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The Corruption of Transition

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Abstract

A political economic framework is used to describe an economy following transition to private ownership. The transition, characterized by massive privatization, is accompanied by a change in the legal system, which is influenced by the elite who may be described as either corrupt or non-corrupt. The ability of the corrupt elite to influence the ruling party may lead to weak legal institutions, which cause underinvestment, corruption, and capturing of lucrative industries by corrupt investors. By introducing heterogeneity among industries, we extend the literature and show that the corrupt investors corrupt the more lucrative industries, and in corrupt economies corrupt investors may separate themselves from the non-corrupt investors. Furthermore, we identified two methods used by the corrupt investors to siphon profit – output stealing and profit stealing – and illustrate that corrupt investors may substitute between the two methods to alleviate the constraints created by stronger institutions. To this end, strengthening the institutions only in one dimension may, at the end of the day, cause output, as well as investment, to decline.

Keywords: Transition economies, reforms, constitutional change, illicit trade, (mass) privatization, ownership structure, investment, corruption

1. Introduction

In the latter part of the 20th century, we witnessed transition from centralized regimes to market regimes (Bulgaria, Poland, and Russia, to name a few). During the transition, economic resources were privatized and market and legal institutions created. The transition, in many cases, was associated with corruption manifested with expropriation of revenues and financial assets from their legal owners, and with the ability to tolerate illicit activities (Naim, 2005). In 1994, for example, a new issue of Komineft stock, one of Russia's largest oil companies, was offered without giving adequate notice to its outside investors. This resulted in the dilution of outside investors' ownership in the company by one-third (see Blasi, Kroumova, & Kruse, 1997, p. 93).

Corruption, however, affects some industries more than others. Corrupt activities are concentrated in lucrative industries such as natural resource industries. It is also more common in less-transparent and shadier industries—i.e., industries where theft can go unnoticed (Naim, 2005). In Moldova, for instance, trade in human organs and guns flourishes and is controlled by local families who abide by no law but their own.

This paper presents a model of transition which strives to characterize some of the underlining forces that cause corruption to infiltrate lucrative, as well as shadier, industries. To this end, we view transition as a process which is characterized by three facets: (1) establishment of market-based rule of law; (2) privatized economy and change in ownership from public to private hands; and (3) the movement of economy to profit-maximizing behavior, where some, but not all, owners divert the firm's profit and output to their own benefit. While the changes in Eastern Europe during the 1990s are obvious examples of transitions to a market regime, the notion of transition presented here also applies to the changes in Africa after the end of the colonial era, as well as some of the reforms in Asia and South America.

To derive a framework that illustrates the consequences of a corrupt transition, assume, as in existing literature, that changes in regime enable the elite to affect laws governing economic outcomes to their advantage, in expectation of future economic benefits (see Hellman, 1998; Roland, 2000; Acemoglu, 2003; Stiglitz &Hoff,

2005; among others). The elite are divided into two groups: the corrupt, who take advantage of a poorly defined and enforced rule of law, and the noncorrupt. We draw from the literature on interest groups and menu auction (e.g., Bernheim & Whinston, 1986; Grossman & Helpman, 1994 and 1995; Dixit, Grossman & Helpman, 1997) to illustrate that political constraints may corrupt the transition to market regime. This distortion can lead to underinvestment (see Brunetti & Weder, 1997; Knack & Keefer, 1997; Mauro, 1995; Lambsdorff, 1999; among others). The intuition developed in the paper can be used to better understand why privatization and restructuring in Poland was delayed by various interest groups (see Roland 2000). A similar story, whereby political struggle mitigated the benefit of privatization, is true also for Hungary (Dervis & Condon, 1994).

In this paper we emphasize the importance of heterogeneity between industries. Assuming heterogeneity with respect to average industries' profitability (i.e., heterogeneity between industries, but not within industries) illustrates that distorting the transition *also* corrupts certain industries; lucrative industries are captured by corrupt investors, i.e., inherently high-profit industries such as natural resource monopolies (supported empirically by Campos, 1999, among others), and criminal business conduct is introduced. (Note 1) Furthermore, corrupt investors may fully control lucrative industries, but will partner with non-corrupt investors in less lucrative industries, exploiting the non corrupt investors in these industries (e.g., by stealing output from the firm and selling it on the black market).

The paper also contributes to the existing literature, which emphasizes profit stealing (allocation and enforcement of property rights), by introducing output stealing. (Note 2) Allowing for an array of unproductive activities illustrates that corrupt investors may substitute between activities to alleviate the constraints created by stronger institutions. To this end, strengthening the institutions only in one dimension may, at the end of the day, cause output, as well as investment, to decline. Furthermore, the monotonic relation between output and the rule of law may not hold if two unproductive activities exist.

This paper, therefore, extends work on connected firms (Note 3) (Roberts, 1990; Kroszner & Stratmann, 1998; Ang & Boyer, 2000; Morck, Stangeland & Yeung, 2000; Fisman, 2001; Johnson & Mitton, 2003; Faccio, 2006; among others), and argues that although corrupt investors may be less productive than the average investor (Faccio, 2006), they are located in the more lucrative industries. Moreover, and different from the literature that investigates the role bribes to the government play in income transfer (Grossman & Helpman, 1994 and 1995; Dixit et al., 1997; Bulte, Damania, & Lopez, 2007; among others), this paper focuses on how corrupting transition is used by corrupt investors to expropriate others, and shows how this process leads to corruption of some industries, but not others.

This paper, therefore, links privatization and corruption. Corrupt investors may use their power to establish a weak state, which will allow them to capture excess profit and revenue down the line. In Russia, for example, massive privatization accelerated selling control in the largest enterprises cheaply to frauds, which transferred their skimming talents to the enterprises they acquired and used their wealth to further corrupt the government and block reforms that threatened to constrain their actions (Black, Kraaman & Tarassova, 2004). Finally, a link between interest rates and the market institutions is also identified—higher interest rates lead to weaker institutions. To this end, Stiglitz and Hoff (2005) showed that a higher interest rate is negatively correlated with the demand for legal reforms.

The economic structure is depicted in section 2, whereas the legal and political institutions are presented in section 3. The timing of the game is given in section 4. In section 5, the equilibrium is characterized via political economic equilibrium. Discussion and concluding remarks are given in section 6. Proofs are relegated to the Appendices.

2. The Economic Structure

Assume an economy producing $J+1$ commodities, where commodity 0 is the numéraire, and the other J commodities, i.e., $y=(y_1,\ldots,y_J)$, are produced by J industries. We represent the behavior of each industry by the behavior of a representative firm, which is assumed to capture the average industry's characteristics and is denoted with subscript j.

