both influences, and is influenced by, various aspects of economic performance (e.g., Ades and Di Tella 1999; Gyimah-Brempong 2003; Keefer and Knack 1997; Mauro 1995, 1997; Paldam 2002; Tanzi and Davoodi 1997; Treisman 2000).[4]

[1] For surveys of the literature, see Aidt (2003), Bardhan (1997), Jain (2001), Rose-Ackerman (1999) and Tanzi (1998).

[2] The concepts of governance and corruption are intimately connected: just as bad governance fosters corruption, so corruption undermines good governance. Other important aspects of governance include transparency, accountability, political stability, social order, the rule of law and the like.

[3] This is referred to as bureaucratic corruption, as distinct from political and legislative corruption which may also arise within the public sector (e.g., Jain 2001). That corruption is a flourishing industry is evidenced by the World Bank (2004) which estimates that more than $1 trillion is paid in bribes each year around the world.

[4] As their name suggests, the indices provide measures of perceived (rather than actual)

As indicated above, bureaucratic corruption may be seen as being an almost inevitable consequence of the administrative machinery of state intervention. Yet according to one argument, this may be a blessing in disguise (e.g., Huntington 1968; Leff 1964; Leys 1970; Lui 1985). Known as the "speed money" hypothesis, the argument contends that bribery is a means of improving efficiency by helping to circumvent red tape: that is, paying kickbacks to bureaucrats is a way that individuals can avoid cumbersome regulations that create obstacles to doing business. Whilst plausible at first glance, the hypothesis can be challenged on both conceptual and empirical grounds. Conceptually, there are at least two main problems: first, although bribery may speed up individual transactions with bureaucrats, both the sizes of bribes and the number of transactions may increase so as to produce an overall net loss in efficiency; second, and more fundamentally, the rules and regulations that bribes are meant to overcome are often the result of corrupt practices to begin with and should therefore be treated as endogenous, rather than exogenous, to the bureaucratic process. Empirically, the evidence offers very little support for the hypothesis: in Ades and Di Tella (1997), Mauro (1995) and Meon and Sekkat (2005) it is found that the correlation between growth and corruption is consistently negative (and particularly strong) in samples of countries with reputedly high levels of red tape, weak rules of law and widespread government inefficiencies (the type of environment where the argument is most relevant); in Kaufman and Wei (2000) it is found that the use of bribes to speed up the bureaucratic process is largely self-defeating as the amount of time negotiating bribes increases. Based on these observations, the prevailing consensus is that corruption does more harm than good and that, if anything, puts sand, rather than grease, into the wheels of bureaucracy.

Why red tape exists is a non-trivial question to which different answers may be given. From a welfare perspective, it is possible that red tape has some positive social value, though the reasons are not yet very well understood. One argument is that it may function as a screening device to reveal information and to improve outcomes in otherwise unregulated markets (e.g.,

levels of corruption, being based on questionnaire surveys sent by various organisations to networks of correspondents around the world. Their wide acceptance is due largely to the fact that, in spite of their differences in construction and their reliance on survey data, they are all highly correlated with each other and all highly correlated with key economic variables, properties which suggest that they are, in fact, measuring the same phenomenon and that biasedness is not a major issue. The most commonly used index - a "poll of polls" - is that of Transparency International, details of which can be found at www.transparency.org/surveys/index.html♯.For A general review of the empirical work on corruption is presented in Lamdsdorff (1999, 2005).

