

Ownership and the Temptation to Loot: Evidence from Privatized Firms in the Czech Republic¹

Robert Cull, Jana Matesova, and Mary Shirley

World Bank, Washington, DC

Received April 5, 2001; revised November 29, 2001

Cull, Robert, Matesova, Jana, and Shirley, Mary—Ownership and the Temptation to Loot: Evidence from Privatized Firms in the Czech Republic

Using a new dataset on firms privatized in the Czech Republic from 1993 to 1996, we show that, even after controlling for size and structure, voucher-privatized joint stock companies perform worse than firms with concentrated shareholdings that had to be purchased for cash, i.e., limited liability companies and foreign joint stock companies. We argue that static asset stripping, or tunneling in Czech parlance, was combined with dynamic looting of the Akerlof and Romer (1993) type because these same joint stock companies had privileged access to soft credit from state controlled banks. Although we do not have direct evidence of looting, we show that liabilities increased at a much faster rate in joint stock companies than in limited liability companies. *J. Comp. Econ.*, March 2002, **30**(1), pp. 1–24. World Bank, Washington, DC. © 2002 Elsevier Science (USA)

Journal of Economic Literature Classification Numbers: L2, G3, K4.

1. INTRODUCTION

The Czech Republic has 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 the weak rule of law gave managers or dominant owners

¹ We thank Dun & Bradstreet for providing us with data. We are grateful for the comments and suggestions of John Bonin (Editor), Jerry Caprio, George Clarke, Colin Xu, and two anonymous referees. The views expressed are the authors' own and do not necessarily reflect those of the World Bank, its Board of Directors, or the countries they represent. Cull and Shirley are, respectively, Senior Economist and Research Manager, Development Economics Research Group, The World Bank; Shirley is also President, The Ronald Coase Institute. Matesova is currently assistant to the Executive Director, World Bank. At the time of this study's inception, Matesova was visiting scholar in the Development Economic Research Group.

an opportunity to strip assets from the firm for their sole benefit, rather than exert extra effort to secure future economic returns that would be shared with minority owners. Glaeser et al. (2001) note that this form of stealing assets from minority shareholders was so widespread in the Czech Republic that it acquired a new, Czech-specific name, i.e., tunneling.² However, critics disagree on whether bad corporate governance resulted because voucher privatization dispersed ownership too widely or because it failed to select 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.³

We study the Czech experience because it sets voucher privatization in one of the stronger institutional settings among transition countries, rather than in institutionally weaker states, such as countries in the former Soviet Union, where it was a failure. Presumably, the problems that arose in the Czech Republic would be worse in less institutionally developed countries. Understanding the Czech case is important to future privatizers who would want to know whether any failings of the Czech privatization were due to the failure to concentrate assets, the failure to select better owners, or, as we shall argue, both of these factors in combination with wider policy and institutional failings.

Weiss and Nikitin (1998) make the case that the failure to concentrate ownership caused the poor performance of voucher privatization in the Czech Republic. They argue 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, because many of these funds were closed-ended so that shares could not be redeemed, shareholders had no way to discipline fund managers and fund managers, in turn, had 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.

However, Claessens and Djankov (1999) find that ownership concentration has in fact increased rapidly in the Czech Republic and, contrary to Weiss and Nikitin

² Johnson, La Porta, Lopez-de-Silanes, and Shleifer (2000) define tunneling as “the transfer of assets and profits out of firms for the benefit of their controlling shareholders” (p. 22). See also Coffee (1996).

³ World Bank (1998) finds that firms in which the largest owners held more than 50% of shares increased from 1% of all listed firms in 1993 to 38% in 1997, and those in which the largest owner held 30 to 50% increased from 6 to 35% of all listed firms over the same period.

(1998), they find only weak association between concentration and improved performance. These authors show that the type of owner, i.e., foreign strategic owners 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. The dominant owners strip the assets from a firm with dispersed ownership and tunnel the assets into a firm or account that they control solely. Tunneling is essentially a static form of asset stripping that ends when the firm's resources are exhausted. Hence, 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.

