

# Ownership Structure and the Temptation to Loot

## Evidence from Privatized Firms in the Czech Republic

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Evidence from the Czech Republic shows that financial incentives and regulation are as important as ownership structure in the design of privatization.

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## Summary findings

Using a new data set on privatized firms in the Czech Republic, Cull, Matesova, and Shirley examine how the design of privatization affects outcomes.

Earlier studies of privatization in the Czech Republic focused largely on how the broad distribution of shares through vouchers may have motivated the new owners to strip assets from privatized firms.

The authors find evidence for static asset stripping, but also for what Akerlof and Romer (1993) call looting—

borrowing heavily with no intent to repay and using the loans for private purposes. This looting occurred because the larger privatized companies had privileged access to credit from state-controlled banks, which had little incentive to enforce debt contracts.

The policy implications are significant: financial incentives and regulation are as important as ownership structure in the design of privatization.

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**OWNERSHIP STRUCTURE AND THE TEMPTATION TO LOOT:  
EVIDENCE FROM PRIVATIZED FIRMS IN THE CZECH  
REPUBLIC**

By

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## 1. Introduction

Firms are likely to gravitate to ownership structures that yield the best performance. Those structures are likely to differ across industries or even across different firms in the same industry, so that one might expect little relationship between measures of ownership structure, such as concentration levels, and relative performance. Indeed, Demsetz and Lehn (1985) found that for a sample of U.S. firms there was no significant relationship between ownership concentration and profit rates. They noted, however, that ownership was relatively concentrated for the vast majority of firms in their sample. One could interpret those results as indicating that, in a country like the U.S., where equilibrium ownership structures have been achieved and protection of minority shareholders is adequate, small variations in concentration have little impact on profitability.

However, more recent evidence casts doubt on the idea that, in general, there is no relationship between the ownership structure of a firm and its performance. Using Tobin's Q as the measure of firm profitability, Morck, Shleifer, and Vishny (1988) find a positive relationship between profitability and ownership for ownership shares in U.S. firms between 0 and 5 percent. For shares larger than 5 percent, they find a negative relationship. Shleifer and Vishny (1997) provides one possible interpretation of that finding:

“[C]onsistent with the role of incentives in reducing agency costs, performance improves with higher manager and large shareholder ownership at first. Yet, as ownership gets beyond a certain point, the large owners gain nearly full control and are wealthy enough to prefer to use firms to generate private benefits of control that are not shared by minority shareholders. Thus there are costs associated with high ownership and entrenchment, as well as with exceptionally dispersed ownership.”<sup>1</sup>

Stulz (1988) provides a formal theory of the roof-shaped relationship between ownership concentration and firm performance, and McConnell and Servaes (1990) and Wruck (1989) provide additional empirical support for that proposition.<sup>2</sup>

Outside of the U.S., little country-level evidence exists on the effects of ownership structure on firm performance. This is largely because ownership structures

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<sup>1</sup> p. 759.

<sup>2</sup> McConnell and Servaes, however, find a positive relation between profitability and ownership concentration until the largest shareholding reaches approximately 40% to 50%.

are highly concentrated in almost all other countries, which is presumably due to the relatively weak protections afforded minority shareholders – potential small shareholders do not willingly enter into an arrangement in which they could be exploited by larger shareholders.<sup>3</sup> Because of the dispersed shareholding that resulted from voucher privatization programs, the transition economies offer a unique opportunity to study the extent to which minority shareholder expropriation might occur. We study the Czech experience because it represents an attempt at voucher privatization in one of the stronger institutional settings among transition countries, in striking contrast to failures in institutionally weaker states, such as countries in the former Soviet Union. If we find evidence of expropriation in the Czech Republic, one can probably assume that it would be worse in less institutionally developed countries. Understanding the Czech case is also important to future privatizers, who would want to know whether any failings of the Czech privatization were due to failure to concentrate assets, failure to select for better owners, or, as we shall show, both of these factors in combination with wider policy and institutional failings.

The Czech Republic has increasingly become an example for critics of voucher privatization who argue that the free or virtually free transfer of shares in state owned enterprises to citizens produces bad corporate governance. These critics agree that poor corporate governance and weak rule of law gave managers (and/or dominant owners) an opportunity to strip assets from the firm for their sole benefit, rather than exert extra effort to secure future economic returns that might have to be shared with minority owners, a process known as “tunneling.”<sup>4</sup> They disagree, however, on whether bad corporate governance resulted because voucher privatization dispersed ownership too widely or because it failed to select for better types of owners. They also do not explain how badly run, privatized firms have managed to survive for years, presumably after all valuable assets have been stripped, or why owners would want to purchase additional stock to concentrate their shares, as happened quickly in the Czech Republic.<sup>5</sup>

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<sup>3</sup> Shleifer and Vishny (1997).

<sup>4</sup> Johnson, La Porta, Lopez-de-Silanes and Shleifer 2000 defines tunnelling as “the transfer of assets and profits out of firms for the benefit of their controlling shareholders.”

<sup>5</sup> World Bank 1998 found that firms where the largest owners held more than 50% of shares increased from 1% of all listed firms in 1993 to 38% in 1997, and those where the largest owner held 30 to 50% increased from 6 to 35% of all listed firms over the same period.

The case that failure to concentrate ownership resulted in poor performance is made in Weiss and Nikitin 1998, which argues that the initial wide dispersion of ownership and rules limiting share ownership for some investors meant that voucher-privatized Czech firms had no single concentrated owner who was motivated and capable of exercising control over managers. This separation of ownership and control was exacerbated by the fact that most voucher shares were held by investment funds. Weiss and Nikitin 1998 and World Bank 1998 suggest that the closed ended nature of many of these funds, which meant that shares could not be redeemed, gave shareholders no way to discipline fund managers, and this in turn gave fund managers no incentive to monitor actively the managers of the enterprises. World Bank 1998 further argues that the management contracts that were written to block most takeovers, virtually eliminated the market for corporate control. The weak to nil enforcement of legal protection of minority shareholders gave small shareholders little chance to replace managers who ignored their interests.

Claessens and Djankov 1999, however, finds that ownership concentration has in fact increased rapidly in the Czech Republic, and contrary to Weiss and Nikitin 1998, they find only weak association between concentration and improved performance. They show that certain types of owners (foreign strategic or investment funds not sponsored by banks), rather than concentration per se, is more significant in improving performance.

Claessens and Djankov 1999, Weiss and Nikitin 1998, and World Bank 1998, agree that the poor performance of many privatized firms is due to tunneling. Tunneling is essentially a static form of exploitation that ends when the firm's resources are exhausted. It would not explain why owners would want to purchase additional stock to concentrate their shares or how such firms continued to survive despite apparently widespread asset stripping.

We believe that tunneling did take place, but that another activity, looting, allowed managers and dominant owners of firms with privileged access to credit to make dynamic gains. Akerlof and Romer 1993 (AR) show that looting is likely when the expected future economic value of a firm is less than the amount that owners can currently pay themselves. Looting, as described by AR, arises when a government guarantees a firm's debt obligations, such that owners can borrow heavily, extract funds

from the firm, and default on the debt without penalty. As AR point out, “optimizing individuals will not repeatedly lend on terms that let them be exploited...” but “this premise may not apply to lending arrangements undertaken by the government.” AR suggest that looting is likely where there is poor accounting, lax regulation, and low penalties for abuse, the same weaknesses that also make asset stripping possible. Unlike tunneling, where most of the cost of bad behavior is borne largely by non-controlling shareholders, looting spreads costs to taxpayers as well. And the apparently healthy firm can sign contracts with non-looted firms, which will then suffer and may go under when the looted firm eventually collapses. Another serious problem, especially for a transitional economy like the Czech Republic, is that looting diverts credit from more productive firms, choking off new entrants and slowing the transition. While AR focused on financial enterprises that go bankrupt for profit, we will extend their model to non-financial firms that continue to exist, but end up as hollowed out shells.

Both looting and tunneling occur in many, similar ways. Funds can be extracted by owners paying themselves large dividends or high salaries, or by the firm making loans or investments in straw companies set up by the owners, buying assets from the straw at inflated prices or selling assets at deep discounts, or making concessional loans to owners. It could, but does not necessarily, involve fraud.