Acemoglu and Verdier 2000; Banerjee 1997; Guriev 2004). Another is that it may serve to contain corrupt activity by limiting the scope for discretion and favouritism on the part of bureaucrats through complex rules and procedures (e.g., Wilson 1989). The problem, of course, is that the amount of red tape is typically determined by those who stand to benefit from producing too much of it. Indeed, to the more cynical observer, the main reason why it exists is that it is the means by which bureaucrats seek to extract rents in pursuit of their own self-interests (e.g., Stigler 1971; De Soto 1989). With this in mind, one appreciates the significance of the fact that it is the poorer, more corrupt countries of the world that tend to be mired in bureaucratic regulations. The literature on corruption is replete with examples - particularly from developing and transition economies - of how red tape can impose significant costs on firms, of how corruption can do the same, of how firms often seek to avoid red tape by complying in corruption and of how corruption appears to proliferate the amount of red tape (e.g., Bardhan 1984; Bhagwati 1993; Brunetti *et al.* 1997; De Soto 1989, 2000; Djankov *et al.* 2002; Kaufman 1997a,b; Mbaku 2000; Shleifer 1997; Sjaifudian 1997; World Bank 2002, 2006). The following is just a handful of observations that have been made. De Soto (1989) recounts an investigation by the Institute for Liberty and Democracy into the costs of setting up a small, fictitious firm in Peru, a venture that took 289 days of full-time work, with bribe payments being asked for on 10 occasions (and being unavoidable in 2 instances). Kaufman (1997a) reveals that 64 (44) percent of firms surveyed in the Ukraine (Russia) admitted to paying bribes to overcome red tape, and that 96 (43) percent of firms confessed to making illegal payments to obtain official licenses and permits. Brunetti *et al.* (1997) observes that, in a survey of firms around the world, red tape and corruption were ranked amongst the highest major obstacles to doing business (especially in the less developed regions). Similarly, the World Bank (2002) reports that between 50 and 80 percent of firms surveyed in developing and transition economies considered red tape and corruption to be significant constraints on their activities. In a subsequent study, the World Bank (2006) estimates that the average length of time to register a new business is usually more than 100 days in the poorer countries of the world, compared with less than 30 days in most of the richer nations. This accords with the results of Djankov *et al.* (2002) who use cross-country data on entry regulations to show that the costs of obtaining legal status to operate a firm decrease uniformly with per capita GDP.

The foregoing discussion provides the motivation for this paper which has two main objectives. The first is to offer an account of why red tape and corruption may or may not be damaging to an economy. The second is to provide an explanation for why the amount of red tape and corruption

differs so markedly across economies. Our analysis is based on a simple model of public procurement in which government officials (bureaucrats) are delegated the task of acquiring some intermediate good from private firms which serves as an input in the production of a final public good or service. For example, the government may wish to purchase cement or some other building material for use in the construction of a road, a bridge or some other infrastructure. We assume that the quality of the input may be either good or bad, and is known only to firms at the time that procurement is made. Given this informational asymmetry, the government maximises public good provision by offering firms a contract for the delivery of the high quality input at positive profit. Under such circumstances, there is an opportunity for bureaucrats to capture rents through the creation of red tape and the extraction of bribes.

The main result of our analysis is that red tape has an effect on public good provision only if it is greater than some critical, or threshold, amount. Above this threshold, red tape distorts the optimal price-quantity combination that the government offers suppliers of the intermediate good. Below the threshold, red tape has no effect on any aspect of the procurement contract. The same is also true of bribe payments, there being a critical size of bribe above (below) which public good provision is undermined (unaffected) by rent extraction. Significantly, the factors that determine the level of the threshold are factors that can be allied to the development of an economy, and the key implication is that the threshold is higher at lower stages of development. This means that poorer countries are able to absorb a greater amount of red tape and corruption without the aims of these programmes being compromised. In this way, a government that is more resource-constrained (or more resource-deprived) may show a greater willingness to tolerate corrupt behaviour, especially if the costs of rooting out such behaviour are high, or if those engaged in such behaviour are prepared to accept low wages in return for being able to ply their trade with confidence of impunity.

Our treatment of red tape and rent-seeking is opposite to that of the "speed money" hypothesis. In our case red tape functions as an instrument of bureaucrats in their corrupt dealings, being determined endogenously from the solution of their bribe maximisation problem. More notably, our analysis offers a new perspective on the idea that a government may have benevolent objectives, but may be prepared to live with the illegal profiteering of those whom it appoints to achieve these objective. As indicated earlier, it is the poorer countries of the world that are plagued most by bureaucratic regulations and bureaucratic malfeasance. Governments of these countries are rarely accused of putting a great deal of effort into stamping out these frictions and distortions. One may view this as simply a reflection of the fact

that some types of environment are more conducive than others to fostering corruption at all levels of public office. The typical argument is that corruption thrives most in less developed societies, where institutional structures are fragile and the returns to legitimate economic activity are small. Our analysis offers a quite different interpretation based on the idea of threshold effects in red tape and rent-seeking - an idea that has not, to our knowledge, been alluded to before.

