

ECONOMIC ANALYSIS OF CORRUPTION: A SURVEY*

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Corruption is a persistent feature of human societies over time and space. The sale of parliamentary seats in ‘rotten boroughs’ in England before the Reform Act of 1832 and ‘machine politics’ in immigrant cities in the US at the turn of the 19th century are just two historical examples. Contemporaneous examples also abound and not only from developing countries such as Nigeria, India, and Philippines but also from transition economies such as Russia. Some of these and many other instances of corruption are extensively documented in *The Politics of Corruption*, edited by Robert Williams and associates. Its four volumes contain a large collection of articles published during the past 40 years in social science journals with contributions from political scientists, sociologists, anthropologists, law scholars, and a few economists including Andrei Shleifer and Robert W. Vishny. It is not surprising to find the work of Shleifer and Vishny represented in this interdisciplinary collection. As is evident from the collection of articles reprinted in *The Grabbing Hand*, they have, with various co-authors, made a large number of important contributions to the study of corruption and other government pathologies throughout the 1990s. Currently, the study of corruption is also high on the research agenda of international organisations such as the World Bank and the International Monetary Fund (IMF), and some of the most significant studies on corruption coming out of the IMF in recent years are collected in *Governance, Corruption, and Economic Performance*, edited by George T. Abed and Sanjeev Gupta.

The aim of this article is to review developments in the economics literature on corruption in order to put some of this material into a broader analytic perspective.¹ Corruption is a many-faceted phenomenon and it is hard to give a precise and comprehensive definition. Yet, it is important to try. If for nothing else, the definition of the concept determines what gets modelled and what empiricists look for in the data. Many of the articles in volume 1 of *The Politics of Corruption* are devoted to a systematic discussion of this issue (e.g., Williams, 1976; Philp, 1997). Most economic models of corruption take a somewhat parsimonious view focusing largely on market corruption or bribery, and the starting point for economic theorising is, typically, some version of the following definition:

Corruption is an act in which the power of public office is used for personal gain in a manner that contravenes the rules of the game (Jain, 2001).

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¹ A theoretical as opposed to a practical or an empirical angle is chosen to differentiate this survey from existing ones such as Andvig (1991), Bardhan (1997), Tanzi (1998), Rose-Ackerman (1978, 1999), and Jain (1998, 2001).

From this definition, it is clear that at least three conditions are necessary for corruption to arise and persist:

1. Discretionary power: the relevant public official must possess the authority to design or administer regulations and policies in a discretionary manner.
2. Economic rents: the discretionary power must allow extraction of (existing) rents or creations of rents that can be extracted.
3. Weak institutions: the incentives embodied in political, administrative, and legal institutions must be such that officials are left with an incentive to exploit their discretionary power to extract or create rents.

I make a distinction between four different analytic approaches to corruption.² Although there is overlap, they highlight two important considerations in the theoretical analysis of corruption: the degree of benevolence of the government official in charge of implementing policies and designing institutions ('the principal') and the role of institutions versus history as a determinant of corruption levels. The categories are:

1. Efficient corruption: corruption arises to facilitate beneficial trade between agents that would not otherwise have been possible. It promotes allocative efficiency by allowing agents in the private sector to correct *pre-existing* government failures.
2. Corruption with a benevolent principal: corruption arises when a benevolent principal delegates decision making power to a non-benevolent agent. The level of corruption depends on the costs and benefits of designing *optimal* institutions.
3. Corruption with a non-benevolent principal: corruption arises because non-benevolent government officials introduce inefficient policies in order to extract rents from the private sector. The level of corruption depends on the incentives embodied in *existing* institutions.
4. Self-reinforcing corruption: the reward to corruption depends on the incidence of corruption due to strategic complementarity. The level of corruption depends, for given institutions, on history.

1. Efficient Corruption

The view that corruption can be efficiency-enhancing has a long tradition in economics. Corruption, it is argued, allows individuals to work around misguided government policies and red tape, and is viewed as a rational market response to preexisting government failures. One illustrative example, suggested by Leff (1964), is the differential response by the bureaucracies in Chile and Brazil to price control for food products introduced in the two countries during a period of high inflation in the early 1960s. In Chile, the bureaucracy enforced the freeze and food production stagnated. In Brazil, a corrupt bureaucracy effectively sabotaged the freeze and production increased to the benefit of consumers.

² For alternative categorisations see e.g., Alam (1989) or Rose-Ackeriman (1999).

It is clear that the notion of efficient corruption is based on second-best reasoning: given a set of unavoidable distortions created by various government procedures or policies, corruption can promote allocative efficiency by allowing agents to circumvent these procedures or policies; yet the first-best policy would be to remove the distortions themselves. Two specific channels through which corruption can enhance allocative efficiency are often highlighted: (1) corruption speeds up bureaucratic procedures ('greases the wheels') and (2) corruption introduces competition for (scarce) government resources with the result that services are provided more efficiently than they otherwise would have been.

These mechanisms are formalised in the 'queue model' proposed by Lui (1985) and the 'auction model' proposed by Beck and Maher (1986).³ In the 'queue model', a bureaucrat is charged with the task of allocating (industrial) licences to individuals that queue up to get them. Individuals dislike waiting in the queue to different degrees, but these differences cannot be observed by the bureaucrat. The licences are allocated on the principle that those who are willing (and able) to pay a high bribe are served first. This simple rule minimises the average time costs of the queue. The reason is that the bribes reveal how much individuals value (not) waiting and by collecting the maximum bribe, the bureaucrat implicitly gives priority to those who value getting the service fast. Interestingly, the bureaucrat does not want to slow down the speed of the queue. This is because doing so would reduce the number of people entering the queue to such an extent that it would reduce total bribe income. In the 'auction model', the analogy between bribery and competitive, open auctions is further explored. It is shown that the two are, in fact, isomorphic: the prize (say, an industrial licence) is allocated to the same entrepreneur at the same (expected) price under the two arrangements. This is because corrupt officials effectively perform a covert auction and allocate the licenses to the entrepreneurs who offer the highest bribes. Hence, the only difference is in who get the revenues.

