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Corruption, connections and transparency: Does a better screen imply a better scene?

MEHMET BAC*
Department of Economics, Bilkent University, Ankara, Turkey 06533

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Abstract. A higher level of transparency in decision making increases the probability that corruption or wrongdoing is detected. It may also improve outsiders' information about the identities of key decision makers, thereby enhance incentives to establish "connections" for corruption. The connections effect may dominate the detection effect for local improvement in transparency and generate an increase in corruption, a prediction sharply in contrast with standard theories of transparency.

1. Introduction

Having a good "*connection*" with key decision makers is often considered a valuable asset because it can be used to facilitate exchange of bribes and gifts for favors and services. A connection with a high-ranked public official may be abused, depending on the context, to "buy" a job, to smuggle goods or destroy criminal evidence. In organizations, one may influence decisions on promotion or pay raise by building a connection with an upper-layer member. Building a connection for corruption is a costly investment that establishes mutual trust, thereby reducing or eliminating the enforcement costs of corrupt transactions.[1]

Besides the network of connections, another potentially important determinant of corruption in an organization is *transparency*. When the decision making process is completely impenetrable, corrupt behavior can hardly be detected. At the other extreme, under full transparency decisions can easily be verified and there is no secrecy concerning the rules and the identities of decision makers. Connections cannot be abused in a fully transparent organization. Legal and corruption experts and organization theorists associate a higher degree of transparency with lower corruption of all kinds.[2]

Theoretical models that study the control of corruption have by and large neglected individual incentives to build and use connections for corruption.

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In these models, connections are implicitly assumed to be given or costless to establish and the degree of transparency of a decision making system is captured by the probability that corrupt or wrong decisions are detected. The vast informal public administration literature on transparency focuses on how transparency can be achieved and factors that limit transparency be surmounted.[3] This paper presents a model with explicit links between transparency, incentives to build connections and the use of connections for corruption. It shows that more transparency does not necessarily imply less corruption. Corruption may increase or become more likely at least for local improvements in transparency, if one takes into account the potential impact of transparency on outsiders' information about the identities of key decision makers, and therefore on the incentives to build connections. That is, though corruption is more likely to be detected in a more transparent organization, as an inevitable side effect potential corruptors receive better information about with whom they should connect. If this "connections effect" is important and dominates the effect on the detection probability, corruption may actually increase when the organization becomes (locally) more transparent. However, in a most representative range of parameter values, for sufficiently large improvements in transparency the detection effect dominates the connections effect; then more transparency reduces corruption.

It is worth recalling that connection building is a costly investment that consumes time and resources. Like all investments, connections depreciate over time. The connections effect of improved transparency should be operating slowly (though at a speed that depends on the context), leaving potential corruptors with their fixed established connections in the short run. With fixed connections, thus absent the connections effect, more transparency always implies less corruption. But as the result mentioned above suggests, corruption may well increase when connection-building becomes a choice variable, in the long run.

The next section develops a simple model and shows the possibility of a local positive correlation between transparency and corruption. In Section 3 I present a brief discussion of the result and extensions of the model.

2. The model and the result

Consider a public office with two agents, A and B, who are delegated the task of providing various services to the public. A client, representing the public, is interested in obtaining an illegal service from which he derives a benefit worth z dollars. This benefit may be a job in the public sector for which the client is unqualified, a construction permit in a forbidden zone and the like. Thus, if the client ever applies, he should be denied the service. The office has a rule or assignment mechanism, unknown to the client, which determines the agent who will handle the application, A or B. Denote this agent by r.

The agents are corruptible, that is, the agent r may deliver the service for a bribe of b dollars. To capture the idea that connections facilitate corruption, I assume that the client can use bribery to influence the decision of agent r only if he has an established connection with r. The client's number of established connections (two, one or zero) is therefore an important determinant of expected corruption in the office. If the client has zero connections, bribery is impossible. With two connections, the client can bribe agent r with probability one. With only one connection, say A, the client may have the wrong connection ex-post, if the assignment mechanism determines agent B as agent r. In this case the client will not be able to bribe r.[4] Establishing connections is not illegal per se, but the abuse of connections for corrupt benefits is.