The remainder of the paper is organised as follows. In Section 2 we set out and solve the basic problem of public procurement. In Section 3 we reconsider this problem in the presence of red tape and rent-seeking. In Section 4 we discuss our results and draw some implications from these. In Section 5 we make a few concluding remarks.

2 The Basic Set-up

We consider a scenario in which a government seeks to provide a public good or service that requires some privately-manufactured input for its production.[5] The procurement of this input is delegated to bureaucrats whose interests may be different from those of the government. The input may be either of a high grade (or high quality), in which case it incurs a high cost of production, or a low grade (or low quality), in which case it incurs a low cost of production. The government instructs bureaucrats to procure only the high quality variety by offering firms a contract that specifies the price to be paid and the quantity to be purchased. Complications in designing such a contract arise from asymmetric information. Specifically, only a firm knows the true quality of its product at the time that procurement is made. This raises a problem of moral hazard, as firms may try to pass off bad quality inputs as good quality inputs. Solving this problem is the basic task confronting the government. In more detail, the model is as follows.

Different grades of input make different contributions to public good provision: for the same amount of each, an input of high quality yields a greater provision than an input of low quality. In the case of the former, one unit of such an input delivers $S > 0$ units of public good.[6] The per unit cost of

[5] As indicated earlier, one may think of this in terms of the construction of various infrastructures that require certain types of building material supplied by the market. Our analysis also fits well with the case in which a government procures essential items such as food and medical supplies which it distributes to low-income groups through controlled channels.

[6] These S units may be thought of as measuring either the quantity or the quality of the public good.

producing this type of input is $C > 0$ which we assume to be greater than the per unit cost, $c > 0$, of producing the low quality variety.

The government has available $Z > 0$ amount of resources to spend on input procurement. Its benevolent objective is to maximise the provision of the public good by maximising its procurement of the high quality input, subject to its limited budget. To do this, it designs a set of procurement rules which are handed over to bureaucrats to administer and implement. The important assumption of our analysis is that neither the government nor any one of its representatives is able to distinguish *ex ante* between an input of high quality and an input of low quality. As indicated above, this means that the government may find itself bereft of the former and saddled with the latter as firms exploit its ignorance by making false claims about what they are supplying. We suppose that any firm that does this faces a probability, $\pi \in (0, 1)$, of being exposed, in which case it is forced to replace its inferior product with the high grade variety at no extra charge. With probability $1 - \pi$, the firm succeeds in its deception.[7]

Let P and Q denote, respectively, the procurement price and quantity of the high quality input. We can readily make the following observations: the total provision of the public good is SQ; the budget constraint of the government is $PQ \leq Z$; the profit of a firm that supplies the high quality input is $(P - C)Q$; and the expected profit of a firm that supplies the low quality input (whilst claiming it be high quality) is $[(1 - \pi)(P - c) - \pi C]\, Q$. We may now state the governement's procurement contracting problem as follows:

$$\begin{aligned}
\underset{Q,P}{\text{maximise}} \quad & V = SQ, && (1)\\
\text{subject to} \quad & PQ \leq Z, && (2)\\
& (P - C)Q \geq 0, && (3)\\
& (1 - \pi)(C - c) \leq \pi P, && (4)\\
& Q \geq 0, \quad P \geq 0. && (5)
\end{aligned}$$

The above expressions have the following interpretations: (1) defines the objective function of the government; (2) gives the resource constraint of the government (as alluded to above); (3) establishes the individual rationality

[7] Continuing with our earlier example, suppose that a firm supplies the government with cement of an inferior quality, where cement is used to construct a road. There is always a chance that, sooner or later, the government will learn about this: even if it is not obvious at the outset, the development of cracks and pot-holes in the road will give it away. As punishment for its misdemeanour, the firm is forced to repair the road using cement of superior quality. An alternative description of events with the same implications is to assume that the firm incurs a fine that is proportional to the scale of its operations.

