



THE WILLIAM DAVIDSON INSTITUTE
AT THE UNIVERSITY OF MICHIGAN BUSINESS SCHOOL

Corruption in Transition

by Susanto Basu and David D. Li

Working Paper Number 161
May 1998

Comments Welcome

Presented at the International Workshop in Transition Economies, July 1998 in Prague, Czech Republic. Copyright Susanto Basu and David D. Li, 1998. Disseminated by the Davidson Institute with permission of the authors.



International Workshop in Transition Economics
A CEPR/WDI Workshop
Hosted by CERGE-EI
Prague, 9/12 July 1998

Corruption in Transition
Susanto Basu and David D Li

We would like to thank CERGE-EI for their generosity in hosting this meeting. Additional funding from the Ford Foundation is gratefully acknowledged.

The views expressed in this paper are those of the author(s) and not those of the funding organization(s) nor of CEPR which takes no institutional policy positions.

12.6.98

Corruption in Transition¹

Susanto Basu
University of Michigan
David D. Li
University of Michigan

and

Hoover Institution
Revised: May 1998

Abstract

Countries making the transition to a market economy often experience an increase in corruption along with an increase in growth. This observation is puzzling in the context of current models, which emphasize the destructive nature of corruption. We present a model of corruption and reform which shows that under some circumstances, a particular gradualist reform strategy consisting of temporarily relaxing control of corruption provides a windfall to existing bureaucrats, thereby gaining their support for a reform effort that will ultimately reduce the distortions stemming from bureaucratic power. Thus, in the context of reform, a one-time surge of corruption can be a prelude to a permanently reduced level of corruption in the future, which provides the incentive for high current growth. We illustrate our point with examples from the recent Chinese reform.

JEL Classification Code: D72, P21, P, O12.

¹We would like to thank Robert Barak, John Fernald, Edward Glaeser, Roger Gordon, Kenneth Lieberthal, and Yingyi Qian for very useful discussions, and participants in seminars at the University of Michigan, University of California at Davis, Stanford University, and the 1996 Annual Meetings of the American Economic Association for comments.

Keywords: Corruption, Bureaucracy Institutional Change, Transition, Reform, Property Rights.

1. Introduction

In this paper, we present a new view of the role of corruption in a reforming economy. We define corruption broadly as a situation where government bureaucrats obtain personal benefits in exchange for the exercise of their power. Corruption is widely regarded as a major cause of government inefficiency. We agree with this view. However, as we note below, countries reforming their economies to encourage a greater degree of capitalism often experience a surge in the level of corruption. This increase in corruption is widely interpreted as a signal that reform is being blocked or distorted by the power of entrenched bureaucrats. Our paper suggests that this view is not always justified. Instead, our analysis indicates that a one-time rise in corruption may speed the process of reform, which in turn permanently reduces the level of corruption and the power of the bureaucrats. Thus our analysis has a normative implication: transitory corruption can be desirable if it facilitates market-oriented institutional changes, such as the post-socialist transition. This may be true even if corruption is destructive both before and after reform.

Our argument is simple. Corruption results from the power that bureaucrats enjoy. Bureaucratic power, in turn, is a product of institutions that allow generations of unsupervised bureaucrats to succeed one another, controlling productive activities for their own benefit without necessarily providing useful inputs to production. The aim of reform is to identify and eliminate the inessential parts of the bureaucracy by breaking the chain of succession of bureaucrats in these offices and to restructure the remaining parts. Faced with a reform, bureaucrats will fight in various ways to block or delay institutional change, unless they can benefit personally from such change. This bureaucratic opposition is a major obstacle to a top leadership that is newly

committed to reform, since much of the actual implementation of reform must be accomplished by mid-level career bureaucrats who are effectively asked to destroy their own livelihood. We argue that in this context a one-time increase in corruption can provide bureaucrats with a financial stake in the success of reform and moderate their opposition to losing power. Once the reform is successful and the unproductive bureaucratic institutions are eliminated, corruption is permanently reduced and is less of an obstacle to development.

Our analysis of the role of corruption in reform is rooted in observations of large-scale social changes in many countries, especially China. In reforming transitional economies, corruption is widespread and takes on a great variety of forms, ranging from directly taking money, to obtaining free shares in a privatized firm, to taking important positions in newly formed business ventures. Below we document several instances where corruption rises while reform is taking place.

This observation is a puzzle, since the dominant view is that corruption is harmful and impedes economic development.² Analyses of corruption during reform have generally taken this perspective, arguing that since corruption impedes development in the steady state, it must also impede the transition to a market economy. Many Chinese experts list corruption as a potential pitfall of the Chinese economic reform.

²See Rose-Ackerman (1975), Rose-Ackerman (1978), Gould and Amaro-Reyes (1983), Lai (1985), United Nations (1989), and Klitgaard (1991), Shleifer and Vishny (1993) for arguments along this line. Mauro (1995) and Wei (1997) provide empirical support on this view by conducting mostly cross-country analysis. Leff (1964) represents a minority view arguing that moderate corruption can improve efficiency. Bardhan (1997) provides a recent survey of existing literature. Recently, Acemoglu and Verdier (1994) and Banerjee (1994) present careful models on how corruption and associated inefficiency arise. But it seems to us that there have been few efforts addressing corruption in the context of institutional change.