Commodity 0 is manufactured from labor alone with constant returns to scale and an input-output coefficient of 1 (e.g., food). Since we assume that the aggregate supply of labor is large enough to ensure a positive supply of this commodity and since the price of commodity 0 is normalized to 1, the wage rate in the competitive equilibrium equals 1.

Although we do not assume heterogeneity within an industry, we do assume heterogeneity between industries.

(Note 4) Specifically, under the market regime, the revenue from producing commodity j depends on the price, p_j, and the quantity, y_j and equals $p_j \cdot y_j$. The cost of production, on the other hand, is $C_j(y_j, X_j)$; where $X_j = \sum_I x_{ij}$, x_{ij} denotes the capital transferred to firm j by investor i for $i \in I$, and where I denotes the set of potential investors, i.e., the owners of capital. Let $\Pi_j = p_j \cdot y_j - C_j(y_j, X_j)$ denote firm j's gross profits (the realization of profits if no output is stolen), and assume it is profitable to produce a strictly positive amount with existing technology. Furthermore, assume $\frac{\partial C_j}{\partial y_j} \geq 0$ and $\frac{\partial^2 C_j}{\partial y_j^2} \geq 0$; the cost function is convex and the marginal cost is upward sloping. In addition, $\frac{\partial C_j}{\partial X_j} \leq 0$, $\frac{\partial^2 C_j}{\partial X^2{}_j} \geq 0$, and $\frac{\partial^2 C_j}{\partial y_j \partial X_j} \leq 0$; namely, investment reduces the cost of production, as well as the marginal cost of production.

The economy is populated by individuals with identical preferences, where the size of the population is normalized to 1. Each individual maximizes utility given by

$$u = q_0 + \sum_{j \in J} u_j\,(q_j),$$

where q_0 is the consumption of commodity 0, and q_j is the consumption of commodity j, produced by firm $j \in J$. The sub-utility function $u_j(.)$ is differentiable, increasing, and strictly concave. Commodity 0 serves as the numéraire with a price of 1.

Given these preferences, an individual spending an amount E will consume $q_j = d_j(p_j)$ of commodity j. The demand function $d_j(p_j)$ is the inverse of $\frac{\partial u_j(q_j)}{\partial q_j}$. A consumer consumes $q_0 = E - \sum_{j \in J} p_j \cdot d_j(p_j) > 0$ of the numéraire commodity. The indirect utility, then, takes the form of

$$W = E + cs(p), \tag{1}$$

where $cs(p) = \sum_{j \in J} u_j\left[d_j(p_j)\right] - \sum_{j \in J} p_j \cdot d_j(p_j)$ is the consumer surplus derived from these commodities. Note that these assumptions imply that q_j equals in equilibrium to the quantity supplied, y_j.

3. Institutions

To quantify the institutional setup, a coefficient that represents the overall performance of the legal system and its ability to support a competitive environment under a market regime is introduced, namely, the rule-of-law coefficient (RLC). This coefficient denoted by $\theta \in [0,1]$ assigns the economy a number between 0 and 1 based on its institutional state; the stronger the government's ability to write and enforce laws protecting investors, the higher the assigned value is. In the game, the RLC is endogenous and is determined by the government and the elite.

The investors in the economy are owners of the firms following privatization, when ownership is identified with residual rights of control of physical assets (e.g., Grossman & Hart, 1986; Hart, 1991). (Note 5)

We also assume investors vary in their behavioral norms (e.g., use of corrupt methods, as opposed to legal methods, of acquiring firms). (Note 6) Specifically, assume two types of investors: (Note 7)

- NCIs, who consume and benefit from the goods in the economy.
- CIs, who also consume and benefit from the goods in the economy and are corrupt; in other words, a CI has the ability to steal from others either because he has the required technology or because of cultural norms (see Naim, 2005).

CIs may exploit other investors by increasing their share of the residual claim on the physical assets. The CIs' ability to dilute other investors' residual claims over the physical assets is a function of the RLC, and it does not affect the firm's profits directly (although it may affect the amount invested in the firm). Let $\alpha_C(\theta)$ denote the CI's residual claim.

In addition, CIs may simply steal directly from the firm (e.g., taking a proportion of the products produced, reselling them, and benefiting from the proceeds independent of any residual claim over the firm's profits—illicit trade). Contrary to the CI's ability to redistribute its residual claim, his ability to steal from the firm reduces the firm's output and is firm specific. Formally, the firm's output decreases by a proportion D_j. A proportion equal to $(1-\tau) \cdot D_j$ of firm j's output is lost, where $\tau \leq 1$. The parameter τ captures the illicit

technology. An iceberg assumption, where part of the output stolen is consumed by the very act of stealing, is used to model the rent-seeking behavior. (Note 8) Henceforth, we refer to D_j as the illicit trade ratio. (Note 9) The CI chooses D_j to maximize income; the illicit trade ratio is endogenously determined in the model.

CIs possess two capacities, namely, the corruption technology's ability to: (i) redistribute the firm's residual claim over its physical assets, and (ii) steal from the firm and corrupt the industry. While the former assumption affects income distribution, the latter affects total income as well. The model, therefore, draws both from the literature on institutions and growth (e.g., North, 1981 and 1990; Alesina &Rodrik, 1994; Acemoglu, Johnson, & Robinson, 2005; Glaeser, La Porta, de Silanes, & Shleifer, 2004) and from the literature on investor rights (e.g., La Porta, de Silanes, Shleifer & Vishny, 1998, 1999, and 2000; Glaeser, Johnson, & Shleifer, 2001) to explain the transition to capitalism. (Note 10) Note that the discussion is static, and therefore does not include the evolution of constitutional changes. (Note 11)

The ability of a given legal system under a market regime to create viable checks and balances affects different industries differently. Given an enforcement regime, and because the contracting environment and the observable outcome are different between industries (e.g., the gambling industry versus the software applications industry), we assume the probability of getting caught stealing is different among industries. Formally, and building on seminal work by Becker (1968), assume the probability of getting caught stealing $\psi_j(\theta, D_j)$ is a function of the RLC and the amount stolen and is industry dependent. If the CI is caught, then the CI pays $\Gamma(\theta)$, which is a function of the RLC θ. Therefore, $\psi_j(\theta, D_j) \cdot \Gamma(\theta)$ denotes expected cost from illicit trade. In addition, assume $\frac{\partial \psi_j}{\partial \theta} \geq 0$, $\frac{\partial \psi_j}{\partial D_j} \geq 0$, and $\frac{d\Gamma(\theta)}{d\theta} \geq 0$. The probability of getting caught increases with the RLC, as well as the amount stolen, and the two are complements in the sense that $\frac{\partial^2 \psi_j}{\partial \theta \partial D_j} \geq 0$. This probability increases at an increasing rate, i.e., $\frac{\partial^2 \psi_j}{\partial D_j^2} \geq 0$. The fine also increases in the RLC. The level of enforcement that guarantees 0 level of illegal activity is achieved when $\theta = 1$, and it is assumed to be too weak (smaller than the optimal level) for $\theta < 1$; it increases with the RLC. It is assumed that collected fines are distributed back to consumers in a lump-sum fashion.

