

Corruption in dictatorships

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Abstract In this paper, we consider a simple model capable of explaining why some dictatorships choose to extract rents via seemingly inefficient institutions. In particular, this paper focuses on institutions associated with high levels of corruption and examines the conditions under which such institutions could serve the interests of a dictatorship. Developing such a model requires that we pose alternative institutions that dictators can choose to extract rents. Using this framework, this paper builds a model providing a theoretical basis for some stylized facts about the observed cross-country variation in corruption levels. Specifically, the model motivates a rationale for the finding that higher levels of corruption are observed in countries characterized as having more heterogeneous populations, longer expected dictator tenure, and more severe punishment norms. The model is then estimated using international country level data.

Keywords Institutional choice · Economic development · Public choice

JEL Classification D72 · D73 · H11 · K42

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“Fight corruption too little and destroy the country; fight it too much and destroy the Party”, Chen Yu, veteran leader of the Chinese Communist Party.¹

1 Introduction

The recent introduction of corruption indices for a cross section of countries has spawned a large body of empirical research on the causes and consequences of corruption. Some of the results are robust with respect to alternative empirical approaches and are consistent with common preconceptions. For example it is generally found that countries with higher levels of corruption have lower levels of economic performance. And, it is generally found that corruption is lower in countries with more democratic and transparent institutions.

These results, while often “comfortable”, raise at least two analytical puzzles. First, if we accept that higher corruption leads to lower economic performance, and that corruption is highest in countries run by dictatorships, then we should ask why a dictatorship would “choose” to run a country in a corrupt manner. For example, consider a dictatorship that has demonstrated the power to ferret out and punish every individual who has engaged in, or is only suspected of, political opposition. Presumably such a dictatorship would also have the power to find and punish individuals engaged in, or only suspected of, corrupt behavior. If, as the research suggests, corrupt behavior reduces economic performance, then we need to understand why a dictatorship would not use its police powers to deter this behavior. A simplistic answer is that the dictatorship doesn’t arrest and punish persons engaged in corrupt activities because the corrupt behavior somehow benefits their regime despite its deleterious effects on the economy. Continuing this line of thinking, we then come to a second puzzle. Within the subset of countries that are ruled by dictatorships, we observe a wide variation in corruption levels. If we accept that corrupt behavior can somehow benefit a dictatorship, then we need to ask why all dictatorships don’t “choose” to allow corrupt behavior, or to allow even more corrupt behavior than is already observed.

While the premise that a dictatorship can “choose” an optimal level of corruption will seem artificial, we maintain that it is not farfetched. After all, we routinely observe that dictatorships can be extremely effective in deterring a wide variety of behaviors deemed harmful to their regime. Some dictatorships use their powers to apprehend and prosecute religious leaders, separatists, political opponents, or drug traffickers. And some dictatorships choose to root out and punish anyone engaged in corrupt behavior. Others do not. The premise that high levels of corruption can be the result of dictatorship choice forces our analysis to consider the conditions under which a dictatorship can benefit from corrupt behavior despite its negative effects on economic performance.

This paper proceeds as follows. Section 2 reviews the relevant research on the causes and consequences of corruption. Section 3 develops a model of institutional choice. Section 4 describes the data used to estimate the empirical model in Sect. 5. The paper concludes with some final comments in Sect. 6.

¹ Quotation from Bergsten et al. (2008, p. 99).

2 Corruption research

The economics literature usually notes that corrupt behavior, in theory, could either raise the cost of economic activity as “hold-up money”, or it could encourage economic performance in the same way that a tip encourages good performance from a waitress. But the preponderance of empirical work reports that higher levels of corruption are associated with lower economic performance as measured on many different dimensions (Mauro 1995; Wei 2000; Lambsdorff 2003; Gupta et al. 2002; Fredriksson and Svensson 2003). While it is generally accepted that corrupt behavior leads to lower economic performance, this leads the researcher to ask why corrupt behavior is so common in some countries but not in others.

The research on the cross country variation in corruption examines three sources of corrupt behavior: economic policy, political system, and country fixed effects. With respect to economic policies, the literature extends the models of criminal behavior to study the costs and benefits of engaging in corrupt behavior (Ades and Di Tella 1999). The individual benefits of corrupt behavior depend on the size of rents available, the expected probability that corrupt behavior is detected and punished, and the level of punishment. For example, holding other things constant, countries with economic policies restricting international trade create rents accessible to corrupt officials, and empirical work finds that greater trade openness is related to lower levels of corruption (Lederman et al. 2001). The expected costs for government employees for engaging in corrupt conduct are related to job compensation and the probability of detection. Empirically, however, the evidence that corruption levels are lower in countries using an efficiency wage strategy is limited (Van Rijckeghem and Weder 2001; Pellegrini and Gerlagh 2008). The literature reports that countries with a British legal tradition have lower levels of corruption (Treisman 2000). The interpretation is that the British legal origin leads to a more transparent legal system with tighter and more predictable enforcement of the rule of law, and this results in a higher expected probability that corrupt behavior will be detected and punished. Although the crime model suggests that punishment levels should affect the incentive for corrupt behavior, to our knowledge, this connection has not been tested in the literature.

Much of the research analyzing the linkage between political structure and levels of corruption stems from the principal agent literature. Political leaders have different objectives than their principles and operate in an environment of asymmetric information. Characteristics of political structure are modeled as clauses of an incomplete contract. The degree to which political leaders can pursue their narrow self-interests is then a function of the tightness of the political constraints they face. According to this model corruption will be lower in countries where political accountability and constraints on opportunistic rent seeking are tighter. One strand of thinking is that we should expect corruption levels to be lower in democracies having frequent, transparent elections, a separation of powers, and free presses since these institutions can expose and punish corrupt officials (Persson et al. 1997; Linz and Stephan 1996; Lederman et al. 2001; Djankov et al. 2001). On the other hand, it can be argued that a strong dictator can impose and enforce restrictions on corrupt behavior, impose severe punishments on violators, and appropriate some of the gains associated with reduced corruption. The level of corruption in a country ruled by a dictator will vary depending

on the institutions used by the dictatorship to solidify its hold on power (Wintrobe 1998; Wintrobe 2001). The empirical results on the relation between democratic institutions and corruption levels are also mixed. Pellegrini and Gerlagh (2008) recently reported no significant relationship between corruption levels and their measure of democracy, and they suggest that variation in reported results reflects differences in samples and omitted variable biases.