In the Russian context, Shleifer (1994) argues that corruption can be dangerous. Other observers of economic reform are puzzled by the paradoxical combination of improvement in economic efficiency and increases in corruption (e.g. *The Economist*, 1994). Our model can explain why corruption might increase – even as a fraction of total output – in a reforming economy experiencing high growth.

The message of our paper is that steady-state analyses of corruption do not by themselves provide a basis for analyzing the causes and effects of corruption during transitions. We show that the welfare effects of transitory corruption can be quite different from those of steady-state corruption, if the transitory corruption is a necessary part of a reform package that implements permanent, desirable institutional change. We argue that governments do (and should) use this sort of “good corruption” to increase the likelihood of successful reform.³ Of course, excessive levels of corruption may cause social dissatisfaction and result in severe political repercussions. Thus, even reform-inducing corruption should be controlled within moderate levels and executed in a politically safe way.

In order to examine the relationship between corruption and institutional change, we utilize a framework in which corruption arises naturally as a by-product of economic institutions. Before reform, the economy is in a “bureaucratic steady state” in which power is transferred between generations of bureaucrats and corruption is endemic. We assume that, before reform, the top leadership is ideologically committed to bureaucratic control over the economy. We define “reform” as a time when the top leadership permanently abandons this ideological stance and switches to pro-

³In the context of analyzing China's reform, this conclusion is consistent with that of Lau, Qian, and Roland (1997), i.e., the bureaucrats have not been losers of the reform. They are incentivized and co-opted in the reform process.

moting economic efficiency. However, some bureaucratic offices can be restructured during a reform to provide useful services, so the top leadership would prefer not to simply close all offices indiscriminately. But the top leadership needs cooperation from bureaucrats in order to reform. While there are many reasons why cooperation is needed, our model focuses on one in particular: informational imperfections. In our model, the leadership is unable to observe directly the productivity of offices and discern which offices should be closed.

Thus, the leadership must enlist the cooperation of the bureaucrats themselves. We show that a one-time increase in corruption can provide the appropriate incentives for bureaucrats to reveal the necessary information. Thus our model predicts that, in a wide variety of cases, corruption will rise subsequent to a reform before falling to its new, lower, steady-state value. On the other hand, output will often rise immediately, as entrepreneurs anticipate the future removal of distortions. Thus we might temporarily observe the puzzling juxtaposition of high growth combined with high corruption, even though corruption is generally inimical to growth. Our analysis is positive, but it carries the normative implication that certain kinds of corruption during a reform process may be tolerated.

We have modeled the need for bureaucratic cooperation in a specific way, but we believe the point is more general. Reform is a difficult and politically dangerous process. Even if it is socially desirable, it usually attacks the perquisites of an entrenched elite, who generally oppose the process. Given the limited political capital of any set of reform-minded leaders, who must spend some of that capital undertaking essential reforms like privatizing industry and eliminating popular subsidies, it may be optimal for the leadership to co-opt the opposing interests. This temporary rise in distortions

can actually improve welfare by raising the probability that reform will be successfully implemented. However, we emphasize that for transitional corruption to be welfare-improving it must be implemented as part of a controlled plan by a top leadership that expects to remain in power to reduce corruption in the future. Corruption that results from a total breakdown of law and order is not welfare-improving; it is a sign that the state has lost much of the power it needs to implement reform successfully.

In the next section, we present two case studies of corruption during reform and argue that the evidence is consistent with our interpretation that bureaucrats need to be bribed in order to accede to reform. Then in sections 3 and 4, we model corruption, both in a steady state where bureaucrats have power and during the process of a reform designed to reduce that power. The analysis based on the model forms the core of the paper's argument. In section 5, we discuss the results and extend the basic model along several dimensions. Section 6 concludes the paper.

2. Two Cases of Corruption during Economic Reform

Before presenting our formal analysis of reform and corruption, we examine two case studies of corruption during reform. Both cases are from China, where the reform has lasted for over fifteen years, often accompanied by increases in corruption.

Corruption has gone up hand-in-hand with China's economic reform. Meanwhile, anti-corruption campaigns have always been visible, but apart from the rhetoric, which is constant, actual attempts to reduce corruption are often modest and their intensity varies greatly with the reform cycle. A repeated pattern is that when the reformist top leadership is able to push for faster reforms, the anti-corruption campaign takes secondary importance; when reform slows down, much tougher anti-corruption

policies are pursued.⁴ This short-term negative correlation between corruption and reform is exactly what our model would predict.

In general, during the reform process, out-going bureaucrats in China have benefited handsomely from reform via the increased level of corruption. Reform gives corrupt bureaucrats two main sources of income. The first is from sponsoring new businesses, and the second is from restructuring existing state agencies - in particular, the state-owned enterprises. In both cases, the scope of bureaucratic institutions is eventually reduced and replaced by the market mechanism. In many cases, the outgoing bureaucrats become businessmen.

The first case of corruption we analyze is government officials' direct "sponsoring" of new businesses. This has been responsible for the rapid entry of new firms in China. The second case of corruption is the so-called "stock craze" induced by initial public offerings of shares of state enterprises from 1991 to 1993. Many government officials benefited greatly during the stock craze.