Three factors made static tunneling and dynamic looting probable outcomes of Czech privatization. First, shares in the voucher privatized firms were widely dispersed and sold for virtually no initial capital investment to citizens, which gave Czech minority owners little incentive to monitor and dominant owners or managers little reason not to transfer the firm’s assets to their own accounts. Even if minority shareholders were motivated to protect their interests, lax security laws “accommodated” tunneling, most of which was “probably legal under the existing Czech law” (Johnson and Shleifer 1999, p. 23).<sup>6</sup> Second, the government retained part (40-50%) ownership of the four largest banks and gave them few incentives to be assertive in collecting debts or scrutinizing loan

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<sup>6</sup> For example, trades did not have to take place on an exchange, ownership did not have to be disclosed, those acquiring large blocks of shares did not have to buy out minority shareholders, self-dealing transactions by shareholders with controlling board seats were hard for minority to even discover, much less overturn. See Coffee 1999 and Johnson and Shleifer 1999.



applicants.<sup>7</sup> Regulatory and other barriers to new bank entry combined with incumbent advantages protected the “big four” from competition, while implementation of the bankruptcy law was delayed and poorly enforced (Brom and Orenstein 1994). A state-owned bank (Consolidation Bank or KOB) set up to clear non-performing loans from the large bank portfolios was transformed from a temporary “hospital” for bad loans inherited from the communist era to a “state-run commercial debt-alleviation agency” (Desai 1996). Some observers argue that the government went further and encouraged banks to lend to the large voucher privatized firms to avoid bankruptcies that might discredit the reform program or lead to politically costly unemployment (Desai 1996; Brom and Orenstein 1994). Third, the “big four” banks had long-standing creditor relationships with the voucher privatized SOEs, which made up the bulk of their portfolios, and had also made equity investment in these firms through their voucher investment funds. Thus, they had a strong incentive to prop up troubled firms through further lending and rollovers (Phelps et al. 1993, Hrnčir 1993, Capek 1994, Brom and Orenstein 1994, Desai 1996).

Understanding the interaction between looting and privatization in the Czech Republic is important. If the Czech failures are largely due to the poor design of an idiosyncratic give-away scheme that resulted in weak corporate governance that motivated tunneling, then the main lesson is simple: avoid vouchers/concentrate ownership when privatizing in environments with weak protection of minority shareholders (i.e. most developing countries). If, however, they are due to a combination of weak corporate governance and perverse incentives in the banking system, then the lessons are complex and have much wider applicability. We cannot estimate the extent to which static tunneling took place, but we can show evidence consistent with looting. Although looting is hard to identify directly, since it is by its nature hidden, we can find evidence for it by comparing leverage and performance across ownership types. The most important contribution of this paper is that, unlike other papers on the Czech privatization, which only have information on the large joint stock companies that were part of the voucher privatization, we can also compare the joint stock companies with limited liability firms (largely sole proprietorships) that had far less potential for looting.

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<sup>7</sup> Bonin and Wachtel (2000).

That is, because there was no separation between ownership and control rights for limited liability companies, relatively strong performance by them would provide one indication that expropriation of minority shareholders occurred at joint stock companies.

In the next section we adapt the AR model to fit the circumstances of the Czech Republic. In section 3 we provide background on the Czech privatization process and describe our dataset. Section 4 contains testable hypotheses, which focus on how the Czech privatizations resulted in ownership forms with different incentives for looting. Section 5 presents results on the performance of different ownership forms and their borrowing. Section 6 provides a series of robustness checks on our basic empirical results. Section 7 concludes and draws implications for privatization in transitional economies.

## 2. *A Theory of Looting*

The AR model begins without any perverse incentives. A firm is created in period zero with an initial investment by its owners equal to  $W_0$ . The firm then takes on liabilities  $L_0$  and purchases a bundle of assets,  $A$ , whose initial value is  $A_0 = W_0 + L_0$ . In the Czech case, the firm's liabilities were typically incurred through bank loans. We also assume that the firm must be solvent to continue operations. Therefore, its net worth  $W_0$  must be greater than or equal to  $cA_0$  for some constant  $c$ . The assets purchased by the firm yield a cash payment of  $p_1(A)$  in period 1 and  $p_2(A)$  in period 2. For simplicity, the AR model assumes that the firms' assets cannot be sold and that the firm does not purchase any new assets after period zero.

In period 1, the firm receives its net operating profits  $p_1(A)$  and pays a dividend  $\Delta_1$  to its owners. To facilitate this transaction, the firm adjusts its liabilities so that, after the transaction, the firm's net liabilities will include the liabilities from the previous period with accumulated interest,  $(1+r_1)L_0$ , minus its operating profits  $p_1(A)$ , plus its dividend payment  $\Delta_1$ . The period 1 net liabilities relationship implies that the firm can borrow to finance its dividend payment (Table 1).

In period 2, the firm's assets yield their last operating profits  $p_2(A)$  and the owners liquidate the firm. Net liabilities carry over from period 1, and must be financed. With accumulated interest those net liabilities can be expressed as

$$(1+r_2)[(1+r_1)L_0 + \Delta_1 - p_1(A)] \quad (1)$$

The firm's terminal net worth, which devolves to its owners, is merely the difference between its assets and its liabilities. The firm's owners, therefore, choose  $A$  and  $\Delta_1$  to maximize their total discounted net profits. In period 2 units, that maximization problem can be expressed as

$$\begin{aligned} \text{MAX}_{A,\Delta} \quad & p_2(A) - (1+r_2)[(1+r_1)L_0 + \Delta_1 - p_1(A)] + (1+r_2)\Delta_1 \quad (2) \\ \text{subject to} \quad & 0 \leq cA_0 \leq W_0 \end{aligned}$$

The first term,  $p_2(A)$ , is the operating profits that devolve to the owners in period 2; the second,  $(1+r_2)[(1+r_1)L_0 + \Delta_1 - p_1(A)]$ , is the net financing obligation between periods 1 and 2; and the third,  $(1+r_2)\Delta_1$ , is the period 2 value of the period 1 dividend payment. Note that  $\Delta_1$  cancels out of this expression since the owners are paying the dividend to themselves. For ease of exposition, AR eliminate the dividend component of the maximization problem and re-express it in period 1 units:

$$\begin{aligned} V^* = \text{MAX}_A \quad & [p_2(A)/(1+r_2)] - (1+r_1)L_0 + p_1(A) \quad (3) \\ \text{subject to} \quad & 0 \leq cA_0 \leq W_0 \end{aligned}$$

To this point the objective of the owners is simply to choose the bundle of assets  $A$  to maximize the present discounted value of the payments from the firm. However, the situation changes once we suppose that the firm's owners face limited liability, and that the government guarantees the firm's liabilities in some way, perhaps through deposit insurance. In the Czech case, firm owners did face limited liability and losses associated with non-performing bank loans to Czech firms were not in practice imposed on banks' depositors, despite the absence of a formal deposit insurance scheme.

As in the AR model, we assume that the combination of limited liability and (implicit) deposit insurance prompts the government to impose an upper bound  $M(A)$  on

the amount of dividends that the firm can pay to its owners in period 1.<sup>8</sup> Note that the dependence of  $M$  on  $A$  was deliberately chosen to reflect an important aspect of the owners' underlying incentives. This dependence can encourage owners to assume liabilities ( $L$ ) to invest in negative net value projects ( $A$ ), simply in order to increase their period 1 dividend. Note also that the limit on period 1 dividends,  $M(A)$ , is given only by regulatory and accounting rules, so all decisions about asset purchases and dividend payments made by firm owners continue to be legal. A weak legal framework, therefore, can affect owner behavior, and these changes are independent of any deliberately fraudulent activities that they might undertake. We incorporate owner incentives to engage in fraud below.

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<sup>8</sup> In the Czech case this limit was set by the commercial code's requirements for a minimum level of capital and a reserve fund in readily realizable assets equivalent to 20% of the minimum capital requirement (Gray 1992).