In modeling the political constraints, we assume that noncorrupt and corrupt elites solved the collective action problem (Olson, 1971) and have organized themselves into an interest group, i.e., a lobby. Noncorrupt and corrupt elites decide, given their common interests in the RLC, to join forces and be political active. (Note 12) Let $\Im \equiv \{NC, C\}$ denote the set of lobbies in the economy and s_l denote the amount lobby l contributed to the government. Lobby l makes its political contribution contingent on the RLC chosen by the government, i.e., $s_l(\theta)$. Due to the desire to govern and maximize the number of votes during the elections, the incumbent government maximizes the economic surplus, W. Governments, however, also care about contributions (e.g., rhetoric and advertising during elections, as well as personal perks), and thus the incumbent government wants to maximize total contributions, $\sum_{l \in \Im} s_l$. Combining these two objectives, and following Ledyard (1989), Snyder (1990), Baron (1994), Feddersen and Pesendorfer (1996), and Grossman and Helpman (1996a and 1996b), among others, results in the following government benefit function,

$$G = aW + \sum_{l \in \Im} s_l, \tag{2}$$

where a is the marginal benefit from the economic surplus.

Each lobby tailors the contribution schedule $s_l(\theta)$ to maximize the *total income* of its members (income less contributions). It then collects the necessary donations in such a way as to allow all to share in the gains from the political contribution. Therefore, the joint income of the members of lobby l is $V_l = \Omega_l - s_l$, where Ω_l is their gross-of-contributions joint income, i.e.,

$$\Omega_l = w_l, \tag{3}$$

and where l_l is the total labor supply (and also the labor income) of members of lobby l. The monetary value of lobby l's profit from capital is denoted w_l. (Note 13)

Let $t_l(\theta)$ denote the tax collected by the government from interest group l as its share of the transaction costs of the RLC where $\frac{\partial t_l(\theta)}{\partial \theta} > 0$. The net initial endowment, $e_l - t_l(\theta)$, of lobby l is distributed between investment in the firms, x_l, and alternative options in the capital market, $e_l - t_l(\theta) - x_l$. The NCI's total income gross of contributions is

$$w_{NC} = \sum_{j=1}^{J} \left(\alpha_{NC}(\theta) \cdot \left(p_j \cdot y_j \cdot (1 - D_j) - C(y_j, X_j) \right) \right) + (e_{NC} - t_{NC}(\theta) - x_{NC}) \cdot (1 + r), \tag{4}$$

and the CIs' relative share in the firm's profits is $\alpha_C(\theta)$; in other words, $\alpha_{NC}(\theta) = 1 - \alpha_C(\theta)$. It is also assumed that $\frac{\partial \alpha_{NC}}{\partial \theta} \geq 0 \geq \frac{\partial \alpha_C}{\partial \theta}$. The alternative profit from one unit of capital is $(1 + r)$. In addition, let $x_l = \sum_{j=1}^{J} x_{lj}$. The CIs' total income, on the other hand, is

$$w_C = \sum_{j \in J} \left(\alpha_C(\theta) \cdot \left(p_j \cdot y_j \cdot (1 - D_j) - C_j(y_j, X_j) \right) + p_j \cdot \tau \cdot y_j \cdot D_j - \psi_j(\theta, D_j) \cdot \Gamma(\theta) \right) + (e_C - t_C(\theta) - x_C) \cdot (1 + r). \tag{5}$$

The behavior of the different representative investors, i.e., NCIs or CIs, is derived explicitly in Appendix A. The CI receives a share $\sum_{j=1}^{J} \left(\alpha_C(\theta) \cdot \left(p_j \cdot y_j \cdot (1 - D_j) - C(y_j, X_j) \right) \right)$ of the firms' profit, whereas the expected benefit from illicit trade and theft is

$$\sum_{j=1}^{J} \left(p_j \cdot \tau \cdot y_j \cdot D_j - \psi_j(\theta, D_j) \cdot \Gamma(\theta) \right).$$

In addition, and to simplify the presentation, output is the solution to the following optimization problem and is chosen given the amount to be stolen after, i.e., $D(y)$:

$$y_j^* = y_j \arg\max\{\pi_j = p_j \cdot y_j \cdot (1 - D_j) - C_j(y_j, X_j)\}. \tag{6}$$

4. The Multi-Stage Game

The transition is modeled as a multi-stage game—first, a reform takes place, and then markets interact (see Fig. 1). The reform includes the establishment and enforcement of investors' rights, as well as the ability to enforce law and order and prevent theft and illegal activity.

The parameter of the reform is determined in a menu auction game between the elite and the government. (Note 14) Recall that the elite may include CIs. It may, for example, be composed of oligarchs who are a unique constituency that is both willing and able to lobby for development of market institutions (Acemoglu 2003; among others). These variations in benefits produce differing incentives for the elite in pursuing the desired level of reform. The outcome of the reform is summed up by a coefficient, namely, the RLC.

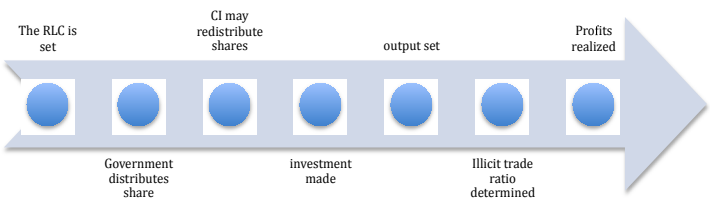

Figure 1. The multi-stage game

This RLC is determined in a political economy game a la' Bernheim and Whinston (1986). A unique feature of

this game is a menu auction in which the RLC coefficient is chosen. Appendix B relies on Bernheim and Whinston to show that if the contributions are "locally truthful" and the elite choices correctly reflect their true preferences, then the menu auction implements efficient actions. This "truthful equilibria" possess a strong stability property and are essentially the only equilibria that possess this property (see Bernheim & Whinston, 1986, page 17).