In addition to this, insofar as bribes are like side-payments, the logic of the Coase Theorem suggests that corruption can improve bargaining outcomes between agents in the public and private sector. Shleifer and Vishny (1994*a*) study this possibility and show how bribery can facilitate an efficient allocation of resources. This is because bribery is a cheap way to distribute wealth between politicians and agents in the private sector, and because of this, both parties have an incentive to maximise total wealth. In the absence of bribery, the politician would attempt to expropriate wealth in other, less efficient ways and the resource allocation would become politically motivated and inefficient. Thus, corruption increases efficiency by allowing private sector agents to buy their way out of some of the inefficiencies that would otherwise be introduced by politicians. This does, however, not guarantee a first best allocation of resources unless the objectives of politicians and their counterparts in the private sector reflect accurately social welfare more broadly (Boyko *et al.*, 1996).

The notion of efficient corruption is based on a number of problematic assumptions that makes it unsatisfactory from a theoretical point of view and

³ See Saha (2001) for a more recent contribution within this tradition.

reduces its empirical relevance.⁴ For starters, corrupt officials can often adjust both the quantity and quality of the services they provide and would have an incentive to supply the bribe maximising quantity (or quality) rather than the (constrained) efficient one. Although this might, as in 'the queue' model discussed above, amount to the same thing, this result is, as pointed out first by Andvig (1991), sensitive to the specific assumptions made about how the queue is organised. Another critical issue is that real resources are often wasted in order to keep corrupt deals secret and in searching for 'partners'. This is one of the themes of a large literature on rent seeking (Nitzan, 1994; Tollison, 1997) and implies that bribery would not, in general, be equivalent to a competitive auction. Moreover, even if these rent seeking costs were negligible, it does often matter for efficiency who collects the revenues: when revenues are not collected by the treasury but by corrupt officials, the opportunity to use these revenues to reduce pre-existing distortionary taxes (or to provide public services) is forgone and that has implications for the excess burden of taxation (Goulder *et al.*, 1997). A third critical issue is that corrupt contracts cannot be enforced by courts. The resulting insecurity of property rights along with problems of asymmetric information is likely to prevent corruption from playing the role envisaged by the Coase Theorem (Farrell, 1987; Boyko *et al.*, 1996). The most fundamental weakness, however, is the implicit assumption that the government failure that corruption is supposed to correct is exogenous and in itself unrelated to corruption, when, in fact, it may well be put in place and maintained by corrupt politicians precisely *because* of its corruption potential. This point is a re-occurring theme of *The Grabbing Hand* and many of the articles in *The Politics of Corruption and Governance, Corruption, and Economic Performance*.

2. Corruption With a Benevolent Principal

On a day-to-day basis the government must delegate a range of necessary activities such as collection of taxes, implementation of specific policies, and control of compliance with regulation to a bureaucracy. To the extent that (some) bureaucrats fall short of the 'Weberian ideal', they might exploit their position. Consequently, whenever authority is delegated to a bureaucracy, the *potential* for corruption is created. The *actual* level of corruption is determined by how well the institutions governing the (corruptible) bureaucracy are designed. The key theoretical question therefore becomes: is it optimal for a benevolent principal to design a corruption-free bureaucracy? If not, corruption can be viewed as an integrated part of an *optimally* designed institution.

⁴ Most, if not all, of the case studies from developing as well as industrial countries in volumes two and three of *The Politics of Corruption* find evidence of significant costs of corruption. The same message comes through from numerous cross-country studies of the relation between corruption, investment, and economic growth (Mauro, 1995, 1998; Wei, 2000; Paldam, 2002; and the survey by Jain, 2001). Kaufman and Wei (1999), for example, investigate the hypothesis that bribes reduce red tape and report evidence to the contrary.

2.1. An Agency Model of Corruption

The natural starting point for thinking about this type of corruption is a principal-agent model. To be concrete, let me consider the classical example of corruption in tax collection. Corrupt tax officials often collude with taxpayers to understate tax liabilities with the result that revenues collected fall far short of their potential. An extreme example of this, mentioned by Toye and Moore (1998), is that of Peru where tax collection, partly due to corruption and partly due to other factors, fell from about 20% of GDP in the 1960s to less than 4% in the early 1990s. Ghura (2002) provides more systematic evidence from Sub-Saharan Africa regarding the nexus between corruption and tax revenues.

Suppose tax collection is delegated to a tax collector (an agent) whose job it is to investigate if a firm is liable for taxation. Tax liabilities vary with circumstances and the firm is only liable to pay taxes if it earns a profit, $\pi > 0$. It does so with probability $h > 0$. Thus, with probability $1 - h$, the firm earns no profits and is not liable to pay taxes. If the firm is liable *and* this is reported to the government by the tax collector, the government levies a 100% profit tax $t(=\pi)$ and the firm has no choice but to pay. The tax collector may, however, agree not to report the firm in exchange for a bribe. In this case, the firm avoids the tax but must bear the cost of the bribe. The government (the principal) discovers corrupt acts with probability p . A discovery results in dismissal of the tax collector involved. In addition, he pays a penalty $f \geq 0$. Likewise, the firm pays a penalty $g \geq 0$ if caught offering a bribe. The tax collector earns the wage w and can get the wage $w_0 \geq 0$ in the private sector. Some tax collectors are more honest than others, possibly because of internalised moral costs. To capture this heterogeneity, I assume that a fraction (γ) of all potential tax collectors are honest, while the rest ($1 - \gamma$) are willing – if it is in their personal interest – to misinform the government in return for a bribe. All parties are risk neutral.

Consider what happens when a corruptible tax collector finds out that the firm is liable for taxation.⁵ The firm has an incentive to offer a bribe to the tax collector to get him to conceal this fact. By avoiding the tax, the firm gains π but faces legal sanctions if the transaction is discovered. Its expected gain, therefore, is $\pi - pg$. The need for secrecy introduces a *transaction cost* in the sense that only a fraction of the bribe, $k \in (0,1]$, is actually received by the tax collector. Assuming that the tax collector has all the bargaining power, the bribe is $b = \max\{k(\pi - pg), 0\}$.

The tax collector takes a chance by accepting the bribe and is only willing to do so if the expected gain, $(1 - p)(w + b) + p(w_0 - f)$, is larger than the return to honest reporting, w . Thus, he accepts the bribe if, and only if

$$(1 - p)b + p(w_0 - w - f) > 0. \quad (1)$$

It is clear that the incidence of corruption depends crucially on the design of government institutions as captured by the three control instruments: the wage rate (w), the monitoring system (p), and the legal remedies (f, g).