Although tunneling did take place, another activity, looting, allowed managers and dominant owners of firms with privileged access to credit to make dynamic gains. As described by Akerlof and Romer (1993), hereafter AR, looting arises when a government guarantees a firm's debt obligations so 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. . . . However, this premise may not apply to lending arrangements undertaken by the government" (p. 5). AR show that looting is likely when the expected future economic value of a firm is less than the amount that owners can pay themselves currently. AR suggest that looting is likely in the presence of poor accounting, lax regulation, and low penalties for abuse; these are the same weaknesses that make tunneling possible. Unlike tunneling, in which the cost of bad behavior is borne largely by noncontrolling shareholders, looting spreads costs to taxpayers as well. Thus, tunneling takes assets from a firm, while looting takes assets from the rest of the economy. Hence, looting can have broader repercussions. The apparently healthy firm can sign contracts with nonlooted firms, which will then suffer and may go under when the looted firm eventually collapses. Moreover, looting diverts credit from more productive firms, choking off new entrants and slowing the transition. While AR focus on financial enterprises that go bankrupt for profit, we focus on nonfinancial firms that continue to exist but end up as hollowed out shells.

Both looting and tunneling occur in similar ways. Owners can extract funds by paying themselves large dividends or high salaries or granting themselves concessional loans. Both could occur by having the firm make loans or investments in straw companies set up by the owners or by buying assets from these straw companies at inflated prices or selling assets at deep discounts. Looting and tunneling could, but do not necessarily, involve fraud. To reiterate, the central difference is that tunneling is confined to the assets of a single firm and ends when these assets are exhausted while looting involves new funds borrowed from outside the firm and continues for much longer because the debt is guaranteed by the state.

Three factors made static tunneling and dynamic looting probable outcomes of Czech voucher privatization. First, shares in the voucher-privatized firms were

widely dispersed and sold for virtually no initial capital investment to citizens. Hence, Czech minority owners had little incentive to monitor and dominant owners or managers were able 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).⁴ Second, the government retained part, between 36 and 65%, ownership of the four largest banks and gave them few incentives to be assertive in collecting debts or scrutinizing loan applicants (Bonin and Wachtel, 2000). Regulatory and other barriers to new bank entry combined with incumbent advantages protected the big four banks from competition, while implementation of the bankruptcy law was delayed and poorly enforced (Brom and Orenstein, 1994). A state-owned bank, Consolidation Bank (KOB), set up to clear nonperforming 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, while additional funds were used to recapitalize banks and to write off bad debts (Desai, 1996). By 1994, KOB had taken over the bad debt of about 80% of the large and medium-sized firms in the Czech Republic (Brom and Orenstein, 1994). Some observers argue that the government went even 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 longstanding creditor relationships with the voucher-privatized SOEs, which made up the bulk of their portfolios. Bank managers had a strong incentive to prop up troubled firms through further lending and rollovers to avoid revealing their own insolvency (Hrncir, 1993; Capek, 1994; Brom and Orenstein, 1994; Desai, 1996). Their close and longstanding relations with these borrowers might also have created more opportunities for bank managers to collude with dominant owners of these firms to engage in looting.

Understanding the interaction between looting and privatization in the Czech Republic is important. If the Czech failures are due largely to the poor design of an idiosyncratic give-away scheme that resulted in weak corporate governance and led to tunneling, the main lesson is simple: avoid vouchers and concentrate ownership when privatizing in environments with weak protection of minority shareholders, i.e., most developing countries. However, if these failures are due to a combination of weak corporate governance and perverse incentives in the banking system, the lessons are complex and have much wider applicability.

Unlike other papers on the Czech privatization, which have information only on the large joint stock companies that were part of the voucher privatization, we compare the joint stock companies with limited liability firms, largely sole

⁴ For example, trades of shares need not take place on an exchange, ownership was not required to be disclosed, those acquiring large blocks of shares did not have to buy out minority shareholders, and self-dealing transactions by shareholders with controlling board seats were hard for minority shareholders even to discover, much less to overturn (Coffee, 1999; Johnson and Shleifer, 1999).

proprietorships. Tunneling and looting are hard to identify directly, since they are by their nature hidden, but our data permit us to find evidence of these activities by comparing performance across ownership types. Limited liability firms had far less incentive for tunneling or looting because there was no separation between ownership and control rights. As we shall show, they also had less potential for looting than joint stock companies. Relatively strong performance by limited liability firms would provide one indication that asset stripping to the disadvantage of minority shareholders occurred at joint stock companies as long as we control adequately for other relevant differences between limited liability and joint stock companies in the empirical tests. Hence, we find evidence consistent with looting by comparing leverage and performance across ownership types.

In the next section, we provide background on the Czech privatization process and describe our data set. In Section 3, we adapt a model of stealing by firm managers from Johnson et al. (2000), hereafter JBBF, to fit the Czech situation and use it to derive simple propositions that we can test with our data set. Section 4 presents results on the performance of different ownership forms and their borrowing behavior. Section 5 provides a series of robustness checks on our basic empirical results. Section 6 concludes and draws implications for privatization in transitional economies.