**Table 1**

Summary of Basic Model
<p>Period 0: Initial Investment by Owners, Purchase of Productive Assets</p> <p style="text-align: center;">Choose <math>A_0 = W_0 + L_0</math>, subject to <math>W_0 \geq c A_0</math></p>
<p>Period 1: Firm Earns Period 1 Profits; Owners Receive Dividend; Liabilities are Financed</p> <p style="text-align: center;">Firm's Net Position: <math>p_1(A) - \Delta_1 - (1+r_1) L_0</math></p>
<p>Period 2: Firm Earns Period 2 Profits; Finance Net Liabilities from Period 1; Owners Liquidate Firm (If Still in Operation)</p> <p style="text-align: center;">Firm's Net Position: <math>p_2(A) - (1+r_2)[(1+r_1)L_0 + \Delta_1 - p_1(A)]</math></p>

With limited liability, implicit deposit insurance, and the government-imposed limit on  $\Delta_1$ , the owners' decision becomes more complicated. They can choose  $A$  to remain solvent, pay themselves  $\Delta_1 \leq M(A)$  in period 1, continue to operate through period 2, and then pay themselves  $\Delta_2 = p_2(A) - (1+r_2)[(1+r_1)L_0 + \Delta_1 - p_1(A)]$ . This option is the same as described in the basic model, except that there is now a limit on the period 1 dividend. The owners also have a second alternative. They can pay themselves  $\Delta_1 \leq M(A)$  in period 1, and then ignore any losses incurred in period 2, because those will be assumed by the government on behalf of the depositors that underwrote the bank loans to the firm. In that case, the owners receive  $\Delta_2 = 0$  in period 2. The owners' decision problem can be expressed, in period 1 units, as maximizing  $E$ , their own equity position:

$$MAX_{A, \Delta_1, \Delta_2} E = [\Delta_2 / (1+r_2)] + \Delta_1 \quad (4)$$

*subject to*

$$0 \leq cA_0 \leq W_0$$

$$\Delta_1 \leq M(A)$$

$$\Delta_2 \leq \max \{0, p_2(A) - (1+r_2)[(1+r_1)L_0 + \Delta_1 - p_1(A)]\}$$

AR define  $M^*$  as the maximum of  $M(A)$  over all choices of  $A$  satisfying  $0 \leq cA_0 \leq W_0$ .  $M^*$  is the maximum dividend that can be extracted in period 1. The key result of the model is that, if  $M^*$  is less than  $V^*$  (the period 1 maximum value of the firm's flow of payments to its owners from equation (3)), the owners choose  $A$  to maximize the economic value of the firm. However, if  $M^*$  is greater than  $V^*$ , the owners choose option two. That is, they choose  $A$  to maximize  $M(A)$ , pay a dividend equal to  $M^*$  in period 1, and default on the firm's obligations in period 2. In other words, if limited liability and government guarantees of the firm's liabilities are in place, the owners may have strong incentives to pay themselves high dividends in period 1, and discontinue operations in period 2. This incentive is increasing in  $M(A)$ , which implies that, in weak accounting and regulatory environments, firm owners are more likely to adopt this strategy. In addition,  $M^*$  is likely to be greater than  $V^*$  if productive capabilities are low (i.e.,  $p_1(A)$  and  $p_2(A)$  are small), or the cost of financing liabilities is high (i.e.,  $r_1$  and  $r_2$  are large).

A key feature of the Czech case may have been the fraudulent activities undertaken by some classes of firm owners. To incorporate fraud into the model, we follow AR and let  $F$  denote the fraudulent activities undertaken by firm owners. We assume that an increase in  $F$  increases the expected cost of being caught and prosecuted by the authorities, which we denote  $C(F)$ . This expected cost will also incorporate the attitudes towards risk of the owners and the reputation costs associated with legal action. We hypothesize that  $C(F)$  was greater for foreign-owned firms because of greater potential reputation costs. That is, looting by foreign firms may have affected negatively their reputations in markets outside the Czech Republic. Therefore, for a given level of fraudulent activity, foreign-owned firms stood to lose more than their Czech-owned counterparts.

$F$  not only imposes costs on owners, it also conveys benefits as it represents an increase in the amount of total resources that can be extracted by the owners. As AR note, "these resources would not take the form of explicit dividend payments, but they

still represent reductions in the net worth of the institutions.” They should, therefore, be reflected in the firm’s balance sheet and in the optimization problem that we model. We incorporate these benefits by expanding  $M(A)$ , the limit on first period wealth extraction, to include  $F$ . We denote the new limit  $M(A, F)$ , and assume that  $M$  is increasing in both  $A$  and  $F$ . For simplicity, we assume that  $M(A, F) = g(A) + h(F)$ . That is,  $M$  is additively separable in  $A$  and  $F$ . The definition of  $M^*$  becomes

$$M^* = \text{MAX}_{A,F} M(A, F) = \text{MAX}_{A,F} g(A) + h(F) = g^*(A) + h^*(F) \quad (5)$$

Owners will again loot if  $M^*$  is greater than  $V^*$ . That is, owners will loot if

$$g^*(A) + h^*(F) > \text{MAX}_A [p_2(A)/(1+r_2)] - (1+r_1)L_0 + p_1(A) \quad (6)$$

To further adapt the AR model to the Czech situation, we introduce shareholding arrangements. Let  $n_i \sim [0,1]$  be the share of the firm in the hands of owner  $i$ . If the owner is the sole proprietor ( $n_i = 1$ ), or if the firm is owned by a group of owners that can effectively monitor each other’s actions, the looting decision remains unchanged for each owner. In deciding whether to loot, each owner simply multiplies each side of equation (6) by  $n_i$ .

However, if the benefits of fraudulent activities devolve only to one owner or to a small group of owners, while the other benefits and costs are shared on a pro-rated basis, the calculation changes. For example, if a firm were widely held, except for one dominant controlling shareholder  $i$ , we would expect that shareholder to make production and investment decisions, and we would expect him to loot if

$$n_i g^*(A) + h^*(F) > \text{MAX}_A n_i ([p_2(A)/(1+r_2)] - (1+r_1)L_0 + p_1(A)) \quad (7)$$

Dividing both sides of (7) by  $n_i$  yields

$$g^*(A) + h^*(F)/n_i > \text{MAX}_A [p_2(A)/(1+r_2)] - (1+r_1)L_0 + p_1(A) \quad (8)$$

Since  $n_i \sim [0,1]$ ,

$$g^*(A) + h^*(F)/n_i \geq g^*(A) + h^*(F) \quad (9)$$

That is, the left hand side of equation (8) is greater than or equal to the left hand side of (6), which implies that a controlling shareholder in a widely held firm is more likely to loot than a sole proprietor of the same firm would be. Moreover, as  $n_i$  increases, the likelihood of looting on the part of the controlling shareholder approaches that for the sole proprietor. In other words, as the controlling shareholder owns more of the firm, the incentive to choose  $A$  to maximize the present discounted value of the payments from the firm increases, and the incentive to steal decreases.<sup>9</sup>

We should state at the outset that we lack the data necessary to test directly whether the incentive to loot declines as the controlling shareholder owns more of a firm. However, in those cases where one existed, we can identify the type of controlling shareholder in joint stock companies. Unlike other studies, we also have data for a large number of limited liability companies, which tend to be owned by a sole proprietor and not to have access to implicitly guaranteed debt. Our basic strategy, therefore, is to demonstrate that, all else equal, limited liability companies outperformed joint stock companies with controlling shareholders. We will also investigate whether, despite their relatively poor performance, joint stock companies became more leveraged than others. Taken together, these two types of evidence should help confirm the looting hypothesis.

### 3. *Background and Data*

At the time of the “velvet revolution,” almost the entire economy of the former Czechoslovakia was state owned.<sup>10</sup> The government first auctioned about 24,000 smaller firms. Starting in 1991, the government converted many of the medium and large enterprises, about 1,700 firms, into joint stock companies and divested them through a combination of methods dominated by a voucher privatization scheme. In some of these firms the dominant owner was a foreign strategic investor; but in most, ownership was dominated by investment funds. Many smaller state firms were sold to a dominant owner for cash and became limited liability companies. The state retained majority ownership of the large utilities and the banks.

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<sup>9</sup> Johnson, Boone, Breach, and Friedman (1998) provide a very similar model to explain why owner/managers of East Asian firms were less likely to engage in theft during the crisis if they held a higher share of their firm.



Under the Czech privatization scheme, all citizens eighteen or older could buy a package of vouchers worth 1000 points for a nominal fee (equivalent to about \$35). They could use these points to bid directly for shares in the enterprises that were being privatized, or they could offer their points to one or several of the more than 550 investment funds that came into existence just prior to the auctions. The funds captured more than two thirds of the voucher points. The investment funds used their accumulated points to bid for shares on behalf of their “investors.”<sup>11</sup>

Our sample comes from a slightly later time period than other authors have used to study the Czech Republic, and, unlike the others, includes limited liability companies.<sup>12</sup> A breakdown of the sample by firm type appears in Table 2; a breakdown by size (total assets) for each type of firm appears in Table 3. The data cover 1993-96 and just under half of the total observations are for limited liabilities. We have 1017 total observations from 392 firms, roughly 2.5 observations per firm. Observations are divided nearly evenly between 1994, 1995, and 1996 (very few observations come from 1993).<sup>13</sup>

Most studies have followed Demsetz and Lehn (1985) in measuring ownership concentration by either summing a firm’s largest five ownership shares or creating a Herfindahl index by summing the squared shares for the five largest owners.<sup>14</sup> While those are good measures of concentration, they are not necessarily accurate measures of

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<sup>10</sup> Czechoslovakia split into the Czech and Slovak Republics in 1993; for ease of reference we use the term Czech Republic throughout.