⁵ If the firm is not liable, there is no scope for misreporting. That is, collusion can only arise when the opportunity is present. However, another related phenomenon, extortion, can arise in this case. Extortion refers to cases where the tax collector reports or threatens to report a taxable income higher than the true one (Hindriks *et al.*, 1999).

Efficiency Wages The idea that efficiency wages can be used to control corruption goes back to Becker and Stigler (1974) who write ‘The fundamental answer is to raise the salaries of enforcers above what they could get elsewhere, ... A difference in salaries imposes a cost of dismissal. ... That cost more than offsets the gain from malfeasance’ (page 6).

An efficiency wage, hence, deters corruption because it increases the cost of dismissal and that makes bureaucrats more reluctant to accept bribes. In the tax collection example, the efficiency wage that keeps all corruptible tax collectors honest (with $f = 0$) is

$$w^e = w_0 + \frac{(1-p)}{p} b. \quad (2)$$

The efficiency wage is a mark-up on the private sector wage, w_0 , equal to the temptation of malfeasance. The mark-up is small when the monitoring system is effective. This points to complementarity between different corruption deterrence strategies. Even so, it is clear that it is expensive to pay efficiency wages⁶ and even worse, there is no universal guarantee that an efficiency wage will, in fact, reduce corruption. While it is true that an efficiency wage reduces the number of corrupt acts, those who continue to be corrupt may demand higher bribes to compensate for the increase in the cost of dismissal, and the net outcome may therefore be more (as measured by expected bribe revenues) rather than less corruption (Mookherjee and Png, 1995).

In addition, even when efficiency wages do reduce corruption, their introduction can conflict with other government objectives. Besley and McLaren (1993) show that capitulation wages – wages so low that only corrupt citizens would accept employment as tax collectors – rather than efficiency wages may maximise total tax revenues *net* of wages paid to tax collectors. This would be the case, for example, if the number of firms liable to pay taxes is small and most potential tax collectors are corruptible. Under these circumstances, an incentive system that allows all tax collectors to be corrupt – and, by implication, collects revenue only when corruption is being discovered – generates larger net revenues than a system that keeps all tax collectors honest by paying them a sufficiently high wage. The extremely low wages that public officials receive in many developing countries suggest that capitulation wages are often used in practice.⁷ On the other hand, evidence from a recent cross-country study by van Rijckeghem and Weder (2001) suggests that higher (relative) wages do, in fact, reduce corruption in the public sector, and may, as pointed out by Haque and Sahay (1996), also help attract high quality employees to the sector. Yet, it can be misleading to think of the public sector as one homogenous unit. Often different departments within the

⁶ The cost to the public can be reduced (possibly to zero) by designing a pay structure with three components: each bureaucrat posts a bond equal to the temptation of malfeasance when he takes up the job; during his tenure he receives a salary premium equal to the interest on the bond; and when he retires he gets a pension with a capital value equal to the bond. If at any point he is discovered taking a bribe, he loses his pension rights and is fired (Becker and Stigler, 1974). A problem with this pay scheme is that prospective bureaucrats might face a credit constraint and be unable to post the bond.

⁷ Klitgaard (1997) discusses wage reforms in the public sector in a number of developing countries.

bureaucracy have different corruption levels and should therefore, in principle, be exposed to different efficiency wages. This may, however, cause an undesirable misallocation of talented bureaucrats between departments, much in the same way as an efficiency wage can cause misallocation of talent between the public and private sector (see section 2.2).

Institutional Controls It follows trivially from (1) that an increase in the probability of being caught misreporting can reduce corruption in the tax collection example. However, in general, matters are more complex and designing an effective control and monitoring system is both difficult and costly. For starters, the simple fact that monitoring is done by individuals who may themselves be corruptible implies that an increase in p (more individuals employed to monitor) may, in fact, *increase* rather than decrease corruption (Laffont and Guessan, 1999). In some cases, where corruption affects agents in the private sector adversely, the cost of monitoring can be reduced if these 'victims' have an incentive to report corruption. Mookherjee and Png (1992) show that it is often more cost-efficient for the government to rely on such reports to decide when to start an investigation than to do random checks.⁸

Legal Remedies Lawyers often argue that the most effective way of reducing corruption is to increase the legal punishments. The rationale for this is clear from the tax collection example: an increase in the penalties (either f or g) reduces the expected gain from corruption. If, for example, the penalty imposed on tax collectors is equal to the bribe ($f = b$), then no one would be willing to accept a bribe if $(1 - 2p)b + p(w_0 - w) \leq 0$. Thus, for $p > 1/2$, corruption is eliminated completely simply by paying reservation wages. This suggests that the lawyers' argument has some merit, and without doubt it has but often matters are – even in theory – more complicated. The precise design of the penalty system, in particular the marginal deterrence, is crucial. The classical study by Rose-Ackerman (1975), for example, demonstrates that ill-designed legal penalties can actually encourage rather than discourage corruption. The critical point is to avoid punishment systems that make the (expected) punishment a concave function of the size of the bribe.⁹

2.2. *Optimal Institutional Design*

Would a benevolent government allow corruption to persist? The answer is a qualified yes. The optimal design of incentives in bureaucracies often leaves room for corruption. The optimal level of corruption trades off the cost of allowing corruption (in terms of misallocation of resources due, for example, to misreporting) and the cost of designing incentives to eliminate it: corruption persists when the cost of eliminating it is too high. Shleifer and Vishny (1998, chapter 1) call this the 'helping hand theory of corruption' because of the maintained assumption that the government is benevolent in the double sense that it wants to implement socially beneficial policies *and* it attempts to optimise the working of its institutions.

⁸ See Dye and Stapenhurst, (1998) for a practical guide to institutional controls.

⁹ Posner (1986) provides an exposition of the relevant law and economics literature.