2. BACKGROUND AND DATA

At the time of the velvet revolution, almost the entire economy of the former Czechoslovakia was state owned.⁵ Starting in 1991, the government converted many of the medium and large enterprises, about 1700 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 primarily 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.

Under the Czech privatization scheme, all citizens 18 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 450 investment funds that came into existence just prior to the auctions. Ultimately, the funds captured more than two thirds of the voucher points and used their accumulated points to bid for shares on behalf of their investors.⁶

⁵ Czechoslovakia split into the Czech and Slovak Republics in 1993; for ease of reference, we use the term Czech Republic throughout.

⁶ Details on the Czech privatization scheme are drawn from Claessens et al. (1997), Weiss and Nikitin (1998), and Shafik (1995).

TABLE 1
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 ^a	453	44.5	506	49.8

^a For 58 observations we could not categorize the firm as either a joint stock or a limited liability company. Based on the relatively small size of the firms, these are likely to be observations for limited liability companies. Rather than eliminate these observations, we include them in the base category, which is Czech limited liability companies. Qualitative results are unchanged when these 58 observations are dropped from the regressions.

Our sample comes from a slightly later time period than those used by other authors to study the Czech Republic and, unlike the others, includes limited liability companies.⁷ A breakdown of the sample by firm type appears in Table 1; a breakdown by size measured by total assets for each type of firm appears in Table 2. The data cover 1993 to 1996 and about half of the total observations are for limited liability companies. We have 1017 total observations from 392 firms, approximately 2.5 observations per firm. Observations are divided nearly evenly between 1994, 1995, and 1996, with very few observations coming from 1993.⁸

We have classified firms based not only on our data on ownership shares, but also on telephone interviews with regulatory agencies and the firms themselves to clarify and fill gaps in the information. We rely on the experience that one of the authors has in conducting surveys and dealing with individual firms in the Czech Republic

⁷ Other authors include Claessens et al. (1997), Frydman et al. (1997), and Weiss and Nikitin (1998). Although Weiss and Nikitin (1998) do not include data from limited liability companies, they cover the same time period that we do. Our data come from Dun & Bradstreet with follow-up telephone calls by the authors and by Dun & Bradstreet on behalf of the authors. They have been reviewed carefully and cross checked for accuracy and completeness.

⁸ The number of limited liability companies increases up to 1995 as more firms are privatized and remains 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; they certainly would be more likely to go bankrupt. Therefore, sample selection bias could arise in favor of the better performing joint stock companies. However, our hypothesis is that limited liability companies outperformed 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.

TABLE 2
Sample Characteristics, Total Assets, Czech Crowns (000s)

	Mean	1st percentile	10th percentile	Median	90th percentile	99th percentile
Observations for joint stock companies						
Controlling shareholder						
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 ($n = 126$)	1590.9	73.8	142.7	441.4	2380.8	29420.1
State-owned ($n = 42$)	7668.1	187.4	279.0	3695.3	23760.6	27566.9
Observations for limited liability companies						
Foreign-owned ($n = 204$)	488.0	4.9	25.8	159.9	1488.5	4600.7
Czech ($n = 360$)	226.5	4.2	18.1	70.8	469.3	3611.5
Identified ($n = 302$)	167.6	7.0	17.5	62.4	316.0	1208.3
Unidentified ($n = 58$)	533.2	4.2	31.1	268.3	1537.5	5097.6

to further check and improve the accuracy of the information; this has allowed us to identify firm ownership and control more closely. 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.⁹ While those are good measures of concentration, they are not necessarily accurate measures of control as discussed in the governance literature. Consider a hypothetical firm (A) in which 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) in which three large shareholders each own one third of the total shares. On the Demsetz–Lehn concentration measures, firm (B) would score higher than firm (A) but, in our view, ascertaining who had actual control of firm (B) would be more difficult than for firm (A). Our view is that any current measure of effective control in the Czech Republic is subject to substantial measurement error, but we have done our best to minimize that error.