Empirical research on country level corruption generally includes a set of country control variables. While the control variables are usually not motivated by formal modeling, statistically significant empirical results suggest these variables are picking up something. For example, statistically significant results for dummy variables for countries in Africa, South America, East Europe, and Central Asia have been reported (Treisman 2000; Lederman et al. 2001). Other studies report statistically significant results for control variables like Distance from the Equator, Per Cent Protestant, Land Locked, and Country Size (e.g. Treisman 2000; Knack and Azfar 2000; Pellegrini and Gerlagh 2008). Importantly for our purposes, many studies include different measures of “Ethnic Fractionalization” (Fisman and Gatti 2002; Lederman et al. 2001; Svensson 2000; Treisman 2000; Van Rijckeghem and Weder 2001; Rauch and Evans 2000). The underlying hypothesis is that countries with a more varied social landscape and having more competing social groups will be less able to enforce a cooperative solution, and the competing social groups will use corrupt practices in their rent seeking activities. Most of the empirical work finds that countries having greater ethnic diversity tend to have higher levels of corruption.

For our purposes we extract the following stylized facts from the empirical research, and we use these to guide the model constructed in the next section.

1. Countries with higher levels of corruption have lower levels economic performance.
2. The cross country variation in corruption levels is large.
3. Economic policies and institutions that reduce the potential gains and increase the expected costs of corrupt behavior can reduce the level of corruption.
4. Countries characterized by greater diversity have higher levels of corruption.

3 Institutional choice model

The existing literature does not establish a convincing explanation for the high levels of corruption observed under dictatorships (Wintrobe 1998). Why do we think that the pluralistic haggling over rents observed in democratically elected congresses should result in lower corruption than occurs in authoritarian dictatorships? One might think that authoritarian regimes would be better able to stamp out inefficiencies and corruption than democratically elected regimes. Wintrobe (2001, p. 49) argues “dictators, at least of the more successful (i.e. relatively long lived) variety, often know how to organize things so that they get a substantial return out of the process of rent-seeking”.

Following Wintrobe (2001) and Lambsdorff (2002), this section proceeds to develop a model where a rational dictator selects an institutional arrangement for extracting rents that will maximize the returns for the dictatorship. Such a model needs to recognize the transaction costs, incentive compatibility, and commitment problems that are

central to the contracting literature. We borrow from a model in the industrial organization literature where a centralized monopolist extracts rents from a local market using either its own employees, or alternatively franchises the exclusive right to extract rents to a local franchisee. As in [Mathewson and Winter \(1985\)](#), part of the problem is that the central monopolist has imperfect information concerning the potential to extract rents from a local market.

3.1 An historical example

We use an historical example to draw out the characteristics of the institutions used by dictatorships to extract rents from an economy. The example relates the mix of institutions used in China to collect customs duties during the 19th century, a period of considerable change in Chinese international trade. After the Opium War and the Taiping rebellion, there occurred a remarkable shift in how customs duties were collected ([Wright 1936, 1950](#)). In short, prior to the shift, the institutions used to extract rent resulted in high levels of corruption. After the shift, the new institutional framework extracted rents from the trade sector without inducing high levels of corruption. While admittedly running roughshod over a rich history, we'll label these as "Pre Taiping Customs Collection" (prior to 1854) and the "Post Taiping Customs Collection" (after 1854).

3.1.1 *Pre taiping customs collection*

Prior to the Opium Wars, all foreign trade came through the port at Canton, and foreign merchants were obliged to trade through a cartel of Chinese merchants. Tariffs, port fees, and inspections for contraband were under the jurisdiction of the Canton Chinese Customs House. We cannot improve on [Wright's \(1936, p. 6\)](#) description:

"At that time Chinese Custom House officials, from the highest to the lowest, procured their posts by purchase, and as the official pay attached to these posts was invariably a mere pittance utterly inadequate to cover the receiver's living expenses even on the most modest scale, and as the holders of these posts were liable to quick and sudden dispossession on the change of a chief, it is not to be wondered at that Customs officials followed the long-established practice of making what they could at the expense of revenue, or the merchants, or of both. It was a system similar in its main characteristics to what has been tried by other great nations, Persia, Egypt, Greece, Rome, and by not a few of more recent date".

According to Wright the central Qing government in Beijing had little knowledge of the ever changing trade environment in the ports of Southern China. For example, while the central government's trade regulations specified a tariff rate per "chest", the size of a chest would vary by country of origin and the currency used to pay duties varied. Official published port fees were levied according to ship length, but new ships arrived with varying widths. And negotiations would be carried out through "linguists" of untested skill and honesty. Bargaining over fees and tariffs as well as smuggling were the order of the day.

Under this system the Canton customs collector agreed to remit a fixed sum of tariff duties to Beijing and kept any excess as his own profit. The incentive structure was such that the customs collector kept 100% of any rents extracted over and above the sum that was initially paid for the agency. The customs collector was not bound by published tariff rates or restrictions of trade in contraband. The institutions used to regulate trade in Canton “turned out in fact to be a rich private booty for the court and for one group of officials after another”.²

3.1.2 *Post taiping customs collection (1854–1939)*

In an interesting twist of history, the Taiping rebellion set up the conditions under which the existing custom collection institutions would change dramatically. The Taiping rebels succeeded in taking Shanghai and sacked the Shanghai Customs House. After the Chinese customs officials fled the city, the British proclaimed neutrality, and their resident British Counsel became the de facto supervisor of Chinese Customs. The British Counsel wrote a memo suggesting that customs rates be set and be the same for all importers. He also suggested that there should be a chief foreign customs collector responsible for customs collection. Notably the memo detailed a compensation schedule for the foreign customs official and his staff at pay levels high enough to insure honest behavior. The memo also noted that evidence of dishonest behavior would lead to instant dismissal (Fairbank 1964). Remarkably, foreign and Chinese trade regulators subsequently adopted this arrangement. Under the new system, a well paid staff of bureaucrats appointed from the civil services of Great Britain and other foreign countries collected customs and remitted customs revenue to the Peking government. This system remained in place until after the fall of the Qing dictatorship in 1911.

3.2 Dictator institutional menu

We model the dictator having the choice between two institutions to extract rent. First, we have a franchise bidding framework like the set up used in the “pre Taiping” arrangement. In the “pre Taiping” arrangement, the exclusive monopoly right to collect rents was granted to a local agent who paid a franchise fee to the central government and then kept all collections as personal profit. This arrangement is associated with high levels of discretionary behavior by the local agent, and this discretionary behavior that can be characterized as corrupt. The alternative is the salaried civil certain arrangement like the one used during the “post Taiping” period where well-paid civil servants were employed to collect rents according to a strict schedule of regulations with all collections submitted to the central government. The “post Taiping” arrangement features strong incentives for local agents to work according to rules, so as not to risk being dismissed from secure and lucrative employment as well as civil service pensions. This arrangement was associated with low levels of corrupt behavior.

² Fairbank (1964, p. 50).