<sup>11</sup> Details on the Czech privatization scheme are drawn from Claessens, Djankov, and Pohl (1997), Weiss and Nikitin (1998), van Wijnbergen and Marcini (1995), and Shafik (1995).

<sup>12</sup> These include Pohl et al. (1997), Frydman et al. (1997), and Weiss and Nikitin (1998). Although Weiss and Nikitin (1998) does not include data from limited liability companies, it does cover the same time period that we do.

<sup>13</sup> The number of limited liabilities increases through 1995 (as more firms are privatized) and holds constant in 1996. By contrast, the number of joint stock companies increases in 1994, holds roughly steady in 1995, and declines in 1996. We are unsure whether this occurred because some joint stock companies went out of business or, as is more likely, some merely failed to provide 1996 data by the time our sample was collected. One might argue that poor performers are less likely to report; and they certainly would be more likely to go bankrupt. A sample selection bias could, therefore, arise in favor of the better performing joint stock companies. However, our hypothesis is that limited liabilities out-performed joint stock companies. The sample selection bias discussed here should make it more difficult to confirm that hypothesis, which should inspire greater confidence in the regression results that follow.

<sup>14</sup> An exception is Frydman et al. (1997) which classifies firms by their largest shareholder and then measures performance differences across firm types. A drawback to that approach is that if an investment fund were the largest shareholder in two different firms, those firms would be put in the same group, even if the fund owned 50.1% of the shares in the first firm (a case of clear control) and only 25% of the shares in the second.

control as discussed in the governance literature. Consider a hypothetical firm (A) where one shareholder owns 50.1% of total shares and no other shareholder has more than 1%. Control of that firm would be clear-cut. Now consider firm (B) where three large shareholders each own one-third of the total shares. On the Demsetz/Lehn concentration measures, firm (B) would outscore firm (A) but, in our view, ascertaining who had actual control of firm (B) would be more difficult than for firm (A).

Rapid ownership changes also introduce error in concentration measures. In the Czech Republic, secondary market activity produced steadily increasing ownership concentration in joint stock companies (Claessens et al, (1997) and World Bank (1998)). This meant that the ownership structure at the beginning of a year was not necessarily the ownership structure responsible for performance throughout the year. These problems are compounded because our dataset on performance came from a different source than our data on ownership, and because the Byzantine links between funds, individual investors, the companies themselves, and subsidiaries made it very difficult to track which shareholders were inter-linked and thus voted as a block. Our view is that any current measure of effective control in the Czech Republic is subject to substantial measurement error. To minimize that error we have classified firms based not only on (1) our data on ownership shares, but also on (2) phone interviews with regulatory agencies and the firms themselves, and (3) the reservoir of experience that one of the authors (Matesová) has in conducting surveys and dealing with individual firms in the Czech Republic.

#### **4. *Looting – Testable Hypotheses***

##### ***Part A – Systematic Under-performance by Czech Joint Stock Companies***

The model in Section 2 has several testable implications for our sample of Czech firms, especially for comparisons between limited liability and joint stock companies. The trends in ownership after the voucher privatization made the looting of joint stock companies more likely than of limited liabilities. The initial allocations of shares were widely dispersed, much more widely than the LaPorta, Lopez-de-Silanes, and Shleifer

(1998) results would predict given the Czech Republic's weak legal system.<sup>15</sup> As noted, ownership of joint stock companies became increasingly concentrated over time and, as a result, ownership of many Czech joint stock companies was characterized by one or few dominant and many minority shareholders. In contrast, limited liability companies are generally sole proprietorships or close partnership of very few owners.

In addition to differences in ownership structure, the incentives of owners differ between the two forms. Each owner of a company eventually organized as a limited liability paid the equivalent of at least \$3,000 to obtain the firm's assets. We presume that these investors were unlikely to part with their funds unless any control issues had been resolved to their satisfaction.<sup>16</sup> Since voucher points required only a nominal fee, investors in joint stock companies were putting virtually none of their own capital at risk. Thus, in terms of our model, the initial investment was not equal to the firm's net worth  $W_0$ , except in the artificial accounting of the voucher privatization system, adding to the incentive of owners of joint stock companies to loot (or not to exert costly effort to scrutinize looting managers). For all these reasons, we would therefore expect performance of limited liabilities to be better than that of joint stock companies.

Foreign owners of joint stock companies may have had incentives to behave differently. We assume that foreign owners are more likely to have a reputation at stake, and that damage to it could affect their ability to attract external finance for future

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<sup>15</sup> The dispersion in shareholding is, in part, attributable to the limits imposed by the Czech government on the fraction of a firm's total shares that any single investor (individual or fund) could accumulate through the voucher privatization process.

<sup>16</sup> In some cases there was non-cash investment in these companies, but the value of the assets pledged was required to exceed \$3,000. In other cases a limited liability company was established that later established subsidiary limited liability companies. No additional capital was required to create the subsidiaries. Despite these minor exceptions, we are confident that the disciplining effects of external finance were, on average, present in transactions that established the limited liabilities, and that such effects were much less important in the transactions that established the joint stock companies.

Van Wijnbergen and Marcinin (1995) provides evidence on bidding activity that could be interpreted as indicative of small investor fears over corporate governance. They note that individuals and investment funds bought roughly comparable shares in small enterprises, but that funds invested substantially more in larger ones. They also note that private individuals had their peak purchases of shares in large companies in the last auction round thereby following the funds "at a safe distance in time," and that the prices paid for shares in the same company tended to be somewhat lower at the end of the auction than those paid by funds in prior rounds. This may indicate that small investors, worried about the prospect of expropriation by larger shareholders, waited to learn what they could about future control prior to committing their points.

activities both in the Czech Republic and abroad.<sup>17</sup> While we acknowledge that some Czech owners could also be trying to establish such reputations, we argue that the foreign firms in our sample (e.g., Levi Strauss) are, on average, much more likely to be disciplined by reputation and capital markets. In terms of our model, their cost of fraud  $C(F)$  was therefore larger than Czech joint stock companies.

In addition, superior regulatory and accounting standards in their home country likely made it more difficult for foreign owners of joint stock companies to increase their legal dividend payments or hide diverted assets as much as they could have under Czech regulation. In other words, foreign firms likely had lower  $M(A)$  in the basic model, or  $g(A)$  in the model that incorporates fraud. Thus, in the basic model,  $M^*$  for foreign owners was more likely to be greater than  $V^*$ , so they were more likely than Czech owners to choose  $A$  to maximize the economic value of the firm. We expect, therefore, that foreign-controlled joint stock companies would have outperformed other joint stock companies.

### ***Part B - Access to Finance***

For multi-period looting to have taken place, joint stock companies needed a renewable source of liabilities, such as loans. The proceeds of loans could then be siphoned to the controlling owner through various methods. The largest banks in the Czech Republic were those that were carved out of the old monobank that operated under the communist regime, and the state retained substantial ownership in those banks throughout the period under study.<sup>18</sup> For reasons that we explained in Section I, it is unlikely that depositors at these banks ever felt their deposits were truly at risk or that they paid attention to the reputation of these banks. Nor were these banks subject to regulatory discipline or competition. Because of the importance of the joint stock

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<sup>17</sup> Others have suggested that superior performance by foreign-owned firms derives from expertise. Frydman et al. (1997) notes that, “[F]inancial resources, managerial know-how, and corporate governance expertise of foreign strategic investors are often seen as giving an instant advantage to the firms in which they invest.” p.20. Our view does not differ from theirs to the extent that know-how and expertise spring forth from a desire to establish a good reputation with investors and thus attract the financial resources that they mention.

<sup>18</sup> Meyendorff and Snyder (1997) notes that, “In the Czech Republic, the banks hived off from the monobank and the former specialty banks control over 80% of the country’s banking assets.” p.6. Bonin and Wachtel (1998, p.11) found that even as late as 1997 the government owned 36 to 65% of the four largest banks.

companies as creditors whose bad debts in the past have been forgiven or rolled over, we expect them to have more access to implicitly guaranteed loans than limited liability companies.