3. LOOTING: TESTABLE HYPOTHESES

3.1. A Simple Model of Stealing and Systematic Underperformance by Czech Joint Stock Companies

Tunneling was widespread in the Czech Republic in part because of the weak legal protections afforded minority shareholders. La Porta et al. (1998) offer an index

⁹ An exception is Frydman et al. (1997) who classify firms by their largest shareholder and measure performance differences across firm types. In that approach, 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.

of how well a commercial code, or company law, protects minority shareholders against expropriation, in the sense of stripping of assets, by insiders. The Czech Republic scores 2 out of a possible 6, below average for La Porta et al.'s sample of countries. Not only were these legal protections weak, but enforcement was also lax due to an unmotivated securities regulator and general judicial ineffectiveness (Glaeser et al., 2001).

To highlight that types of owners differed in their incentives to tunnel, we follow JBBF, who, like Jensen and Meckling (1976), model the conflict of interest between insiders or managers and outsiders or equity owners. In the Czech context, we assume that the insider is the largest shareholder, while the outsiders are the other shareholders. Because there is a controlling shareholder for most firms in our sample, the conflict is typically between them and the minority shareholders.

Assume that the controlling shareholder holds a share α of the firm and the minority shareholders own $(1 - \alpha)$. The firm's productive assets are denoted by A . The controlling shareholder steals $S \geq 0$ of productive assets and obtains a utility of S from them.¹⁰ Following JBBF, we use stealing as the terminology for tunneling by controlling shareholders.

Because there is some probability that the controlling shareholder will be caught and punished, stealing has associated expected costs $C(S) = (S^2/2k)$, where k is an index of the weakness of corporate governance rules or the legal system. Thus, stealing becomes less costly as k increases. Represented in this way, $C(S)$ is concave in S . The intuition is that the marginal cost of stealing increases with the amount stolen because stealing becomes more obvious and thus easier for a court to discern.

The productive assets that are not stolen by the controlling shareholder generate a rate of return $R > 1$, of which he or she receives a share α . The optimization problem for the controlling shareholder becomes:

$$\text{Max}_S U(S; R, k, \alpha) = \text{Max}[\alpha R(A - S) + S - (S^2/2k)].$$

The optimal amount of theft, S^* , is derived from the first-order condition:

$$\partial U / \partial S = 1 - S^*/k - \alpha R = 0,$$

which yields:

$$S^*(R, k, \alpha) = k(1 - \alpha R).$$

¹⁰ In the JBBF model, only the firm's retained earnings can be stolen. Here, we assume that all of the firm's productive assets, including its retained earnings, can be stolen. In our view, this assumption is more reflective of the Czech situation.

The key insight is that, because the controlling shareholder owns α of the firm, he or she has an incentive to use at least some of the firm's assets productively rather than steal them all. Therefore, as α rises, the optimal level of stealing falls. If $\alpha > 1/R$, the controlling shareholder's stealing is negative, meaning that he or she puts some of his or her own money into the firm to keep it going. We should state at the outset that we lack the data necessary to test directly whether the incentive to asset strip declines as the controlling shareholder owns more of a firm. However, unlike other studies of the Czech experience, we do have data for a large number of limited liability companies, which tend to be owned by a sole proprietor, and thus have firms with α 's that are higher than they are for the joint stock companies in our sample. Therefore, our basic strategy is to demonstrate that, all else equal, limited liability companies outperformed joint stock companies with controlling shareholders. We take this as an indirect test of the hypothesis.

Our second set of hypotheses involves foreign versus domestic ownership. In those cases where one existed, we identify whether the controlling shareholder in a joint stock company was Czech. We also identify the nationality of the proprietors of the limited liability companies. We expect that foreign-owned firms performed better than Czech firms because they were subject to stronger corporate governance rules in their home countries. In the context of the model, they faced lower k 's and thus were less apt to steal.¹¹ In addition, they were likely to enjoy higher average returns R on their productive endeavors, leading to better performance and less stealing. Frydman et al. (1997) provide evidence consistent with the idea that financial resources, managerial know-how, and corporate governance expertise of foreign strategic investors gave immediate benefit to the firms in which they invested in the transition economies.

We also expect that any advantages of foreign ownership are likely to be much smaller among the limited liability companies. This is because $\alpha > 1/R$ is likely to hold for most, if not all, Czech limited liability companies; thus, they had no incentive to steal. However, to the extent that the expected rate of return is higher for foreign-owned limited liabilities, the model implies greater incentive for them to invest their own resources in the firm. This might give them a slight edge over Czech limited liability companies in terms of expected performance. We note that the tendency for foreign-owned companies to perform better due to foreign expertise cannot be distinguished from the incentive effects of weak corporate governance rules and a weak legal system in the empirical tests.