This set-up can be applied to various contexts of decision making. Consider for instance an upper layer of a hierarchical organization with members A and B, and let the client be a lower-rank employee whose promotion decision is to be considered by either A or B. Suppose that the client does not qualify for promotion but that he can try to influence the decision if he has an established connection with A, B or both, but not otherwise. The variable z would denote the benefit from promotion and b would denote the bribe (which may not be entirely monetary in kind) that the employee may have to offer member r to secure the promotion. Another application of this set-up would be government procurement contracts, where especially in several less developed countries a firm's likelihood of success depends so much on its connections with high-ranked officials.

Corruption is detected and the two parties are penalized with probability μ. This probability is linked to the concept of transparency below. The penalties are F_C for the client and F_r for the agent $r = A, B$, inclusive of all the potential losses that the detected parties incur. These penalties and the potential corrupt benefit z are exogenously given. To simplify the analysis I assume that the parties consume their respective net corrupt benefits $z - b$ and b before any detection occurs. The analysis and the results go through under the opposite assumption, when these benefits are made conditional on that corruption goes undetected.

Transparency of the office is measured by the parameter α, a number between zero and one. The extreme case $\alpha = 1$ corresponds to the most "open" office while the other extreme $\alpha = 0$ corresponds to the impenetrable "black box" office. In this model the degree of transparency influences the client's corruption incentives through two channels. First, bribery is more easily detected in a more transparent office. That is, the detection probability

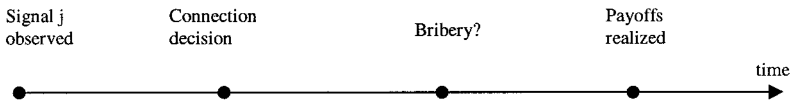

Figure 1. The sequence of events.

$\mu(\alpha)$ is increasing in α. It is impossible to detect bribery in the black box office ($\mu(0) = 0$), while any bribery is detected in the fully transparent office ($\mu(1) = 1$). Any real world organization or office would lie in between these two extremes. Second, information about the identities of decision makers is relatively less noisy in more transparent offices. To represent this information problem I let the client receive a signal $j = A$ or $j = B$ about the identity of agent r at the very beginning, before deciding on his connections (see the sequence of events in Figure 1). The signal j is true with probability $p(j, \alpha)$. Prior to this signal the client is completely uninformed about r, that is, A and B are equally likely to be r. The signal is informative: $p(j, \alpha) \geq 1/2$, which holds with strict inequality if $\alpha > 0$.[5] Thus, $p(j, \alpha) > 1/2$ is the probability that the client correctly identifies agent j as agent r, and it is increasing in α. For the two extreme cases, I assume that the signal j from a black box office is completely uninformative regarding the assignment rule, i.e., $p(j, 0) = 1/2$, while the fully transparent office is completely informative, i.e., $p(j, 1) = 1$. To summarize these assumptions formally:

Office α is more transparent than office α' if $\alpha > \alpha'$, and therefore (i) $\mu(\alpha) > \mu(\alpha')$ and (ii) $p(j, \alpha) > p(j, \alpha')$ given the observed signal $j \in \{A, B\}$.

The payoffs are determined as follows. Suppose that ex-post the client is connected with the right agent, that is, agent r. If the client does not offer a bribe, his payoff is zero. If he pays the bribe b, the client obtains the benefit z but he may be detected with probability $\mu(\alpha)$, so his expected payoff is $U_C(\alpha) = z - \mu(\alpha)F_C - b$. The agent's expected payoff is $U_r(\alpha) = b - \mu(\alpha)F_r$ if he accepts the bribe, zero otherwise. Corruption will occur if there exists $b > 0$ such that $U_C(\alpha) > 0$ and $U_r(\alpha) > 0$. I assume that the size of the bribe is determined according to the Nash bargaining solution; that is, when the total surplus from corruption $z - \mu(\alpha)(F_C + F_r)$ is positive, the bribe is given by[6]

$$b^*(\alpha) = \mu(\alpha)F_r + [z - \mu(\alpha)(F_C + F_r)]/2.$$

Using this expression, the client's and the agent's potential payoff from corruption can be written as $U_C(\alpha) = [z - \mu(\alpha)(F_C + F_r)]/2$.

In determining his optimal number of connections, the client will weight the potential payoff from each connection against the corresponding costs. These costs, denoted γ per connection, consist of the time, effort, resources and possibly the gifts that the client allocates to the agent with whom he seeks a connection. Suppose, to simplify the analysis, that the client unilaterally bears the cost of establishing connections (this can easily be relaxed). Then the client is said to have a connection with agent j if he incurs the corresponding cost γ. Connecting with both agents will double the cost, to 2γ, but it will increase the probability that the client ex-post has the right connection to one.