2.2.1. *Explicit incentives and corruption*

Corruption often arises because bureaucrats and agents in the private sector have a common interest in concealing information. The best way to design incentives to avoid this is the topic of a fast growing literature on collusion in organisations.¹⁰ To illustrate the basic ideas, return to the tax collection example.¹¹ Above, I treated the tax policy and institutions, captured by w , p , f and g , as exogenous features but, under the assumption of a benevolent principal, both policies and institutions will be designed optimally. To highlight the costs and benefits of providing explicit incentives, I rule out legal penalties and external monitoring ($p = f = g = 0$) and normalise the reservation wage to zero ($w_0 = 0$). A benevolent government wants to devise a tax policy, $t(\cdot)$, and an incentive wage, $w(\cdot)$, that maximise social welfare. A simple and often used formulation of social welfare in this context is the utilitarian representation. Here, I simply assume that social welfare is the weighted sum of tax revenues net of wages paid to the tax collector plus the welfare of the firm, u_f , and the tax collector, $u_t = w(\cdot) + b$:

$$u_p = t(\cdot) - w(\cdot) + \alpha(u_f + u_t), \quad (3)$$

where $\alpha \in (0,1)$ is the weight attributed to the welfare of the firm and the tax collector.¹² The welfare of the firm is equal to net of tax profits. Net of tax profit is equal to $\pi - t$ if the firm earns profits and equal to $-at$ if not with $a > 1$. The parameter a captures that it is more costly for the firm to pay taxes if it has no retained profits to spend on the purpose. The assumption is introduced to make the government reluctant to tax the firm and for $a > [(1 - h\alpha)/(\alpha - h\alpha)]$, the government would not, without additional information from the tax collector, want to collect any taxes. This condition is assumed to be satisfied in what follows.

Now assume that the tax collector can only observe a noisy signal of profitability. If the firm earns profits (π), which it does with probability h , this is observed by the tax collector with probability ε , but with probability $1 - \varepsilon$, he observes nothing (\emptyset). If the firm makes no profit, which happens with probability $1 - h$, then the tax collector observes nothing for sure. After having observed the signal, the tax collector must report back to the government that then uses the reported information to determine the appropriate tax and the tax collector's wage. If the tax collector reports that the firm makes profits ($r = \pi$), the government can verify that this is, in fact, the case. If the tax collector, on the other hand, reports that the firm does not make profits ($r = \emptyset$), the government cannot know if this is really

¹⁰ Important papers in this literature include: Tirole (1986, 1992, 1994); Kofman and Lawarree (1996); and Laffont and Martimort (1997). The literature is discussed in detail by Laffont and Tirole (1993, chapter 11) and Laffont (2000). See Banerjee (1997) for a related theory of misgovernance.

¹¹ The analysis in this section is based on Tirole (1992).

¹² One can question whether the utility of corrupt bureaucrats should enter the social welfare function. The utilitarian approach derives from welfare economics where there is no corruption, so the question is how to transplant the approach into a framework where corruption can take place. One argument in favour of including the welfare of corrupt bureaucrats is that it takes into account the fact that, bribes do benefit those who collect them and are not entirely lost from a social point of view. On the other hand, one may be worried about designing optimal institutions based on such considerations. In the present example, it does not matter for the key insight which position is taken, but in some applications it might matter more.

true or if the tax collector, in return for a bribe equal to $b = k\pi$ with $k \in (0,1]$, is concealing that the firm is, in fact, making profits.

As a benchmark, suppose the government can observe the profit signal directly. If so, it is optimal to tax the firm only if there is conclusive evidence that it earns profits, i.e., $t(\pi) = \pi$ and $t(\emptyset) = 0$, and expected social welfare is $\bar{u}_p = h(\alpha\pi + (1 - \alpha)\varepsilon\pi)$. The intuition is that the profit is worth more as tax revenue than as retained profits ($\alpha < 1$); that is, the government can make better use of the revenues than the firm. However, if the profit position of the firm remains unknown, it is optimal not to tax. This follows from the assumption that it is very costly for the firm to pay taxes if it earns no profit ($a > [(1 - h\alpha)/(\alpha - h\alpha)]$). When authority is delegated to a tax collector who may be corruptible (with probability $1 - \gamma$), the government needs to provide incentives to guarantee truthful reporting. To illustrate that it is sometimes optimal *ex ante* to allow corruption among tax collectors, I compare two stylised incentive structures: one that eliminates corruption and one that does not.¹³

1. No corruption. To make it unattractive for a corruptible tax collector to accept a bribe, the government offers a high powered incentive contract: no reward (on top of the reservation wage) is paid for a report that the firm does not earn profits ($w(\emptyset) = 0$), but a high reward equal to the value of the bribe, $w(\pi) = k\pi$, is paid in return for a report that profits are high. Knowing that this weeds out all misreporting, the government can then implement the tax schedule $t(\pi) = \pi$ and $t(\emptyset) = 0$. Expected social welfare

$$u_p^{NC} = \bar{u}_p - \varepsilon h(l - \alpha)k\pi \quad (4)$$

is, however, below \bar{u}_p . This is because the government pays the wage $k\pi$ to the tax collector every time high profits are observed and reported which happens with probability εh . The potential for corruption is internalised in the incentive structure, and although corruption is eliminated, the fact that it *could* happen reduces social welfare below \bar{u}_p .

2. Corruption. With probability γ the hired tax collector is of the type that cannot be corrupted. By exposing all tax collectors to a low powered incentive contract ($w(r) = 0$ for all r), only an incorruptible tax collector reports profits. As before, the tax schedule is $t(\pi) = \pi$ and $t(\emptyset) = 0$ but expected social welfare is different:

$$u_p^C = \bar{u}_p - (1 - \gamma)\varepsilon h(1 - k\alpha)\pi. \quad (5)$$

The reason is that corruptible tax collectors withhold information from the government and accept bribes. Thereby, social value equal to $(1 - k\alpha)\pi$ is lost with probability $(1 - \gamma)\varepsilon h$,

¹³ A third possibility is to eliminate corruption by not allowing the tax collector any discretion, i.e., by ignoring his reports. For $\gamma > 0$, this strategy is dominated by the incentive structure that allows corruption (Tirole, 1992).