2.1. Government "Sponsored" Entry of New Businesses

Rapid entry of non-state-owned businesses is arguably the most successful aspect of China's economic reform. These new businesses enter the so-called non-state sector, which accounted for less than 20 percent of GDP at the start of the reform. With an

⁴An outstanding example is the dispute within the Communist Party in the summer of 1988. The reform-minded party secretary Zhao Zhiyan tried to push a bold plan for further reform, the so-called "New Order for the Socialist Commodity Economy", as a response to surging corruption. The conservative premier Li Peng advocated a retrenchment plan against reform and insisted on the importance of a full-fledged anti-corruption campaign. Zhao lost the confrontation. The Tiananmen incident and the two-year rectification program followed. For details, see Gong (1994).

average annual growth rate of over 20 percent, the non-state sector now accounts for more than 50 percent of GDP.

Almost all newly-established firms in the non-state sector are "sponsored" by government officials, especially local officials. Even private firms (other than very small family businesses) usually have government "sponsors" when first set up.⁵ The reason is simple. The entrepreneur needs constant help from the "sponsor" to obtain the right to use land, to secure low interest loans, and to evade excessively high formal taxes. In the case of potential contract disputes with other firms, support from the "sponsor" becomes even more important.⁶

Corruption surges with the "sponsorship" of new businesses. Formally, there is a "sponsorship" fee, which is typically 10% of the profit. Revenue from this fee is a main source of the "extra-budgetary" income for officials' own use. In addition, officials can collect various ad hoc taxes and fees, use the new businesses as expense accounts, and force these firms to hire their relatives. These perquisites have made Chinese bureaucrats very happy to set up new enterprises.⁷

The most important and often-neglected aspect of the phenomenon of government officials "sponsoring" new businesses is that the bureaucratic institutions themselves are subsequently changed. A widely observed pattern among these new businesses is that as they grow larger, they seek independence from the "sponsoring government" by registering as an independent business group. The former government officials retire from government and become major managers of the company. In this way, the

⁵In Chinese, the words for the "sponsor" is *gus lao ren wei* (the connecting and relating agency).

⁶See Li (1996) for a detailed analysis of these sometimes called "ambiguously owned" firms.

⁷For a detailed case study on the incentives of local government officials, see Lin, He, and Du (1992).

officials' long-term stake in the businesses is secured. Also, as the officials retire, the control span of the government is reduced, since the spun-off company is now more independent of the government and operates according to market principles.⁸

In this case, corruption provides incentives for bureaucrats to support, and even to initiate reform. In fact, those bureaucrats who obstructed the most worthwhile investments before reform have the most incentive to "sponsor" new businesses, since they can expect to retire from the government and become managers of the most profitable new firms. This example illustrates our contention that an increase in corruption can smooth the path of institutional change. This change then reduces the long-run level of corruption, while bringing needed economic reform.

2.2. Initial Public Offering of State Enterprise Stocks

A highly visible wave of corruption was observed in China between 1991 to 1993, when the so-called "stock craze" swept the country. The level of corruption was high because the bureaucrats in charge of approving initial stock issuing of state enterprises were offered shares at their book value. Because the total amount of stock issued was quite small in relation to the demand, these shares often traded at ten times their book value. As a result, "(T)here have been scores of millionaires made among officials controlling the application of a potential stock market" (Chen (1994)).

From the top reformers' point of view, the stock craze played an important role in jump-starting the reform process after the Tiananmen incident. At that time, the

⁸The best illustration of this is the recent development in rural China under the name of "clarifying property rights of rural enterprises." As a result, many local officials become solely business owners and managers. See Cui (1993) for interesting cases.

reformers faced a dilemma. They wished to partially privatize some firms, in order to improve corporate governance. But they were concerned that a large stock offering would divert a large amount of household saving away from buying the government bonds that had to be floated to finance the budget deficit. Thus, they decided to limit the amount of stock that would be offered. This implied that only the "most suitable" enterprises would be privatized. The problem was that only the lower-level bureaucrats knew which enterprises would be most suitable for privatization, but they stood to lose if they lost control of their most efficient firms. The leadership used corruption to solve this problem, offering low-priced shares to create the proper incentives.

The procedure of the stock offering was initiated by the bureaucrats controlling the firm. These bureaucrats made proposals to higher level bureaucrats. All parties involved were offered "initial shares" at par value. Therefore, these officials had clear incentives to choose the firms with the biggest upward potential in the secondary market. In other words, the corrupt bureaucrats had strong incentives to privatize those firms which would benefit the most from privatization. In addition, bureaucrats losing control of the privatized firms were also compensated. This way, the forces that would have opposed reform were turned into its enthusiastic supporters. Again, a temporary surge of corruption was used as a means of improving long-term economic efficiency.

3. Corruption and Economic Development in Steady State

In this section, we build a simple model to analyze the role of corruption in economic development in steady state, i.e., either before the reform takes place or

after it is completed.

3.1. Three Classes of Agents

There are three classes of agents in the economy. The first class is the top leadership, denoted by T . Before reform, T monitors bureaucratic offices by setting anti-corruption policies.

The second class of agents comprises overlapping generations of bureaucrats. Each bureaucrat lives for two periods: first as an "apprentice" of an office and then the "chief" of the office when he obtains the full control right of the office. Let B_t indicate the bureaucrat who is in control in period t . B_t 's economic life starts at the beginning of period $t - 1$.

Entrepreneurs comprise the third class of agents. Like bureaucrats, there are also overlapping generations of entrepreneurs. Let E_t be an entrepreneur born at time t . Without losing generality, we assume that neither bureaucrats nor entrepreneurs discount future utilities.

