Relationships in the Wild: How Institutions Affect the Governance of Firms

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Abstract

We study how political checks and balances affect the governance of firms. In our model, a firm's owner motivates a manager and an upstream agent through relational contracts sustained by the value of future rents. We uncover a non-monotonic relationship between institutions and governance. Under strong institutions, incentives can be better sustained in a private firm where ownership motivates the manager, and only the agent needs to be motivated through relational contracts. Under mediocre institutions, the economy gets caught in a "trap" of poorly managed private firms: the threat of state expropriation undermines relational incentives under private ownership, and yet prevents such contracts from being developed under state ownership because expropriating the private firm is an attractive fallback option for the ruler. Under very weak institutions, however, the private firm's output shrinks too much to be an attractive fallback option, and as a result, the ruler can provide some relational incentives to the manager and the agent under state ownership. Our model can explain the mixed success of privatizations and the slow diffusion of best management practices in emerging markets, and suggests that unbundling the two pillars of governance in advanced economies – private ownership and high-powered incentives – may be a pre-condition for development in those settings.

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1 Introduction

What makes firms like Toyota, Netflix or Caterpillar successful? Being asked this question, a Martian visitor may notice three things. First, these firms arose in market economies with democratic institutions and checks and balances on the government. Second, they are owned by private investors. Third, they adopted management practices – such as highpowered incentives, delegation of authority, and relational supply chain management – that are known to improve firm performance (Bloom, Sadun and Van Reenen, 2012; Helper and Henderson, 2014). Consistent with the observations of our Martian visitor, economic theory has shown that both private ownership of productive assets (Alchian and Demsetz, 1972; Grossman and Hart, 1986; Holmstrom, 1999) and the use of advanced management practices (Williamson, 1979; Holmstrom and Milgrom, 1991, 1994; Aghion and Tirole, 1997) are critical determinants of productive efficiency.

This paper develops a theoretical model to investigate whether the governance of capitalist firms, with its combination of private ownership and advanced management practices, can be transferred from liberal democracies to countries with weaker political institutions, and if not, what kind of governance would be efficient in such settings. Cross-country comparisons suggest the answer to these questions is not as obvious as it may seem. On the one hand, research on transition economies shows that private firms in countries with weak checks and balances are poorly managed and plagued by holdup and contracting frictions (Blanchard and Kremer, 1997; Bloom, Schweiger and Van Reenen, 2012; Knyazeva, Knyazeva and Stiglitz, 2013). Figure 1 below further illustrates this point by showing that delegation of authority – one of the managerial best practices identified by the World Management Survey – is less frequently adopted by private firms located in countries with weak protection of property rights. On the other hand, there is casuistic and empirical evidence that state-owned firms in China, India and other emerging countries have successfully adopted the management practices of capitalist firms in advanced capitalist economies, including high-powered incentives (Pucik, Xin and Everatt, 2003) delegation (Xu, 2000; Kala, 2022) and lean supply chain management (Barg, 2020). Do weak formal institutions jeopardize the ability of private firms to implement efficient management practices? Are state-owned firms more resilient to weak institutions? These are the questions addressed by our model.

Our theory builds on an important insight from organizational economics: since formal contracts are incomplete and prone to gaming and distortions, efficient management practices require credible self-enforcing agreements, or "relational incentive contracts" (Baker, Gibbons and Murphy, 2002). For instance, a firm can better incentivize its employees or suppliers through a close assessment of their contributions (subjective evaluation) than by relying on piece rate or spot market contracts. However, these subjective assessments are



Figure 1: Firm decentralization and security of property rights¹

not contractible, and hence require the firm's promise to reward deserving employees and suppliers to be sustained by the shadow of future interactions (Baker et al., 1994, 2002; Levin, 2003). Similarly, a boss can elicit initiative and innovation from her employees by delegating decision authority to them (Aghion and Tirole, 1997); however, the boss can always recentralize authority, and hence the promise to delegate must be again sustained by the shadow of the future (Baker et al., 1999). While economic models of relational contracting assume fixed (private) firm ownership and fixed (strong) political institutions, our goal here is to study how varying checks and balances on the government and the firm's ownership structure jointly affect the sustainability of relational contracts and, through that channel, economic surplus.

In our model there are two productive agents, a "seller" (equivalently, a supplier or an employee) and a "buyer" (a manager), each of whom provides inputs to a firm. Additionally, there is a non-productive agent, the "ruler," who can expropriate output (and any payments received by the buyer or the seller). The firm can be private (that is, owned by the buyer) or state-owned (that is, owned by the ruler). Agents' efforts and firm output are not perfectly contractible, implying that surplus can be enhanced by a relational incentive contract in which efforts are rewarded by the owner through a discretionary bonus. (This bonus could be

¹Note: The decentralization index (z-scored) by country is measured as the average plant manager's degree of autonomy over hiring, investment, products, and prices. The source is the LSE-CEP organizational survey (see Bloom et al., 2012). The index of security of property rights is by Ouattara and Standaert (2020). Regression analyses, available upon request, show that the positive correlation between delegation and institutional quality is robust to controlling for generalized and bilateral trust, both of which Bloom et al. (2012) found to be positively associated with delegation.

easily reinterpreted as employee empowerment, as in the delegation literature, with limited changes in notation). If the firm is privately owned, its value can be further enhanced by developing a self-enforcing "political contract" between the buyer and the rule (Greif, Milgrom and Weingast, 1994; Acemoglu, 2003). This political contract incentivizes the buyer and the seller to exert effort by turning the ruler from a "roving bandit" into a "stationary bandit" (Olson, 1993): the ruler receives a share of output in every period via taxes, in exchange for a promise not to expropriate the rest.

Under state ownership the buyer and the seller are both employed by the ruler, and thus have low-powered incentives. Consequently, relational contracts are relatively difficult to sustain because bonuses must be high enough to elicit both efforts. Private ownership reduces aggregate moral hazard, and hence makes relational contracts easier to sustain, by incentivizing one of the two productive agents (the buyer) to maximize output. This implies that if the ruler is constrained by strong formal institutions, such that there is no risk of expropriation, the private firm is more efficient than the state-owned firm. As institutional constraints on the ruler become weaker, a political contract becomes necessary to prevent expropriation, which requires rewarding the ruler via taxes. Taxation, however, reduces the future rents available to the buyer and the seller to sustain their relational contract, and as a result, incentive power and value in the private firm decline. Eventually, expropriation becomes too attractive for the ruler, the political contract breaks down, and incentive power and value at the private firm drop sharply. At the same time, the attractiveness of expropriation prevents relational incentives from being developed under state ownership, and as a result, the firm is "trapped" into a perverse combination of private ownership and poor management.

Our model also shows that the relationship between governance, firm value and institutions is non-monotonic. When institutional constraints are weak enough, low-powered incentives and low output make the poorly managed private firm an unattractive fallback option for the ruler, allowing to sustain some degree of relational contracting in a stateowned firm. Sustaining relational contracts under state ownership is now possible because the ruler owns the output and directly contracts for effort with the buyer and the seller. Thus, there is no need to "appease" a third party through taxes, and the firm's entire output surplus can be used to sustain relational incentive contracts.