The trade off is clear. On the one hand, it is costly to eliminate corruption because high powered incentive contracts are expensive. On the other hand, it is costly to allow corruption to persist. This is so for two reasons. First, tax revenues that could have been spent productively by the government are not collected and, second, the transaction cost (k) associated with each corrupt act represents a social loss. Figure 1 shows (expected) social welfare under the two incentive structures as a function of k . The incentive structure that allows corruption is optimal when the transaction cost is low ($k \geq [(1 - \gamma)/(1 - \alpha\gamma)]$). The intuition is that low transaction costs make it attractive for corruptible tax collectors to collect bribes and this, in turn, makes it expensive for the government to provide explicit incentives for truthful reporting. At the same time, precisely because the transaction cost is low, corruption becomes more acceptable from a social point of view. Somewhat paradoxically, in societies where most tax collectors are incorruptible (γ close to 1), it is, typically, better to allow the infrequent occurrence of corruption than to expose *all* tax collectors to a high powered incentive scheme.

This illustrates an important point: eliminating corruption by means of a high powered incentive contract is partly expensive because the government cannot screen its agents before they are hired. Thus, it is the lack of an effective screening mechanism that makes it optimal under some circumstances to allow corruption. The fact that the government – in the tax collection example as well as in many other applications in the literature – is able to determine an agent's type simply by observing what he does when first employed suggests that screening may, in fact, be feasible in a dynamic setting. In general, however, screening is made difficult because the incentives of bureaucrats would change when they realise that their actions have intertemporal consequences, and it may be costly to get them to

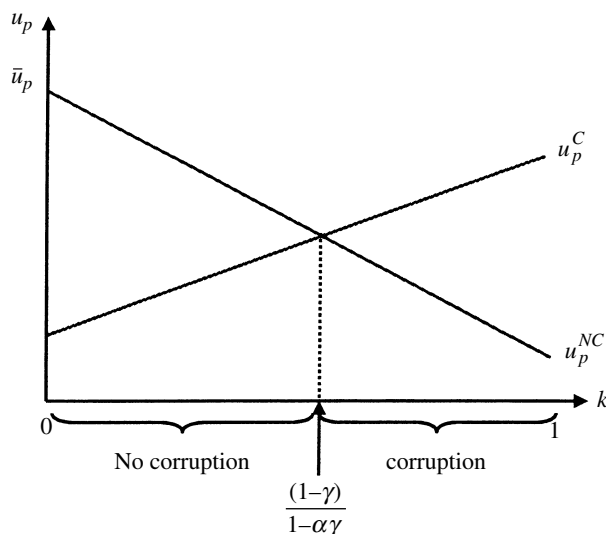


Fig. 1. *Expected Social Welfare With and Without Corruption as a Function of the Transaction Cost*

reveal information (about tax liabilities) as well as their type. A preliminary analysis of these issues can be found in Dhami (2003).

2.2.2. *Optimal efficiency wages and corruption*

The role of high powered incentives in controlling corruption in bureaucracies is somewhat limited in practice because of multiple and possibly conflicting public sector goals and because it is hard to describe *ex ante* and verify *ex post* the exact nature of the information that the bureaucrats should collect and report (Tirole, 1994). These difficulties may motivate using a package of efficiency wages and external monitoring as an alternative. Acemoglu and Verdier (1998, 2000) study the conditions under which (some) corruption is optimal in a bureaucracy where incentives can only be provided by means of these instruments. In their general equilibrium framework, it is costly to pay all bureaucrats wages above private sector alternatives because it induces misallocation of talent. Talent is misallocated because a high public sector wage attracts individuals with entrepreneurial skills that, from a social point of view, would be better employed in the private sector. The socially optimal efficiency wage, therefore, reflects a trade off. On the one hand, a high wage reduces corruption in the bureaucracy. That helps enforce property rights and encourages investment (Acemoglu and Verdier, 1998) or helps direct subsidies to the right firms (Acemoglu and Verdier, 2000). On the other hand, an increase in the wage attracts too many individuals with the 'wrong' talent to the bureaucracy. In resolving this trade off, it may be optimal to allow the most corruptible bureaucrats – those with the lowest moral cost of corruption – to collect bribes (and withhold information). Acemoglu and Verdier (2000), however, demonstrate that as long as the market failure that the bureaucrats are hired to correct is serious enough, it is optimal to eliminate corruption. Corruption arises, therefore, when the benevolent government delegates the correction of 'minor' market failures to a corruptible bureaucracy.

3. Corruption With a Non-benevolent Principal

The theories of corruption discussed in the previous section assume a dichotomy between the corruptible agents employed as bureaucrats and the benevolent principal that designs the institutional framework within which these agents operate. Theories of corruption based on the notion of a non-benevolent principal are more sceptical about the motives of government officials and start from the premise that *all* agents – bureaucrats as well as politicians – are corruptible. An implication, then, is that institutions and policies in place at a given point in time can be highly dysfunctional and inefficient: there is no benevolent principal that designs optimal institutions and policies. This view of government, of course, has a long tradition within public choice (e.g., Buchanan and Tullock, 1962) but has recently been advocated forcefully in the context of corruption by Shleifer and Vishny (1993, 1998, chapter 1). They have coined the term 'the grabbing hand' to describe the idea that all government officials can be expected to seek rents only restricted in this pursuit by *given* economic and political institutions. When

political institutions are particularly weak, this can lead to epidemic corruption, as in the case of the Philippines under the Marcos regime where ‘cheap credit, tax incentives, state licenses and monopoly privileges hinge on personal considerations’ (and) state resources are appropriated for private ends (Hutchcroft, 1991) or as in the case of Russia after the fall of the Soviet Union where a system of ill-defined property rights, corruption, and Mafia-style crime developed (Varese, 1997).