One subset of joint stock companies deserves special mention. Banks sponsored many of the Czech investment funds and eventually acquired 44% of all voucher points (Claessens et al., 1997). Firms controlled by bank-sponsored funds may have had an advantage in attracting bank loans, which could have increased their opportunities for looting. In the context of the model, joint stock companies controlled by those investment funds that were sponsored by banks may have been best able to obtain bank loans (through lower  $r_1$  and  $r_2$ ) that could be converted into period 1 payments ( $M^*$ ). We test whether these firms incurred new liabilities at a faster rate than others in the next section.

## 5. Results

### A. Performance

We focus on two measures of performance – return on assets (ROA) and the output growth rate.<sup>19</sup> The regression results in Table 4 report performance for each firm type relative to the omitted category – Czech owned limited liability companies. We also control for industry, year, and size (total assets). To reiterate, we expected limited liabilities to outperform joint stock companies because their ownership was more concentrated; owners paid money (rather than voucher points) to acquire productive assets; and their opportunities to borrow were less likely to be subject to political influence. The ROA regressions on columns (1) and (2) strongly confirm the hypothesis that these firms performed better. Coefficients for all types of joint stock companies were negative and significant compared to the Czech limited liability companies using standard OLS regression. The few state owned enterprises in our sample perform better than all the joint stock companies in these and the other regressions, and are statistically

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<sup>19</sup> In the spirit of Morck, et al. (1988), Claessens, et al. (1997) used Tobin's-Q (the ratio of the market value of the firm to the replacement value of the net fixed assets of the firm) as a level measure of performance. Market values were calculated using share prices from the stock market. Because we include limited liabilities in our sample that are not publicly traded, Tobin's Q was not a viable option. Moreover, disparities between share prices on the stock exchange and the informal market, and unreliable estimates of

indistinguishable from the limited liabilities, but we suspect that the sample of SOEs tracked by Dun and Bradstreet may be biased in favor of better performers.<sup>20</sup>

We also expected joint stock companies controlled by investment funds to perform at least as poorly as other joint stock companies. Coefficients in the ROA regressions were negative and larger (in absolute value) for fund-controlled companies than for any other sub-group of firms. However, in the regressions that pool data from 1993 to 1996, they were not statistically distinguishable from those for foreign-owned joint stock companies, nor for joint stock companies where a dominant fund could not be identified. Although strategic investors were increasing their holdings during this period in many of the firms where a dominant shareholder was not identified, total shareholding often remained widely dispersed. We therefore expected their performance in the aggregate to be mixed, but somewhat better than fund-controlled joint stock companies, if looting by dominant shareholders was widespread. Although the OLS results for the pooled sample do not confirm that expectation, we present results in the robustness checks section that do.

We also expected joint stock companies controlled by bank-sponsored investment funds to be more able to loot due to their privileged access to credit from state banks, and hence to perform worse than limited liability companies and all other types of joint stock companies. With the exception of the leverage regressions, which we describe below, we found firms controlled by bank-sponsored fund to be statistically indistinguishable from those controlled by other funds. In the rest of the performance regressions in the paper, we group all fund-controlled joint stock companies into one category.

A common problem in studies of governance and firm performance in the Czech Republic is poor data quality. Studies that have used data from surveys encountered difficulties in gauging how respondents interpreted questions, while those using data from firm balance sheets confronted weak accounting standards. Because of the substantial measurement errors that ensued, regression results were often quite sensitive to individual observations (outliers). We dealt with this problem in two ways. We first

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the replacement value of the net fixed assets for our firms would have introduced substantial measurement error had we limited our analysis only to joint stock companies.

<sup>20</sup> Few SOEs are included and they are much larger than most firms in the sample. The results do not differ if they are excluded.

tried to eliminate obvious cases of measurement error and then applied standard estimation techniques. Next, we employed robust estimation techniques using all available observations.<sup>21</sup> We find relatively consistent results for both methods.

To eliminate obvious cases of measurement error, we first limited our sample to only those firms with balance sheets that were internally consistent.<sup>22</sup> We then eliminated firms with extreme values for return on assets (less than -50%). In most cases, firms with ROA below -50 percent had large inconsistencies between their balance sheets and their operating statements. In specification 3, which eliminates observations that had ROA less than -50%, the significant coefficients for the pooled sample (1993 to 1996) indicate that joint stock companies generated returns on assets 5-6 percentage points lower than the typical Czech limited liability company. However, specification 3 differs from the first two in one key respect. Unlike the Czech joint stock companies, the performance of foreign owned joint stock companies is not statistically distinguishable from that of the limited liabilities.

One final difficulty is that our data come from an environment where there is some corruption. Controlling shareholders and managers may, therefore, have incentives to answer survey questions and construct balance sheets that mask their activities. Our sense is that it may be easier to hide some things than others and that, as a result, some of our measures may display greater sensitivity to ownership structure than others. Frydman et al. (1997, 1999) argue that the output growth rate is a very sensible measure of performance. One of its primary advantages may be that it is more easily measured than other variables or that managers have less reason to mis-represent it.<sup>23</sup> As in the ROA regressions, the output growth regressions show fund-controlled joint stock companies to be the weakest performers (specifications 5 and 6). However, in the pooled

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<sup>21</sup> Frydman et al (1997) computed annualized growth rates of performance measures over their entire period of interest (1990-93), "to smooth out year-to-year variations." A later paper, Frydman et al. (1999), does, however, include regressions of yearly growth rates upon levels of ownership. That paper also attempts to control for sample selection problems with respect to ownership structure by including initial performance levels and firm-specific fixed effects in some regressions. Weiss and Nikitin (1998) uses robust estimation techniques to confront this problem.

<sup>22</sup> Internal consistency implies that the basic accounting identity,  $Assets=Liabilities+Equity$ , held. We also required that the sum of the sub-categories of assets matched the total assets entry in the balance sheet, and that the sub-categories of liabilities summed to the total liabilities entry.

<sup>23</sup> Frydman et al. (1997) argues that another major advantage of the output growth rate is that it better captures entrepreneurship than other variables. The obvious drawback is that it ignores costs and thus provides information about only one aspect of economic performance.

models, their performance was statistically indistinguishable from other joint stock companies.<sup>24</sup>

While we expected all limited liability companies to do better than joint stock companies, we also expected foreign-owned limited liability companies to outperform Czech limited liabilities due to reputation effects and technological know-how. However, in the ROA pooled regressions, estimated coefficients were negative, though insignificant, in the specifications that control for outliers (3-4). In the output growth regressions, coefficients were positive, but insignificant. In general, however, the base results provide strong support for the hypothesis that Czech joint stock companies underperformed limited liabilities, and some support for the hypothesis that foreign-owned joint stock companies outperformed Czech ones. The robustness checks section will make these distinctions even clearer.

### ***B. Leverage***

The regressions in Table 5 indicate that joint stock companies have become substantially more leveraged than the limited liabilities or state owned enterprises over time, with firms controlled by bank-sponsored investment funds leading the way. We measure leverage as the ratio of total liabilities to total assets. One might argue that the joint stock companies had artificially low leverage ratios due to the voucher privatization process, and we may just be witnessing the equilibration process. The levels regression indicates that joint stock companies were indeed less leveraged on average during the period than either limited liability companies or state-owned enterprises (specifications 1-3).

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<sup>24</sup> In addition, we also controlled for liability growth rates in the output growth regressions (results not reported). Our thinking was that firms might borrow for looting, but they may also borrow to expand faster or invest in improvements in efficiency. By including the liability growth rate in our output growth rate regressions, therefore, we tested whether firm types varied in their abilities to convert a given change in liabilities into new output or higher returns. The positive relationship between the growth rates of outputs and liabilities suggests that debt obligations were, at least in part, used to acquire productive resources. In standard production functions one obviously needs to account for inputs. We lack reliable data on either capital accumulation or changes in labor input, and thus must rely on liability growth as a proxy in our output growth regressions. Controlling for the rate at which new liabilities were incurred, we then compare the performance of the ownership classes. Qualitative results do not differ substantially from those presented in specifications 5 and 6 of Table 4.

We also included the liability growth rate in regressions where the dependent variable was return on assets. The connection between the liability growth rate and that variable is less straightforward,



We suspect that this largely reflected the post-privatization starting points for the various classes of firms. Schwartz (1997) notes that, prior to privatization, many larger firms were given subsidies by state banks from the Fund for National Property (FNP) that could have reduced their liabilities and thus improved their balance sheets.<sup>25</sup> Hayri and McDermott (1998) also asserts that FNP funds were used to finance debt write-offs and purchases of loans at state banks. Furthermore, the voucher privatization process assured that no liabilities would be incurred to acquire the firm, which may account for some of the disparity. Lower initial leverage may have been an advantage to joint stock companies and this, conceivably, could be reflected in higher return on assets and greater output growth. To bias our results against our hypothesis that joint stock companies under-performed, therefore, we did not include initial leverage in our base performance regressions (Tables 4 and 6).