3.3 Assumptions of the model

3.3.1 Information asymmetry

The local agent is assumed to have more information on the potential rents in a district than the central dictatorship. Consider a state with N districts from which rents can be extracted over time, where r_{it} , ($i = 1, \dots, N$; $t = 1, \dots, t^*$) is the extractable rent in district i for period t . Rents are assumed to vary across districts and over time such that:

$$\begin{aligned} r_{it} &= r + x \text{ with probability } \beta \\ r_{it} &= r - x \text{ with probability } (1 - \beta). \end{aligned}$$

We assume that each period the local agent learns r_{it} with certainty but that the central government only knows the expected rents per district: $E(r_{it}) = (r + x(2\beta - 1))$. We assume that $r > x$ so that the range of district rents is strictly positive. We also assume that rents for any district in any period t are independent of rents for that district in other periods. At the beginning of each period, the local agent discovers r_{it} while the central monopolist only knows r , x and β . The monopolist's time horizon (t^*) is assumed to be known by all with certainty. Lastly, throughout the model, the central monopolist and the local agents are all assumed to be risk neutral, expected income maximizers.

3.4 Wage regime

Under this institutional arrangement, the central government hires local agents for a wage rate at or above market wages to collect rents in each district as set forth in a transparent set of laws enforced by the dictator's militia.³ We restrict our analysis to a wage schedule set such that all agents choose to collect potential rents for the central government. The dictator's problem is to find the lowest wage level such that all employees will submit 100% of the district rents. In this model, the wage level that deters malfeasance by employees in the high rent districts will deter malfeasance in all districts.

In each period the agent is paid a wage premium ($w_t \geq 0$) for an expected t^* years, where t^* is the expected duration of the dictatorship. The wage premium is 0 if the agent is compensated at prevailing market wages. Agents who expropriate district rents for themselves in any period are detected and punished with probability α :

Prob(detected and punished) = 0 if agent submits $(r + x)$

Prob(detected and punished) = α ($0 < \alpha < 1$) if agent submits $(r - x)$ and $r_{it} = r + x$

Prob(detected and punished) = 1 if agent submits rents $r_{it} < (r - x)$

³ Besley and McLaren (1993) build a related model where the decision maker has the choice to use an efficiency wage structure to collect taxes, which deters bribery. Their alternative wage structure offers below reservation wages to public sector employees with the expectation that tax collection will be lower and bribery income for employees will be higher. They conclude (page 137), "Overall, the results suggest that the efficiency wage strategy may not be a good idea...the government may be better off paying a low wage at which no one behaves honestly".

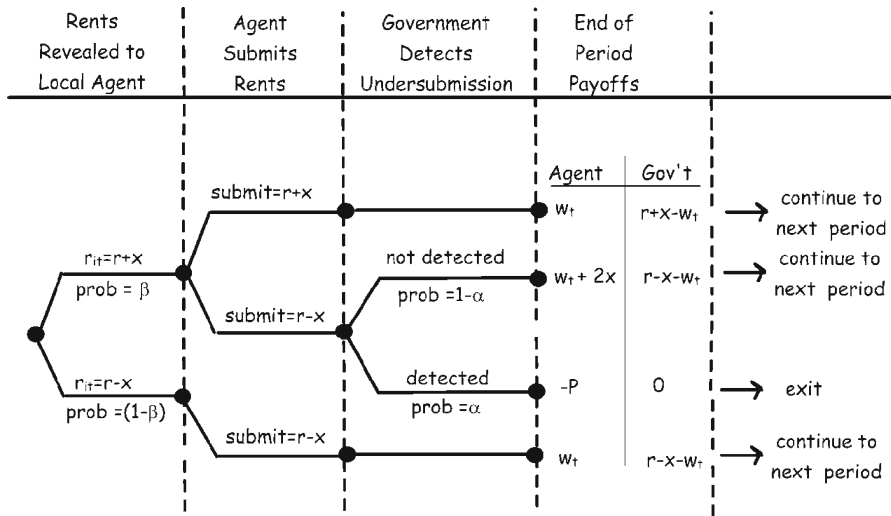


Fig. 1 One period schema for the wage regime

If detected submitting less than all district rents, the local agent does not receive the wage for that period, is penalized P , and is discharged from the position. We assume that local agents treat α and P to be independent of their individual decisions.

Figure 1 presents the timing of the events during one period of the wage contract. At the beginning of any period, the local agent learns the district rents for that period. If the district has low rents for this period, ($r_{it} = r - x$ with probability $(1 - \beta)$), the agent will submit all rents to the central government. If the district has high rents ($r_{it} = r + x$ with probability β), the agent chooses to submit either full rents ($r + x$) or partial rents ($r - x$). If the agent submits partial rents, then government auditing will detect the under-submission with probability α . If undetected, the agent keeps the unsubmitted rents ($2x$), receives the period t wage, and continues to be employed into the next period. When they are detected submitting less than full rents, agents lose the rents, receive no wage, pay a penalty P , and are dismissed from the job. P is the monetary equivalent of the punishment meted out for detected employee malfeasance and would take a high value in a country where stiff penalties are assigned for minor crimes. A dictatorship may, in practice, simultaneously select an optimal combination of w_t and P . However, we assume that P is exogenously determined by country cultural and historical characteristics.

To determine the wage structure that deters under-submission of rents over the life of the contract, we first analyze the wage that deters under-submission by agents in the high rent districts in the last period (w_t^*). The payoffs for the last period are the same as those shown in Fig. 1 except that the agent does not consider the present value of keeping her job into future periods. In the last period the lowest wage that will induce full rent submission by all agents is given by (1).

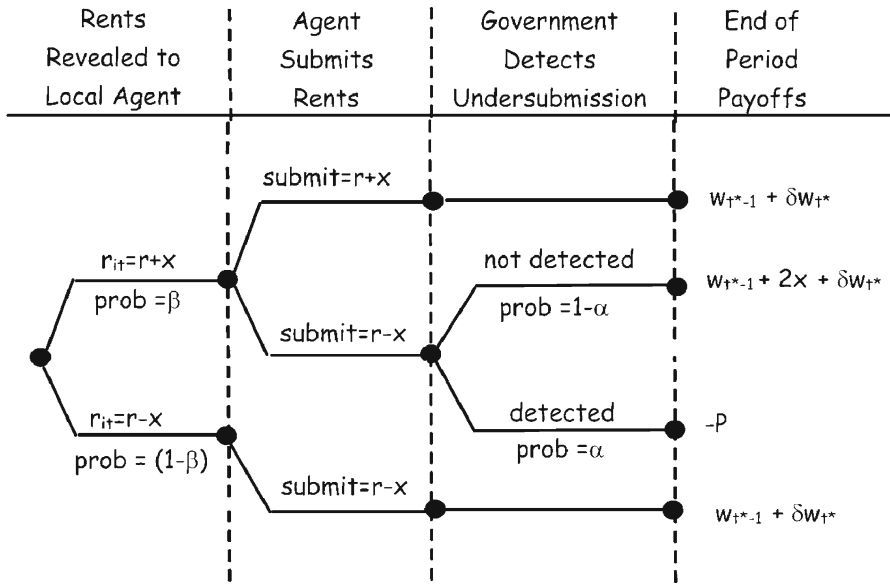


Fig. 2 Next to last period for the wage regime

$$\begin{aligned}
 \text{Submit } (r + x) \text{ if } w_{t^*} &\geq \operatorname{argmax} \begin{cases} 0 \\ (1 - \alpha)(w_{t^*} + 2x) - \alpha P \end{cases} \\
 w_{t^*} &\geq \operatorname{argmax} \begin{cases} 0 \\ ((1 - \alpha)/\alpha)2x - P \end{cases}
 \end{aligned} \tag{1}$$