The government initially owns the firms, whereas after the transition all firms are privately owned. Once the RLC is determined, the government distributes the firms' shares in a fair and equitable manner (e.g., vouchers are distributed to the population, as they were distributed by the Russian government in late 1992). In the next stage the CIs can redistribute the residual claims over physical assets, where the ability to redistribute the residual claim is a function of the RLC. This, for example, captures tactics that (illegally) altered the initial distribution of shares in Krasnoyarsk, Russia, where laws were subject to loose interpretation. In this case, a large stake in Russia's second-biggest hydro-electric power plant somehow changed hands for roughly 2% of the market price (*The Economist*, 1998). Finally, and given the ex post distribution of shares, investment is made, output is set, the illicit trade ratio is determined, and profits realized.

5. Equilibrium

The impact of the existing political constraints on the evolving legal system, and therefore on the economy, are now explored. Using the framework developed above, we start with the benchmark regime where the economy is clear of any type of corruption and theft (Section 1). In Section 2 property rights are well defined and enforced, but the illicit trade ratio may be different from zero. Next, we investigate the importance of defining and enforcing property rights, assuming illicit trade is not possible, i.e., $D_j \equiv 0$ for all j (section 3). Finally, we model and analyze the case in which both rent-seeking activities are possible (section 4). Focusing on each rent-seeking activity separately, and then adding the two together, allows us to develop intuition and to better understand the predictions made in the paper.

5.1 The Benchmark Regime

We start with the benchmark regime, where the economy is clear from any type of corruption and theft, i.e., $D_j \equiv 0$ for all j, and α_{NC} and α_C are fixed and not a function of θ. We derive the equilibrium by solving the game backward; deriving the output and investment schemes, y_j, and X_j, respectively. In the benchmark case, given that we assume the economy is clear of any type of corruption or theft, there is no role for the RLC; for completeness, we assumed $\theta = 1$. Let R_{Cj} and R_{NCj} denote the return from investing in firm j for the CI and NCI, respectively.

Proposition 1. If endowments, e_C and e_{NC}, are sufficiently large, then in equilibrium $x_{Cj} > 0$ and $x_{NCj} > 0$ and $R_{Cj} = R_{NCj} = (1 + r)$ for all j. Furthermore, output increases in investment, i.e., $\frac{\partial y_j}{\partial X_j} > 0$.

Proof. Proposition 1 follows from Appendix A.

Increasing investment lowers cost and therefore increases output. Proposition 1 also depicts the conditions for both types of investors to invest in industry j for all $j \in J$; namely, that they have the money and that it is strictly profitable to produce a strictly positive amount.

5.2 Illicit Trade

In this section we assume illicit trade is possible (i.e., stealing output from the firm and selling it on the black market), but redistributing firms' shares is not, i.e., α_{NC} and α_C are fixed and not a function of θ. The equilibrium then is derived by solving the game backward; first deriving the illicit trade ratio, output, and investment schemes, $D_j, y_j,$ and X_j, respectively, and then deriving the legal institutions, i.e., the RLC θ. Note that low RLC implies industries are shadier and less transparent, and therefore it is easier to carry out illicit trade.

Proposition 2. Assume endowments, e_C and e_{NC}, are sufficiently large:

- *The illicit trade ratio increases with output, i.e.,* $\frac{\partial D_j}{\partial y_j} > 0$*, and decreases with the RLC, i.e.,* $\frac{\partial D_j}{\partial \theta} \leq 0$.
- *Furthermore,* $\frac{\partial x_{NCj}}{\partial \theta} > 0$.

Proof. Proposition 2 follows from Appendix A.

The direct impact of the RLC on the illicit trade ratio, D_j, is mitigated by the impact of y_j on D_j. Proposition 2, therefore, highlights the trade-off CI face: When θ increases, the CI can allocate more investment to productive activity, or simply increase the volume of unproductive activity.

Next, we show that when revenues are sufficiently large, CI separates from NCI such that only the CI invests in the firm. When CI capture a lucrative industry, they do not steal from themselves (because it is costly) but they gain from holding the lucrative industry. However, when revenues are not sufficiently large, CI shares the investment with NCI simply because it benefits from illicit trade; namely, an *(incomplete) separation theorem* is derived.

When the benefits from illicit trade are sufficiently large, the threat $D_j = 1$ is credible and the NCI will not invest in the firm, i.e., $X_j = x_{Cj}$; namely, the conditions for a separating equilibrium hold. If these conditions are not met, and CIs cannot credibly commit to an illicit trade ratio of 1, the NCI will invest in a firm as long as the firm makes positive profits, and the return to capital is equal to or greater than $(1 + r)$.

Proposition 3. If the conditions for a separating equilibrium hold, then only CIs invest in firm j. If, on the other hand, these conditions do not hold, then NCIs invest in firm j, and CIs use nonproductive, as well as productive, activities to generate income, i.e., $0 \leq D_j < 1$.

Proof. Proposition 3 follows from Appendix A.

We now turn to the first stage of the game and determine the equilibrium RLC. Following Grossman and Helpman's (1994) *Proposition 1*, the political-economic equilibrium is characterized where the RLC equates the marginal benefit from the RLC to the marginal cost times the alternative cost of capital, i.e., $(1 + r)$. Let η_j denote the elasticity of demand for good j.

Proposition 4. If an internal solution exists, and investors are organized to politically active lobbies, then in equilibrium the RLC is determined by the following relationship:

$$
\begin{aligned}
&(1+r)\cdot S(\theta)\\
&\equiv (1+r)\cdot(1+a)\cdot \sum_{i=\{NC,C\}} \frac{\partial t_i}{\partial \theta}\\
&= (1+a)\cdot \sum_{j=1}^{J}\left(\tau\cdot D_j\cdot p_j\cdot\left(1+\frac{1}{\eta_j}\right)\cdot\frac{\partial y_i}{\partial\theta} - \alpha_{NC}\cdot p_j\cdot y_j\cdot\frac{\partial D_i}{\partial\theta}\right)\\
&\quad -\sum_{j=1}^{J}\frac{\partial}{\partial\theta}(\psi_j\cdot\Gamma) - a\sum_{j=1}^{J}\left(q_j\cdot\frac{\partial p_i}{\partial\theta}\right)\\
&\equiv B(\theta).
\end{aligned}
$$

Proof. The proof is relegated to Appendix B.