3.2. Entrepreneurs' Investment

E_t makes an investment k at the beginning of period t and the investment pays off stochastically at the end of periods t and $t + 1$. At each time of payoff, with probability $\mu(k_t)$, the gross payoff is R_t , a constant; otherwise it is 0. In other words, the investment k is intended to increase the chance of success of the investment rather than the conditional payoff. We will maintain the following assumptions:

Assumption 1: $\mu(0) = 0$, $\mu'(0) = \infty$, $\mu'(k) > 0$, and $\mu''(k) < 0$.

It turns out that the most interesting case when discussing the effect of corruption is when the probability function μ is highly concave, i.e., having rather rapidly

decreasing returns to investment. Consequently, we will maintain the following assumptions:

Assumption 2: $-\frac{u'(k)}{u(k)}$ is a decreasing function of k .

3.3. Corruption and Anti-Corruption Policies

We model two types of corruption. The first type arises because B_t is in control of the office and therefore can prevent both E_{t-1} and E_t from reaping the return on their investments. For simplicity, we will assume that the bureaucrat can make a take-it-or-leave-it offer in negotiating the amount of the bribe.

To control this type corruption, T implements an anti-corruption policy. We model a very simple version of such a policy. At the end of each period, with probability ϕ_0 , T investigates whether B_t has taken a bribe. If B_t is found to have taken a bribe b , he will have to pay a fine of $F(b)$. For simplicity, assume that the fine function is $F(b) = b^2$. At the end of period, the fine is rebated in a lump-sum fashion to the entire population.⁹ Under such an anti-corruption policy, B_t chooses to maximize $b - \phi_0 b^2$, so the optimal bribe B_t demands is $b = \frac{1}{2\phi_0}$ and the associated payoff to B_t is $b = \frac{1}{4\phi_0}$.

Throughout our analysis, we shall assume that the anti-corruption policy is a binding constraint on the amount of the bribe. That is, the total net profit is bigger than the bribe so that it is worthwhile for the entrepreneur to bribe the bureaucrat. Also, for our analysis, we shall assume that ϕ_0 is the exogenous steady state intensity of anti-corruption policy. For technical convenience, we shall focus on changes in ϕ_0 .

⁹We assume that the fine is evenly distributed among all agents, so that there are no incentive consequences. We can allow the fine to be paid back to the investing entrepreneur without any qualitative changes in the following analysis.

rather than changes in $F(\cdot)$. To summarize, in the following discussions involving q , we have

Assumption 3: $R > \frac{1}{2q}$.

The second kind of corruption is called *internal corruption*, which arises because a senior bureaucrat has power to choose his successor and aspiring junior officials have to compete for the position.¹⁰ Therefore, we assume that before B_{t+1} inherits power from B_t , he has pay a "tribute" to the old.

Avoiding the details of modeling internal corruption, we simply assume that the "tribute" is a constant (α) proportion of the junior official's expected future bribe. The "tribute" is a perk enjoyed by the senior official. Since it is unlikely that there are well-functioning capital markets to finance junior bureaucrats' pursuit for future power, α is likely to be much less than 1.

3.4. Corruption and Steady State Investment

We can now analyze the role of corruption in economic development, assuming that there is no institutional change. The conclusion is consistent with the conventional wisdom on corruption, which is that corruption reduces investment and welfare. The intuition is that bribes to bureaucrats siphon off returns to entrepreneurs, who then have less incentive to invest.

From our previous analysis, E_t has to bribe B_t in period t and then B_{t+1} in period $t + 1$ in the amount of:

$$b = \frac{1}{2q_0}. \quad (1)$$

¹⁰In our model, for simplicity, we assume away competition among junior bureaucrats. In general, such competition can be important.

Consequently, B_t expects to get a payoff of $b - q_0 b^2 = \frac{1}{4q_0}$ with probability μ and 0 otherwise from each project and there are two projects existing during B_t 's reign of the office.

How much will E_t invest? E_t will maximize her expected return, which is

$$2\mu(k)(R - b) - k,$$

since she does not discount the second period payoff.

The first order condition for k becomes:¹¹

$$2\mu'(k_0)(R - \frac{1}{2q_0}) = 1. \quad (2)$$

Notice that given the existence of the bureaucratic office, the expected social welfare from investment k is

$$2\mu R - k$$

which requires that the first best investment level satisfy

$$2\mu'(k)R = 1. \quad (3)$$

Comparing equations (2) and (3), we conclude:

Proposition 1 *Given the existence of bureaucratic offices, a higher q_0 leads to higher investment, higher output, and higher social welfare.*

Can anti-corruption policies be Pareto improving, so that both bureaucrats and entrepreneurs prefer tighter anti-corruption policies? In the real world the answer is likely to be no, since otherwise popular political demand should have already produced

¹¹The second order condition is guaranteed by our convexity assumption on μ .

stricter policies. In our model, however, the answer may be yes. The intuition is that an increase in q may increase k so much that the higher success rate μ leads to more frequent bribes, which more than compensates for the lower amount of each bribe. It turns out that this situation does not arise when q is not too low. Assumption 5 rules out this unlikely case. We shall maintain this assumption for the remainder of the paper.

Assumption 5: $q \geq \frac{\mu^2}{-\mu\mu''}$, for $k > 0$.