condition for a firm to find it profitable to supply the high quality input; (4) depicts the incentive compatibility condition for a firm not to find it profitable to supply the low quality input; and (5) states the non-negativity constraints on the price and quantity of the input.[8]

The solution to the above problem involves the first-order conditions,

$$S - \lambda_1 P + \lambda_2 (P - C) + \lambda_4 = 0, \tag{6}$$
$$-\lambda_1 Q + \lambda_2 Q + \lambda_3 \pi + \lambda_5 = 0, \tag{7}$$

and the complementary slackness conditions,

$$\lambda_1 (Z - PQ) = 0, \quad \lambda_1 \geq 0, \ Z \geq PQ, \tag{8}$$
$$\lambda_2 (P - C)Q = 0, \quad \lambda_2 \geq 0, \ (P - C)Q \geq 0, \tag{9}$$
$$\lambda_3 [\pi P - (1 - \pi)(C - c)] = 0, \quad \lambda_3 \geq 0, \ \pi P \geq (1 - \pi)(C - c), \tag{10}$$
$$\lambda_4 Q = 0, \quad \lambda_4 \geq 0, \ Q \geq 0, \tag{11}$$
$$\lambda_5 P = 0, \quad \lambda_5 \geq 0, \ P \geq 0. \tag{12}$$

where λ_i $(i = 1, 2, 3, 4, 5)$ is a Lagrange multiplier associated with each of the constraints. Having established as much, the solution now proceeds via a series of assertions that are verified straightforwardly.

Claim 1 $\lambda_5 = 0$.

Proof. Suppose the contrary that $\lambda_5 > 0$, implying $P = 0$ from (12). Then (10) would require $0 \geq (1 - \pi)(C - c)$ which is never satisfied. ■

Claim 2 $\lambda_4 = 0$.

Proof. Suppose the contrary that $\lambda_4 > 0$, implying $Q = 0$ from (11). Then (1) would mean that $V = 0$ which can always be improved upon by any $Q > 0$. ■

Claim 3 $\lambda_1 > 0$.

Proof. Since $\lambda_4 = 0$, implying $Q > 0$ from (11), then (9) requires $P \geq C$. The claim is then validated by virtue of (6). ■

Claim 4 $\lambda_2 = 0$ *if* $\frac{1-\pi}{\pi} > \frac{C}{C-c}$.

Proof. Suppose the contrary that $\lambda_2 > 0$. Since $Q > 0$, then (10) would require $P = C$, in which case (11) would imply $\frac{1-\pi}{\pi} \leq \frac{C}{C-c}$. ■

[8] As regards (4), this is derived from $[(1 - \pi)(P - c) - \pi C]\, Q \leq (P - C)Q$.

Claim 5 $\lambda_3 > 0$.

Proof. Since $\lambda_1 > 0$, $Q > 0$ and $\lambda_2 = \lambda_5 = 0$, the claim is validated by virtue of (7). ■

The foregoing results show that the optimal procurement contract is one in which the price and quantity of the high quality input are set in such a way that the budget constraint of the government is binding, that the incentive compatibility constraint on firms is binding, and that the profits of firms are positive. These results can be used to deduce the following.

Proposition 1 *The optimal procurement price and quantity of the public good input are given by* $P^* = \frac{(1-\pi)(C-c)}{\pi}$ *and* $Q^* = \frac{\pi Z}{(1-\pi)(C-c)}$.

Proof. Strict equality in (4) yields the expression for P^*, whilst strict equality in (2) delivers the expression for Q^*. ■

Evidently, the profit to a firm from entering into this contract is $(P^*-C)Q^* = \frac{[(1-\pi)(C-c)-\pi C]Z}{(1-\pi)(C-c)}$. The factors that determine P^* and Q^* are the costs to firms of producing different grades of input (C and c), the probability that any attempt by firms to deceive the government will be exposed (π) and the amount of resources available to the government for spending on procurement (Z). The greater is C, the higher must be P^* in order to satisfy (3) and (4), in which case the lower must be Q^* in order to satisfy (2). Conversely, the greater is either c or π, the lower needs to be P^* in order to satisfy (4), in which case the higher can be Q^* without violating (2). Finally, the greater is Z, the higher can be Q^* without similarly compromising (2).