The marginal benefit from the RLC, $B(\theta)$, can be broken down into four parts:

1) The consumption effect, i.e., $-a\sum_{j=1}^{J}\left(q_j\cdot\frac{\partial p_i}{\partial\theta}\right)$,

2) The illicit trade effect, i.e., $-(1+a)\sum_{j=1}^{J}\left(\alpha_{NC}\cdot p_j\cdot y_j\cdot\frac{\partial D_i}{\partial\theta}\right)$,

3) The production effect, i.e., $(1+a)\sum_{j=1}^{J}\left(\tau\cdot D_j\cdot p_j\cdot\left(1+\frac{1}{\eta_j}\right)\cdot\frac{\partial y_i}{\partial\theta}\right)$, and

4) The enforcement effect, i.e., $\sum_{j=1}^{J}\frac{\partial}{\partial\theta}(\psi_j\cdot\Gamma)$.

The first part, i.e., the consumption effect, captures the change in consumer surplus as θ increases. The second part, i.e., the illicit trade effect, captures the change in the illicit trade ratio and, therefore, the change in the marginal cost to NCI from illicit trade. The third part, i.e., the production effect, captures the change in output as θ increases. And finally, the enforcement effect captures the marginal increase in the cost to the CI from unproductive activity. On the other hand, the marginal cost of the RLC, $S(\theta)$, is a function of the cost of capital.

Corollary 1. If interest rates, r, are very high, then institutions might be in total anarchy during the privatization

process.

Corollary 1, which follows directly from Proposition 4, sheds new light on the role the price of capital plays in creating new institutions. More specifically, it shows that the price of capital affects an economy in transition, both at the investment and institutions levels (see also Stiglitz and Hoff, 2005). Increasing the interest rate increases the opportunity cost of financing better institutions, i.e., higher RLC. Then, because the cost of the institutions is financed by the investors, and because these investors includes elite that influence government decisions, government will now be more reluctant to reform and improve the institutions.

Next, assume $S(\theta)$ is an increasing function and $B(\theta)$ is a decreasing function of θ. Assume also that $S(0) < B(0)$ and $S(1) > B(1)$. These assumptions imply a unique internal equilibrium at $\theta^* \in (0,1)$ (see Fig. 2).

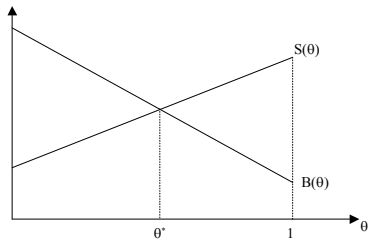

Figure 2. The RLC

According to this scenario depicted in Fig. 2, the economy does not reach full capitalism, i.e., $\theta = 1$, in part because of the monetary cost associated with stronger institutions, i.e., higher θ's. Hence, and similar to the predictions of Polishchuk and Savvateev (2004), fully secured property rights will not emerge during transition. To this end, Hellman (1998) argued that short-run winners will try to prevent the reform from continuing.

The absence of a rule of law, i.e., a low RLC, has led to an increase in predatory activities that are likely to have adverse effects on productive activity such as investment, e.g., in Russia.

The question then is why is the law enforced in some countries and less (or barely) enforced in other countries? The existing literature (e.g., Johnson, Kaufmann, & Shleifer, 1998; and Roland & Verdier, 1999) explains this difference by modeling coordination problems (law enforcement is a public good; see also Roland, 2000, chapter 8, and reference therein). In those papers, there is a "good" equilibrium and a "bad" equilibrium, and economies may choose one or the other. By focusing on a unique equilibrium, we abstract from the coordination problem and focus instead on the economic and political cost of reform; a cost that is affected by the distribution of power among the elite prior to the reform. To this end, output may decrease after reform. In terms of Fig. 2, if for low values of θ the marginal benefit from the RLC, $B(\theta)$, is small compared with the marginal cost of the constitution index, $S(\theta)$, then output declines after transition (recall that for expositional purposes we assumed that the marginal benefit from the RLC declines with θ).

An alternative explanation to this decline in output is given by Braguinsky and Myerson (2007), who focused on capital market, or lack of. The cost to capital and the maturity of the capital markets, as well as the monetary cost of the RLC, affect the likelihood of a successful reform. Political institutions may increase these costs, especially if CIs target lucrative industries. Therefore, gradual privatization in economies with poorly defined and enforced rule of law, whereby smaller and less profitable industries are privatized first, may alleviate demand for poorly defined market institutions and corruption of industries.

5.3 Defining and Enforcing Property Rights

Next, and unlike section 2, we assume that the RLC does affect property rights enforcement, i.e., $\alpha_{NC}(\theta)$ and $\alpha_C(\theta)$ vary with θ, but that illicit trade is not possible, i.e., $D_j \equiv 0$. Note that $D_j \equiv 0$ implies $\psi_j = 0$ because illicit trade is not allowed.

Starting from the last stage of the game, and unlike section 5.2, the amount produced does not depend on the RLC.

Proposition 5. Assume endowments e_C and e_{NC} are sufficiently large:

- *Output increases in investment, i.e.,* $\frac{\partial y_j}{\partial x_j} > 0$*, and it is not directly affected by the RLC.*
- *Furthermore,* $\frac{\partial x_{NCj}}{\partial \theta} > 0 > \frac{\partial x_{Cj}}{\partial \theta}$ *and if* $\alpha_C = \alpha_{NC} = 1/2$*, then* $\frac{dX_j}{d\theta} = 0$.

Proof. Follows from Appendix A.

In other words, the amount NCIs invest in firm j increases, whereas the amount CIs invest in firm j decreases with θ. The reason is that investors are similar except for their ability to exploit other investors, where the larger θ is, the larger the residual claim that goes to NCIs. Note that because the illicit trade ratio is fixed at zero, the separating theorem does not hold.

5.4 Property Rights Institutions and Illicit Trade

Now we are ready to incorporate both rent-seeking activities and shed further light on the RLC. A change in the RLC affects the demand for y_j (the illicit trade ratio—see section 5.2), as well as the supply (the residual claim over physical assets—see section 3).

The ability of CIs to redistribute shares mitigates the direct cost imposed by the illicit trade ratio on the firms' output. On the other hand, if only investor protection is improved, then CI may increase illicit trade to compensate for the additional constraints imposed on the ability to illegally redistribute the residual claim over physical assets; theft leads to lower output. Note that if everyone is corrupt, then there is no one to steal from.

$$\frac{dX_j}{d\theta} = \frac{-\frac{d\alpha_C}{d\theta}\frac{\partial C_j}{\partial X_j} - \alpha_C(\theta)\frac{\partial^2 C_j}{\partial X_j \partial y_j}\frac{\partial y_j}{\partial \theta} + \Delta_\theta}{\alpha_C(\theta)\left[\frac{\partial^2 C_j}{\partial X_j^2} + \frac{\partial^2 C_j}{\partial X_j \partial y_j}\frac{\partial y_j}{\partial X_j}\right] - \Delta_{X_j}},$$

where

$$\Delta_\theta \equiv \frac{\partial}{\partial X_j}\left[\frac{\partial}{\partial y_j}\left(\tau p_j y_j D_j\right)\frac{\partial y_j}{\partial X_j}\right] \text{ and } \Delta_{X_j} \equiv \frac{\partial}{\partial \theta}\left[\frac{\partial}{\partial y_j}\left(\tau p_j y_j D_j\right)\frac{\partial y_j}{\partial X_j}\right].$$

To this end, foreign and Russian investors who participated in the 2001 Center for Economic and Financial Research survey were asked to set reform priorities, evaluate the depth of problems in a number of investment-related areas, and identify major reasons for capital flight from Russia. It is interesting to note that the survey concluded that the highest priority should be given to fighting corruption, and that the lack of independence in the judiciary system and the authorities' failure to implement court decisions were seen by the respondents as an extremely serious barrier to investment.