An important implication of our model is that the optimal governance of firms depends not only on firm and market characteristics, as emphasized by the economic literature, but also on the political and institutional environment. While the most productive firms are privately owned and can implement "Toyota-like" management practices, that might be driven by the fact that those firms are located in countries with strong institutions. Under weak institutions, forcing a firm that manages employees and suppliers at arm's length to adopt relational governance may backfire and completely break down cooperation. Moreover, transferring advanced management practices to firms in weak institutional environments might have greater chances of success if those firms are state-owned, while privatizing a state-owned firm under weak institutions may backfire and reduce the firm's productivity.

A second set of implications of our model pertains to political economy and development. First, we show that in the design of development policies, institutions should come first, and governance should follow. Rather than attempting to import strong governance into a weak institutional environment, hoping that institutional improvements will follow economic growth, reformers should prioritize the creation of checks and balances on the government as that is a pre-condition for strong governance to be transferrable. Second, and related, our non-monotonicity result suggests that while radical institutional improvements, if feasible, improve firm governance, half-hearted reforms may backfire. Weak political institutions can support decent (though not excellent) governance but mediocre institutions can only support poor governance that will lead to a reduction in firm value. This result may explain why the transition from communism to democracy and capitalism in the former Soviet countries, back in the 1990s, reduced economic output (Blanchard and Kremer, 1997). While the transition process introduced some constraints on governmental power, such as formal property rights and democratic elections, checks and balances remained weak after the collapse of communism, and the government often enacted in arbitrary taxation, especially against foreign firms (Spar and Jarosz, 1996; Lowes et al., 2023). The prospect to tax mediocre privatized firms may have caused post-soviet rulers to breach the relational contracts that state-owned firms had developed with employees and suppliers, imprisoning the newly privatized firms into a trap of weak governance and low productivity.

The rest of this paper is organized as follows. Section 2 discusses how our model relates to the economic literature. Section 3 presents the model. Section 4 analyzes firm performance when neither relational nor political contracts are sustainable, comparing the cases of private and state ownership under different political institutions. Section 5 studies how private and state-owned firms can build political and relational contracts, characterizing the optimal governance configuration under different institutions. Section 6 discusses opportunities for future research and concludes.

2 Relation to the literature

Our paper primarily relates to two strands of economic research – the literature on relational contracts and the literature on development under weak political institutions. Early models of relational contracts emphasized the role of implicit and self-enforcing agreements in employment relationships (Bull, 1987; MacLeod and Malcomson, 1989) and the interplay of piece rates and relational incentives (Baker et al., 1994). Subsequent models generalized the theory of relational contracts (Levin, 2003), and applied it to interfirm relationships and the make-or-buy decisions (Klein and Murphy, 1997; Baker et al., 2002). More recently, models of relational contracts have explored issues such as relationship dynamics (Halac, 2012; Li and Matouschek, 2013) and multilateral relationships (Barron and Guo, 2020). Several studies have provided empirical support for these theories (see the reviews in Gil and Zanarone, 2018, and Macchiavello, 2022). Existing models of relational contracts differ from ours because they assume strong political institutions, and thus do not study how the threat of expropriation affects the ability of economic agents to sustain self-enforcing agreements.

A common theme in the literature on weak political institutions is the commitment problem faced by a powerful ruler. We discuss the contributions most relevant to our paper, while referring readers to Dixit (2004), and North, Wallis and Weingast (2009), for a more comprehensive and in-depth discussion of this literature. Olson (1993) is one of the earliest studies to argue that even an autocrat with unconstrained power may be able to promote trade and economic growth. The mechanism informally suggested by Olson is a self-enforcing agreement, sustained by repeated interactions with productive agents, which commits the ruler not to entirely appropriate the gains from trade and therefore turns her from a "roving bandit" into a "stationary bandit". A series of subsequent papers formally analyze how institutions that coordinate multilateral retaliation against the ruler in case of defection may strengthen the self-enforcing agreements described by Olson (1993). Examples of coordination institutions studied in this literature are merchant guilds (Greif et al., 1994), federalism (Weingast, 1995), democratic elections (Fearon, 2011), and uniform legal codes (Hadfield and Weingast, 2012). Aldashev and Zanarone (2017) study the separate problem of how a ruler may use self-enforcing agreements to commit to enforce contracts between traders. According and Wolitzky (2020) analyze a similar problem focusing on the case in which multiple individuals, rather than a unitary ruler, may act as enforcers.

There are two key differences between this literature and our paper. First, this literature solely focuses on the relationship between governments and economic agents and, therefore, does not study how weak constraints on the government affect the governance of transactions between agents. Second, most of the existing papers (with the exception of Aldashev and Zanarone, 2017) assume the ruler is an autocrat – that is, she can only make commitments by entering self-enforcing agreements with productive agents. In contrast, our paper allows the ruler to be constrained by formal institutions of varying strength. This innovation allows us to explore how the degree of institutional weakness modifies the optimal governance of firms. Our paper also contributes to a (small) theoretical literature in economics, which uses an incomplete contracting approach to study the choice between state and private firm ownership (Roland, 2008, provides a concise review). Early works in this literature are Sappington and Stiglitz (1987) and Laffont and Tirole (1993, ch. 17). Sappington and Stiglitz (1987) argue (without a formal model) that if contracts between the government and firms are incomplete, it is easier for the government to intervene in a state-owned firm than in a private firm, both when the intervention is socially optimal and when it is opportunistic. This creates a potential tradeoff between the two ownership structures. Laffont and Tirole (1993) provide the first formal analysis of private versus state firm ownership from the incomplete contracting perspective. In their model, the state has stronger incentives, relative to a private firm's shareholders, to hold up managerial investments ex post by redeploying the firm's assets to serve social goals. The downside of private firms is that their managers face two principals – regulators and shareholders – and this potentially dilutes the managers' incentives.

More recent studies are Schmidt (1996), Hart et al. (1997), and Williamson (1999). Schmidt (1996) argues that under private ownership the government does not observe production costs and can therefore credibly commit not to subsidize the firm. This lack of subsidy may cause inefficient bankruptcies ex post but has the benefit of incentivizing the firm's manager to invest in cost reduction ex ante. Hart et al. (1997) and Williamson (1999) study a make-or-buy problem in which government may produce a public service inhouse or outsource it to a private contractor. They argue that in-house production mutes the profit-oriented incentives typical of private contractors, and is therefore preferable when profit maximization induces overinvestment in cost cutting at the expense of service quality. Unlike our paper, none of the studies discussed so far models how institutions affect the choice between private and state firm ownership.

Che and Qian (1998) are closer to us in that they model firm ownership under an autocratic government. Focusing on the case of China, they show that since the owner of a private firm appropriates revenues hidden from the government, she exerts more productive effort than the manager of state firm; however, she also chooses a less inefficient production technology in order to facilitate revenue hiding. Aside from the modeling approach and specific predictions, the main difference between Che and Qian (1998) and our paper is that they do not allow for variation in institutions and hence do not study how institutional differences affect optimal firm ownership. Another important difference is that since the cost of private ownership in Che and Qian (1998) is a distortion in the production technology, their model cannot explain the short-run negative effects of privatizations in weakly institutionalized environments.