Lemma 1 *Under Assumptions 1 to 5, an increase in q_0 makes the entrepreneur better off, but the bureaucrat worse off, i.e. $(\frac{\partial k}{\partial q})_q < 0$.*

4. Corruption and Reform

Suppose that at $t = 0$, a reformist leader T assumes power. The intended market-oriented reform involves changing the role of the bureaucracy.¹² We identify two general objectives of such a reform: to eliminate those unproductive bureaucratic offices and to restructure those potentially productive ones. Correspondingly, suppose there are two types of offices. The first type office does not provide any value-added to investment projects as modelled above and cannot be restructured. This will be called the low type office and the reform intends to close such offices. The second type can be restructured during a reform so that with the service of the office, the positive return to an investment becomes Rv with $v > 1$. Restructuring such offices requires efforts of a bureaucrat equivalent to a monetary cost c . Let us call this the high type office.

¹²After all, as Kornai (1992) argues, bureaucratic coordination is a key feature of many non-market economies.

The model is concerned with a fundamental difficulty of reform, i.e. the top reformer does not have sufficient political and administrative capacity to implement a reform. To analyze this difficulty of reform, we focus on the issue of information. Suppose that T cannot distinguish between the two types of offices and cannot force a bureaucrat to make efforts to restructure. T only knows that a certain proportion of offices are of the high type.¹³ Furthermore, suppose T has limited capacity so that he cannot observe the output of each office.

Facing limited capacity, in general, T can adopt one of two broad approaches to reform. He can order the bureaucrats to close all offices without any restructuring. We call this a sweeping reform. Alternatively, he can provide incentives for bureaucrats and delegate the rights to reform to them. We call this a decentralized reform. In the following, we discuss strategies to implement a decentralized reform.

4.1. Buying Out Bureaucrats

A simple strategy to implement a decentralized reform is to buy out bureaucrats. In such a strategy, T compensates bureaucrats who choose to close their offices immediately. We show that such a buy-out strategy may or may not induce a successful decentralized reform. Suppose that the monetary compensation is m . In order for a B_0 in a low type office to decide to close the office, it must be:

$$m > \frac{\mu(k_0)}{2q_0} + \alpha \frac{\mu(k_0)}{2q_0} = (1 + \alpha) \frac{\mu(k_0)}{2q_0}$$

where k_0 is the amount of investment defined in equation (2), since without closing the office, B_0 expects to get bribes from E_{-1} , E_0 , and B_1 .

¹³This informational asymmetry is our way of formalizing why T needs bureaucratic cooperation during reform. See section 5.1. for other reasons why this might be true.

Meanwhile, in order for the buy-out strategy to be successful, m cannot be too high. Otherwise, a B_0 in a high type office will also choose to close the office. We have

$$m \leq \frac{\mu(k_0)}{4q_0} + \frac{\mu(k_H)}{4q_0} - c + \alpha \frac{\mu(k_H)}{2q_0},$$

where the first term is the expected bribe from E_{-1} and the second term is that from E_0 with k_H being the new and increased investment level associated with successful restructuring, i.e.,

$$2\mu'(k_H)(Rv - \frac{1}{2q_0}) = 1.$$

Clearly when c is non-trivial, both conditions cannot be satisfied simultaneously.

Proposition 2 *If $c < (1 + 2\alpha) \frac{\mu(k_0) - \mu(k_0)}{4q_0}$, then a buy-out strategy that offers m to those bureaucrats who decide to close their offices will induce a successful decentralized reform, where $m \in ((1 + \alpha) \frac{\mu(k_0)}{2q_0}, \frac{\mu(k_0)}{4q_0} + (1 + 2\alpha) \frac{\mu(k_H)}{4q_0} - c)$.*

In addition to the condition specified above, there are other constraints that may prevent a buy-out strategy from being feasible. In particular, T is likely to face a tight budget constraint during the reform period so that he does not have the funds to buy out B_0 's. Furthermore, even if T can borrow against future tax raises in order to finance the buy-out strategy, the taxes will fall on future productive investors and this may not be desirable.

4.2. Co-opting Bureaucrats for Reform

When the buy-out strategy of reform is not feasible, the only other way to achieve a decentralized reform is through co-opting bureaucrats for reform, i.e., to bureaucrats

with incentives that are linked to the performance of the office during reform. A natural choice of the co-opting strategy is to give bureaucrats profit shares of returns to investments under their control. However, this strategy may not be desirable, since the profit shares are easily institutionalized (e.g., in the case of IPO's) so that they become chronic taxes on future investments. Moreover, given that returns to investments are often difficult to measure, implementing a profit-share based scheme requires new administrative instruments and capacity that the reformer may not enjoy during a reform.

In the following, we analyze an interesting co-opting strategy which involves a temporary relaxation of control of corruption and delegation of decision rights of reform to bureaucrats. Given that this strategy requires no new administrative apparatus, it seems to be a very common approach to reform. We will show that under certain conditions, such a reform strategy can be effective.

Suppose that the anti-corruption policy is relaxed from q_0 to q^* for period 0 and bureaucrats are granted autonomy to initiate reforms, i.e., either to close or to restructure their offices. Let us analyze the decisions of bureaucrats in each type of office.