Figure 2 shows the next to last period ($t^* - 1$) wage problem. The next to last period wage (w_{t^*-1}) that guarantees full rent submission from the higher rent districts is the lowest wage satisfying (2). The one period discount factor is δ , and so the present value of continuing into the next period as an agent is δw_{t^*} .

$$\begin{aligned}
 \text{Submit } (r + x) \text{ if } w_{t^*-1} &\geq \operatorname{argmax} \begin{cases} 0 \\ (1 - \alpha)(w_{t^*-1} + \delta w_{t^*} + 2x) - \alpha P - \delta w_{t^*} \end{cases} \\
 w_{t^*-1} &\geq \operatorname{argmax} \begin{cases} 0 \\ (((1 - \alpha)/\alpha)2x) - P - \delta w_{t^*} \end{cases}
 \end{aligned} \tag{2}$$

Substituting for w_{t^*} from (1),

$$w_{t^*-1} \geq \operatorname{argmax} \begin{cases} 0 \\ (1 - \delta)w_{t^*} \end{cases} \tag{3}$$

Turning to the second to last period the condition for all agents to submit full rents is (4).

$$w_{t^*-2} + \delta w_{t^*-1} + \delta^2 w_{t^*} \geq \operatorname{argmax} \begin{cases} 0 \\ (1 - \alpha)(w_{t^*-2} + \delta w_{t^*-1} + \delta^2 w_{t^*} + 2x) - \alpha P \end{cases} \tag{4}$$

Substituting from (3) and rearranging terms leads to (5).

$$w_{t-2} \geq \operatorname{argmax} \begin{cases} 0 \\ (1 - \delta)w_{t^*} \end{cases} \tag{5}$$

Working back through time, for all periods except the last period, the wage that deters under submission of rents in all periods is (6).

$$w_t \geq \operatorname{argmax} \begin{cases} 0 \\ (1 - \delta)w_{t^*} \end{cases} \quad t = 1 \dots (t^* - 1). \tag{6}$$

In (6), it is interesting to note that the wage premium required to induce all local agents to submit full rents will equal zero if w_{t^*} is zero. And from (1), the malfeasance deterring wage premium in the last period will be zero if $\alpha P/2(1 - \alpha) \geq x$. So, in this model it is possible that all agent malfeasance can be deterred even without paying agents a wage premium if the country has some combination of (1) strict penalties, (2) high probabilities of detection, and (3) low between district variability. Otherwise, the wage premium will be low, positive, and constant until the relatively large last period wage premium.

3.5 Dictator participation constraint

The last period presents a sticky problem. As discussed above, when the wage premium is positive, the last period wage is significantly higher than previous periods. To insure that government workers rationally expect the dictator to pay the last period wage, the last period expected rents, net of wages, must be non negative. If not, the dictator will sack all agents after period $t^* - 1$, and knowledge of this will change agent behavior in earlier periods and the wage contract will not attract any workers.⁴ Since expected rent collection is $E(r_{it}) = (r + x(2\beta - 1))$, and using the last period wage from (1), then the dictator participation constraint is (7).

$$\begin{aligned} E(r_{it}) &\geq w_{t^*} \\ r + x(2\beta - 1) &\geq \left(\frac{1 - \alpha}{\alpha}\right) 2x - P \\ x &\leq \left(\frac{\alpha}{2(1 - \alpha) - \alpha(2\beta - 1)}\right) (r + P) \end{aligned} \tag{7}$$

The intuition is behind (7) straightforward. The incentive for last period opportunism by the dictator is lower when the last period wage is lower (high P , high α) and the last period expected rents are higher (high β). The effect of district variability on the dictator’s incentive for last period opportunism depends on β and α .

⁴ There are other ways to adapt the model to treat this kind of last period problem. Dictators could chose some institutional arrangement that would credibly tie their hands to prevent opportunistic last period behavior on their part and guarantee the payment of last period wages even if wages exceed expected rents. Elsewhere in the literature, this type of result has been termed “the irony of monarchy”.

For $\beta < 0.5 + (1 - \alpha)/\alpha$, increases in x decrease expected rents and increase last period wages thus decreasing the incentives for the dictator to pay the last period wage. For values of $\beta > 0.5 + (1 - \alpha)/\alpha$, increases in variability increase the dictator's last period income net of wages.

For the wage regime the expected present value of government rent collections, net of wages, is V_w in (8).

$$\begin{aligned}
 V_w &= N \sum_{t=0}^{t=t^*} \delta^t (r + x(2\beta - 1)) - N \sum_{t=0}^{t=t^*} \delta^t w_t \\
 V_w &= N \sum_{t=0}^{t=t^*} \delta^t (r + x(2\beta - 1)) - N \left[\sum_{t=0}^{t=t^*-1} \delta^t w_t \right] - N \delta^{t^*} w_{t^*}
 \end{aligned}
 \tag{8}$$

Substituting for w_t from (6),

$$\begin{aligned}
 V_w &= N \sum_{t=0}^{t=t^*} \delta^t (r + x(2\beta - 1)) - N \left[\sum_{t=0}^{t=t^*-1} \delta^t (1 - \delta) w_{t^*} \right] + N \delta^{t^*} w_{t^*} \\
 V_w &= N \sum_{t=0}^{t=t^*} \delta^t (r + x(2\beta - 1)) - N w_{t^*} \left[\sum_{t=0}^{t=t^*-1} \delta^t (1 - \delta) + \delta^{t^*} \right] \\
 V_w &= \left[N \sum_{t=0}^{t=t^*} \delta^t (r + x(2\beta - 1)) \right] - N w_{t^*} = \left[N \sum_{t=0}^{t=t^*} \delta^t (r + x(2\beta - 1)) \right] \\
 &\quad - N \left(2x \left(\frac{1 - \alpha}{\alpha} \right) - P \right)
 \end{aligned}
 \tag{9}$$

In (9) it is interesting to note that the present value of total wage payments (per district over time) are equal to the last period wage (w_{t^*}), and are independent of t^* and the discount factor, δ . Dictator income under the wage regime is higher in a background with stiffer penalties (high P) and higher probability of detection (high α). The effect of higher variability on dictator income under the wage regime depends on β . If $\beta \leq 0.5$, then increases in x unambiguously lower V_w . But for relatively high values of β increases in x increase expected rents more than enough to cover the increase in wages.