3 Model

Consider an infinitely lived economy consisting of a ruler, two productive agents and a court. We will call the two productive agents the "buyer" and the "seller". These agents jointly constitute a firm, and exert effort on their respective tasks. One can think of the buyer as a downstream manager, and of the seller as a supplier or an employee in an upstream division of the firm, although other interpretations are also possible. Production by the buyer and the seller is overseen by the court and the ruler, as discussed below. The output generated in the economy each period is given by

 $v = \alpha_B a_B + \alpha_S a_S,$

where a_B and a_S are the contributions of the buyer and the seller to the productive process, respectively, and α_i the respective marginal values of those contributions. For simplicity, we will assume throughout that $\alpha_B = \alpha_S = \alpha$. The private cost for each productive agent of supplying "effort" or "quality" is $C(a_i) = \frac{1}{2}a_i^2$. This productive activity can take place under two different ownership arrangements, which we will describe next, together with the roles of the ruler and the court.

Private ownership: Under private ownership, the buyer owns the output, v, and contracts with the seller for the provision of effort a_S . The ruler may collect a lump-sum tax agreed upon with the buyer, t, or expropriate the whole value generated in the private sector. The court enforces formal contracts between the buyer and the seller, and may also serve as a formal institutional constraint on the ruler's expropriation. We discuss the court's dual role below.

State ownership: Under state ownership, the ruler owns the output, v, and contracts with both the buyer and the seller for the provision of their services. The court enforces formal contracts between the ruler and the two productive agents. No expropriation risk exists as the ruler is now the residual claimant of the firm's output.

The role of the court: The court provides both contract enforcement for productive transactions and checks and balances against abuses of power by the ruler. To model these two roles, we make the following assumptions. First, with respect to contract enforcement, we assume that output is not directly contractible, but the parties can write (imperfect) contracts for each agent's effort, a_i , and for the associated compensation, β_i . In particular, there is a binary state of the world $\theta \in \{E, N\}$ that determines whether the contract is enforceable (E) or not (N). The ex ante probability of the enforcement state is $q \in [0, 1)$, in which case the court applies specific performance remedies and forces the focal agent to deliver the contracted effort a_i (regardless the size of the contracted payment β_i and hence of the counterpart's damages from non-performance).² With probability 1 - q the focal agent can breach the contract, that is, is able to satisfy the letter of the contract with zero effort, $a_i = 0$, and still collect the payment. Further, we assume the agent observes the state of the world before choosing the effort. Enforcement quality is the same whether the contract is written by the ruler or the buyer. One may interpret q as an institutional characteristic (efficiency of the legal and judicial system) or, alternatively, as a technological characteristic (simplicity of the buyer's and seller's tasks).

The second role of the court is to provide protection against misbehavior by the ruler. In particular, under private ownership, if the ruler decides to expropriate all of the output (that is, above the agreed-upon taxes), there is a probability $\tau \in (0, 1)$ with which the court can block expropriation and have the ruler deposed. With the converse probability of $1 - \tau$, the ruler's expropriation succeeds, that is, the ruler grabs the firm's output and continues in office. Under state ownership, the ruler is the residual claimant and thus no expropriation temptation exists. We interpret τ as the strength of constitutional checks and balances, such as the rule of law and the recognition of property rights.

Relationships: The goal of our model is to examine how the parties can build relationships (that is, self-enforcing agreements) given formal institutions (τ and q) and firm ownership. These relationships come in two forms. First, the parties can complement formal contracts about the agents' efforts and compensation with self-enforcing "relational contracts" to elicit effort in the non-enforcement state. Such relational contracts can exist either between the buyer and the seller under private ownership, or between the ruler and the two productive agents under state ownership. Second, under private ownership, the agents can enter a self-enforcing "political contract" with the ruler, whereby they agree to pay taxes in exchange for non-expropriation.

Timing and assumptions: The game resulting from the setup above is as follows. Each period, the stage game begins with the firm's owner contracting with the productive agents for effort. The agreement may include a formal contract, which specifies an effort level and an upfront payment (a_i, β_i) , a relational contract, which specifies an effort level for the non-enforcement state N and a bonus to be paid if the informally agreed effort is provided $(a_{i,ast}, B_{i,*})$, and a political contract, which specifies a tax (t) paid by the buyer to the ruler.³ Second, after signing formal contracts, the agents observe the state of the world

 $^{^{2}}$ For simplicity, we assume that the court can perfectly verify whether compensation is paid or not. The qualitative logic of the analysis would be unchanged if we allowed for a stochastic opportunity to breach on a contractual payment.

³As will be clear later, we can focus without loss of generality on equilibria where the buyer is receiving

(that is, whether the formal contracts are enforceable or not), and choose their efforts. If an agent deviates from the formally contracted effort and the contract is enforceable (state E), the court enforces the formal contract and the agent is forced to perform. Third, output is realized and any agreed-upon relational bonuses and taxes are paid. Fourth, under private ownership, the ruler decides whether to expropriate the firm's output, and if so, she either succeeds or is deposed. All players discount the future at the common discount factor $\delta \in [0, 1)$ and we will look for the surplus-maximizing equilibrium of the repeated game, consisting of either private or state ownership plus the relationships sustained under that ownership structure. The play following a deviation by any of the players will be discussed below as a part of the equilibrium analysis.

4 Preliminaries: Economy without relationships

To examine the value and sustainability of relationships, we first need to consider the possible equilibrium outcomes in the absence of relationships. The reason for this is that the outcomes in the absence of relationships constitute the continuation equilibria in the case of deviations by any of the players, as we will discuss in more detail when considering the building of relationships in the next section.

In the absence of relationships, there are only two types of arrangements to consider. The first is state ownership, where the ruler is the residual claimant of the output and uses only formal contracts to purchase inputs from both the buyer and the seller. The second is (unstable) private ownership, where the ruler leaves ownership in the hands of the buyer, but then attempts to expropriate the value generated each period at the risk of being deposed, while the buyer and the seller use only a formal contract to govern their relationship under the ongoing expropriation threat by the ruler. Below, we solve for the Nash Equilibria of these two alternative ownership arrangements, and in the next section we will examine how the ruler may achieve stability in the case of private ownership by building trust with the productive sector and agreeing to forego expropriation in exchange for tax payments each period, and how the sustainability of productive relationships is impacted by the ownership status in the economy and in particular the stabilization of political relationships.

4.1 Spot contracting under state ownership

Under state ownership, the ruler is the residual claimant of all output, and contracts with the buyer and the seller for their services. The formal contract consists of the provision of

the initial surplus from the productive relationship and thus the only party capable of paying taxes

action a_i in return for a payment β_i . This contract is enforced by the court. Recall that any formal payment can be verified, while the focal agent's (buyer or seller) effort can be monitored only imperfectly. In particular, with probability 1 - q, the provider can get paid without exerting the promised effort, and this opportunity is observed by the agent before choosing effort.