To illustrate the basic insight of the grabbing hand view of corruption, imagine a government official that can regulate entry into economic activity by issuing or with-holding licences. One can think of this as a regular industrial licensing system as the one used in, for example, India, or more generally as legislation that makes it cumbersome for entrepreneurs to start new firms (De Soto, 1990). To simplify matters, assume that the economy is free of any market distortions, so there is no need – from an efficiency point of view – for entry regulation. Let λ be the number of licences issued and let $b(\lambda)$ denote the value to a would-be entrepreneur of obtaining a license if λ licences are already issued. I assume that $b' = \partial b / \partial \lambda < 0$ and that $b(\lambda_H) = 0$ where λ_H corresponds to the number of firms that would enter under free competition. The politician in charge of issuing the licences is in a monopoly position from which he can extract bribes in exchange for licences, only restricted by the willingness to pay of would-be entrepreneurs. A rent seeking official wants to maximise bribe revenues, $B(\lambda) = \lambda b(\lambda)$, and issues $\lambda_L = b(\lambda) / b'(\lambda)$ licences. This is less than λ_H , so, at equilibrium, entry restrictions are erected in order to generate bribes: inefficient regulation and corruption are two sides of the same coin. The crucial point is that licences and other artificial barriers to private transactions have value to the holders only if entry is restricted below the competitive level.¹⁴ The example of entry regulation is just one among many examples of similar distortionary policies that are created because of their corruption potential. Shleifer and Vishny (1992), for example, show how the same principle can be used to understand systematic shortage under socialism. Bliss and di Telia (1997) show how corruption can create its own potential, even when the scope for generating scarcity rents by means of restrictive policies is limited. By extracting bribes from, say, firms in a competitive industry, the most inefficient firms are induced to exit because the cost of production is pushed up. This increases the excess profit of the infra-marginal firms and they can afford to pay higher bribes. This process eventually comes to a stop because officials become wary of losing the source of their bribe income. From these examples, a general principle emerges. Economic policies are adopted, not to eliminate market failures but *because* they create corruption opportunities: inefficient policy and corruption are equilibrium

¹⁴ Ades and di Telia (1997) show that, corruption is higher in countries with active industrial policies and that the (beneficial) impact of such policies on investment is reduced by as much as 45% because of corruption. Ades and di Telia (1999) report evidence that corruption levels are higher in countries where firms enjoy higher rents either because they are sheltered from foreign competition or because antitrust regulation is ineffective in preventing anti-competitive behaviour. Natural resources and military spending are two other important sources of corruption. Gupta *et al.* (2001) show that countries that are perceived to be more corrupt tend to be spending more on the military as a fraction of GDP. Leite and Weidmann (2002) study the link between corruption and natural resource abundance.

phenomena and are jointly determined by underlying economic and political institutions.

3.1. *The Industrial Organization of Corruption*

Analogies from industrial organisations can, as argued by Shleifer and Vishny (1993), provide important insights into the scale of corruption under different institutional structures. Some economists have argued that competition between providers of government services can effectively reduce corruption. While the logic of Bertrand competition supports this view when the services in question are close substitutes, the opposite is true when services are complements. The most grotesque case is when an entrepreneur who wants to start a firm legally needs to spend months getting the required permits and documents from dozens of government offices (De Soto, 1990), but similar problems arise when entry into complementary private sector activities is restricted.

To see this, suppose, in the licence example discussed above, that a separate license is required for each of two different activities in the private sector. Let $b_i(\lambda_1, \lambda_2)$ denote the value of holding a licence of type i ($i=1, 2$) given the number of licences of the two types issued. I assume that $\partial b_i/\partial \lambda_i < 0$ and that the two licences are complements, i.e., $\partial b_i/\partial \lambda_j > 0$, $i \neq j$. As a benchmark, suppose that the two licences are issued by the same government official. He exploits his monopoly position and maximises total bribe income, $\sum_i \lambda_i b_i(\lambda_1, \lambda_2)$, by issuing licences of type 1 until $\lambda_1(\partial b_1/\partial \lambda_1) + b_1 + \lambda_2(\partial b_2/\partial \lambda_1)$ is equal to zero and likewise for licences of type 2. However, if the two licences are issued by two independent government officials, the outcome is quite different. Official i maximises $\lambda_i b_i(\lambda_1, \lambda_2)$ and issues licences until $\lambda_i(\partial b_i/\partial \lambda_i) + b_i$ is equal to zero. The equilibrium supply of licences is reduced because the two officials do not take into account that they increase the value of the licences issued by the other when they issue more themselves. Thus, with regard to complementary public services, it is better to have a (single) monopoly than a bilateral monopoly because externalities are then internalised and some of the negative effects of corruption are avoided (Shleifer and Vishny, 1993).

Hillman and Katz (1987) stress how the hierarchical structures of government can be a source of corruption in itself. Consider, again, the licence example. The license system creates rents because the would-be entrepreneurs are willing to pay a bribe to get hold of a licence. This in turn makes the job of issuing licences valuable and would-be 'licence issuers' are willing to pay a bribe to get the job. This creates another valuable job higher up in the hierarchy and further corruption opportunities and a long vertical chain of bribery. This amplifies the social cost of bribery as officials at each level are willing not only to pay a bribe, but also to invest real resources in obtaining the rent created – and those investments obviously constitute a social cost. The market for public offices in India described by Wade (1985) is just one among many examples of this phenomenon.

The implications for overall resource allocation, however, depend critically on what motivates officials (politicians) at the top of the hierarchy as well as on the type of incentive contracts they can expose the corruptible officials (bureaucrats)

at the bottom to (Dhami, 2003). To see this, return to the licence example. As before, the bureaucrat at the bottom of the hierarchy is in charge of issuing licences and would, in the absence of further incentives, issue the bribe maximising number of licences (λ_L) and collect the bribe $B(\lambda_L) = \lambda_L b(\lambda_L)$. Suppose the politician at the top of the hierarchy can raise taxes to finance a wage to the bureaucrat and that he can observe, in a verifiable way, the number of licences issued. This would enable him to expose the bureaucrat to an incentive contract that specifies a wage as a function of λ . A corruptible politician who anticipates to get a share of the bribes collected by the bureaucrat would have little incentive (unless he also cares about social welfare) to design incentives to avoid scarcity of licences. In contrast, a benevolent politician would ask the bureaucrat to issue the efficient number of licences (λ_H) and pay him a wage equal to $B(\lambda_L)$ to do so.¹⁵ Thus, the degree to which scarcity and corruption persists in a hierarchical government organisation, not only depends on what is observable (and contractible) but also on the motives of politicians at the top. A point that I shall return to in the conclusion.

3.2. *Political Institutions and Corruption*

Democratic institutions can play an important role in limiting the scope of corruption, but as the example of India – the world's largest democracy – demonstrates such institutions are not a panacea, and, in any case, they may not be able to control bureaucratic corruption unless elected politicians have an incentive to introduce appropriate incentives for their agents (as discussed above). Moreover, Shleifer and Vishny (1994b) stress that democratic governments are unlikely to place sufficient weight on economic efficiency because of capture by special interests that are asking for favours.