This conclusion, that interest groups may create incentives large enough to prevent the economy from fully implementing reforms, can provide us with a rationale for the differences in economic performance and reforms between Yeltsin's presidency, during which Russia grew in 1997 and 1998 by 0.009 and -0.049, respectively, and Putin's presidency, during which Russia grew in 1999 and 2000 by 0.054 and 0.09, respectively (Berglof, Kunov, Shvets, & Yudaneva, 2003, Table 3.3). This paper can offer a political-economic rationale for the difference in the performance of the two presidents, if indeed the various domestic interest groups that supported Yeltsin (but not Putin) benefited from "lawlessness." Putin started his political career from scratch, whereas Yeltsin depended heavily on the support of various domestic interest groups during his rule and 1996 reelection. The Putin government passed about 80% of its legislative agenda through the Duma: 29 reform laws in such contentious areas as land property and law enforcement. The government back in 1996-1997 had prepared most of these laws, but they had no chance of being passed by the previous Duma, given the fierce conflict between the two branches of government (see Berglof et al., 2003, and reference therein). (Note 15) Overall, the combination of additional resources, the absence of commitments to interest groups, and lack of parliamentary opposition allowed Putin to pursue his own personal agenda. Of course, Putin's regime had its own problems, especially with respect to human rights.

6. Discussion and Concluding Remarks

The paper assumes a multi-stage transition. First, property rights institutions and illicit trade institutions are

created. Then, the economic regime is transformed to a market regime, firms are privatized, illegal activity reallocates firms' residual claim, and productive (as well as unproductive) activity is performed.

The ability of the corrupt elite to influence the ruling party may lead to a low RLC, which causes underinvestment, corruption, and capturing of lucrative industries by CIs. Then, by introducing heterogeneity among industries, we extend the literature and show that the corrupt elite also corrupts the more lucrative industries and in corrupt economies, CIs may separate themselves from the NCIs. To this end, preliminary analysis suggests (i) positive correlation between industry earnings/profits and corruption, and (ii) the number of corrupt industries is greater in corrupt economies. (Note 16) These predictions are also consistent with the empirical findings of Campos (1999), who observes that CIs own the large corporations.

Introducing two unproductive (imperfect) substitute technologies illustrates that CIs may substitute between technologies to alleviate the constraints created by stronger institutions. To this end, strengthening the institutions only in one dimension may, at the end of the day, cause output, as well as investment, to decline.

Although further empirical analysis is warranted before policy implications are derived, this paper does support gradual privatization under certain conditions. It suggests that privatization should be contingent on the evolution of the legal system, because, if the legal system does not yet include the required legal institutions, privatizing the economy's lucrative industries may corrupt those industries. To this end, it is interesting to note that in the 1980s and 1990s, China privatized its local and regional firms, and only much later did it start privatizing its lucrative state-owned enterprises. This paper also suggests that culture and moral norms of elite may matter: when the elite have a strong sense of social responsibility, it may lead to a "clean transition," in contrast to when elite members have no sense of "noble oblige" and moral limitation. In the latter, gradualism may include civic education. Polterovich (2000), while focusing on Russia, comes to a similar conclusion. In that paper, Polterovich argues that "shock therapy" may be destructive under the Russian cultural environment and that it will introduce strong distortions due to fast liberalization and privatization, which will increase the incentives for rent-seeking activity. Polterovich then concludes that a "good reform strategy should take a country's civic culture into account and not put forward overly ambitious tasks, by building a sequence of interim institutions which would be more congruent to the initial cultural and institutional environment, facilitate the adaptation of the people, and stimulate modernization of cultural norms to reach an effective market system with time."

This paper shows that the elite corrupts the legal institutions, captures key industries, and causes capital to migrate away from the production sector. Although it is our opinion that the intuition derived in the paper carries over to a variety of transitions (e.g., from communism to capitalism and from colonialism to independence), we wish to further investigate this by explicitly modeling political institutions and/or privatization methods.

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Appendices

Appendix A

1A. Illicit Trade

The RLC is determined at the first stage, whereas the amount invested is set at the second stage. Once investment is made, output is set, volume of illicit trade determined, and profit realized. Therefore, differentiating equation (5) with respect to D_j yields the following conditions:

$$(\tau - \alpha_C(\theta)) \cdot p_j \cdot y_j = \frac{\partial \psi_j}{\partial D_j} \cdot \Gamma \text{ for } j \in J. \qquad (1A.1)$$

In other words, the marginal benefit from illicit trade, $(\tau - \alpha_C(\theta)) \cdot p_j \cdot y_j$, equals the expected marginal cost, $\frac{\partial \psi_j}{\partial D_j} \cdot \Gamma$.

Lemma 1A: If $\frac{\partial \alpha_C}{\partial \theta}$ *is sufficiently small, then* $\frac{\partial D_j}{\partial y_j} \geq 0$ *and* $\frac{\partial D_j}{\partial \theta} \leq 0$.

Proof: Fix the RLC. Starting from equation (7), while using the implicit function theorem and assuming $\frac{\partial^2 \psi_j}{\partial D_j^2} \geq 0$ (the probability of getting caught increases with D_j at an increasing rate),

$$\frac{\partial D_j}{\partial y_j} = \frac{\left(\tau - \alpha_C(\theta)\right) \cdot p_j \cdot \left(1 + \frac{1}{\eta_j}\right)}{\frac{\partial^2 \psi}{\partial D_j^2} \cdot \Gamma} \geq 0.$$

Recall the demand is downward sloping.