To solve the equilibrium of the one-shot game, consider a contract that offers a payment of β_i for delivery of a_i . In the non-enforcement state N, the focal agent will set $a_i = 0$ and keep the payment β_i . In contrast, in the enforcement state, the agent must deliver effort a_i . Then, for the agent to be willing to accept the proposed contract, it needs to be that $\beta_i - \frac{1}{2}qa_i^2 \ge 0$ and so the maximal effort that can be contracted on (conditional on payment) is given by $a_i = \sqrt{\frac{2\beta_i}{q}}$. The supplier thus loses money in the states where performance is contractible as the procurer of the service is clawing back the rents in the case where the contract is not enforceable. From this, the ruler computes the bonus necessary to elicit a given effort level, and then offers to each agent a formal contract that maximizes the surplus generated by such contract, thus solving

$$\max_{a_i} q\alpha a_i - \beta_i \left(a_i \right) = q\alpha a_i - \frac{qa_i^2}{2},$$

which gives $a_i^{ss} = \alpha$. Intuitively, given that all players have deep pockets and there are no frictions other than imperfect enforcement, the optimal formal contract specifies the first-best level of effort, although due to imperfect enforcement, the focal agent exerts such contractually specified effort only with probability q. The pairwise surplus to the ruler is then $q\alpha^2 - \frac{q\alpha^2}{2} = \frac{q\alpha^2}{2}$, and the total social surplus is equal to the ruler's total payoff, given by

$$\pi_R^{ss} = q\alpha^2,$$

while the productive agents' expected payoff is zero. This result is summarized in the following proposition:

Proposition 1 Spot contracting under state ownership

(i) The ruler implements formal contract $\left\{a_i^{ss} = \alpha, \beta_i^{ss} = \frac{q\alpha^{ss2}}{2}\right\}$, leading to a net surplus of $q\alpha^2$, all appropriated by the ruler.

Two observations are in order. First, and most relevant for the analysis of relationships below, the surplus realized under state ownership depends on the quality of the enforceability of formal contracts, q. When contracts are unenforceable, the surplus falls to zero as

it becomes impossible to incentivize production, while when contract enforcement becomes perfect, state ownership achieves the first-best outcome. Second, the analysis above assumes that the court can perfectly enforce formal payments agreed upon by the ruler. Notice that if payments were made after the agents choose efforts, the ruler could renege on the payments and have a chance τ to walk away with it (much like she can potentially get away with expropriation). However the ruler circumvents this temptation by making her formal payments upfront and then relying on the court to enforce the agents' efforts. One may worry that the ruler could make the payment upfront and then expropriate them back once the agents' efforts are sunk. However, we assume that because there is a stage of production in between the payments and the ruler's expropriation decision, the agents have time to consume their compensation before any expropriation can take place. While this assumption seems reasonable and allows us to simplify the analysis, we could easily relax it: allowing for expropriation of the formal payments would simply place an upper bound on the payment levels the ruler can commit to, and thus worsen the equilibrium surplus under state ownership, without qualitatively changing the analysis.

4.2 Spot contracting under private ownership

Under private ownership, the buyer is the residual claimant of the firm's output, and contracts with the seller for the delivery of effort a_S while at the same time choosing his own effort a_B . In addition, in the one-shot equilibrium, the ruler cannot credibly promise not to expropriate, so the equilibrium consists of the ruler attempting to expropriate every period. As we shall see, the risk of expropriation will dampen productive activity, although the ruler may still prefer to leave the firm in private hands because despite the expropriation risk, it may be more productive than under state ownership.

To solve for the resulting equilibrium, consider first the agents' efforts. The players will receive positive payoffs only if the ruler fails to expropriate the value created, which occurs with probability τ . Thus, when considering contracting between the buyer and the seller, the seller's expected payoff is given by

$$\tau\beta_S - \frac{q}{2}a_S^2$$

where β_S is the contracted payment, τ is the likelihood that the ruler fails to expropriate and q is the probability that the seller needs to deliver the contracted action. The seller is then willing to accept the contract as long as $\beta_S = \frac{q}{2\tau} a_S^2$. The buyer, in turn, receives an expected payoff of

$$\tau \left(\alpha a_B + \alpha q a_S - \beta_S\right) - \frac{1}{2} a_B^2.$$

In other words, with probability τ the buyer gets to keep the surplus, while incurring the costs of own effort and the contractual payment, which in turn may be expropriated from the seller if expropriation is successful. As a result, the buyer's effort level is given by $a_B = \tau \alpha$, while the contract with the seller will solve

$$\max_{a_S} \tau \left(\alpha q a_S - \frac{1}{2\tau} q a_S^2 \right) \to a_S^{ps} = \tau \alpha.$$

Thus, given the expropriation risk $(1 - \tau)$, we can write the output generated under private ownership as

$$y = \alpha \left(a_B^{ps} + q a_S^{ps} \right) = \tau \alpha^2 \left(1 + q \right).$$

For the ruler, this is the amount of value that she can expropriate if successful, so we can write the ruler's discounted expected payoff stream as

$$(1-\tau) \left[\Pi_R + \delta \left(1 - \tau \right) \left(u_R + \dots \right) \right] = \frac{(1-\tau)\Pi_R}{1 - \delta(1-\tau)} = \frac{(1-\tau)\tau \alpha^2 (1+q)}{1 - \delta(1-\tau)},$$

which follows from the fact that with probability $(1 - \tau)$, the expropriation is successful, yielding the ruler a realized payoff of $\Pi_R = \tau \alpha^2 (1 + q)$, which leaves the ruler in power, which allows the same ruler to attempt to expropriate the next period, which succeeds with probability $(1 - \tau)$, and so on, while a failure means the ruler is deposed and a new ruler is installed. As a result, the per-period average payoff of the ruler is given by

$$\pi_R^{ps} = \frac{(1-\delta)(1-\tau)\tau\alpha^2(1+q)}{1-\delta(1-\tau)},$$

while the economy-wide surplus is given by

$$\tau \alpha^2 (1+q) - \frac{1}{2} (\tau \alpha)^2 - \frac{q}{2} (\tau \alpha)^2 = (1+q) \tau \left(\frac{2-\tau}{2}\right) \alpha^2.$$

This solution is summarized in the following proposition:

Proposition 2 Spot contracting under private ownership:

(i) Under private ownership, the buyer chooses $a_B^{ps} = \tau \alpha$ and offers a contract $\{a_S^{ps} = \tau \alpha, \beta_S^{ps} = \frac{1}{2}qa_S^{ps2}\}$ to the seller, leading to a total surplus of $(1 + q) \tau \left(\frac{2-\tau}{2}\right) \alpha^2$, split between the ruler and the productive agents. The ruler attempts to expropriate every period and is deposed each time with probability τ



Figure 2: Preferences of state and private ownership in spot markets

There are three key differences between the solutions under state ownership and private ownership. First, since under private ownership the buyer is residual claimant of the firm's output, he will always perform the efficient action. As a result, surplus is less sensitive to the quality of formal contract enforcement, scaling with 1 + q instead of 2q. Second, surplus under private ownership is dampened due to the expropriation risk, which is absent under state ownership. Third, under private ownership, some of the surplus remains in the hands of the productive sector due to possibility that the ruler's expropriation efforts fail. These three basic points then lead to the comparison between the two arrangements, as summarized in the following proposition:

Proposition 3 Choice between private and state ownership in the absence of relationships:

(i) If the arrangement is chosen cooperatively at the beginning of the game to maximize social surplus, then private ownership is preferred over state ownership when $q \leq \frac{\tau(2-\tau)}{(1+(1-\tau)^2)}$ and vice versa.

(ii) If the arrangement is chosen by the ruler, then private ownership is preferred over state ownership when $q \leq \frac{(1-\delta)(1-\tau)\tau}{(1-(1-\tau)(\delta+(1-\delta)\tau))}$ and vice versa.