For a B_0 in a low type office, without reform (i.e., he keeps the office open), he will obtain bribes from both E_{-1} and E_0 and a "tribute" from B_1 :

$$\left[\frac{\mu(k_0)}{4q^*} + \frac{\mu(k^*)}{4q^*} \right] + \alpha \left[\frac{\mu(k^*)}{4q_0} + \frac{\mu(k_0)}{4q_0} \right] \quad (4)$$

where the first term in square brackets is the sum of bribes B_0 obtains from E_{-1} and E_0 ; the second term is the "tribute" paid by the young bureaucrat; k^* is the amount of investment made by E_0 anticipating that the office will stay open, i.e.,

$$\mu'(k^*)(2R - \frac{1}{2q^*} - \frac{1}{2q_0}) = 1.$$

Alternatively, if B_0 chooses to reform (i.e., to close the office), he will benefit from higher bribes due to higher investments but will lose the "tribute" from B_1 who will change career. B_0 's total payoff is:

$$\left[\frac{\mu(k_0)}{4q^*} + \frac{\mu(k_c)}{4q^*} \right] \quad (5)$$

where k_c is the amount of new investment by E_1 anticipating the closing of the office, i.e.,

$$\mu'(k_c)(2R - \frac{1}{2q^*}) = 1.$$

Apparently, $k_c > k_0 > k^*$. Therefore, in order to induce B_0 in the low type office to reform (close the office), it is necessary and sufficient that

$$\frac{\mu(k_c) - \mu(k^*)}{4q^*} > \alpha \left[\frac{\mu(k^*)}{4q_0} + \frac{\mu(k_0)}{4q_0} \right], \quad (6)$$

which means that the increase in current bribe due to higher investment associated with reform should offset the loss of "tribute" from the young generation of bureaucrat.

For a bureaucrat in a high type office, he has three choices: close the office, keep the office open without restructuring, and keep the office open with restructuring. Apparently, the choice between the first two is the same as that analyzed above. Meanwhile, if a B_0 in a high type office takes the third option, his total payoff is:

$$\left[\frac{\mu(k_0)}{4q^*} + \frac{\mu(k_R)}{4q^*} \right] + \alpha \left[\frac{\mu(k_R)}{4q_0} + \frac{\mu(k_H)}{4q_0} \right] - c \quad (7)$$

where k_R is the investment by E_0 during reform:

$$\mu(k_R)(2Rv - \frac{1}{2q^*} - \frac{1}{2q_0}) = 1$$

and k_H is the investment by E_1 after the reform:

$$2\mu(k_H)(Rv - \frac{1}{2q_0}) = 1.$$

Therefore, under the condition that a E_0 in a low type office decides to close his office, we need the following condition to induce a E_0 in a high type office to restructure:

$$\frac{\mu(k_R) - \mu(k_C)}{4q^*} + \alpha \left[\frac{\mu(k_R)}{4q_0} + \frac{\mu(k_H)}{4q_0} \right] > c. \quad (8)$$

Therefore, we have:

Proposition 3 *The necessary and sufficient conditions for a co-opting reform strategy characterized by (q_0, q^*) to induce a successful decentralized reform are*

$$\frac{\mu(k_C) - \mu(k^*)}{4q^*} > \alpha \left[\frac{\mu(k^*)}{4q_0} + \frac{\mu(k_0)}{4q_0} \right] \quad (6)$$

and

$$\frac{\mu(k_R) - \mu(k_C)}{4q^*} + \alpha \left[\frac{\mu(k_R)}{4q_0} + \frac{\mu(k_H)}{4q_0} \right] > c. \quad (8)$$

where k_C and k_H are investments by E_1 when the office is closed and restructured, respectively; k^* and k_R are the investments made by E_0 anticipating the low type office to stay open and the high type office to be restructured, respectively.

We can obtain several comparative static results from Proposition 3. Consider a decrease in q^* . Both investments k_C and k^* will be lower, resulting in an ambiguous effect on whether E_0 in a low type office chooses to close the office. However, with the lower q^* , E_0 can benefit even more from the difference between k_C and k^* , since in effect, a more relaxed control of corruption means he is given a larger share in the efficiency improvement. Overall, we show that last factor dominates the ambiguity of the first effect.

Similarly, consider the implication of an increase in q_0 for condition (6), the steady state anti-corruption policy. The first effect is that k^* is higher, since E_0 expects to pay fewer bribes to E_1 in period 1. The higher k^* means that E_0 has more bribes in period 0 and creates a stronger incentive for a E_0 in a low type office not to reform. However, from Lemma 1, a higher q_0 also means that E_1 obtains less expected bribes. This translates into a lower "tribute" paid to E_0 . We can show that under certain conditions, the second effect dominates the first.

Corollary 1 *Ceteris Paribus, 1) a lower q^* makes the co-opting strategy of reform more likely to succeed; 2) When α is sufficiently large and c sufficiently small, a higher q_0 makes the co-opting strategy more likely to succeed; 3) When c is sufficiently small, a smaller α favors the success of the co-opting strategy of reform.*

We can also study the consequence of a successful co-opting strategy. If a reform based on the above co-opting strategy is successful, then a bureaucrat in the low type office expects to get more bribes than before the reform. However, compared with the pre-reform situation, the investment level in the low type office will increase, since entrepreneurs expect that their offices will be closed. After the reform, the investment level will increase further due to the final elimination of the low type office. By the

same argument, bureaucrats in the high type office will also get higher bribes and the investment level in their office will also increase during the reform and will increase further when the reform is successful and the anti-corruption policy is tightened.