Clearly, if $U_C(\alpha)$ is nonpositive, the optimal number of connections is zero. Thus the client will have an incentive to connect only if

$$\mu(\alpha) < \frac{z}{F_C + F_r}. \tag{1}$$

I will assume $z < F_C + F_r$, so that the expected total surplus from corruption is negative when detection is a sure event. Then, one can define $\overline{\alpha}\epsilon[0, 1]$ through $\mu(\overline{\alpha}) = z/(F_C + F_r)$. Since $\mu(\alpha)$ is increasing in α, it follows that the office with transparency $\alpha \geq \overline{\alpha}$ will display zero corruption. I focus below on the analytically interesting case $\alpha < \overline{\alpha}$ and study the client's connection incentives.

Note that $U_C(\alpha) > 0$ for $\alpha < \overline{\alpha}$, $U_C(\overline{\alpha}) = 0$ and $U_C(0) = z/2$. If the client has no connections, his payoff is $U_C = 0$. If he connects with both A and B, his expected payoff is

$$U_C^{AB}(\alpha) = z - \mu(\alpha)F_C - b^*(\alpha) - 2\gamma. \tag{2}$$

Consider the case of one connection, with A or B. Clearly, the client should connect with agent j as the signal suggests, because $p(j, \alpha) > 1/2$ given $\alpha > 0$. Thus, he will connect with agent A if $j = A$, agent B if $j = B$, and be indifferent between A and B only if $\alpha = 0$, which corresponds to the case $p(j, 0) = 1/2$ for $j = A, B$. By connecting only with j, the client expects the payoff

$$U_C^j(\alpha) = p(j, \alpha)[z - \mu(\alpha)F_C - b^*(\alpha)] - \gamma. \tag{3}$$

The client's optimal decision at the connection stage can be derived from (2) and (3) as follows: His optimal number of connections will be

$$\begin{aligned} &\text{two if } U_C(\alpha) > 2\gamma, \\ &\text{one if } \gamma/p(j\alpha) < U_C(\alpha) \leq 2\gamma, \\ &\text{zero if } U_C(\alpha) \leq \gamma/p(j, \alpha) \end{aligned} \tag{4}$$

where $U_C(\alpha) = [z - \mu(\alpha)(F_r + F_C)]/2$. I investigate below the client's connection incentives as a function of the transparency of the office.

From (4), it is clear that the office will display no corruption regardless of the degree of transparency if the cost of establishing connections is high relative to the potential corrupt benefit, that is, if $U_C(\alpha) < \gamma$. To rule out this trivial case at least for a range of α, suppose that z is sufficiently large relative to γ, thus assume

$$\frac{z}{2} > \gamma.$$

The expected payoff $U_C^{AB}(\alpha)$ from having two connections is decreasing in α. The range of transparency levels at which the client has two connections, if it exists, must therefore lie at the left tail of the interval [0, 1]. Such a range exists if $U_C^{AB}(0) = z/2 - 2\gamma > 0$, that is, if $z/2 > 2\gamma$. On the other hand, if $z/2 \leq 2\gamma$, it is never optimal to have two connections. Then the optimal number of connections is zero as $\alpha \to 0$, because $U_C^j(\alpha) < 0$ and $U_C^{AB}(\alpha) < 0$ as $\alpha \to 0$. For the case $z/2 > 2\gamma$, define $\tilde{\alpha}_1$ through $z = 4\gamma + \mu(\tilde{\alpha})(F_C + F_r)$. The optimal number of connections is two for $\alpha \in [0, \tilde{\alpha}_1)$, less than two for $\alpha \geq \tilde{\alpha}_1$. In fact, by (4) the optimal number of connections falls to one at $\alpha = \tilde{\alpha}_1$, since $p(j, \tilde{\alpha}_1)(z - \mu(\tilde{\alpha}_1)(F_C + F_r)) > 2\gamma$ and $p(j, \tilde{\alpha}_1) > 1/2$. For the case $\gamma < z/2 \leq 2\gamma$, set $\tilde{\alpha}_1 = 0$.