3.6 Franchising regime

Under the franchising regime the central government grants the franchise for each district to the bidder submitting the highest bribe or tribute for the exclusive right to collect and keep district rents. Rent collection costs per district are c with $c < (r - x)$. For this model, the collection costs for franchisees include the costs of privately provided enforcement mechanisms. In each period, local agents learn the district rents,

submit their offers of bribes to the central government, and, with competitive bidding, the local agent winning the right to collect rents submits a bribe, B_i . For districts with high rents, $B_{hi} = r + x - c$, and for low rent districts the winning bribe is $B_{lo} = r - x - c$. The present value of expected government revenue from bribes is V_B in (10).

$$V_B = N \sum_{t=0}^{t=t^*} \delta^t (r + x(2\beta - 1)) - Nc \sum_{t=0}^{t=t^*} \delta^t \tag{10}$$

Note that in (10) government revenue under the franchising regime is independent of the penalty for malfeasance (P). Nor does it depend on the probability that the central government can detect malfeasance (α).

3.7 Dictator choice

Given the choice between the rent extraction regimes described above, if the dictator participation constraint is not binding, the dictator chooses the regime capable of extracting higher net rents. If the participation constraint is binding, the dictator will use the franchising regime. Using (1), (9), and (10) leads us to (11).

$$V_B > V_w \rightarrow c \sum_{t=0}^{t=t^*} \delta^t < w_{t^*} = \operatorname{argmax} \left\{ \begin{array}{l} 0 \\ \frac{(1-\alpha)}{\alpha} 2x - P \end{array} \right. \tag{11}$$

For convenience, label $c \sum_{t=0}^{t=t^*} \delta^t = C_{pv}$ as the present value of rent collection costs under the bidding regime. The present value of rent collection costs per district under the wage regime is w_{t^*} . For cases where the participation constraint is not binding the dictator’s decision reduces to a comparison of the rent collection costs under each of the regimes, and the dictator selects the least cost mechanism. If the participation constraint is binding the franchise bidding regime is the only alternative. These results are explored in x -alpha space in Fig. 3. In Fig. 3 we present the most interesting case where it is possible that the wage contract generates higher net income for the dictator, but fails to form due to a violation of the last period participation constraint. This will be the case where $\beta > \beta^* = 0.5 + (1-\alpha)/\alpha - 2(1-\alpha)((r+P)/(C_{pv}+P))$. In this case three outcomes are possible. For low values of x and relatively high values of α and P the wage contract generates higher profits than the franchise regime and the dictator participation constraint is satisfied. This is the darkly shade region of Fig. 3. For settings with relatively high values of x , and low values of α and P , the franchise bidding regime has lower rent collection costs. In Fig. 3 this is the unshaded region. However, for intermediate values of x , α and P (the lightly shaded region in Fig. 3) the wage contract can generate higher dictator income, have lower collection costs, but fail to form because the participation constraint is not satisfied, and so the dictator uses the franchise bidding regime. In the literature this result is noted as the “irony of absolutism” where the absolute power of the dictator implies that the dictator has the power to renege on any contract, and this power in turn limits the types of contracts that

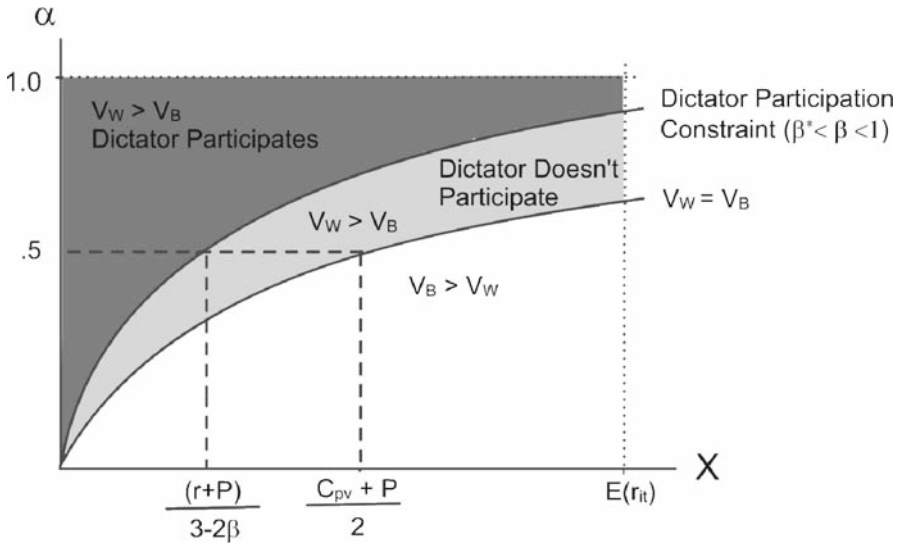


Fig. 3 Wage and franchising regimes; dictator choice

can be used (Wintrobe 1998). In our example there is a time inconsistency problem where the dictator, precisely because she makes and enforces all rules, cannot credibly commit herself to pay the high wages specified in the last period of the wage contract. In this case, the wage contract cannot form even though it is the least cost mechanism.

In (11) the regime choice will depend on the exogenous country characteristics x , t^* , P , δ , and α . An increase in country variability (x), a decrease in malfeasance detection (α), and lower penalties (P) all lead to increased costs for the wage regime, but not for the bidding regime. An increase in the expected time horizon (t^*) or the discount factor (δ) increases the costs of the bidding regime, but not the wage regime. In a nutshell, the result suggests that the bidding regime is more likely to be observed in countries with high variability, low public policing capabilities, ruled by dictators with short time horizons and low discount factors.

4 Empirical strategy

The empirical strategy assumes that the bidding regime will be associated with agent behavior that is observed to be corrupt as this is defined by the organizations that measure this type of behavior. What we have in mind is our previous example of the pre Taiping customs collections. Under the pre Taiping arrangement, exclusive customs collection rights were granted to local agents who submitted bribes to the Qing court. These agents then proceeded to collect customs without reference to published tariffs rates, permitted illegal imports (for a fee), and their behavior was characterized as corrupt by Western observers. We maintain that the outside observer would associate bidding arrangements like this with higher levels of corruption and that the wage regime would resemble the post Taiping arrangement under which well paid

foreign civil servants collected customs according to published schedules and corrupt behavior was noticeably reduced.

4.1 Identification of dictatorships

To test the model, we first need to devise an empirical method for labeling countries as “dictatorship” or “not dictatorship”. Our concern is that the results of any empirical test of our model will be sensitive to the criteria used to define and select countries into our sample of “dictatorships”. Since the resulting sample may be sensitive to the criteria used to define “dictatorship”, we explore several alternative empirical measures.

It is common in the empirical literature to use indices developed by Freedom House as a measure of the degree to which a country is democratic. Freedom House publishes annual country indices for “political freedom” and “civil liberties”. Countries deemed to have the highest level of political freedom are assigned a political freedom score of 1. Those with the least political freedom are scored at 7. The same procedure is used to measure civil liberties. While the two measures are highly correlated ($r = +0.69$), some countries score better on civil liberties than on political freedom (e.g. Tonga) while others score better on Political Freedom than on Civil Liberties (e.g. Venezuela). We use the 2002 Freedom House indices of political freedom and civil liberties that are available for 185 countries.