Proposition 4 *During the implementation of a successful co-opting strategy of reform, the level of corruption in both types of offices (as measured by total expected bribes) goes up. The level of investments in both offices will increase during reform and increases further after the reform.*

5. Extensions and Discussion

5.1. The Need for Bureaucratic Cooperation during the Reform

In our formal model, a key assumption is the information asymmetry between the reformist T and the incumbent bureaucrats B_0 . This asymmetry makes the cooperation of bureaucrats important. In fact, our formal analysis can be extended to a much wider range of circumstances. What is essential to our theory is the premise that the cooperation of lower-level bureaucrats is very important if one is to implement significant institutional change.

There are two broad categories of reasons why bureaucratic cooperation is needed. The obvious one is that bureaucratic skills are often indispensable for institutional changes. Many reform measures have to be implemented by lower-level bureaucrats. Take the issue of mass privatization. All detailed operations, from checking book values of state enterprises and issuing vouchers to organizing auctions of shares, have to be performed by the bureaucrats. Aside from incentive issues, the incumbent industrial bureau officials are the least costly human resources for these tasks. In

general, such bureaucratic capital is a resource that can be utilized efficiently by the reformers.

The second reason for the importance of bureaucratic cooperation during the reform is based on the top reformers limited political capital. The top reformer must amass a critical amount of political support for the reform. Incumbent bureaucrats, through their familiarity with politics, are potentially formidable foes of reform who need to be placated.

5.2. Political Cost of the Co-opting Strategy

Our formal analysis omits any discussion of the political cost of co-opting bureaucrats through corruption. Our theory focuses on the economic costs of co-opting, i.e., decreased incentives for entrepreneurs to invest. However, there are also significant political costs. In a co-opting strategy, bureaucrats getting "golden handshakes" seem like a vestige of the past, and a counterexample to what reforming politicians usually preach. The presence of such examples can create public cynicism and dissatisfaction with the reform process. For instance, in China, corruption was a leading cause of the Tiananmen incident. In other formerly socialist economies, corruption was often regarded as a "second-generation" problem of transition.¹⁴

It seems that the marginal political cost of corruption increases very fast with the level of corruption. Mild levels of corruption can be easily tolerated by the general public so long as the economy grows fast. Extremely high levels of corruption even in rapidly growing economies can lead to extreme political responses, from voting out the government to military *coup d'état*. This leads us to believe that our theory is

¹⁴See Transition, June, 1995.

more relevant to cases where corruption levels are low before the reform and a mild increase of corruption is enough to provide the incentives for bureaucrats to comply with the reform.

6. Conclusion

We analyze corruption in the context of institutional changes such as the post-socialist reform. Our conclusion is generally different from the widely-received view on corruption. We argue that a one-time surge in the level of corruption may induce the incumbent bureaucrats either to give up their control rights or to restructure their offices. Our analysis can explain a set of observations of transitional economies that seem puzzling – in particular, how increasing corruption can co-exist with an apparently successful reform that has given rise to rapid economic growth.

Our conclusion stems a our new approach to corruption. First, we treat corruption as a by-product of bureaucratic institutions; therefore changes in such institutions have consequences for corruption. Second, we regard the bureaucratic institution as a succession of generations of bureaucrats. Thus, bureaucrats are not a uniform class. Our analysis emphasizes that reform does not affect different generations of bureaucrats in the same way. In that case, a temporarily high level of corruption can be useful for “buying-out” bureaucrats currently in power, even if later generations of bureaucrats suffer as a consequence. These features of our approach lead to our key distinction: corruption during reform may be qualitatively different from corruption in the steady state. Even if steady-state corruption always impedes growth, as it does in our model, a short-lived burst of corruption may increase the likelihood that reform will succeed, and thus increase welfare.

This implication of the conclusion should be treated with care. Although corruption during reform is often unavoidable, it is not harmless and therefore should not be left unbridled. Excessive corruption in overt forms can be politically dangerous and should be controlled. But, within limits, corruption can be the friend of a well-designed program of reform.

Appendix

A.1. Proof Lemma 1

$$\left(\frac{\mu}{q}\right)' = \frac{\mu' k'_q}{q} - \frac{\mu}{q^2} \quad (a1)$$

From the first order condition (2), we get

$$k'_q = -\frac{\mu'}{q(2qRv_L - 1)\mu^\alpha} = -\frac{\mu'^2}{q^2 \mu^\alpha} \quad (a2)$$

Plugging (a2) into (a1), we have

$$\left(\frac{\mu}{q}\right)' = -\frac{1}{q^2} \left[\frac{\mu'^3}{\mu^\alpha} + \mu q \right] \leq 0.$$

The last inequality is from Assumption 5.

A.2. Proof of Corollary 1

Define

$$D = \frac{\mu(k_c) - \mu(k^*)}{q^2} - \alpha \frac{\mu(k_c) + \mu(k^*)}{q_0}.$$

Clearly, $\frac{\partial D}{\partial \alpha} < 0$. Therefore, a lower α makes the co-opting strategy more likely. For an increase in q^* , we know that $\mu(k^*)$ will be higher, since k^* will be higher. k_L is independent of q^* . Therefore, the second term in D will be higher. As for the effect of an increase in q^* on the first term, we have

$$\left[\frac{\mu(k_c) - \mu(k^*)}{q^*} \right]_{q^*} = -\frac{\mu(k_c) - \mu(k^*)}{q^{*2}} + \frac{1}{2(q^*)^3} \left[-\frac{(\mu(k_c))^3}{\mu(k_c)^n} - \mu(k_c)q^* + \frac{(\mu(k^*))^3}{\mu(k^*)^n} + \mu(k^*)q^* \right] < 0.$$

The last inequality is by assumption 2.