First, as noted, the relative advantage of state ownership is increasing in q and decreasing in τ , leading to the basic comparison. In addition, since the ruler is unable to extract all the surplus under private ownership, she is more reluctant to implement private ownership than the society as a whole, and increasingly so when the likelihood of being deposed or her patience increase, as she comes to care increasingly about the future value she will not realize if deposed. This basic mapping is illustrated in Figure 2.

5 Building relationships

Having established what equilibria in the economy are feasible in the absence of relationships, we can now consider the effect of formal institutions and ownership on the players' ability to improve surplus by building relationships. We will first consider the feasibility of political contracts (use of taxation instead of ruler's expropriation under private ownership) in isolation, to develop intuition and insights for our main analysis. Then, we will study the feasibility of relational contracts (self-enforcing agreement about productive efforts) as a function of the choice of ownership structure and the availability of political contracts. This analysis will ultimately enable us to characterize the equilibrium firm governance (i.e., the bundle of ownership and agents' incentives) and the equilibrium institutions (i.e., the ruler's behavior) under different kinds of formal institutions (contractual enforcement quality and constraints on expropriation).

5.1 Sustainability of political contracts

The state, as described so far, is quite dysfunctional: either the ruler owns the firm and is the residual claimant of output, with the associated inefficiencies, or the state lacks any political stability as the ruler engages in constant expropriation. In the latter case, while the firm is nominally private, its productivity is severely constrained. Political contracts, whereby the productive agents pay taxes to the ruler in exchange for stability, are the solution to this problem that plagues private ownership. As a benchmark, we begin by considering the sustainability of political contracts in the absence of relational contracts (i.e., contracts on productive efforts). In the next section we will study the interaction between political and relational contracts. Assume for the moment that productive relationships continue to be governed by formal contracts only, as in section 4, while the ruler now promises not to expropriate the private firm in return for total tax payments of $t.^4$.

From the perspective of the buyer and the seller, the absence of expropriation is equivalent to perfect formal institutions ($\tau = 1$) and so the solution follows immediately from above: the buyer offers a contract $\left\{a_S^{pc} = \alpha, \beta_S^{pc} = \frac{q(\alpha^*)^2}{2}\right\}$ to the seller, who then receives no surplus. Similarly, the buyer, as the residual claimant on his own task will set $a_B^{pc} = \alpha$. As a result, the surplus generated under private ownership is given by $\left(\frac{1+q}{2}\right)\alpha^2$. The only remaining question is whether the ruler is satisfied with collecting the taxes or attempt to expropriate the whole output in the economy. The maximal tax that can be collected is

 $^{^{4}\}mathrm{The}$ allocation of tax payments between buyer and seller does not matter, so we will assume that all taxes are paid by the buyer

given by $t = \left(\frac{1+q}{2}\right) \alpha^2$, the surplus in the economy. An attempt at expropriation would give the ruler an expected payoff of

$$(1-\tau)\left((1+q)\,\alpha^2 + \frac{\delta}{1-\delta}\pi_R^{dev}\right),\,$$

where $\pi_R^{dev} = \max\{\pi_R^{ss}, \pi_R^{ps}\}$, the better of the two spot arrangements for the ruler as derived above. In other words, with probability τ , the ruler fails at the expropriation attempt and is deposed, while with probability $(1 - \tau)$, she grabs the whole surplus generated, and having successfully taken over the economy, she can dictate the continuation equilibrium (who will own the firm going forward). We can then write the sustainability of the political contract as

$$\frac{1}{1-\delta}t \ge (1-\tau)\left((1+q)\,\alpha^2 + \frac{\delta}{1-\delta}\pi_R^{dev}\right) \leftrightarrow \left(\frac{1+q}{2}\right)\alpha^2 \ge (1-\tau)\left((1-\delta)\left(1+q\right)\alpha^2 + \delta\pi_R^{dev}\right).$$

From here, we obtain the following proposition:

Proposition 4 Sustainability of political contracts:

(i) When the ruler's fallback option is private ownership under expropriation, political contracts are sustainable if and only if $\frac{1}{2} \geq \frac{(1-\tau)(1-\delta)(1-\delta(1-\tau)^2)}{1-\delta(1-\tau)}$. (ii) When the ruler's fallback option is state ownership, political contracts are sustainable if and only if $\frac{1}{2} \geq (1-\tau)\left(1-\frac{\delta}{1+q}\right)$.

The resulting boundary is illustrated in Figure 3, with the solid lines representing the sustainability of the taxation equilibrium for different discount factors, while the dashed lines represent the ruler's choice between state and private ownership in the case of no political contract. Intuitively, the taxation equilibrium is sustainable only when the constraints on the executive are sufficiently good, and patience of the ruler substitutes for the constraints so that as the patience of the ruler goes up, the constraints needed for the sustainability of the political contract decrease. The fact that the taxation equilibrium may not be sustainable follows from the somewhat counterintuitive observation that since private ownership is relatively efficient, the temptation to expropriate the value can become overwhelming even when such efficiency can also support high tax payments overall. Finally, when the fallback option remains private ownership, the sustainability of the political contract decrease is private ownership.



Figure 3: Sustainability of the political contract and the fallback options upon deviating

markets is always proportional to (1 + q) and so cancels out in the comparison. When the fallback option is state ownership, quality of contract enforcement tightens the constraint since state ownership is more dependent on the quality of formal contracts and thus becomes relatively more attractive solution following a deviation, thus eroding the sustainability of the political contract itself.

5.2 Building productive relational contracts in the shadow of institutions

We now turn to examine how surplus can be enhanced by building productive relational contracts in the shadow of the possible institutional configurations: state ownership, private ownership under expropriation threat, and private ownership under a political contract. We will first consider each of these arrangements separately, and then we will study which of them achieves the highest total surplus.

5.2.1 State ownership

Under state ownership, there is no political contract but also no expropriation threat since the state is already the residual claimant of the firm's output. The only issue at hand is the credibility of the ruler's promise to pay informal bonuses to the agents in exchange for effort. Let (β_i, a_i) denote the formal contract, as in our analysis above. Since the formal contract implements the efficient efforts in the enforcement state, we can focus, without loss of generality, on a setting where the ruler offers an informal bonus only in the state where the formal contract is not enforceable. Let $(B_{i,*}, a_{i,*})$ denote this relational contract, composed of the bonus and an effort level for the non-enforcement state.