We also consider the two indices of democracy included in the Database on Political Institutions, DPI (Beck et al. 2001), the Legislative and Executive Indices of Electoral Competitiveness (the LIEC and the EIEC). Each of these indices ranges from 1 to 7 (most competitive). One researcher noted that whereas the Freedom House indices reflect the effects of democracy (political freedom and civil liberties), the DPI indices measured the strength of democratic processes (Beck et al. 2001). The Freedom House indices are available for 185 countries and the two DPI indices are available for 172 countries. The four indices are closely correlated.

To define which countries will be labeled as “dictatorships” and included in our sample, we used cluster analysis with different combinations of the 4 indices described above. While we generated estimates for three different samples, the results did not differ in any interesting way from sample to sample. And so we only report the results for the sample where countries were defined as dictatorships by the cluster of the two Freedom House indices since this includes more countries.

4.2 Corruption indices

In surveying the available data measuring corruption, the extent of country coverage for alternative measurements varied considerably. The Transparency International (TI) corruption index was available for 102 countries while another measure of corruption, Kaufman et al. (2003), covered 160 countries. While both seem to measure a similar phenomenon (simple correlation coefficient of +0.97), the choice introduces sample selectivity problems. The TI data includes a measure of corruption for Malta, but not for Cuba or North Korea. Since all the empirical work on corruption uses variable measurements with incomplete country coverage, the resulting estimation is done for

a sample that is selected, by default, as the sample that includes countries for which data is available for all variables. The resulting sample size typically is less than 100 countries (from a population of more than 200 countries), and the sample has not been selected randomly. Knack and Azfar (2000) present evidence that the various measures of corruption come with inherent sample selectivity problems. For example, some studies report statistically significant links between country size and corruption. Knack and Azfar note that corruption measures are broadly available for larger economies, but they are often not available for those small economies with little activity by foreign businesses. And the sample of small economies will be biased toward inclusion of those small economies that attract foreign investment and thus are likely to have lower corruption. They conclude “it is preferable, other things equal, to choose, among existing data sets, those with greater cross country coverage”.⁵ Following this suggestion, in choosing among the available measures for the variables of our model, we have leaned toward using the measurement with the broadest coverage.

Following Knack and Azfar, this paper uses the corruption index developed by Kaufman et al. (2003). It uses an unobserved components model to form a corruption index based on 14 different sources. A high score of *Corruption* indicates low levels of corruption (high levels of institutional quality). It is normalized to have a mean of 0 and ranges from -1.47 (Afghanistan) to $+2.25$ (Finland).

4.3 Other variables

To measure dictator time horizon we use two variables from the Database on Political Institutions: years in office for the chief executive, and years in office for the party. Each of these variables, by themselves, is flawed. For example, the years in office for the chief executive in the PRC is only 4 years but this doesn't reflect the communist party's long tenure. And the variable years in office for the party of the chief executive misses countries where the chief executive (monarchs, religious and military leaders) is not associated with a party. We measure *tenure* as the maximum of (years in office for the chief executive, years in office for the party).

Measurement of country ethnic variability has frequently been used in the new economic growth literature and the literature on civil disturbance. Alternative indices of “ethnic fractionalization” examine religious and linguistic diversity. In large part, these measures cover the same countries and are highly correlated. Ethnic fractionalization ranges from 0.01 (virtually homogenous ethnicity in Portugal) to 0.88 (highly fractionalized in South Africa). According to this measure small European countries not having much history with immigration tend to have a low value of *ethnic* while countries emerging from a colonial history have higher values. We use the variable *ethnic* as calculated by Krain (1997).

We use the variation in altitude in a country, *range*, as an alternative proxy for country heterogeneity. We calculate *range* as the difference between the country's highest and lowest elevations. China, Nepal, and Pakistan have the highest values for *range*,

⁵ Knack and Azfar (2000, p. 19).

while the lowest values for *range* largely appear for small island countries. *Range* is available for 201 countries.

The severity of penalties in a country is proxied by the categorical variable, *death*, taking a value of 1.0 if the country had a death penalty and 0.0 if it did not have a death penalty according to the UN report on Crime Prevention and Criminal Justice in 2000. Alternatively, we use a proxy for the severity of penalties, *execution rate*, as the average annual number (1994–1998) of death penalty executions per 1 million population.

In the model above, dictators ruling countries with a higher probability of malfeasance detection would find the wage contract more attractive. It is argued that agents' perception of the degree to which laws are enforced is related to the origin of the country's legal system. See LaPorta et al. (1998). Following this literature, we use the variable *British* to identify countries with a legal origin based on British common law. The model in this paper generates the hypothesis that dictatorships in countries with lower discount factors will use the bidding regime and have higher levels of corruption. Following Svensson (2000), we use the natural log of gross national income per capital (*lngni*), PPP adjusted, for 2002 as reported in the World Bank's world development indicators. In some specifications we use the additional exogenous variables *latitude*, *population*, and *press freedom*.

Table 1 shows the summary statistics for the two groups of countries as identified by as dictatorship or non dictatorship. From these data there are a few interesting things to note. Corruption, on average, is significantly higher in dictatorships. Dictatorships are also more likely to use the death penalty and restrict press freedom. For other measures of country characteristics, the mean values are not significantly different in dictatorships than in non dictatorships.

5 Empirical results

We have organized our empirical inquiry into three sections. The first section reports the estimates for ordinary least squares regressions of the basic model using our sample of dictatorships and allowing for alternative measures of the explanatory variables. Still using the dictatorship sample, in the second section we report the estimates for two stage least squares estimation of the model when the tenure of the dictators is allowed to be endogenous. And in the third section we compare estimates of the model for the samples of dictatorships, non dictatorships, and the pooled sample.

5.1 Ordinary least squares estimates for corruption in dictatorships

Table 2 presents the OLS results for the basic model using alternative measures for the explanatory variables. Column (1) reports estimates that are representative for this sample. The variable *range* is available for most countries and serves as our proxy for country heterogeneity. According to these estimates and our interpretation, dictatorships governing more heterogeneous countries will be more corrupt. The literature often proxies country heterogeneity with ethnic fractionalization and

the estimates for a model using this proxy are reported in column (2). While these estimates are also negative, the effect is not statistically significant, and the sample size is smaller.

We used two alternative proxies for the severity of punishment; the death penalty (*death*) and the death penalty execution rate (*execution rate*). In the estimates reported in Table 2, dictatorships having and using the death penalty have lower corruption levels, and the estimates are statistically significant when the execution rate is used as the proxy. Measures of income levels are included in empirical models for corruption as instruments for country specific characteristics. In our interpretation, income level proxies for the discount factor. We find that dictatorships with higher incomes have significantly lower levels of corruption and this result is robust across specifications. In our model dictatorships a higher probability that corrupt behavior is detected and punished will lead to lower levels of corruption. We used two different proxies for this probability: *British* and *press freedom*). For our sample of dictatorships neither of these proxies have estimated coefficients that are statistically significant.