Now the interesting aspect of the analysis is that for α in the range $[\tilde{\alpha}_1, \overline{\alpha})$ the expected payoff from having one connection is not monotonically decreasing in α. While $U_C(\alpha)$ is decreasing, $p(j, \alpha)$ is increasing in α, so the expected payoff $U_C^j(\alpha) = p(j, \alpha)U_C(\alpha) - \gamma$ from having one connection may decrease or increase. That is, the sign of

$$\underset{(+)}{\frac{\partial p(j,\alpha)}{\partial \alpha}} U_C(\alpha) + p(j,\alpha) \underset{(-)}{\frac{\partial U_C(\alpha)}{\partial \alpha}} \tag{5}$$

is indeterminate for $\alpha \in [\tilde{\alpha}_1, \overline{\alpha})$. $U_C^j(\alpha)$ may increase and become positive, thus make it beneficial to establish a connection as α is increased in the range $[\tilde{\alpha}_1, \overline{\alpha})$. The upper chart in Figure 2 shows this possibility for the case $z/2 < 2\gamma$ (thus, $\tilde{\alpha}_1 = 0$) where $U_C(\alpha)$ becomes larger than $\gamma/p(j, \alpha)$ at the right neighborhood of a transparency level $\tilde{\alpha}_2$, to decrease later and eventually be equal to $\gamma/p(j, \alpha)$ at some $\tilde{\alpha}_3 > \tilde{\alpha}_2$. The client has one connection in the intermediate range $(\tilde{\alpha}_2, \tilde{\alpha}_3)$, zero connection elsewhere. Bribery occurs with positive probability $p(j, \alpha)$, if the client has the right connection, that is, if $j = r$. The potential bribe size is shown in the lower chart in Figure 2, as a decreasing function of α. Thus, increasing transparency from $\alpha^0 \in [0, \tilde{\alpha}_2]$ to $\alpha^1 \in (\tilde{\alpha}_2, \tilde{\alpha}_3)$ will actually increase connections and corruption.[7]

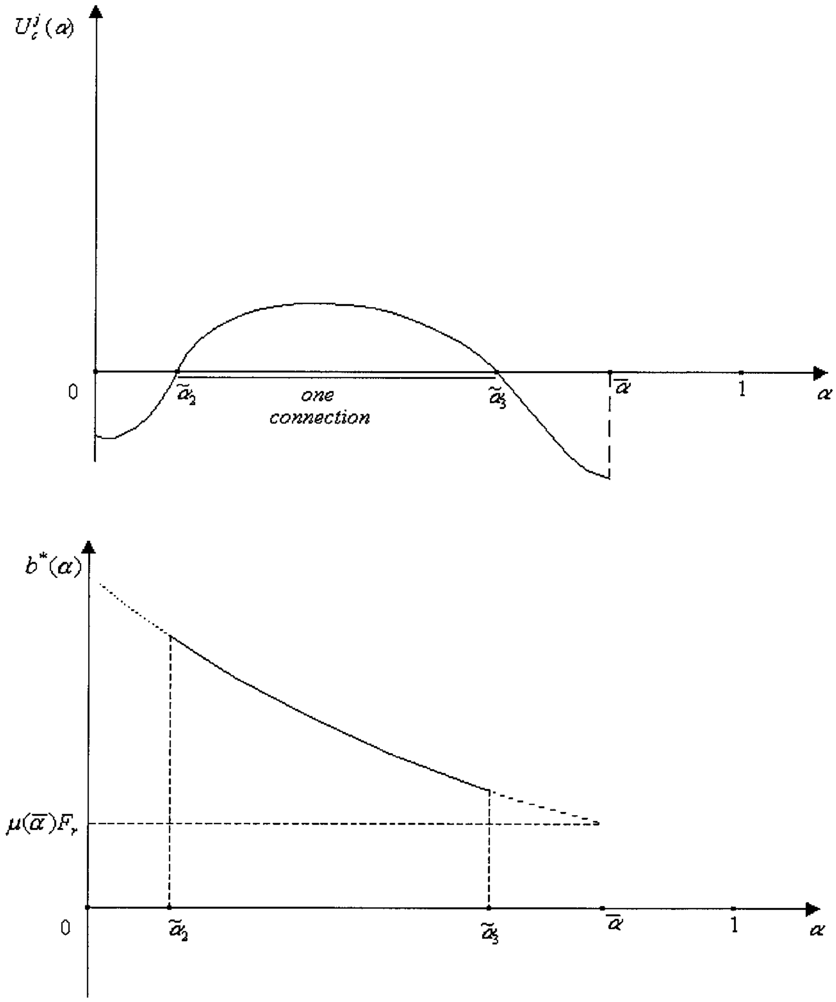

Figure 2. Incentives to establish a connection (upper chart) and the potential bribe size when the client has a connection with r (lower chart) as a function of transparency α for the case $z/2 < 2\gamma$.