Having said that, democracy does expose politicians and sometimes also bureaucrats to electoral accountability and that does provide voters with a valuable tool to control corruption and other inefficiencies (Ferejohn, 1986; Aidt and Dutta, 2001). Suppose (elected) politicians have an incentive to abuse the powers embodied in their office to extract bribes by creating artificial barriers to private economic activities, as in the licence example above. By holding politicians accountable retrospectively for what they do while in office, voters can force a compromise between what the unconstrained politician wants (λ_L) and what the median voter wants (λ_H). They do so by exploiting that a corruptible politician wants to be reelected simply because holding political office is a necessary condition for bribe collection in the future. To see this, suppose that elections take place every period (in an infinite sequence) and that voters after each election ask the politician to issue at least $\bar{\lambda}$ licences if he wants to get reelected next time around. The politician can then decide to comply, get reelected, and earn expected payoff $B(\bar{\lambda})/(1 - \beta)$ where β is the discount rate and $B(\bar{\lambda}) = \bar{\lambda}b(\bar{\lambda})$, or to

¹⁵ Interestingly, if bureaucrats have private information related to how many licences it is desirable to issue from a social point of view, even a benevolent politician would allow shortage of licences (and corruption) in order to economise on information rents (Dhami, 2003).

forego reelection and collect the maximum bribe $B(\lambda_L)$ once. The constrained efficient performance standard ($\bar{\lambda} = \lambda^*$) makes the politician precisely indifferent between these options, i.e., $B(\lambda^*) = (1 - \beta)B(\lambda_L)$, and for $\beta > 0$, it is clear that $\lambda^* \in (\lambda_L, \lambda_H)$. Importantly, even when corruption is perfectly visible, it is generally not in the best interest of voters to attempt to implement a 'zero-tolerance' rule. If they try, it backfires, as politicians would forego reelection and grab what they can while in office. The outcome would be extreme corruption and political instability.

The corruption reducing power of democratic institutions can in some cases be strengthened by separation of powers or by decentralisation of provision of public services.¹⁶ Separation of powers between different politicians can align the interests of voters with those of a subset of politicians (Persson *et al.*, 1997). The point can most easily be seen by considering the following extension of the licence example. Suppose there are two politicians. One politician decides on the number of licences, while the other decides how the bribe revenues are divided between them. Suppose further that the licences are issued *before* the decision on how to share the bribes is taken. Then, the politician in charge of issuing licences has little incentive to create artificial scarcity because he can only expect to get a very small share of the bribes that are actually collected. An implication, then, is that the interests of this politician are aligned with those of voters and electoral accountability is being enhanced. It is critical, however, for this argument that the politician in charge of distributing the bribe cannot promise to share the bribes with his colleague. If he could, then both politicians would have a strong incentive to maximise bribe revenues at the expense of the electorate. Thus, only certain types of separation of powers can be expected to reduce corruption. Decentralisation of public service provision can also in some circumstances enhance voter accountability and reduce corruption among bureaucrats and politicians. This is because decentralisation dilutes the monopoly power of a central bureaucracy and, thus, reduces its bribe taking capacity. It also puts politicians who are directly accountable to local voters in charge of service provision. A downside is that local politicians might be captured by local special interests and so, one type of corruption might replace another (Bardhan and Mookherjee, 2000). Nonetheless, De Mello and Barenstein (2002) provide evidence from a cross section of countries that fiscal decentralisation is associated with lower levels of perceived corruption.

4. Self-reinforcing Corruption

The theories of corruption discussed above all share the feature that corruption levels are determined by the incentive structures embodied in institutions, whether optimal or not. This leaves little room for history, except insofar as history determines the nature of institutions. In contrast, the theories of corruption discussed in this section emphasise that the reward to corruption as perceived by a particular individual depends critically on how many other individuals in the same

¹⁶ The choice of the election system can also affect corruption levels (Myerson, 1993, Persson *et al.*, 2000). Treisman (2000) reports empirical evidence on the relationship between political institutions and corruption.

organisation or society that are expected to be corrupt. This is so for many different reasons:

- (i) it is harder to audit corrupt officials in societies where corruption is more prevalent (Lui, 1986; Cadot, 1987; Andvig and Moene, 1990);
- (ii) corrupt individuals want to interact with other corrupt individuals and continue to be corrupt if they have interacted with a sufficient number of corrupt individuals in the past (Sah, 1988); and
- (iii) the reward to rent-seeking relative to entrepreneurship is high in societies where most individuals seek rents and accept bribes (Murphy *et al.*, 1991, 1993; Acemoglu, 1995). Each of these mechanisms has the potential to make corruption self-reinforcing and to generate multiple equilibria whereby organisations or societies with the same institutional characteristics can experience very different corruption levels. This gives a prominent role to history as a determinant of corruption.

The basic mechanism can be illustrated using the tax collection example from section 2.1.¹⁷ Suppose that a corrupt tax collector is only fired if he is caught by an incorrupt auditor. If he is caught by a corrupt auditor, he can prevent the firing by passing on the bribe b . For simplicity, assume that the proportion of corrupt auditors is the same as the proportion of corrupt tax collectors ($1 - \gamma$) and that there is a continuum of officials with measure one. To endogenise the proportion of corrupt officials assume that all officials are corruptible but faces a different cost of withholding information denoted by c . This cost, which can be interpreted as internalised moral costs, is distributed according to the cumulative density function $F(\cdot)$. Assuming that $f = g = w_0 = 0$, the expected benefit of accepting a bribe is $(1 - p)(w + b) + p(q - \gamma)w - c$ which is compared to the reward of not accepting a bribe, w . The proportion of corrupt tax collectors is implicitly defined by

$$l - \gamma = F[(l - p)b - p\gamma w]. \quad (6)$$

If a lot of officials are corrupt (γ low), then the expected benefit of accepting a bribe is high because the chance of losing the job, if caught, is low and so most officials agree to accept bribes. Thus, a fall in γ can be self-sustained and multiple equilibria may arise. Figure 2 shows condition (6) drawn for a bell-shaped distribution of c . In the example illustrated by the bold S-shaped curve, there exist three equilibria: a stable low-corruption equilibrium (L); a stable high-corruption equilibrium (H), and an unstable equilibrium in between (M). Thus, societies with otherwise similar institutions can experience very different levels of corruption.