It is instructive to compare the above outcomes with those that would transpire in a first-best world of complete and symmetric information. Under such circumstances, the government solves the same optimisation problem, except for the fact that the incentive compatibility constraint on firms is redundant.[9] It is straightforward to show that the optimal procurement contract in this case is characterised by $P = C$ and $Q = \frac{Z}{C}$. Accordingly, the government is able to procure the high quality input at a lower price and in a greater quantity than is possible under asymmetric information (i.e., $C < P^*$ and $\frac{Z}{C} > Q^*$). Moreover, since the price is set equal to the input's unit cost of production, the government extracts all of the surplus from the contract, implying that firms earn zero profits. This is in contrast to the positive profits that firms would enjoy otherwise, a feature that plays an important role in our subsequent analysis.

[9] An equivalent scenario is when $\pi = 1$, in which case (4) reduces to $P \geq 0$.

3 Institutional Frictions

The environment considered so far is one in which a market imperfection (i.e., asymmetric information) encumbers public procurement, causing a departure from the first-best solution. We now introduce other potential frictions that arise from the administrative and regulatory procedures governing procurement, itself.

3.1 Red Tape

In practice public procurement is a complex process that often requires firms to spend non-trivial amounts of resources on going through various administrative procedures in order to do business with the government. As mentioned earlier, the benefits of red tape are not very well understood, though some plausible candidates exist. That some positive level of red tape might be socially-optimal is an issue worth-pursuing, but it is not one that we address in the present analysis. Rather, our interest lies elsewhere, being focused towards the relationship between red tape and corruption, and the partial equilibrium implications of this for public good provision.

We introduce red tape as the set of institutional rules and regulations that firms must comply with if they are to secure a procurement contract from the government. Responsibility for designing and implementing these procedures lies in the hands of bureaucrats using the authority that the government delegates to them. We assume that the procedural process is costly for firms, absorbing $t > 0$ amount of resources (which may include entrepreneurial time and effort, as well as profits). The greater is the amount of red tape, the more complicated or more drawn-out is this process, and the more resources must firms expend.

The immediate effect of red tape is to reduce a firm's payoff by the amount t. This is true irrespective of whether a firm supplies an input of high quality or an input of low quality since bureaucrats, being unable to distinguish between these, impose the same set of regulations on any firm that applies for a contract. Given this, then the only change to the previous set-up is that the firm's individual rationality constraint in (3) becomes $(P-C)Q-t \geq 0$. Neither the government's budget constraint in (2) nor the firm's incentive compatibility constraint in (4) is affected. These observations allow us to establish the following key results.

Proposition 2 *There exists a* $\bar{t} > 0$ *such that the optimal procurement contract is unaffected by any* $t \leq \bar{t}$.

Proof. For any $t > 0$, the first-order conditions for solving the optimal contracting problem remain as (6) and (7). Let $\bar{t}$ be the minimum value of t for which $(P^* - C)Q^* - \bar{t} = 0$. Then for any $t < \bar{t} = (P^* - C)Q^* = \frac{[(1-\pi)(C-c)-\pi C]Z}{(1-\pi)(C-c)}$, (3) holds with strict inequality, implying that $\lambda_2 = 0$. It follows that both Claim 3 and Claim 5 remain valid, in which case the solution of the problem is the same as before when $t = 0$. ■

Proposition 3 *For any $t > \bar{t}$, the optimal procurement price and quantity of the public good input are given by $P_t = \frac{CZ}{Z-t} > P^*$ and $Q_t = \frac{Z-t}{C} < Q^*$.*

Proof. Any P_t and Q_t that solve the optimal contracting problem must satisfy $(P_t - C)Q_t \geq t$. Thus, for any $t > \bar{t} = (P^* - C)Q^*$, it follows that $(P_t - C)Q_t > (P^* - C)Q^*$, or $C(Q^* - Q_t) > P^*Q^* - P_tQ_t$. Since Claim 1 and Claim 2 still hold, then so too does Claim 3, implying that $P_tQ_t = P^*Q^* = Z$. Hence $Q^* > Q_t$, in which case $P^* < P_t$. By virtue of the latter result, together with Claim 5, it must then be true that $\pi P_t > \pi P^* = (1-\pi)(C-c)$ so that $\lambda_3 = 0$. Because $\lambda_5 = 0$ as well, (7) yields $\lambda_2 = \lambda_1 > 0$, establishing that $(P_t - C)Q_t = t$ which may be combined with $P_tQ_t = Z$ to obtain the expressions for P_t and Q_t. ■