3. Discussion and extensions

This paper highlights two opposing effects of transparency on corruption. Transparency deters corruption by making the decision making process more open to the "public" but enhances the incentives to establish connections for corruption by improving the information about the identities of the "key" decision makers. For a substantial improvement in transparency (i.e., increasing α above $\overline{\alpha}$) the detection effect dominates and eliminates connection-building incentives and corruption. Open-government or sunshine laws which mandate that all meetings where decisions are made be open to the public have been enacted in many states to meet this objective. However, not all decisions in organizations, public or private, can be made open to the public or completely transparent. Transparency may conflict with the requirements of confidentiality as in the example of personnel decisions. When transparency is bounded and low, it is not obvious whether the quality of decisions can be improved and corruption or favoritism eliminated through small-scale improvements in transparency.

There are instances in which a lower level of transparency pays off as lower corruption. In Turkey, the law stipulates that each September university departments offer written tests in special fields to students dismissed during the last two academic years. Faculty were receiving calls and visits from students and their relatives during this period. The scope for corruption and favoritism being high, some departments have decided to keep test evaluators' identities secret, to the extent possible. The policy reduced transparency, but it succeeded to reduce favoritism and corruption because its impact on the students' incentives to "connect" with the evaluators has more than offset the increased risk that a wrongdoing goes undetected. Interpreted within the present model, the policy of reducing α caused a large fall in $\mathrm{p}(\mathrm{j}, \alpha)$ while leaving $\mu(\alpha)$ almost unchanged. Thus, to evaluate the potential impact of a change in transparency α, policy makers should not neglect the "connections effect". However, when the connections effect is negligible or relatively small, the correlation between transparency and corruption will be negative as conventional wisdom suggests.[8]

The simple model studied above to my knowledge is a first attempt to link connection incentives, corruption and transparency in decision making. Its extension to the case of N agents (potential decision makers) should generate valuable insights and possibly new questions regarding transparency and the control of corruption in organizations. Uncertainty about the identity of the decision maker is introduced in the simplest way here, by assuming two potential decision makers. In organizations decisions are made in committees or in a hierarchical order. Committees consist of several decision makers, producing decisions in most cases according to the majority voting rule. The review process for building permits in a Buildings Department is hierarchical, where permits are accorded only if they are approved at all levels of the hierarchy. The number of decision makers and the decision making rule will affect connection incentives and corruption possibilities. For instance, incentives to apply for an illegal construction permit will vanish if one has to "connect" with a large number of decision makers to have the permit granted, given the cost of establishing each connection and the level of transparency. Other factors being constant, it seems relatively difficult to influence a hierarchical decision making process where authority and control is not too concentrated, compared to a committee deciding through majority voting (it then suffices to connect with and bribe the majority of committee members). But hierarchies in which authority and control is concentrated at the hand of a top-level decision maker should be relatively easy to penetrate, through a connection with the top. The study of the interaction between connection-building incentives, corruption, transparency and the decision-making rules and processes is an interesting line of research.

A related issue is the emergence and functioning of an intermediate market with specialized "suppliers of connections" who link decision makers in public organizations to outsiders seeking illicit benefits. Our model has ignored the possibility that clients connect to decision makers through intermediaries. In especially developing countries the vicinity of public offices such as customs departments are besieged by "industries" of intermediaries who offer to process the paperwork for various services or applications (legal or illegal) on behalf of the public. As in any market for intermediates, these industries undertake the relevant connection investments that potential clients would otherwise have to undertake individually, thus supply connections with the bureaucracy at a much lower cost. Intermediaries may also arise within organizations. Some members of the organization may specialize in connecting lower layers to upper layers where decisions are made, provide information about key decision makers, carry the messages, transfer bribes and gifts to realize corrupt benefits. Besides the potential impact on the costs of establishing and maintaining connections, the emergence of a business of intermediates would also depend on what happens to the likelihood of detections and the size of penalties compared to the case in which individuals try to build their own connections as explored in the model above. These issues await being addressed in a model that explicitly includes the possibility of intermediates connecting clients to decision makers.