In the regressions of firm performance, we expect that limited liability companies outperform joint stock companies because there is no separation of ownership and

¹¹ We recognize that not all foreign investors were from developed countries and thus did not necessarily face lower k 's than Czech firms. However, our sample includes firms such as Levi Strauss. We suspect that looting was the exception and not the rule among foreign-owned firms, especially those whose owners were from industrialized countries.

control in limited liability companies. We also expect foreign-owned firms to perform better than Czech firms within any subset of ownership types, i.e., limited liability companies or joint stock companies, due to both foreign expertise and the stronger corporate governance rules and legal systems that owners of those firms faced.

3.2. *Access to Finance*

For multiperiod looting to have taken place, as opposed to the one-shot stealing described in the previous section, joint stock companies needed a renewable source of liabilities, e.g., loans. For example, Claessens et al. (1999, 2000) provide evidence from East Asia consistent with the notion that, if the controlling owner of a firm is a financial institution and if there is an expectation that bad loans are going to be forgiven and covered by the taxpayers, tunneling becomes dynamic. In the Czech Republic, new loans were directed to joint stock companies for various reasons. 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.¹² Most of the funds from these banks flowed to firms with whom the banks had long-established ties (Buchtíková and Capek, 1994). The combination of state ownership and the assumption of bad debts by KOB made it unlikely that depositors at these banks ever thought that their deposits were truly at risk so they paid little attention to the reputation of these banks. Furthermore, these banks were not subject to stringent regulatory discipline or much competition. Bank managers of the large banks had a strong incentive to lend to the joint stock companies that comprised the majority of their portfolio since they were fearful that foreclosures would make apparent the banks' own insolvency and they expected that the government would continue to intervene (Desai, 1996). Moreover, banks sponsored many of the Czech investment funds and eventually acquired 44% of all voucher points (Claessens et al., 1997). Joint stock companies owned by bank-sponsored investment funds may have had better access to loans than other joint stock companies.

We cannot perform a direct test of whether firm types varied in their access to soft lending. However, in regressions that control for firm performance, we expect that if Czech joint stock companies have better access to soft lending than Czech and foreign-owned limited liability companies and foreign-owned joint stock companies, they will become leveraged more quickly following privatization. We also separate the joint stock companies owned by bank-sponsored investment funds from the other Czech joint stock companies as an indirect test of whether they had better access to soft lending than all other firm types.

¹² Meyendorff and Snyder (1997, p. 6) note 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." Bonin and Wachtel (2000) found that, even as late as 1997, the government owned 36 to 65% of the four largest banks.

4. RESULTS

4.1. Performance

We focus on two measures of firm performance, namely, return on assets (ROA) and output growth rate.¹³ The regression results in Table 3 report the performance for each firm type relative to the omitted category, i.e., Czech limited liability companies. We also control for industry, year, and size measured by total assets. We find firms controlled by bank-sponsored funds to be statistically indistinguishable from those controlled by other funds. Therefore, with the exception of specification 1 in Table 3, we group all fund-controlled joint stock companies into one category in our performance regressions.

The ROA regressions in columns (1) and (2) are consistent with the hypothesis that limited liability companies performed better than joint stock companies. First, coefficients for all types of joint stock companies were negative and significant compared to the omitted category of Czech limited liability companies using standard ordinary least squares (OLS) regression.¹⁴ Second, although the coefficient for foreign-owned limited liability companies was negative and significant, its size was smaller in absolute value than those for the joint stock companies. We cannot reject the hypothesis that the coefficient for foreign-owned limited liability companies is greater than that for the non-foreign-owned joint stock companies at a 10% level or better. These results, which we derive from a separate hypothesis test, cannot be read directly from the table.¹⁵ However, regressions (1) and (2) do not confirm our second main hypothesis, that foreign-owned firms outperformed Czech ones, although we will offer other regressions that do.

¹³ In the spirit of Morck et al. (1988), Claessens et al. (1997) used Tobin's Q, which is 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 have limited liability companies that are not publicly traded, Tobin's Q is not a viable option. Moreover, disparities between share prices on the stock exchange and the informal market and unreliable estimates of 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 to avoid this problem.

¹⁴ Because of heteroskedasticity problems, all of our OLS models were estimated using White's standard errors. For example, in model 1 of Table 3, we reject the hypothesis that the Cook-Weisberg statistic for constant variance ($\chi^2(1) = 444.34$) is equal to zero at the $p = 0.000$ level. In addition, plots show that the estimated residuals are smaller for larger firms, as measured by total assets.