Our analysis implies that red tape has an effect on public procurement and public good provision only if it is greater than some critical, or threshold, amount, $\bar{t}$. Below this threshold, red tape is irrelevant for the terms and conditions of the optimal procurement contract which specifies the same price-quantity combination as in the absence of red tape. Above the threshold, red tape leads to a different contractual arrangement whereby the optimal price and quantity are distorted at higher and lower levels, respectively. These results have some interesting implications that we intend to reveal shortly.

3.2 Rent Seeking

According to the above description of events, the cost to a firm of acquiring a license to do business with the government is the amount of resources spent on complying with various regulations: the license, itself, is issued free of charge. In what follows we consider an alternative environment in which firms make themselves eligible for government contracts by bribing public officials: the cost of a contract is now the amount of bribe that is paid. This kickback may be given two interpretations. The first is that it is the necessary payment demanded by bureaucrats who have the monopoly power to issue or withhold contracts at will. The second is that it is the optional payment which a firm can make as a means of circumventing red tape. In terms of our

immediate concerns, it makes no difference as to which interpretation is used since our objective is simply to illustrate the effects of bribery. Subsequently, however, we focus on the latter interpretation for reasons that will become clear.

Let b denote the bribe payment of a firm. Like red tape, bribery changes the contracting problem only to the extent that it changes the firm's individual rationality constraint in (3) to $(P-C)Q-b \geq 0$. Given this, then we immediately arrive at the following results.

Proposition 4 *There exists a* $\overline{b} > 0$ *such that the optimal procurement contract is unaffected by any* $b \leq \overline{b}$.

Proof. Substitute b for t in the proof of Proposition 2. Evidently, $\overline{b} = \overline{t}$. ■

Proposition 5 *For any* $b > \overline{b}$*, the optimal procurement price and quantity of the public good input are given by* $P_b = \frac{CZ}{Z-b} > P^*$ *and* $Q_b = \frac{Z-b}{C} < Q^*$.

Proof. Substitute b for t in the proof of Proposition 3. ■

In this model bribery works in exactly the same way as red tape: only above some threshold level, $\overline{b}$, does the amount of bribe payment matter for public good provision by distorting the optimal procurement price-quantity combination; for any size of bribe below this threshold, the procurement contract is unchanged.

4 Interpretation of Results

The foregoing analysis has revealed how institutional frictions in public procurement may or may not affect public good provision. For the purposes of illustration, we have studied each type of friction in isolation and introduced it as simply an additional, exogenous factor in the procurement process. As indicated earlier, however, it is well-recognised that red tape and rent-seeking are often intimately connected through the deliberate, purposeful decisions of public officials. This is because red tape creates the very opportunities that allow such individuals to engage in rent-seeking activity: that is, bureaucrats can offer firms the option of circumventing costly official procedures in return for kickbacks of one form or another. Moreover, it is typically the same individuals who are directly responsible for determining these procedures and who stand to gain by over-producing them. In what follows we seek to explore these connections within the present context of public pro-

curement. In addition, whilst we have established the existence of threshold effects in red tape and rent-seeking, we have yet to elaborate on the potential importance and implications of these. This is another issue that will occupy our attention.

Our starting point is to consider the case in which firms can choose between going through red tape or paying bribes to bureaucrats in their endeavour to become government contractors. Suppose, for the moment, that red tape is fixed exogenously at an amount $t_0 > \bar{t}$, implying an optimal (but distorted) quantity of public good input of $Q_{t_0} = \frac{Z-t_0}{C}$. Evidently, the substitution of red tape by any bribe payment $b_0 < t_0$ will mean a higher level of procurement - either $Q_{b_0} = \frac{Z-b_0}{C}$ if $b_0 > \bar{b}$, or even $Q^* = \frac{\pi Z}{(1-\pi)(C-c)}$ if $b_0 \leq \bar{b}$.[10] This is essentially the "speed money" hypothesis, the main argument against which (as indicated above) is its treatment of red tape as exogenous to the bureaucratic process. In practice, it is typically bureaucrats, themselves, who set the rules and regulations for doing business, and who can exploit this authority to further their own interests. Even if red tape had some positive social value, the fact remains that too much of it may be produced as public officials use it as an instrument in their rent-seeking activities. This is the view that we adopt in the present analysis.