From our model of corruption, dictatorships with longer expected tenure have lower corruption levels. We used three different measures of dictatorship tenure; years in office for the chief executive, years in office for the party, and the maximum of (years in office for the chief, years in office for the party). In Table 2, we only report the estimates for the third proxy. Regardless of the tenure measure used, the estimates for the tenure coefficient were small and statistically insignificant.

5.2 Estimates for corruption in dictatorships with endogenous dictatorship tenure

It is reasonable to argue that the tenure of a dictatorship is a function of the level of corruption, and that the empirical model should allow for the endogeneity of *tenure*. On one hand the deleterious effects of corruption may lead to greater opposition and shorter tenure for dictatorships. On the other hand the effective extraction and distribution of the gains from corruption could solidify support and lead to longer tenure for the dictatorship. To allow and test for the endogeneity of dictatorship tenure, we experimented with several instruments that are both exogenous and correlated with dictatorship tenure. In Table 3, we report the estimates using *population*, *latitude*, and *press freedom* as exogenous variables in the tenure equation where *tenure* is specified to be a function of the corruption level. In columns 1a, 1b, 2a, and 2b we report the two stage least squares estimates for the two equation system. Using a Hausman test, we find no evidence that the 2SLS estimates for the corruption equation are significantly different than the OLS results reported in column (1) of Table 2. The estimated coefficients for *range*, *execution rate*, and *lngni* are close to those reported in Table 2 and the estimate for the *tenure* coefficient remains small and statistically insignificant.

In the 2SLS estimates income levels are significant. So according to these estimates dictatorships ruling countries with higher incomes will have longer tenure and the country will have lower levels of corruption. However, the lower levels of

corruption do not have a significant effect on dictatorship tenure, and longer tenure does not have a significant effect on corruption levels.

5.3 Estimates for corruption in a sample of non dictatorship and in a pooled sample

In Table 4, we present estimates of our model for a sample of non dictatorships and for a pooled sample. We use the OLS estimates as our benchmark for the model in a sample of dictatorships. In Table 4, we show estimates of the benchmark model for three samples: dictatorships (from Table 1, column 1), non dictatorships, and the pooled sample.

There are significant differences when the model is estimated for a sample of non dictatorships as reported in columns (2) and (3) in Table 4. For example the effect of income level (*lngni*) on corruption is four times larger in the sample of non dictatorships than it is in the sample of dictatorships. The *death penalty* and *execution rate* were estimated to have a significant effect on *corruption* in dictatorships. This effect was not found in the sample of non dictatorships. The estimated parameter for *range* was also significantly different for the two samples. Using an *F* test we can reject the hypothesis that the estimates for model based on these two samples are the same. The results indicate that distinctly different processes are generating corruption levels in dictatorships and non dictatorships. The model developed in this paper was built on the assumption that a dictator set the rules to maximize dictatorship income. The empirical results were generally consistent with this model when the sample is restricted to dictatorships, but are not when the sample is restricted to non dictatorships.

In the literature, results are often based on a pooled sample using a model with an indicator variable for democracy or dictatorship. In Table 4 (columns (4), (5), and (6)) we present estimates for a model including an indicator variable for dictatorships using a pooled sample to provide some idea of the estimates using this approach with our data. In columns (5) and (6) we report statistically significant estimates for the coefficients of *ethnic* and *British* similar to what is often reported in the literature. These results were not significant when the sample was restricted to dictatorships. The parameter estimates for the *death penalty* and *execution rate* were a mix of the positive effect found for dictatorships and the negative (insignificant) effect found for non dictatorships. One result is robust across samples; there is no evidence that political tenure has a significant effect on corruption.

6 Concluding remarks

In our model, a dictator collects rents from districts in her domain. Her problem is that district rents vary and she cannot precisely observe whether or not the district rent collector is submitting all of the rents to her. The dictator chooses between two institutional mechanisms for getting these rents collected. One arrangement resembles an efficiency wage contract where local agents are paid wages by the dictator to collect rents. The other arrangement resembles monopoly franchising where the local agent submitting the largest bribe to the dictator is granted the exclusive franchise to collect

district rents. We maintain that the franchising arrangement leads to agent behavior that is observationally equivalent to corrupt behavior since the government positions are awarded according to bribes and local agents are not bound by a rule of law when they collect rents.

Our model of the wage contract differs in some ways from other models. In our model, we arrive at the intuitive result that in homogeneous countries with strict monitoring and high punishment levels, corrupt behavior can be deterred without offering above market wages. We also derive conditions where efficiency wage structures cannot be used due to a time inconsistency problem. The optimal efficiency wage time profile can include a large last period payment like a pension, and the dictator has the power to renege on this payment, the wage contract will fail to form, and the dictator will collect rents using the franchising arrangement. This is an example of the “irony of absolutism” and may be part of the explanation for the high levels of corruption that persist under some dictatorships. This model also provides foundation for the hypotheses that dictator tenure and country characteristics will affect the choice of institutions and the resulting level of corruption. In this model dictatorships with longer expected tenure ruling more homogeneous countries with severe punishment levels will chose the wage contract and have lower levels of corruption.

Empirically the paper makes several innovations. In the literature country heterogeneity is commonly proxied by some measure of ethnic fractionalization or the Gini coefficient. These measures are not widely available for countries ruled by dictators and can introduce a bias to the estimates. Instead we introduce the proxy *range* equal to the difference between the highest and lowest elevations. *Range* has the advantage of being easily understood and is available for virtually all countries. Empirically, we find that dictatorships with higher *range* have higher levels of corruption. We also introduce proxies for punishment levels. One result of our model, and most crime models, is that the level of punishment will affect the level of criminal behavior. However this has not been sufficiently explored in the corruption literature. We introduce the death penalty *execution rate* as a proxy for country punishment level and find that for dictatorships, corruption is lower in countries with higher execution rates.

One result from our model is that dictatorships with longer expected tenure will be associated with lower levels of corruption. Since the empirical literature has not focused on this effect, we explored several alternative measurements for dictatorship tenure. One of the more robust results of our empirical work is that regardless of how tenure was measured and regardless of the model specification, the estimated effect was always close to zero and statistically insignificant. These estimates did not change noticeably when tenure was allowed to be endogenous. This is an unexpected, puzzling and intriguing result that merits more attention.

Appendix

See Tables 1, 2, 3, and 4.