For a given productive agent i (buyer or seller), the agent is then willing to deliver the promised effort in return for the promised payment as long as

$$B_{i,*} - \frac{1}{2}a_{i,*}^2 + \frac{\delta}{1-\delta} \left(\beta_i - q\frac{1}{2}a_i^2 + (1-q)\left(B_{i,*} - \frac{1}{2}a_{i,*}^2\right)\right) \ge 0,$$

while the agent's participation constraint requires that

$$\beta_i - q\frac{1}{2}a_i^2 + (1-q)\left(B_{i,*} - \frac{1}{2}a_{i,*}^2\right) \ge 0.$$

To construct the ruler's constraint for honoring the promised payments, we assume that the enforceability shock for formal contracts is perfectly correlated across the agents. Then, the ruler will deviate either on both contracts or none and the relationship will be sustainable as long as

$$-2B_{i,*} + \frac{2\delta}{1-\delta} \left(-\beta_i + q\left(\alpha_i a_i\right) + (1-q)\left(\alpha_i a_{i,*} - B_{i,*}\right)\right) \ge \frac{\delta}{1-\delta} \pi_R^{dev},$$

where π_R^{dev} denotes, as before, the ruler's payoff following a deviation (discussed more below). Now, the ruler's optimal offer of a relational contract will leave the agent just indifferent between honoring the promise or not, which allows us to write

$$B_{i,*}\left(1 + \frac{\delta}{1-\delta}\left(1-q\right)\right) = \frac{1}{2}a_{i,*}^2 - \frac{\delta}{1-\delta}\left(\beta_i - q\frac{1}{2}a_i^2 - (1-q)\left(\frac{1}{2}a_{i,*}^2\right)\right),$$

while we can rewrite the ruler's constraint as

$$-2\left(1+\frac{\delta}{1-\delta}\left(1-q\right)\right)B_{i,*}+\frac{2\delta}{1-\delta}\left(-\beta_{i}+q\left(\alpha a_{i}\right)+\left(1-q\right)\left(\alpha a_{i,*}\right)\right)\geq\frac{\delta}{1-\delta}\pi_{R,i}^{dev},$$

and so combining the two we get

$$-a_{i,*}^2 + \frac{2\delta}{1-\delta} \left(q \left(\alpha a_i - \frac{1}{2} a_i^2 \right) + (1-q) \left(\alpha a_{i,*} - \frac{1}{2} a_{i,*}^2 \right) \right) \ge \frac{\delta}{1-\delta} \pi_{R,i}^{dev},$$

which gives the credibility constraint for the efforts (and thus the informal bonuses) that can be implemented by the ruler. Since the credibility of the relational contract is independent of the formal payments and increasing in the surplus created by the formal contract, the ruler will continue to select a formal contract where $a_i = \alpha$, and thus the credibility constraint for the relational contract simplifies to

$$\delta\left(2\left(q\left(\frac{\alpha^2}{2}\right) + (1-q)\left(\alpha a_{i,*} - \frac{1}{2}a_{i,*}^2\right)\right) - \pi_R^{dev}\right) \ge (1-\delta)a_{i,*}^2.$$
(1)

The ruler then solves

$$\max_{a_{i,*}} \alpha a_{i,*} - \frac{1}{2} a_{i,*}^2$$

s.t. Equation 1,

solution to which determines $a_{i,*}$, and the resulting social surplus (and thus the ruler's payoff) that can be attained is given by

$$u_R = q\alpha^2 + 2(1-q)(\alpha a_{i,*} - \frac{1}{2}a_{i,*}^2)$$

Ruler's deviation payoff: Before proceeding, we need to address the determination of the ruler's deviation payoff following a deviation either from the relational contract (like here) or from the political contract (as analyzed below) when the private sector is also using relational contracts to manage their relationships. The assumption that we make is that if a deviation by the ruler occurs, the continuation equilibrium will use no relational contracts. In particular, here, if the ruler deviates and the breaking of the relational contract makes production so inefficient that the ruler prefers to privatize the assets, in that continuation equilibrium the buyer and the seller will not use a relational contract to improve their relationship. Similarly, if the ruler breaks the political contract (below), the assumption is that in the continuation equilibrium the ruler is unable to use relational contracts with the buyer or the seller if under state ownership, nor will the buyer and the seller attempt to use a relational contract under expropriation threat if under nominal private ownership. We choose this approach because such contagious breakdown of trust maximizes the punishment on the ruler. Now, one could also argue that a deviation by the ruler should not affect the ability of the private parties to use relational contracts with each other, or maybe even if the ruler breaks the political contract, she might be able to use a relational contract with the buyer and the seller under state ownership. Such modifications would simply weaken the sustainability of relationships under both state and private ownership without qualitatively affecting the analysis.

5.2.2 Private ownership under expropriation threat

Let us now consider the ability of the buyer and the seller to sustain relational contracts under private ownership, first under expropriation threat and then under taxation. As above, Let $(B_*, a_{S,*})$ denote the relational contract offered by the buyer to the seller and (β, a_S) the formal contract. We can then write the buyer's payoff as

$$\tau \left(\alpha a_B + q \alpha a_S + (1-q) \left(\alpha a_{S,*} \right) - (1-q) B_* - \beta \right) - \frac{1}{2} a_B^2,$$

where τ is the probability that expropriation fails and so the buyer gets to keep the surplus generated. The seller's payoff can be written as

$$\tau\beta + (1-q)\tau B_* - \frac{1}{2}qa_S^2 - \frac{1}{2}(1-q)a_{S,*}^2.$$

As a result, the solution for the buyer's effort continues to be $a_B = \tau \alpha$, while the reneging constraint for the subjective bonus payment can be written as

$$-\tau B_* + \frac{\delta}{1-\delta} \left(\frac{(\tau \alpha)^2}{2} + \tau \left(q \alpha a_S + (1-q) \left(\alpha a_{S,*} \right) - (1-q) B_* - \beta \right) \right) \ge \pi_B^{dev}.$$

To maximize the punishment upon deviation, we assume that $\pi_B^{dev} = 0$, which we can achieve simply by giving the contracting rights (i.e., the right to make a take-it-or-leave-it offer) to the seller upon deviation. For the seller to be willing to accept the formal contract and to adhere to the relational contract it needs to be that

$$\tau\beta + (1-q)\tau B_* - \frac{1}{2}qa_S^2 - \frac{1}{2}(1-q)a_{S,*}^2 \ge 0$$

and

$$\tau B_* - \frac{1}{2}a_{S,*}^2 + \frac{\delta}{1-\delta} \left(\tau \beta + (1-q)\tau B_* - \frac{1}{2}qa_S^2 - \frac{1}{2}(1-q)a_{S,*}^2 \right) \ge 0,$$

where the first constraint is the seller's participation constraint and the second is the seller's reneging temptation for the relational contract. As in the case of state ownership above, we can then combine the buyer's and the seller's constraints for adhering to the relational contract as

$$\frac{\delta}{1-\delta} \left(\frac{(\tau \alpha)^2}{2} + \tau \left(q \alpha a_S + (1-q) \left(\alpha a_{S,*} \right) \right) - \frac{1}{2} q a_S^2 - \frac{1}{2} (1-q) a_{S,*}^2 \right) \ge \frac{1}{2} a_{S,*}^2.$$
(2)

As in our earlier analysis, sustainability of the relational contract is maximized when the formal contract is efficient, giving $\tau \alpha = a_S$. Finally, since the allocation of surplus is irrelevant to the action choices, we can again focus without loss of generality on the case where the seller is held to zero surplus and so the relational bonus payment is dictated by

 $\tau B_* = \frac{1}{2}a_{S,*}^2 \Leftrightarrow B_* = \frac{1}{2\tau}a_{S,*}^2$. Thus, we have that the solution under private markets under the shadow of expropriation follows from the buyer solving

$$\max_{a_{S,*}} \left(\frac{(1+q)(\tau\alpha)^2}{2} + \tau(1-q) \left(\alpha a_{S,*} - \frac{1}{2\tau} a_{S,*}^2 \right) \right)$$

s.t. Equation 2.