The key point is that the firms that performed the worst were able to incur the most additional liabilities, with joint stock companies controlled by bank-sponsored investment funds leading the way (specifications 4-6, Table 5).<sup>26</sup> Much of those obligations are in the form of bank loans to these firms, and as noted state influence in the banking sector remained very strong throughout this period. While some equilibration may have occurred, the leverage results are also consistent with our model. Because the banks expected to be bailed out of their non-performing loans, because the banks had incentives to assist the voucher privatized firms, and because the legal system was so weak, leverage increased the most in firms that performed the worst. We also control for current and lagged performance (as measured by ROA) and results are unchanged. Despite their relatively low profitability, Czech owned joint stock companies took on new liabilities at a much faster rate than other firms.

In addition to the leverage results, other data suggest that the new liabilities were not being converted into productive assets. Regressions of the change in the share of intangible assets on firm types indicate that this asset type was also growing much faster

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perhaps, but again qualitative results were similar whether or not liability growth was included in the specifications.

<sup>25</sup> “When the banks were handling NPF subsidies, for example, they were unwilling to recapitalize the loans of potentially profitable firms. Instead, the banks propped up struggling firms that happened to be their clients.” p 77.

at joint stock companies than at other companies.<sup>27</sup> In other words, the joint stock companies, our weakest performers, incurred the most additional liabilities, and the increase in their leverage ratios coincided not with an increase in relatively secure assets such as cash and fixed assets, but rather with an increase in intangible assets.<sup>28</sup> Recall that these were the firms whose output growth rates and ROA substantially lagged those of other firm types. What sort of intangibles were they acquiring? In short, the financial structure regressions lend support to the premise that looting was present, especially when viewed in light of the productivity regressions.

## 6. *Robustness Checks*

### *A. Pooling*

To the extent that firms naturally gravitate to ownership structures that yield the best performance, one might expect little relationship between equilibrium ownership structures, such as concentration levels, and relative performance for reasons explained by Demsetz and Lehn (1985):

“A decision by shareholders to alter the ownership structure of their firm from concentrated to diffuse should be a decision made in awareness of its consequences for loosening control over professional management. The higher cost and reduced profit that would be associated with this loosening in owner control should be offset by lower capital acquisition cost or other profit-enhancing aspects of diffuse ownership if shareholders choose to broaden ownership. Standardizing on other determinants of profit . . . ownership concentration and profit rate should be unrelated.”

However, in the Czech Republic in the 1990s, ownership structures were far from equilibrium and this could have an important bearing on empirical results. For example, if one type of owners were especially good at identifying efficient firms, their initial return on assets might be high, regardless of their ability to manage the firm. In the Czech Republic, one could argue that, in the first few years after privatization, results from regressions of performance on ownership reflected the relative abilities of the

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<sup>26</sup> The increased leverage ratios were not attributable to asset reduction – total reported assets at joint stock companies tended to increase slightly over this period.

<sup>27</sup> Results are not reported but are available from the authors.

<sup>28</sup> Regression results for changes in the shares of fixed assets and cash are also available from the authors.

ownership types in selecting firms that performed well. These selection effects should be less pronounced in regressions of performance changes on ownership.<sup>29</sup> The output growth regressions are one such set of regressions.

Another potential way to confront the selection problem is to include firm-specific fixed effects in the regressions, but this was not a viable approach for our sample, since the time series is short for all of our firms. For any given firm the maximum number of observations for variables that measure change in performance, for example, was three. In the vast majority of cases the actual number was two, because most firms had not been privatized by 1993. Moreover, only one firm in our sample experienced a change in ownership classification.

However, if one subset of owners consistently looted less (more) or governed better (worse) than another, that advantage (disadvantage) should eventually be reflected in yearly cross-sectional regressions. Results from yearly regressions, which appear in Table 6, confirmed our expectations. Estimated coefficients for 1996 were negative and significant for all types of non-foreign controlled joint stock companies, and they were larger (in absolute value) than for 1993-94.<sup>30</sup> Moreover, those estimates indicate that, by 1996, the disparity between fund-controlled joint stock companies and all other firms was at its widest. The coefficient for fund-controlled joint stock companies was statistically different from those for all other firms types at at least the  $p=.10$  level, except for those joint stock companies where no dominant owner could be identified. Unlike foreign-owned companies, which started at an initial disadvantage but later improved their performance, fund-controlled companies appear to have dug themselves further into a hole.

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<sup>29</sup> Weiss and Nikitin (1998) note that, "This approach eliminates the bias stemming from the correlation between ownership composition and initial performance by looking only at changes in performance. Selectivity bias would still arise if different types of owners had better access to information about probable changes in performance, or if some types of owners were able to better evaluate information about future changes in performance, or if certain owners valued changes in future performance more than others did. Although this is a serious potential drawback to this study, we believe that bidders during this period were unlikely to have sufficient private information for this problem to significantly bias our results." p.15. Frydman et al. (1997) also uses rates of change (in revenues, employment, revenue per employee, and cost per unit of revenue) in measuring performance.

<sup>30</sup> Because we have only twenty-nine observations in 1993, we combined them with the 1994 data in the regressions in Table 6. Qualitative results are nearly identical when those twenty-nine observations are dropped.

Foreign-owned joint stock companies, which we argued were more likely to have reputations at stake, were the only joint stock companies that did not under-perform Czech limited liabilities in the cross-sectional regression for 1996. The cross-sectional results also confirm our expectations regarding foreign-owned limited liability companies. In the 1993-4 cross-section, the coefficients for foreign limited liabilities were negative and one was statistically significant (specification 3). By 1996, estimated coefficients were all positive; in the output growth regression, the coefficient was also significant (specification 6). The results are consistent with the idea that foreign-owned limited liabilities started at an initial disadvantage, perhaps due to selection bias, if foreigners had less information about firms. By 1996, these firms had sufficiently improved that their performance levels were either statistically indistinguishable from Czech-owned limited liabilities or they held a slight advantage.

### ***B. Sample Selection Stemming from Timing of Privatizations***

Because companies were privatized at different times, we are left with an unbalanced panel. If the timing of privatizations were non-random, changes in the composition of the sample may be driving our results. For example, the 1996 cross-sectional results in Table 6 indicate that fund-controlled joint stock companies performed poorly relative to other ownership types, and substantially worse than they had in 1993-94. That result, however, may be attributable to the late addition of a number of fund-controlled joint stock companies to the sample, companies that may not yet have had sufficient time to establish effective governance.

To control for this possibility, specifications 1 and 2 in Table 8 include observations from a balanced panel of the 214 firms for which we had data from 1994 through 1996. Results are largely unchanged. The coefficients for fund-controlled joint stock companies and those where no dominant owner was identified were negative and significant in 1993-94. Coefficients for other firm types, including foreign joint stock companies, were insignificant, but they were statistically indistinguishable from those for the fund-controlled and other joint stock companies. By 1996, the coefficient for fund-controlled joint stock companies was negative, significant, and larger in absolute value. Most importantly, that coefficient was now statistically different from those for foreign

joint stock companies and foreign limited liabilities. By contrast, the coefficient for joint stock companies with no dominant owner did not change from 1993-94, it achieved significance at only the  $p=.10$  level, and it was not statistically distinguishable from those for the other ownership types. Sample selection due to the timing of privatization is not driving our results. Balanced panel regressions further confirm the poor relative performance of the fund-controlled joint stock companies.

### *C. Firm Size*

Aside from their performance, which we discuss below, the most striking difference between the joint stock companies and the limited liabilities was their size. Whether measured in total liabilities, total assets, or employees, joint stock companies tended to be much larger than limited liabilities. The median joint stock company was roughly seven times larger (as measured in total assets) than the median limited liability company (Table 3). Within the subset of joint stock companies, those controlled by bank-sponsored investment funds were the largest, but size differences within the subset were much smaller than the differences between joint stock companies and limited liabilities. Among limited liabilities, those controlled by foreigners were typically much larger than those controlled by Czech citizens but, again, not nearly as large as the typical joint stock company. In short, different governance mechanisms were associated with firms of different average size, and size alone may have had an impact on performance. We therefore controlled for total assets in our base regressions.