History understood as past corruption levels becomes an important determinant of current corruption levels in the presence of dynamic strategic complementarities (Acemoglu 1995; Tirole, 1996). In the tax collection example, if for some historical reason, a society has a fairly honest corps of tax collectors ($1 - \gamma < 1 - \gamma^M$ in Figure 2), then it will move to the low-corruption equilibrium,

¹⁷ This extension of the example is based on a simplified version of the model analysed by Andvig and Moene (1990).

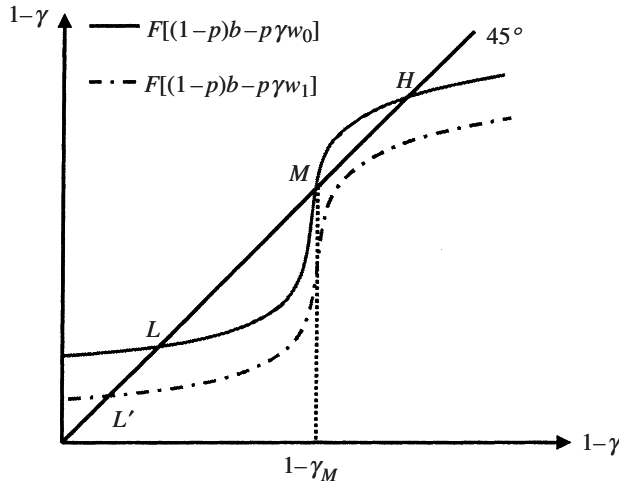


Fig. 2. Corruption and Multiple Equilibria

while a society that inherits a corrupt corps of tax collectors ($1 - \gamma > 1 - \gamma^M$ in Figure 2) will move to the high-corruption equilibrium.

Acemoglu (1995) argues that history dependency of this sort derives from the allocation of talent between production (entrepreneurship) and rent seeking (corruption). Suppose rent seekers each period ask for bribes not to block the activities of entrepreneurs. Rent seeking, then, imposes a cost on entrepreneurs, and this cost is larger, the more rent seekers there are around to ask for bribes. The allocation of talent each period depends on the relative return to the two occupations. This, in turn, depends on the fraction of the population engaged in rent seeking. The choice of occupation is assumed to be irreversible. Therefore, if a majority of individuals choose to seek rents today, then there will be a large number of rent seekers around tomorrow. This shifts the reward structure in favor of rent seeking and new agents entering the economy will choose to be rent seekers. Tirole (1996) points to a different mechanism that leads to similar effects: collective reputation. He studies a situation where beneficial trades require honesty. Individuals can decide to be honest or corrupt but their choice is only imperfectly observed by others. The incentive for an individual to be corrupt depends on the collective reputation of the group to which she belongs. It is not in the interest of an individual to be honest if her group has a reputation for being corrupt. Suppose that an individual that has been corrupt once in her lifetime continues to be corrupt for the rest of her life. Then, the appearance of a cohort of corrupt individuals can have lasting effects: the collective reputation of the group is destroyed and for this reason, it is in the best interest of subsequent generations of individuals to be corrupt. Conversely, it takes time to build up group reputation for honesty. As a consequence, anti-corruption measures need to be in place for a long time and to be substantial to work. This can be illustrated in Figure 2. Although small changes in institutions, such as a marginal increase in p or w , do reduce corruption (by shifting the high-corruption equilibrium down), a

large-scale reform that moves $F(\cdot)$ down to the dotted line is required to eliminate the high-corruption equilibrium and allow the society to move to the low-corruption equilibrium. Importantly, a reversal of the reform before the society has passed the threshold $1 - \gamma_m$ would bring it back to the high-corruption equilibrium.

This suggests that a 'big push' is needed to reduce corruption levels in societies where corruption is epidemic. The most famous example of a successful 'big push' comes from Hong Kong. Skidmore (1996) documents how the extent of corruption in the Hong Kong Police was enormous in the period following World War II and how The Independent Commission Against Corruption set up in the beginning of the 1970s with widespread power to investigate and prosecute corruption effectively eliminated corruption within a decade. This, of course, requires that the politicians in charge actually want to introduce such reforms and seen them through. When political reform is determined by corrupt politicians or by a majority of corrupt citizens, societies with high corruption levels would not be likely to introduce such measures. An implication, then, is that corruption is reinforced through yet another channel (Acemoglu, 1995). More optimistically, Rasmusen and Ramseyer (1994) argue that voters might be able to get even corrupt, but democratically elected politicians to enact and enforce a corruption ban. This is because the scope for collecting bribes, it is argued, is low in a democracy due to coordination failures among different politicians. The generality of this proposition is, however, seriously challenged by the Hong Kong example.

5. Concluding Remarks

The distinction between the theories based on the notion of a benevolent principal and those that are not is more than semantic. It has real implications for our understanding of corruption. Analysis based on the notion of a benevolent principal is best thought of as a normative theory of corruption. It tells us what the optimal institutions are in a given setting and why these, in many cases, are not corruption free. It is, however, unclear how much is learned about actual corruption levels: unless one believes that what we observe around the world is the residual level of corruption allowed for after incentive structures and institutions have been optimised, one is forced to ask the deeper question, why are these institutions not designed better? This inevitably leads to the conclusion that a positive theory of corruption is required and in developing such a theory one would be ill-advised to treat the benevolent planner as anything but an illusion. Only by taking seriously the possibility of self-interest at all levels of government, as advocated by *The Grabbing Hand*, can real progress be made in developing a satisfactory positive theory of corruption. By letting go of the benevolent principal, one is forced to focus more on comparisons between different institutions and market structures as we *actually* observe them and to identify the corruption levels (and other policy outcomes) that would emerge under each. The host of detailed (case) studies of corruption from around the world collected in volumes two and three of *The Politics of Corruption* will be most helpful in this regard. More research in this direction would also help establish more firmly that corruption, economic policies, and economic outcomes are jointly determined by

the underlying political and economic institutions and possibly also by history. This point seems to have been forgotten, at least partly, in much of the recent empirical work that uses survey data from a cross section of countries to study precisely this nexus of relationships.

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