To incorporate the above ideas, we assume that the government, in delegating the task of public procurement, instructs bureaucrats to implement the contract defined by P^* and Q^*. There may well be some minimum amount of red tape (t_1, say) that the government imposes for one reason or another (e.g., to ensure compliance with some minumum set of standards on business practices) but that does not compromise the feasibility of this contract because it is lower than the threshold level (i.e., $t_1 < \bar{t}$). In any event, the government is aware that bureaucrats may deliberately inflate the level of red tape for the purpose of extracting bribes. Evidence of this is immediately forthcoming if any procurement price and quantity other than P^* and Q^* are observed: under such circumstances, the government infers that bureaucrats are either solving some entirely different problem of their own, or else are maximising public good provision but setting $t > \bar{t}$ in order to extract $b > \bar{b}$, thereby delivering P_t and Q_t (or P_b and Q_b). Either way, the failure in executing the government's directives exposes the conflicting interests of bureaucrats. These interests could be pursued clandestinely, however, if bureaucrats were to implement P^* and Q^* whilst setting $t \leq \bar{t}$ (correspondingly, $b \leq \bar{b}$): in this case the government would observe its in-

[10] In either case firms are never worse off by paying bribes than by going through red tape: opting for the latter will always give zero profits, whilst opting for the former will yield zero profits if $b_0 \geq \bar{b}$ and positive profits if $b_0 < \bar{b}$.

structions being adhered to but would not receive any signal that corruption is occuring. Naturally, bureaucrats would exploit this to the fullest possible extent, choosing $t = \bar{t}$ so as to maximise their bribe income by being able to demand $b = \bar{b}$ without compromising public procurement and without revealing their rent-seeking activities. It may well be true, of course, that the government is at least wary of the possibility that rent-seeking is taking place; but it may also be true that, even were this to be so, the government will choose optimally to ignore such behaviour, especially if public good provision is an important objective and if monitoring corruption entails the costly use of limited resources. Bureaucrats, themselves, may have a part to play in this if they are prepared to accept low wages in return for being able to ply their corrupt transactions with confidence of impunity.

The foregoing observations lead us to identify some interesting implications of our analysis that bear importantly on issues of development. Recall that $\bar{t} = \frac{[(1-\pi)(C-c)-\pi C]Z}{(1-\pi)(C-c)}$ which shows that the threshold level of red tape depends positively on the amount of public funds, Z, that are spent on intermediate inputs for use in the public project. Suppose that the government allocates a fixed initial budget to this project, out of which it pays bureaucrats salaries, w, with the remainder going towards purchases of materials. Then Z is a decreasing function of w, as is $\bar{t}$. The natural inference to be drawn from this is that, *ceteris paribus*, the threshold level of red tape is more likely to be higher in lesser developed economies where wages are generally lower. In turn, this has the implication that such economies are more able to absorb a greater amount of red tape without compromising the feasibility of P^* and Q^* as solutions to the procurement problem. The conclusion one is led to is that, for reasons given above, governments of poor countries may be more willing than governments of rich countries to tolerate red tape on a larger scale. Moreover, since $\bar{t} = \bar{b}$, the same arguments can be applied to rent-seeking: with a lower w and higher Z (implying a higher $\bar{b}$), it is the lesser developed economies that have the greater potential to sustain a higher level of corruption without public good objectives being undermined; for the same reasons again, governments of these economies may be more indulgent of corrupt behaviour.

It is important to recognise that our analysis makes no claims about the total level of public good provision. In particular, the fact that Q^* (like $\bar{t}$ and $\bar{b}$) depends positively on Z, does not mean that we infer this provision to be greater in poorer, more corrupt countries. On the contrary, there are good arguments for thinking the opposite. First, the true level of public good provision depends not only on the quantity, but also the quality, of the inputs used, and the highest quality of inputs in less developed economies may be far inferior to the highest quality of inputs in developed economies.