The resulting total surplus generated each period is then given by

$$au \alpha^2 (1+q) \left(\frac{2-\tau}{2}\right) + (1-q) \left(\alpha a_{S,*} - \frac{1}{2}a_{S,*}^2\right).$$

Note that relative to the solution above, the key shortcoming of private markets under expropriation threat is that the threat of expropriation is dampening the parties' interests to build effective relational contract, just like it dampens the parties' interests to use efficient formal contracts.

5.2.3 Private ownership under a political contract (taxation)

The final arrangement to consider is private ownership under taxation. Now, the buyer and the seller need to use the surplus available to build both the political contract with the ruler to prevent expropriation and the relational contract with each other to support more efficient production. Following the logic from above, we can again focus without loss of generality on equilibria where the buyer receives all the surplus from the productive relationship and thus is the only party paying taxes in equilibrium.

Once the expropriation threat is eliminated, the seller's constraint for honoring the relational contract reduces to $B_* \geq \frac{1}{2}a_{S,*}^2$, while the buyer's constraint for honoring the relational contract reduces to

$$\frac{\delta}{1-\delta}\left(\frac{(1+q)\alpha^2}{2} + (1-q)\left(\alpha a_{S,*} - B_*\right) - t\right) \ge B_*,$$

which follows from the fact that the tax payment will be enforced independent of the break in the relationship, while the continuation value for the buyer following a deviation, π_B^{dev} , is again set to zero. Finally, for the ruler, the expropriation constraint becomes

$$\frac{1}{1-\delta}t \ge (1-\tau)\left(\alpha a^e_B + q\alpha a^e_S + (1-q)\alpha a^e_{S,*} + \frac{\delta}{1-\delta}u^{dev}_R\right),$$

where the effort levels are in expectation since the ruler cannot observe these directly due to her distance from the productive activity, while π_R^{dev} gives the ruler's continuation payoff following successful expropriation (and potential reallocation of ownership), as before.

Given the lump-sum taxation, it follows immediately that the buyer and seller set $a_B = a_S = \alpha$, which then equal the expected efforts, and we can combine credibility constraint for the bonus payments and taxation to yield

$$\frac{(1+q)\alpha^2}{2} + (1-q)\left(\alpha a_{S,*} - \frac{1}{2}a_{S,*}^2\right) - \frac{(1-\delta)}{2\delta}a_{S,*}^2 \ge (1-\tau)\left((1-\delta)\left((1+q)\alpha^2 + (1-q)\alpha a_{S,*}^e\right) + \delta\pi_R^{dev}\right)$$
(3)

and so we get that the buyer will choose the seller's relational effort (i.e., his effort in the non-enforcement state) to solve

$$\max_{a_{S,*}} \left(\frac{(1+q)\alpha^2}{2} + (1-q) \left(\alpha a_{S,*} - \frac{1}{2} a_{S,*}^2 \right) - t \right)$$

s.t. Equation 3 and $a_{S,*} = a_{S,*}^e$,

with the resulting social surplus then given by

$$\pi_B + \pi_R = \frac{(1+q)\alpha^2}{2} + (1-q)\left(\alpha a_{S,*} - \frac{1}{2}a_{S,*}^2\right).$$

5.3 Choice of governance structure

Having derived the solution under each of the three arrangements, we can now consider which arrangement is able to achieve the highest social surplus as a function of the underlying parameters, that is, formal institutions (q and τ) and the players' patience. The resulting solution is illustrated in Figure 4 for various τ , q and δ . As the analysis above intuitively suggests, whenever constraints on the executive are sufficient, the equilibrium is characterized by private ownership under both relational and political contracts. When the constraints on the ruler are not sufficient to make the political contract sustainable, the equilibrium solution reverts to either state ownership or private ownership under expropriation threat.

Regarding the choice between state ownership and private ownership under expropriation threat, Figure 4 illustrates how state ownership is more likely to be optimal both when the quality of contract enforcement is high and when the players are sufficiently patient. The reason for this result follows from two simple observations. First, state ownership benefits relatively more from high-quality contract enforcement due to its relatively higher dependence on it. Second, when the ruler becomes more patient, she becomes more able to build productive relational contracts with both the buyer and the seller, while the surplus realized by the buyer and the seller under private ownership remains limited due to the ongoing expropriation threat.



Figure 4: Equilibrium governance structures

Finally, when both the quality of contract enforcement and patience are low, the choice between state and private ownership (under expropriation) depends on the constraints on the executive. State ownership is preferred for low formal checks and balances (low τ) while private ownership is preferred for higher τ , a comparison that we will discuss in more detail below.

The results so far thus confirm the common logic that sustaining functional private productive activity requires sufficient constraints on the ruler. Novel insights arise, however, as we examine how surplus varies when we change the level of constraints on the ruler. This analysis reveals the possibly non-monotone relationship between constraints on the ruler and surplus. An illustrative example of this is provided in Figure 5, which plots the choice of arrangement as a function of the constraints, τ , together with the expected surplus and the value created by the relationships over the static Nash equilibrium.

Consider first the left panel, which illustrates the solution under impatient ruler. When the constraints on the ruler are weak, the equilibrium arrangement is state ownership, where



Figure 5: governance choice and expected surplus as a function of constraints on the executive

the ruler maintains relational contracts with the buyer and the seller, and where these relationships are sustained by the reversion to static state ownership. When the constraints improve, the deviation outcome switches to private ownership under expropriation. Because this arrangement now provides a more profitable fallback option than state ownership, the ruler's ability to sustain relational contracts with the buyer and the seller weakens and so while the equilibrium arrangement remains state ownership, its performance is weakened. Eventually, the ruler's ability to sustain relationships becomes so weak that it is better to switch to private markets under expropriation, despite the fact that the performance of private markets is also severely compromised due to the high fear of expropriation. But as the constraints on the ruler improve even further, performance improves and eventually political contracts become feasible, the fear of expropriation is eliminated and the performance of private markets jumps.

The results thus reveal a *privatization trap*. When contract enforcement is sufficiently weak, the economy does the worst for intermediate constraints on the ruler. Under weak institutional constraints, the ruler's fallback option is sufficiently bad that she is able to build relational contracts with the productive sector for fear of losing the value of those relationships. Under strong institutional constraints, the ruler is able to credibly commit to respect private property rights and the full potential of private ownership can be realized. However, under intermediate constraints, unstable private ownership provides too good of an option for the ruler to fall back on so that she cannot credibly build relationships under state ownership, while at the same time the expropriation fear handicaps the functioning of the private ownership. Thus, we have an equilibrium where productive assets are nominally



Figure 6: Expected surplus in equilibrium as a function of constraints on the executive and quality of contract enforcement

in private hands, but perform worse than they did under state ownership (the optimal arrangement when institutional constraints on the ruler were lower). Finally, the right panel illustrates how the dip in performance from better constraints on the ruler can arise even when the economy transitions from state ownership to private markets under taxation. The reason, again, is that once private ownership under expropriation becomes the fallback option, the ruler's ability to engage in relational contracts with the buyer and the seller is limited.