However, to assume that performance varies with size (as measured by total assets) in a linear fashion may be too restrictive. We may, therefore, still be comparing apples with oranges in our regressions. To address this concern, specifications 3 and 4 in Table 8 include only small firms. Specification 3 includes all firms with assets below the sample median; specification 4 includes only those firms whose assets ranked in the third quartile of the sample. Specification 4 is probably more relevant because there were no fund-controlled joint stock companies that ranked in the lowest quartile in assets. Among all firm types, the negative coefficient for fund-controlled joint stock companies is the only one that is significant in both specifications. That coefficient is also statistically distinguishable from each of the other firm types, except joint stock companies without a

dominant owner. The coefficient for non-dominant owner joint stock companies was not, however, statistically distinguishable from that for other firm types. It does not appear that firm size can account for our results.

#### ***D. Capital Intensity***

Another difference between joint stock and limited liability companies is that joint stock companies in this sample tended to be more capital-intensive (as measured by the ratio of tangible fixed assets to total assets), even after controlling for sector of operations and size. If joint stock companies had to invest more heavily, and it takes several years for capital investments to come fully on line, it may take joint stock companies longer to improve their performance. Consequently, they might have only begun to generate improvements after the period under study had finished.

To address this concern, we include our measure of capital intensity as an explanatory variable in the regressions.<sup>31</sup> Specification 5 in Table 8 includes the full sample; specification 6 includes only those firms ranked in the third quartile in terms of assets. As expected, capital intensity is negative in both specifications, and significant in specification 6. The coefficient for fund-controlled joint stock companies is negative and significant in both specifications, and the largest, in absolute value, for any firm type. In the small firms specification, no other firm type has a statistically significant coefficient. In addition, in the small firms specification, the fund-controlled coefficient is statistically different from that for Czech joint stock companies where no dominant owner was identified at the  $p=.05$  level. In short, performance results are similar even after controlling for capital intensity, as well as sector and size.

#### ***E. Initial Leverage***

As noted above, joint stock companies may have benefited from substantial debt forgiveness just prior to their privatization. Fewer liabilities to service may have meant higher initial returns on assets for those firms. However, because we wanted to bias our analysis against the conclusion that joint stock companies, especially those controlled by

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<sup>31</sup> Similar results obtain when we measure capital intensity as the ratio of tangible fixed assets to employees. However, we have employment data for each firm at only one point in the sample.

funds, performed poorly, we did not include initial leverage in our base specifications. The last two specifications in Table 8 include initial leverage (measured in the year in which a firm joined the sample) as a regressor. Specification 7 includes the full sample of observations; specification 8 includes only those firms ranked in the third quartile in terms of assets.

Capital intensity also appears in those regressions. As expected, both capital intensity and initial leverage are negative and significant in both specifications. The coefficient for fund-controlled joint stock companies is negative and significant in both specifications, and the largest, in absolute value, for any firm type. Most importantly, in the small firms specification, the fund-controlled coefficient is statistically different from that for all other firm types, including those Czech joint stock companies where no dominant owner was identified, at at least the  $p=.10$  level.

## ***6. Conclusion***

We have argued that two perverse incentive were present in the Czech Republic. One was the potential to capture greater income now through borrowing, looting and defaulting, then could be earned in the future from maximizing the firm's economic net worth. The other was the chance for dominant owners and/or managers to strip resources from a firm they own in part and transfer them to a firm they own in whole or to their personal accounts. The critical enabling factors that made asset stripping and looting possible may have been the weak enforcement of rules on disclosure, protection of minority shareholders, and good corporate conduct, coupled with implicit government guarantees and biases in the allocation of credit.

The skeptic might attribute the under-performance of fund-controlled joint stock companies to general failures in corporate governance rather than increased incentives to loot. We have provided various pieces of evidence that undermine that interpretation. The yearly cross-sectional results show that, while the other firm types generally improved relative to Czech owned limited liabilities, the fund-controlled joint stock companies fell further behind. This, too, may be attributable to more general failures in corporate governance, at least for a short period. However, the key question is why the

funds retained control of these firms if they were systematically under-performing over an extended period. Shouldn't they have sold to more capable owners?

Our most compelling evidence in favor of the looting hypothesis comes from our robustness checks. Within the subset of small firms, and controlling for industry, capital intensity, and initial leverage, fund-controlled joint stock companies under-performed all other firms. This includes not only foreign-owned joint stock companies, but also those Czech joint stock companies not controlled by funds. There was not, therefore, anything endemic to the structure of joint stock companies that ensured poor performance. All the while, fund-controlled joint stock companies took on liabilities at a faster rate than other firms. It seems unlikely that general failures in corporate governance for fund-controlled firms can explain all of these results. Looting, as described in our adaptation of the AR model, played a role.

The Czech experience has important lessons for other privatizing countries. In particular it suggests that the potential for looting must be curbed for privatization to succeed. Some policy makers may read the extensive literature on how to privatize to mean that the modality of privatization is paramount. While privatization design is significant, it is second order compared to the creation of a competitive and commercially oriented banking system in which credit allocation is free of politically motivated interventions and self-dealing is curbed by a real threat of loss to depositors and bad creditors. We can't say whether voucher privatization would have succeeded had there been less opportunity for looting. But there is ample evidence from other countries to suggest that, even if the Czechs had privatized through sales to strategic investors, the reforms would have failed to improve performance in those firms that had opportunities to loot compared to firms that lacked such chances.



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**Table 2: Sample Characteristics**

Year	Joint Stock Companies		Limited Liabilities	
	Observations	% of Sample	Observations	% of Sample
1993	31	3.0	3	0.3
1994	162	15.9	103	10.1
1995	146	14.4	201	19.8
1996	114	11.2	199	19.6
Total	453	44.5	506	49.8

**Table 3: Sample Characteristics, Assets**

Total Assets (000s)	Mean	1 <sup>st</sup> Percentile	10 <sup>th</sup> Percentile	Median	90 <sup>th</sup> Percentile	99 <sup>th</sup> Percentile
<i>Joint Stock Cos. Controlling Shareholder</i>						
Foreign (n=65)	1182.7	114.9	156.3	544.4	3305.9	7453.7
Investment Fund (n=127)	1390.4	69.5	182.2	636.5	3302.2	11360.5
Bank-Sponsored Fund (n=93)	1439.2	119.6	266.4	828.5	3417.1	7577.7
Other (n=168)	3110.2	73.8	151.2	642.5	7734.5	29420.1
<i>Limited Liabilities</i>						
Foreign-owned (n=204)	488.0	4.9	25.8	159.9	1488.5	4600.7
Czech-owned (n=302)	167.6	7.0	17.5	62.4	316.0	1208.3

**Table 4: Regression Results, Performance**

Explanatory Variable	Return on Assets	Return on Assets	Return on Assets	Return on Assets	Output Growth Rate	Output Growth Rate
	OLS White's SE (1)	OLS White's SE (2)	OLS White's SE ROA > -.5 (3)	Robust Regression (4)	OLS White's SE, Growth < 250% (5)	Robust Regression (6)
Total Assets (millions)	.0006 (.002)	.001 (.002)	-.002*** (.0006)	-.001 (.0007)	.001 (.003)	-.001 (.004)
Foreign LL	-.026** (.012)	-.026** (.012)	-.006 (.010)	-.009 (.005)	.071 (.043)	.045 (.030)
JSC: Dominant Owner Foreign	-.055** (.026)	-.055** (.026)	-.022 (.017)	-.015 (.009)	-.150*** (.042)	-.010** (.047)
JSC: Dominant Owner Any Domestic Fund		-.062*** (.009)	-.056*** (.008)	-.030*** (.006)	-.160*** (.033)	-.146*** (.032)
JSC: Dominant Owner Non-Bank Domestic Fund	-.070*** (.010)					
JSC: Dominant Owner Domestic Bank Fund	-.052*** (.012)					
JSC: No Dominant Owner Identified	-.058*** (.012)	-.058*** (.012)	-.048*** (.010)	-.022*** (.007)	-.136*** (.047)	-.101*** (.038)
State Owned	-.060 (.068)	-.060 (.068)	.007 (.015)	.009 (.017)	-.150 (.088)	-.034 (.066)
Constant	.052*** (.020)	.052*** (.020)	.078*** (.019)	.037 (.019)	.359*** (.084)	.247*** (.071)
Observations	1017	1017	1007	1017	617	624
R-square	.07	.07	.10		.13	
F	5.95	6.11	6.45	4.38	5.33	6.40
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000

\* indicates statistically significant at the p=0.10 level. \*\* indicates significance at the p=0.05 level. \*\*\* indicates significance at the p=0.01 level. Standard errors in parentheses. All specifications included dummy variables for industry and year. Output growth = (output(t)-output(t-1))/output(t); return on assets = pre-tax profits(t)/total assets(t). Capital intensity = Fixed Assets/Total Assets. Initial Leverage = Total Assets(t=1)/Total Liabilities(t=1).