Second, the services yielded by public goods may also differ between poor and rich countries for a variety of reasons such as congestion externalities and environmental conditions. Third, public good provision in the economy as a whole will depend on the total amount of resources available to the government, with fewer public projects being affordable to the more budget-constrained governments of poorer nations. Thus, whilst our analysis implies that Q^* is higher in such countries, there is no presumption that this is translated into a higher level and better quality of total public services. What our results do suggest is that, for a given size of public project, corruption is more tolerable at lower levels of development.

A further point to note concerns the well-versed argument that corruption (especially in less developed countries) is largely the result of low public sector pay which induces bureaucrats to supplement their legal earnings with illegal income (e.g., Chand and Moene 1999; Mookherjee 1997). Given this, it has been suggested that one way of eliminating corruption is to remunerate civil servants with sufficiently high salaries that rid them of the incentives to transgress (e.g., Gould and Amaro-Reyes 1983; Klitgaard 1988). This idea - a type of efficiency wage hypothesis - can be challenged on both theoretical and empirical grounds. At the theoretical level, Besley and McClaren (1993) have argued that the payment of above market salaries to bureaucrats may make sense only under certain conditions. Focusing on the issue of bribery and tax evasion, the authors show how such a strategy can be counter-productive in terms of maximising net tax revenues if the incidence of corruption is high and if the monitoring of corruption is poor - which are precisely the circumstances that one associates with less developed countries. At the empirical level, Rijckeghem and Weder (1997) present evidence which offers some support for the efficiency wage approach, but which also indicates that pursuing this strategy is likely to be very costly because of the very high wages that are needed. By contrast, Huther and Shah (2000), Rauch and Evans (2000) and Treisman (2000) find no such evidence, but rather suggest that the payment of high salaries to public officials does little or nothing to reduce corruption. From the perspective of our own analysis, the payment of low salaries to public officials, rather than being seen as a cause of corrupt behaviour, is a feature of economies that may be explained on the basis of deliberate, purposeful decisions. If procurment for a public project is not threatened by corruption, then it may be optimal for a government to put up with such behaviour in return for bribe-takers' acceptance of low salaries. In this way, resources can be freed for other uses as the balance sheet of the government is improved.

Much has been written on the issue of why red tape and corruption vary so markedly across countries. Differences in institutional structures, political

processes, cultural ideologies and social norms have all been put forward as candidate explanations. Whilst interesting and plausible, such arguments are not always very informative and often run the risk of becoming mere tautologies. Our analysis offers a quite different perspective that is grounded more firmly on economic fundamentals. Its basic contention is that lesser developed countries are more able to endure higher levels of red tape and rent-seeking before any damage from such frictions is realised. As a result, governments of these countries may be prepared to live with bureaucratic malfeasance on a larger scale than governments of richer nations are prepared to do. The apparent lack of political will and social pressure to fight corrupt behaviour may be a rational choice, especially if the fight is likely to entail costs that absorb limited resources which could be used productively elsewhere, or if turning a blind eye eases the pressure on public finances by inducing corrupt public officials to accept bribe-adjusted salaries.

5 Conclusions

The objective of this paper has been two-fold: first, we have sought to offer an account of why red tape and corruption may or may not be damaging to an economy; second, we have ventured to explain why the amount of red tape and corruption differs so markedly across economies. Our analysis has been based on a simple model of public procurement in which asymmetric information between private producers and public officials leads to a procurement contract that allows the former to make positive profits which the latter can appropriate through the substitution of bribe payments for costly regulations. The novel result of our analysis is that there is a critical, or theshold, level of red tape and rent-seeking below (above) which procurement is unaffected (distorted) by these frictions. Significantly, this threshold may be seen as being higher at lower levels of development, implying that poorer countries are more able to absorb a greater amount of red tape and rent-seeking without compromising procurement objectives. Given this, then resource-constrained governments of such countries may be more willing to tolerate corruption than governments of richer nations.

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