Notes

1. The relation between connections and corruption is well known: In an article on privatization in China published in The New York Times (Dunn, May 8, 1993, p.3), a Chinese businessman is cited to the effect that "if you have guanxi (the Chinese word for "connections"), it is the time to make big money." Of course, connections or trust can also be used to the benefit of the society or organization. While not denying this possibility, I focus exclusively on the potential abuses of connections. Organizations have institutionalized responses to potential abuses of established connections: In academics, departments sometimes recruit their chairs from outside to avoid an appointment with strong internal connections. Resistance to inbreeding has become a common practice of departments partly because of the typically close connection between the graduate and the supervising

faculty. Rotation policies that replace key decision makers in the organization also serve to prevent connection building.

2. See for instance Klitgaard (1998), Gardiner and Lyman (1990) and the collection of essays in Heidenheimer (1970).
3. Woodhouse (1997) offers a discussion of openness and transparency in the legal/public administration context. For recent theoretical treatments of the problem of corruption control in public hierarchies, see Bac (1996, 1998) and Bac and Bag (1999).
4. To keep the analysis simple I assume that the client cannot bribe agent $r = B$ indirectly through his connection with A. Using an indirect connection, if possible, is always more risky and costly than a direct connection because the parties rely on the intermediates of a third party (A if $r = B$). See the concluding section for a brief discussion of the use of intermediaries for corruption.
5. That is, given the transparency level $\alpha > 0$, the signal $j = A$ increases the probability $p(A, \alpha)$ that agent A is the decision maker above 1/2. Then the probability that B is the decision maker is less than 1/2.
6. The Nash bargaining solution divides the total surplus from corruption equally among the two involved parties. The total surplus is $U_C(\alpha) - 0 - [0 - U_r(\alpha)] = z - \mu(\alpha)(F_C + F_r)$, and the threat points are both zero. Then, the Nash solution is $b = \mu(\alpha)F_r + [z - \mu(\alpha)(F_C + F_r)]/2$ whenever the total surplus is positive. Note that this surplus, if positive, is increasing in z but decreasing in α, F_C and F_r.
7. A numerical example can easily be constructed, for instance by choosing $\mu(\alpha) = \alpha^2$ and $p(., \alpha) = (1+\alpha)/2$, and setting the values for the parameters z, F_C, F_r and γ appropriately to satisfy the assumptions $z < F_C + F_r$ and $\gamma < z/2 \leq 2\gamma$. To give an example for the "normal" case in which more transparency reduces the number of connections monotonically from two to one and next from one to zero, let $\mu(\alpha) = \alpha$, $p(., \alpha) = (1 + \alpha)/2$, $z = 10$, $F_C + F_r = 20$ and $\gamma = 2$. Then the number of connections is two for $\alpha \in [0, 0.1)$, one for $\alpha \in [0.1, 0.153)$ and zero elsewhere.
8. The relative size of the potential corrupt benefit z and the connection cost γ are also important. Consider the potential benefit that a Soviet Army officer in 1980, stationed in a good staff position in Leningrad, can obtain by avoiding being transferred to a unit headed for Afghanistan. Corruption and connections (with assignment committees, admissions committees or local housing committees) will not be affected by small-scale improvements in transparency when the potential corrupt benefits are so high.

References

Bac, M. (1996). Corruption and supervision costs in hierarchies. *Journal of Comparative Economics* 22: 99–118.

Bac, M. (1998). The scope, timing and type of corruption. *International Review of Law and Economics* 12: 101–120.

Bac, M. and Bag, P.K. (1999). Cost-effective control of corruption in public offices. Unpublished manuscript.

Gardiner, J.A. and Lyman T.R. (1990). The logic of corruption control. In A. Heidenheimer et al. (Eds), *Political corruption: A handbook*, 827–840. New Brunswick: Transaction Publishers.

Heidenheimer, A.J. (1970). Political corruption. New York: Holt, Rinehart and Winston Inc.

Klitgaard, R. (1998). *Controlling corruption*. Berkeley: University of California Press.

Woodhouse, D. (1997). *In pursuit of good administration*. Oxford: Clarendon Press.