Finally, we can study the effect of a change in q_0 on D . The only terms affected by q_0 are $-\frac{\mu(k^*)}{q^*} - \alpha \frac{\mu(k_c)\mu(k^*)}{q_0}$. k_L increases with an increase in q_0 by Proposition 1. At the same time, the second term decreases with an increase in q_0 by Lemma 1. Similar to A.1., we have

$$\frac{\partial D}{\partial q_0} = \frac{(\mu(k^*))^3}{2q_0^2 q^* \mu'(k_c)} + \alpha \left[\frac{(\mu(k_c))^3}{(q_0)^3 \mu(k_c)^n} + \frac{\mu(k_c)}{q_0} + \frac{(\mu(k^*))^3}{2(q_0)^2 \mu(k^*)^n} + \frac{\mu(k^*)}{q_0} \right].$$

Notice that both $\mu(\cdot)$ and $\mu'(\cdot)$ are increasing functions of k by assumptions. Therefore, we have

$$\frac{\partial D}{\partial q_0} \geq \frac{1}{2} \frac{q_0}{q^*} + \frac{3}{2} \alpha \frac{(\mu(k^*))^3}{(q_0)^2 \mu(k^*)^n} + 2\alpha \frac{\mu(k^*)}{q_0}.$$

which gives the condition in Corollary 1.

References

- Acemoglu, Daron and Thierry Verdier (1994): "Property Rights, Corruption and the Allocation of Talent: A General Equilibrium Approach," mimeo, MIT, 1994.
- Banerjee, Abhijit (1994): "A Theory of Mis-Governance." mimeo, MIT, 1994.
- Bardhan, Pranab (1997): "Corruption and Development: A Review of Issues."

- Journal of Economic Literature*, v.35, pp. 1320-1346. September 1997.
- Boycko, Maxim, Andrei Shleifer, and Robert Vishny (1993): "Privatizing Russia", *Brookings Paper on Economic Activities*, pp.139-192, 1993.
- Chen, Aimin (1994): "Chinese Industrial Structure in Transition: The Emergence of Stock-Offering Firms," *Comparative Economic Studies*, 36, 4:1-20. Winter, 1994.
- Cui, Rongfa (1994): "The Experiment of the TVE Property Rights Reform in Taizhou Prefecture" ("Taizhou Diqu Xiangzheng Qiye Chanquan Gaige De Shiyan"). Mimeo., System Reform Commission of Taizhou Prefecture, Zhejiang Province, 1994.
- Gong, Ting (1994): *The Politics of Corruption in Contemporary China: An Analysis of Policy Outcomes*. Praeger:London, UK, 1994.
- Gould, D. and J. Amaro-Reyes (1983): "The Effects of Corruption on Administrative Performance", *World Bank Staff Paper No. 580*, 1983.
- Hua, Sheng, Xuejun Zhang, and Xisopeng Luo (1988): Rethinking the Past Ten Year's Reform (in Chinese), *Jingji Yanjiu (Economic Research)*, 1988:11, 1988.
- Hungtington, Samuel (1968): *Political Order in Changing Societies*. Yale University Press, 1968.
- Kornai, Janos (1992): *The Socialist System*. Princeton University Press, 1992.
- Lau, Lawrence, Yingyi Qian, and Gerard Roland: "Reform without Losers: An Interpretation of China's Dual-Track Approach to Transition", *CEPR Working*

- Paper, 1997.
- Leff, Nathaniel (1964): "Economic Development Through Bureaucratic Corruption", *American Behavioral Scientist*, pp8-14, 1964.
- Li, David (1996): "A Theory of Ambiguous Property Rights in Transition Economies — the Case of Chinese Non-State Sector," *Journal of Comparative Economics*, v.19, n.1, pp.1-19, August 1996.
- Lui, Francis (1985): "An Equilibrium Queuing Model of Bribery," *Journal of Political Economy*, v.93:4, pp760-781, August 1985.
- Lin, Qingsong, and Jiacheng He, and Haiyan Du (1992): "Rural Industrial Enterprises and the Role of Local Governments: A Chinese Case Study." In Jones, Derek, and Svejnar, Jan, Eds., *Advances in the Economic Analysis of Participatory and Labor-Managed Firms*, (Volume 4), pp.243-271. Greenwich, CT: JAI Press, 1992.
- Mauro, Paolo (1995): "Corruption and Growth," *Quarterly Journal of Economics*, v.110, pp.681-712.
- Rose-Ackerman, Susan (1975): "The Economics of Corruption," *Journal of Public Economics*, v.4 n.1:187-203, 1975.
- Rose-Ackerman, Susan (1978): *Corruption: A Study in Political Economy*. New York: Academic Press.
- Shleifer, Andrei and Robert Vishny (1993): "Corruption", *The Quarterly Journal of Economics*, v.108:617-640, 1993.
- Economics*, v.136, 1993.
- The Economist*: "Something Smelly in Vietnam's Doi Moi," June 4, 1994.
- United Nations (1989): *Corruption in Government*. New York, United Nations, 1989.
- Wei, Shang-jin (1997): "How Taxing is Corruption on International Investors?" mimeo. Working Paper, The Kennedy School of Government, Harvard University.
- The World Bank (1995): "World Bank Discussion on Second-Generation Transition Issues," *Transition*, v.6, n.5-6, May-June 1995. pp.1-6.