**Table 5: Regression Results, Financing**

Explanatory Variable	Leverage			Change in Leverage		
	OLS White's SE	OLS White's SE	OLS White's SE	OLS White's SE	Robust Regression	Robust Regression
Return on Assets		-.691*** (.250)				
Return on Assets [t-1]			-.916*** (.152)			-.088 (.054)
Foreign LL	-.013 (.027)	-.031 (.023)	-.069** (.029)	.094 (.092)	-.009 (.018)	-.012 (.018)
JSC: Dominant Owner Foreign	-.399*** (.029)	-.437*** (.032)	-.397*** (.041)	.160** (.079)	.024 (.027)	.021 (.027)
JSC: Dominant Owner Non-Bank Domestic Fund	-.330*** (.021)	-.378*** (.026)	-.350*** (.027)	.126*** (.064)	.051** (.021)	.045** (.022)
JSC: Dominant Owner Domestic Bank Fund	-.396*** (.023)	-.432*** (.024)	-.407*** (.028)	.197*** (.056)	.106*** (.024)	.101*** (.024)
JSC: No Dominant Owner Identified	-.329*** (.023)	-.369*** (.025)	-.343*** (.032)	.086 (.052)	.057*** (.022)	.053** (.022)
State Owned	-.038 (.040)	-.077 (.050)	-.052 (.050)	-.019 (.113)	.009 (.036)	.009 (.035)
Constant	.802*** (.056)	.838*** (.053)	.734*** (.039)	.966*** (.093)	.942*** (.042)	.948*** (.042)
Observations	1017	1017	624	624	624	624
R-square	.41	.50	.49	.03		
F	46.62	56.85	37.16	2.38	2.92	2.94
Prob > F	0.000	0.000	0.000	0.001	0.000	0.000

\*\*\* indicates statistically significant at the p=0.10 level. \*\* indicates significance at the p=0.05 level. \* indicates significance at the p=0.01 level.; All specifications also included dummy variables for industry and year. Leverage = Total Liabilities/ Total Assets; Change in Leverage = Leverage(t)/Leverage(t-1); Return on Assets = Pre-tax profits(t)/Total Assets(t).

**Table 6: Regression Results, Cross-sections**

Explanatory Variable	Return on Assets				Output Growth	
	1993-94	1996	1993-94	1996	1993-94	1996
	OLS White's SE ROA>-.5 (1)	OLS White's SE ROA>-.5 (2)	Robust Regression (3)	Robust Regression (4)	Robust Regression (5)	Robust Regression (6)
Total Assets (millions)	-.001 (.001)	-.002** (.001)	-.001 (.001)	-.002 (.0014)	.002 (.005)	-.004 (.006)
Foreign LL	-.019 (.019)	.018 (.017)	-.026** (.011)	.010 (.009)	-.035 (.047)	.083** (.041)
JSC: Dominant Owner Foreign	-.039** (.019)	-.010 (.021)	-.021 (.014)	.002 (.019)	-.102* (.058)	-.099 (.082)
JSC: Dominant Owner Any Domestic Fund	-.050*** (.014)	-.064*** (.015)	-.030*** (.010)	-.034*** (.011)	-.127*** (.043)	-.175*** (.048)
JSC: No Dominant Owner Identified	-.051*** (.019)	-.043*** (.015)	-.024** (.011)	-.025* (.015)	-.109** (.048)	-.119* (.065)
State Owned	.002 (.031)	.012 (.026)	.004 (.019)	.025 (.024)	-.045 (.088)	-.023 (.103)
Constant	.014 (.016)	.048*** (.017)	.014 (.041)	.094*** (.029)	.269** (.099)	.287** (.125)
Observations	310	331	312	336	289	335
R-square	.13	.13				
F	2.93	3.51	3.00	2.83	3.55	4.29
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000

\* indicates statistically significant at the p=0.10 level. \*\* indicates significance at the p=0.05 level  
 \*\*\* indicates significance at the p=0.01 level. Standard errors in parentheses All specifications also included  
 dummy variables for industry. Output growth = (output(t)-output(t-1))/output(t); return on assets = pre-tax  
 profits(t)/total assets(t).

**Table 7: Distributions of Dependent Variables**

Dependent Variable	Mean	1 <sup>st</sup> Percentile	10 <sup>th</sup> Percentile	Median	90 <sup>th</sup> Percentile	99 <sup>th</sup> Percentile
Return on Assets (n=1017)	.018	-.490	-.075	.017	.124	.323
Output Growth (n=624)	.300	-.744	-.193	.109	.571	2.53
Leverage (n=1017)	.630	.065	.252	.613	.976	1.34
Change in Leverage (n=624)	1.06	.316	.784	1.00	1.27	3.16

number of observations in parentheses; Output Growth = (Output(t)-Output(t-1))/Output(t); Return on assets = Pre-tax profits(t)/Total Assets(t); Leverage = Total Liabilities/ Total Assets, Change in Leverage = Leverage(t)/Leverage(t-1).



**Table 8: Robustness Checks**

Explanatory Variable	Balanced Panel		Small Firms		Control for Capital Intensity and Initial Leverage			
	ROA (>-.5)	ROA (>-.5)	ROA (>-.5)	ROA (>-.5)	ROA (>-.5)	ROA (>-.5)	ROA (>-.5)	ROA (>-.5)
	OLS, White's SE	OLS, White's SE	OLS, White's SE	OLS, White's SE	OLS, White's SE	OLS, White's SE	OLS, White's SE	OLS, White's SE
	1994	1996	Firms w/ Assets < Sample Median	Firms w/ Assets in Third Quartile		Firms w/ Assets in Third Quartile		Firms w/ Assets in Third Quartile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total Assets (millions)	-0.001 (.001)	-0.001 (.001)			-0.001** (.0005)		-0.0004 (.0005)	
Foreign LL	-0.025 (.019)	.003 (.022)	.009 (.013)	-0.006 (.016)	-0.002 (.009)	-0.005 (.016)	-0.005 (.009)	-.018 (.015)
JSC: Dominant Owner Foreign	-0.034 (.025)	-0.0004 (.022)	-.016 (.044)	.007 (.048)	-0.002 (.017)	.011 (.048)	-.063*** (.019)	-.037 (.046)
JSC: Dominant Owner Any Domestic Fund	-.044*** (.014)	-.057*** (.017)	-.064*** (.019)	-.050** (.021)	-.035*** (.010)	-.046** (.022)	-.091*** (.012)	-.110*** (.024)
JSC: No Dominant Owner Identified	-.033** (.017)	-.033* (.018)	-.038*** (.014)	-.018 (.015)	-.031*** (.011)	-.012 (.016)	-.083*** (.012)	-.075*** (.020)
State Owned	-.031 (.037)	.004 (.030)	.014 (.029)	-.001 (.030)	.007 (.015)	-.005 (.033)	.002 (.014)	-.049 (.037)
Capital Intensity					-.085*** (.016)	-.031 (.026)	-.112*** (.017)	-.062** (.028)
Initial Leverage							-.147*** (.017)	-.159*** (.037)
Constant	.036*** (.000)	.035*** (.000)	.030 (.030)	.059** (.027)	.101*** (.019)	.069** (.028)	.213*** (.023)	.210*** (.044)
Observations	214	214	504	250	1007	250	1007	250
R-square	.16	.15	.08	.13	.13	.13	.22	.24
F	2.67	2.85	3.32	3.21	7.62	2.77	9.61	4.97
Prob > F	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000

\* indicates statistically significant at the p=0.10 level. \*\* indicates significance at the p=0.05 level. \*\*\* indicates significance at the p=0.01 level. Standard errors in parentheses. Specifications 3-8 also included dummy variables for industry and year. Specifications 1-2 included only dummy variables for industry. Output growth = (output(t)-output(t-1))/output(t); return on assets = pre-tax profits(t)/total assets(t). Capital intensity = Fixed Assets/Total Assets. Initial Leverage = Total Assets(t=1)/Total Liabilities(t=1).



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