Furthermore, if we fix output and repeat the exercise done above, then if $\frac{\partial^2 \psi_j}{\partial D_j^2} \geq 0$ and $\frac{\partial \alpha_C}{\partial \theta}$ is sufficiently small,

$$\frac{\partial D_j}{\partial \theta} = -\frac{\frac{\partial^2 \psi_j}{\partial D_j \partial \theta} \cdot \Gamma(\theta) + \frac{\partial \psi_j}{\partial D_j} \cdot \frac{\partial \Gamma(\theta)}{\partial \theta} + \frac{\partial \alpha_C}{\partial \theta} \cdot p_j \cdot y_j}{\frac{\partial^2 \psi}{\partial D_j^2} \cdot \Gamma} \leq 0.$$

Q.E.D.

2A. Output

Assume the manager solves the following optimization problem:

$$y_j^* = y_j \arg\max\{\pi_j = p_j \cdot y_j \cdot (1 - D_j) - C_j(y_j, X_j)\}.$$

The first-order conditions are

$$\left(1 + \frac{1}{\eta_j}\right) \cdot p_j \cdot (1 - D_j) - p_j \cdot y_j \cdot \frac{\partial D_j}{\partial y_j} = \frac{\partial C_j}{\partial y_j} \text{ for } j \in J. \tag{2A.1}$$

Note that because the illicit trade ratio is set after output is decided, it is factored into the manager's calculations. The marginal revenue, corrected for the cost of theft, is equated in equilibrium to the marginal cost of production.

3A. Investment

First, we show that higher investment leads to higher output; investment lowers cost and increases output.

Lemma 2A. $\frac{\partial y_j}{\partial X_j} \geq 0$.

Proof: To derive Lemma 2A, fix y_j and increase X_j. The right-hand side (RHS) of equation (8) shifts down. Therefore, to reach the new equilibrium, y_j should increase.

Q.E.D.

The RLC is determined at the first stage and before investors decide how much to invest in the firm (which is determined at the second stage). Hence, when investors decide how much to invest in the firm, i.e., when they maximize Ω (Eq. 3) with respect to x_{ij}, they take θ as given. Using the envelope theorem, the return for investment for the CI is

$$R_{Cj} \equiv -\alpha_C(\theta) \cdot \frac{\partial C_j(y_j, X_j)}{\partial X_j} + \frac{\partial}{\partial y_j}(\tau \cdot p_j \cdot y_j \cdot D_j) \cdot \frac{\partial y_j}{\partial X_j}.$$

The CI factors the change in income from illicit trade, as well as the decline in cost, when determining the rate of return to investment. In equilibrium, either $x_{Cj} = 0$ or

$$R_C \equiv R_{Cj} = R_{Ch} = 1 + r \text{ for all } j, h \in J. \tag{3A.1}$$

Recall that we assume the investors endowments, e_C and e_{NC}, are sufficiently large. The return to capital is equal to or greater than $(1 + r)$. It is strictly greater than $(1 + r)$ if the CI is constrained by its budget and does not invest in the outside option.

Similar computations for the NCI yields

$$R_{NC} = 1 + r \text{ or } x_{NCj} = 0, \tag{3A.2}$$

where

$$R_{NC} \equiv -\alpha_{NC}(\theta) \cdot \frac{\partial C(y_j, X_j)}{\partial x_{NCj}} \ \forall j \in J.$$

As seen from equation (10), the return to capital, R_{NC}, is equal to the return from investing in the outside option, $(1 + r)$, if $x_{NCj} > 0$. It also indicates that a decrease in the residual claim over the physical assets of NCIs, $\alpha_{NC}(\theta)$, will decrease the investment made by NCIs.

4A. The RLC

We start with the CI. As mentioned above in section 3, the contribution schedule in equilibrium is locally truthful, i.e., (Note 17)

$$\sum_{j=1}^{J}\left(\frac{\partial \alpha_C}{\partial \theta} \cdot \pi_j + \tau \cdot D_j \cdot p_j \cdot \left(1 + \frac{1}{\eta_j}\right) \cdot \frac{\partial y_j}{\partial \theta} - \frac{\partial}{\partial \theta}(\psi_j \cdot \Gamma)\right) - \frac{\partial t_C}{\partial \theta}(1 + r) = \frac{\partial s_C}{\partial \theta}. \tag{4A.1}$$

Thus, in equilibrium, the marginal contribution schedule of CIs, RHS, is equal to the net marginal benefit attributed to the RLC, left-hand side (LHS).

It is postulated that the larger the RLC, the lower is CIs' share of the residual claim, i.e., $\frac{\partial \alpha_C}{\partial \theta} \leq 0$, and the higher the cost of illicit trade, i.e., $\frac{\partial}{\partial \theta}[\psi_j \cdot \Gamma] \geq 0$.

Now we move to the NCI. The government solves a common-agent problem when determining the RLC in equilibrium. Therefore, while applying the envelope theorem and since the contribution plan is locally truthful (i.e., the marginal contribution equals the marginal benefit from the RLC),

$$\sum_{j=1}^{J}\left(\frac{\partial \alpha_{NC}}{\partial \theta} \cdot \pi_j - \tau \cdot p_j \cdot y_j \cdot \frac{\partial D_j}{\partial \theta}\right) - \frac{\partial t_{NC}}{\partial \theta}(1 + r) = \frac{\partial s_{NC}}{\partial \theta}. \tag{5A.1}$$

The marginal benefit from the level of the RLC, LHS, is equated to the marginal cost of acquiring a higher RLC, RHS. NCIs' marginal benefit from an increase in θ is larger the larger is $\frac{\partial \alpha_{NC}}{\partial \theta}$. The marginal cost of acquiring a higher index is smaller the smaller is $\frac{\partial t_{NC}}{\partial \theta}(1 + r)$. Furthermore, if taxes are not contingent on the RLC and $\frac{\partial^2 \psi}{\partial D^2{}_j} \geq 0$, then the contribution function slopes upwards, i.e., $\frac{\partial s_{NC}}{\partial \theta} > 0$ (since $\frac{\partial \alpha_{NC}}{\partial \theta} \geq 0$ and $\frac{\partial D_j}{\partial \theta} \leq 0$).

Appendix B

Proof of Proposition 3:

The political-economic equilibrium can be characterized in line with Grossman and Helpman's (1994) Proposition 1 (see also Bernheim & Whinston, 1986, Lemma 2).

Lemma 1B.

$(\{s_l^0\}_{l=\{NC,C\}}, \theta)$is a subgame-perfect Nash equilibrium of the political-economic game if and only if

1. $s_l^*$is feasible for $l \in \{NC, C\}$;
2. θ^*maximizes$aW(\theta) + \sum_{l=\{NC,C\}} s_l(\theta)$ on θ;

3. θ^*maximizes$V_l(\theta) + aW(\theta) + \sum_{l=\{NC,C\}} s_l(\theta)$ on θ for every $l \in \{NC, C\}$.