Table 1 Descriptive statistics for dictatorships and non dictatorships

Variable	N	Mean	SD	Min	Max	Correlation with corruption
Dictatorships						
Corruption	69	-0.51	0.62	-1.47	2.14	1.00
Range	69	3.18	2.11	0.05	9.00	-0.35
Ethnic fractional	52	0.49	0.26	0.04	0.86	-0.25
Execution rate	69	0.80	2.51	0	14.92	0.26
Death penalty	69	0.59	0.49	0	1	0.09
ln(gni)	62	7.78	1.24	5.35	10.55	0.43
Tenure	67	12.63	12.33	1	51	0.13
British	69	0.25	0.43	0	1	0.09
Population	67	40.71	154.72	0.33	1262.65	-0.01
Latitude	68	21.92	15.33	0.23	55.68	-0.06
Press freedom	68	68.03	12.82	39	96	-0.04
Non dictatorships						
Corruption	83	0.44	0.95	-1.21	2.25	1.00
Range	83	2.75	2.00	0.06	8.78	-0.16
Ethnic fractional	71	0.35	0.28	0.01	0.88	-0.50
Execution rate	83	0.02	0.13	0	1.13	0.03
Death penalty	83	0.22	0.41	0	1	-0.17
ln(gni)	80	8.95	1.19	6.25	10.82	0.78
Tenure	81	7.93	12.33	1	72	-0.07
British	83	0.30	0.46	0	1	0.09
Population	81	38.51	119.96	0.25	1015.92	-0.11
Latitude	76	30.63	17.31	2.06	63.89	0.67
Press freedom	82	26.74	13.57	8	63	-0.70

Corruption is the corruption index for 2002 from Kaufman et al. (2003). High scores for *corruption* correspond to countries with low levels of corruption. *Range* is the altitude variation calculated as the difference between the country's highest and lowest elevations as reported in the CIA World Fact Book. *Ethnic Fractionalization* data are from Krain (1997). *Execution Rate* is the average annual number of death penalty executions per million population for the years 1994–1998 from the UN (2000), Crime Prevention and Criminal Justice. *Death Penalty* is equal to 0 if the country did not have a death penalty in 1999 and equal to 1 if the country had a death according to the UN Report on Crime Prevention and Criminal Justice (2000). *Lngni* is the natural log of gross national income per capita for 2000 from the World Bank WDI dataset. *Tenure* is measured as a combination of two variables from the Data Base on Political Institutions, World Bank (2006). *Tenure* is the maximum of (years in office for the chief executive, years in office for the party of the chief executive). The chief executive will be in office longer than the party in cases where the chief executive is not a party member (e.g. monarchs, generals). *British* is an indicator variable equal to 1 if the country has a British legal origin and 0 if not. *British* is from the Global Development Network Data Base, World Bank (2001). *Population* is for 2000 from the World Bank World Development indicators. *Latitude* is the absolute value of the country latitude from the CIA Factbook. *Press Freedom* is the Freedom House index of press freedom for the year 2002. Low scores of *Press Freedom* are assigned to countries judged to have freedom of the press. High scores of *Press Freedom* are assigned to countries judged not to have freedom of the press.

Table 2 Ordinary least squares estimates for dictatorships

	(1)	(2)	(3)	(4)	(5)
Range	-0.085*** (0.030)		-0.108*** (0.034)	-0.086*** (0.031)	-0.085*** (0.031)
Ethnic Fractionalization		-0.276 (0.326)			
Execution Rate	0.122*** (0.035)	0.139*** (0.041)		0.124*** (0.036)	0.120*** (0.035)
Death Penalty			0.210 (0.153)		
British				-0.038 (0.152)	
Press Freedom					0.003 (0.006)
Ln(GNI per capita)	0.161*** (0.056)	0.158** (0.074)	0.202*** (0.060)	0.160*** (0.057)	0.164*** (0.057)
Tenure	0.001 (0.001)	-0.005 (0.006)	0.002 (0.006)	0.001 (0.006)	0.000 (0.001)
R ²	0.43	0.41	0.33	0.43	0.43
Observations	60	46	60	60	60

These are the OLS estimates with corruption as the dependent variable. For this measure of corruption, higher values are assigned to countries with lower levels of corruption. Constants were included in the regressions, but are not reported here. Standard errors are noted below the estimated coefficients in parentheses. *, **, *** correspond to 10, 5, and 1% levels of significance, respectively

Table 3 Estimates for dictatorships in a model with endogenous corruption and government tenure

	(1a) Corruption	(1b) Tenure	(2a) Corruption	(2b) Tenure
Range	-0.095*** (0.032)		-0.094*** (.032)	
Execution rate	0.111*** (0.037)		0.112*** (0.037)	
Ln(GNI per capita)	0.139** (0.060)	4.506** (1.780)	0.142** (0.061)	6.028*** (1.976)
Tenure	0.010 (0.009)		0.009 (0.011)	
Corruption		-0.666 (4.810)		-5.589 (5.393)
Population		0.033*** (0.009)		
Latitude press freedom		-0.330*** (0.104)		-0.375*** (0.114)
				0.375*** (0.127)
R ²	0.40	0.37	0.41	0.27
Observations	60	60	60	60

These are the 2SLS(IV) estimates for a system with Corruption and Tenure as the endogenous variables. For this measure of corruption, higher values are assigned to countries with lower levels of corruption. Estimates are based on a sample of 60 dictatorships having data for all variables in the system. Constants were included in the regressions, but are not reported here. Standard errors are noted below the estimated coefficients. *, **, *** correspond to 10, 5, and 1% levels of significance, respectively

Table 4 Corruption estimates for dictatorships, non dictatorships, and a pooled sample

	Dictatorships (1)	Non Dictatorships (2)	(3)	Pooled sample (4) (5)		(6)
Range	-0.085*** (0.030)	0.028 (0.034)		-0.061** (0.025)		-0.062** (0.025)
Ethnic fraction			-0.163 (0.340)		-0.460* (0.263)	
Execution rate	0.122*** (0.035)	-1.477 (1.914)	-2.108 (1.901)	0.080* (0.042)	0.072 (0.046)	0.066 (0.042)
Ln(GNI per capita)	0.161*** (0.056)	0.626*** (0.060)	0.638*** (0.076)	0.430*** (0.044)	0.419*** (0.057)	0.440*** (0.044)
Tenure	0.001 (0.001)	-0.003 (0.007)	-0.003 (0.007)	-0.005 (0.005)	-0.008 (0.005)	-0.005 (0.005)
Dictatorship				-0.456*** (0.123)	-0.319** (0.143)	-0.424*** (0.123)
British			0.353** (0.157)		0.198 (0.135)	0.214* (0.116)
R ²	0.43	0.63	0.67	0.61	0.61	0.62
Observations	60	79	68	139	114	139

These are the OLS estimates with Corruption as the dependent variable. For this measure of corruption, higher values are assigned to countries with lower levels of corruption. Constants were included in the regressions, but are not reported here. Standard errors are noted below the estimated coefficients. *, **, *** correspond to 10, 5, and 1% levels of significance, respectively

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