Whether the dip in performance occurs will depend crucially on the level of formal contract enforcement. If contract enforcement is worse than depicted, the dip gets amplified, while as contract enforcement improves, eventually the dip is eliminated and any improvements in constraints on the ruler provide an improvement in surplus. This arises when the fallback option for the ruler remains state ownership and so the sustainability of relationships is never eroded through the improvement in the fallback option of the ruler. This result is illustrated in Figure 6, which plots the maximal attainable surplus as a function of both τ and q for two different discount factors of the players. In the Figure, the right panel illustrates how the performance may be non-monotone in the quality of formal contract enforcement as well, again due to the changing fallback option of the ruler under state ownership. Again, performance under state ownership can be minimized for intermediate q, which are good-enough to provide a feasible fallback option upon deviation from the relational contract while not being that great in really fixing the contracting inefficiencies.

6 Discussion of empirical relevance and conclusion

We conclude our paper by discussing empirical patterns consistent with our model and opportunities for future empirical research. We begin by reviewing historical evidence on the relative performance of and transition from state to private firm ownership in the former Soviet bloc and South Korea. We then discuss how one could move beyond these encouraging historical correlations and develop a thorough test of our model, which jointly examines our theoretical prediction on how institutions affect firm ownership and management practices.

6.1 Privatizations

An extensive empirical literature, reviewed by Megginson and Netter (2001), finds that privatization in the OECD countries has been generally successful in increasing the productivity and profitability of firms. Some developing and transition economies, most notably Chile and the Czech Republic, also undertook successful privatizations (Biais and Perotti, 1999). Contrarily, in several developing countries, particularly in the former Soviet area, privatizations have been shown to reduce the productivity of former state firms (e.g., studies in Roland, 2008; Knyazeva et al., 2003; Brown et al., 2006; Guriev and Megginson, 2007). In Russia, Karas et al. (2010) find that private banks perform worse than state-owned banks, even in the late 2000s, and that this difference cannot be explained by the choice of production process, the bank's environment, management's risk preferences, the bank's activity mix, or bank size. Anderson et al. (2000) study the early-1990s privatization in Mongolia and find that after privatization, firms with residual state ownership appear to be more efficient than fully private firms. More generally, Nellis (1999) argues that "the farther east one travels, the less likely is one to see rapid or dramatic returns to privatization" (p. 6).

Our model can explain these seemingly conflicting facts. The OECD countries had relatively developed political institutions as they started to privatize state firms in the 1990s (mostly to ease their government budgetary constraints). In all of those countries, the government's taxation power was constrained by an independent elected parliament, though there were differences across them in the strength of broader checks and balances on the government's discretion. In contrast, many developing countries on which privatizations were imposed (often as a precondition for international loans) had weak political institutions. In particular, despite their formal transition to democracy and the creation of checks and balances that did not exist under communist rule, the ex-Soviet countries in the 1990s continued to have imperfect protection of property rights and an unpredictable and punitive tax system (Black et al., 2000). Consistent with these patterns, our model predicts that under mediocre political institutions (i.e., neither autocracy nor advanced democracy), privatizing and then expropriating state-owned enterprises is too attractive for the government, preventing the development of even the modest relational contracts with employees and suppliers that were sustainable under state ownership during autocratic rule. As a result, privatized firms experience a decline in productivity, and are caught in a low-productivity trap until political institutions move closer to the advanced democracy benchmark. Indeed, the historical evidence suggests that privatizations did succeed in countries that transitioned more rapidly to advanced democratic institutions, such as Chile (1986-91) and the Czech Republic (1991-94).

6.2 Industrial development in South Korea

Prior to 1987 (the Sixth Republic), South Korea was essentially governed by military rule (although in 1963-1987 the political regime was nominally democratic). In 1987, antigovernment protests induced a regime change and led to the first direct presidential election in 16 years. Although the first president in this new regime (Roh Tae-woo) came from the military, his government promoted democratization (by increasing freedom of the press, liberalizing international travelling, and giving autonomy to the universities). As a result of these reforms, in 1992 South Koreans elected the first civilian president in 30 years (Kim Young-sam). Since then, South Korea has been effectively a democratic regime.

Amsden (1989) argues that the sustained economic growth of South Korea in a period characterized by weak political institutions (1960-1980) was enabled by the state's involvement in productive activities and by its tight links to business conglomerates (chaebols). Consistent with that, Lane (2019) shows that firms in sectors declared as militarily strategic by the state in 1973 (e.g., the heavy chemicals industry) grew 80 per cent more than comparable manufacturing firms not targeted by the state. Milhaupt and Pistor (2008) investigate in greater depth the role of the chaebols. They note that in the absence of investor protections and a legal framework for financial contracts, the chaebols engaged in a symbiotic relationship with the government, which could influence their business decisions but provided in exchange capital protection from competition, licenses, and favorable regulations. In other words, the chaebols could be seen as quasi-state actors.

The Korean chaebol system was fairly productive when Korean industry primarily relied on the diffusion of foreign technology (Amsden, 2001). However, once the country reached the technological frontier, the Korean model of economic development began showing weaknesses. In additional to the lack of modern legal institutions, the corrupt interlinkage between government and the chaebols was financially harmful for the state (Pirie 2007: 76). Moreover, the chaebols wanted to relax (at least partially) their alliance with the government to gain access to international credit markets (Hundt 2009: 94). As a result of these deficiencies, economic reformers gradually took control of the government's agenda and launched a new wave of institutional reforms in 1997, following the financial crisis. Reforms between 1997 and 2000 deregulated economic activity and established an independent financial regulator, an autonomous central bank, and other checks and balances and market-supporting institutions (Pirie 2007: 107-122). Altogether, these reforms sparked a new and different growth model, based on private economic initiative, which led to a rapid increase in South Korea' RD intensity (Santacreu and Zhu 2018) and innovation (Jamrisko et al. 2019).

Like the historical patterns of privatizations, those of Korean industrial development are consistent with our model. State-owned and semi-private firms performed relatively well under non-democratic institutions, then declined when the country established free elections but lacked the checks and balances of advanced liberal democracies. As the country completed its democratization process, its economic system transitioned to full private ownership and firm productivity increased.

6.3 Testability

Testing our model requires firm-level data on ownership structure and management practices, and exogenous variations in political institutions and firm ownership. While gathering such data is ambitious, recent advances in empirical research in both organizational economics and development suggest it is feasible. The World Management Survey research program has collected (and continues to collect) firm-level data on management practices, including the use of pay-for-performance and delegation, across several countries. Recent studies (Macchiavello and Morjaria, 2020) have surveyed relational management practices in buyer-supplier relationships within a given developing country, providing a benchmark that could be leveraged in future cross-country studies. There are well established approaches to instrument for political checks and balances and the protection of private property rights across countries (Acemoglu, Johnson and Robinson, 2001; Acemoglu and Johnson, 2005), which could be combined with the aforementioned data to study the effect of institutions on firm governance and management practices. Lastly, field experiments on organizational design and management practices have been increasingly conducted in large emerging economies, such as China and India (e.g., Kala, 2022), where there is withincountry variation in both institutional quality and firm ownership.

One plausible strategy to test our model would be to develop a field experiment in which relational management practices are introduced in random samples of state-owned and private firms within country, or across randomly chosen suppliers of a multinational firm operating in multiple countries with varying political institutions. The former experiment could be conducted in collaboration with a governmental or international agency whereas the latter experiment could be conducted in collaboration with a multinational. In the latter experiment, buyer-supplier relationships in which a supplier of the multinational works for a local state-owned firm could serve as a control group. Empirical studies along these lines would provide important insight for research on organizations and development as well as for policy, and we hope they will be pursued in the near future.

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