4. For every $\in \{NC, C\}$, there exists a $\theta^l \in \theta$ that maximizes $aW(\theta) + \sum_{l=\{NC,C\}} s_l(\theta)$ on θ such that $s_l^*(\theta^l) = 0$.

The equilibrium is locally truthful, and thus, in equilibrium,

$$\frac{\partial \Omega_i}{\partial \theta} = \frac{\partial s_i}{\partial \theta}.$$

The marginal economic surplus from the RLC, using the envelope theorem is,

$$\frac{\partial W}{\partial \theta} = \sum_{j=1}^{J} \left(-\alpha_{NC} \cdot p_j \cdot y_j \cdot \frac{\partial D_j}{\partial \theta} + \tau \cdot D_j \cdot p_j \cdot \left(1 + \frac{1}{\eta_j}\right) \cdot \frac{\partial y_j}{\partial \theta} \right) + (1 + r) \sum_{l=\{NC,C\}} \frac{\partial t_l}{\partial \theta}.$$

Applying Part 2 of Lemma 1B implies that $a\frac{\partial W}{\partial \theta} + \sum_{i=\{NC,C\}} \frac{\partial \Omega_i}{\partial \theta}$, where

$$\frac{\partial \Omega_C}{\partial \theta} = \sum_{j=1}^{J} \left(\frac{\partial \alpha_C(\theta)}{\partial \theta} \cdot \pi_j + \tau \cdot D_j \cdot p_j \cdot \left(1 + \frac{1}{\eta_j}\right) \cdot \frac{\partial y_j}{\partial \theta} - \frac{\partial}{\partial \theta}\left[\psi_j \cdot \Gamma\right] \right) - (1 + r) \frac{\partial t_C}{\partial \theta}$$

$$\frac{\partial \Omega_{NC}}{\partial \theta} = \sum_{j=1}^{J} \left(\frac{\partial \alpha_{NC}(\theta)}{\partial \theta} \cdot \pi_j - \alpha_{NC} \cdot p_j \cdot y_j \cdot \frac{\partial D_j}{\partial \theta} \right) - (1 + r) \frac{\partial t_{NC}}{\partial \theta}.$$

Proposition 3 follows.

Notes

Note 1. Campos and Giovannoni (2005) show that the degree of asset stripping is driven by the interplay between the firm's potential profitability and its ability to influence law enforcement.

Note 2. During the 1990s, "gifts" to local managers/owners in China, gifts that included a share of the final product produced (e.g., T-shirts), were common.

Note 3. Connected firms denote firms connected to a politician (the firm's large investors or top officers are members of parliament, ministers, or heads of state, or those closely related to a top official).

Note 4. Although it is possible to introduce within-industry heterogeneity, such heterogeneity introduces significant-added complexity that would not alter the results substantially. Therefore, we elected to make the model more tractable.

Note 5. A slightly different approach, not taken in this paper, is that the residual rights of control are attributed to employee decisions (Williamson, 1985; Coase, 1988).

Note 6. Djankov, Miguel, Roland, Qian, & Zhuravskaya (2005) and Djankov, Roland, Qian, & Zhuravskaya (2006a, and 2006b) show that investors' behavioral norms vary across countries.

Note 7. A different approach, which is not taken in this paper, claims that investors vary in their productive activities, such as innovations, and unproductive activities, such as rent-seeking or organized crime (e.g., Baumol, 1990). Murphy, Shleifer, & Vishny (1993) discussed the negative effect of rent seeking on growth.

Note 8. A different interpretation, which is not used in this paper, assumes the price on the black market equals $\tau \cdot p_j$, which is lower then the price p_j. Using this alternative interpretation does not change the analysis that follows.

Note 9. The characteristics of the illicit trade ratio are reminiscent of the damage function defined in the literature on pesticides (e.g., Lichtenberg, Spear, & Zilberman, 1993), with CIs replacing the pests.

Note 10. Hellman and Schankerman (2000) showed that within a country, economic reforms improve governance in countries with interest groups that lack the ability or will to influence government policies.

Note 11. Hellman, Jones, & Kaufmann (2000) investigated the dynamics of the capture economy (see also Hellman, 1998). To this end, Lau, Roland, Qian (2000) developed a simple model to analyze the "dual track" approach to market liberalization as a mechanism for implementing efficient Pareto-improving economic reform, that is, reform achieving efficiency without creating losers. Stiglitz and Hoff (2005), on the other hand,

investigated the demand for rule of law in post-communist economies *following* privatization.

Note 12. Although such collective action is associated with free-rider problems, we abstracted from such difficulties. Needless to say that if noncorrupt elite cannot solve their collective action problem, a lower RLC will be chosen in equilibrium. The RLC coefficient will be higher in equilibrium if, on the other hand, the corrupt elite cannot solve their collective action problem.

Note 13. The paper's results still hold if we extend the lobby's objective function to include consumption, i.e., $l_l + w_l + \varphi_l \cdot cs(p)$, where φ_l is the lobby's fraction in the voting population.

Note 14. Following Acemoglu (2006) and Acemoglu and Robinson (2008), among others, we model the elite as groups that have de juro power; in other words, they have the power to affect the rules that will govern the transition. In practice, the question of who "the elite" are is a key question, one which we remain agnostic about in this paper, though the model illustrates that the illegal activities of the elites have an important effect on the efficiency of equilibria.

Note 15. Boycko, Shleifer, & Vishny (1995) also noted the strong opposition to reforms since 1992.

Note 16. To perform the analysis, we required observations that single out CIs and allow us to classify them by country and by sector (using the 1987 version of the 1-digit Standard Industrial Classification Codes that indicate the company's type of business). A good starting point was data collected and used by Faccio (2006) on connected firms, i.e., firms connected to a politician (the firm's large investors or top officers are members of parliament, ministers, the heads of state, or closely related to top officials). The measure of connected firms is a good proxy for corrupt investors (Faccio, 2006). Using Mergent online and Hoover's online websites, the firms' main line of business (1-digit SIC code, 1987 version) was added.

Note 17. The contributions are "locally truthful," as defined by Bernheim and Whinston (1986) and Dixit et al. (1997). Grossman and Helpman (1994 and 1995) also reached this conclusion for cases in which groups compete for trade protection in both small and large economies. Dixit (1996) addresses *locally truthful* contributions when there is a dichotomy between taxes and subsidies on production and consumption in an open economy. Brainard and Verdier (1997) investigate how persistent protection emerges from an interaction between industry adjustment, lobbying, and political response. They investigate the behavior of an industry owner following an exogenous shock, and show that the contributions at equilibrium are locally truthful.