¹⁵ That is, we reject the null hypothesis $H_0: \beta_{(\text{foreign limited liability})} - \beta_{(\text{JSC type } i)} \leq 0$. For joint stock companies owned by investment funds, $F(1, 995) = 9.70$, p -value 0.002. For joint stock companies owned by bank-sponsored investment funds, $F(1, 995) = 2.92$, p -value 0.088. For joint stock companies where no dominant owner is identified, $F(1, 995) = 4.51$, p -value 0.034. Based on these tests, we conclude that the coefficients for these three types of joint stock companies are statistically smaller than that for foreign-owned limited liability companies. We use this terminology throughout the paper to make comparisons between coefficients that cannot be read directly from our tables. For foreign-owned joint stock companies, $F(1, 995) = 1.11$, p -value 0.292. Therefore, we reject the hypothesis that the coefficient for foreign-owned limited liability companies is greater than that for foreign-owned joint stock companies.

TABLE 3
Regression Results, Performance

Explanatory variable	(Return on assets)				Output growth rate	
	OLS White's SE	OLS White's SE	OLS White's SE ROA >-.5	Robust Regression	OLS White's SE, Growth <250%	Robust regression
	(1)	(2)	(3)	(4)	(5)	(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)	-.097** (.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	-.118* (.070)	-.118* (.070)	-.041*** (.015)	-.013 (.011)	-.287*** (.088)	-.135** (.064)
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

Note. Standard errors are in parentheses. All specifications include dummy variables for industry and year. Output growth = $(\text{output}(t) - \text{output}(t - 1)) / \text{output}(t)$. Return on assets = pretax profits(t) / total assets(t). Capital intensity = fixed assets / total assets. Initial leverage = total assets($t = 1$) / total liabilities($t = 1$).

* Statistical significance at the $p = 0.10$ level.

** Significance at the $p = 0.05$ level.

*** Significance at the $p = 0.01$ level.

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 or outliers. We deal with this problem in two ways. First, we eliminate obvious cases of measurement error and apply standard

estimation techniques. Next, we employ robust estimation techniques using all available observations.¹⁶ We find relatively consistent results for both methods, which appear in columns 3 through 6 of Table 3. Because these specifications confront the data problems, we prefer to use these regressions for interpretation.

To eliminate obvious cases of measurement error, we limit our sample to only those firms with balance sheets that were internally consistent.¹⁷ Then we eliminate firms with extreme values for ROA, defined as less than -50% , in some specifications. In most cases, firms with ROA below -50% also had large inconsistencies between their balance sheets and their operating statements. In specification 3, which eliminates observations that had ROA less than -50% , the coefficient for joint stock companies owned by investment funds and the one for joint stock companies in which no dominant owner is identified are negative and significant, indicating that those firms generated returns on assets five to six percentage points lower than the typical Czech limited liability company.

Specification 3 differs from the first two in that the coefficients for both types of foreign-owned firms are no longer significant. Unlike the Czech joint stock companies, the performance of foreign-owned companies is not statistically distinguishable from that of the Czech limited liability companies. The same pattern holds for regression 4, which we estimate using the robust technique. Moreover, the coefficient for foreign-owned joint stock companies is statistically larger than those for the Czech fund-controlled joint stock companies. By contrast, the performance of the foreign-owned limited liability companies is statistically indistinguishable from that of the Czech limited liability companies. In Section 3.1, we argue that the advantages of foreign ownership should be more pronounced for joint stock companies than for limited liability companies. These results confirm that expectation. Hence, two of the preferred specifications offer support for both of our main hypotheses.

Another difficulty is that our data come from an environment in which some illegal activities occur. Controlling shareholders and managers might have had incentives to answer survey questions and construct balance sheets that masked these activities. Since it may be easier to hide certain things, some of our measures may display greater sensitivity to ownership structure than will others. Frydman et al. (1997, 1999) argue that the output growth rate is a sensible measure of performance. One of its potential advantages is that it is more easily measured

¹⁶ Frydman et al. (1997) computed annualized growth rates of performance measures over their entire period of interest, 1990 to 1993, to de-emphasize large year-to-year variations. In a later paper, Frydman et al. (1999) include yearly growth rates regressed upon levels of ownership. That paper 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) use robust estimation techniques to confront this problem.

¹⁷ Internal consistency implies that the basic accounting identity, i.e., $\text{assets} = \text{liabilities} + \text{equity}$, holds. We also require that the sum of the subcategories of assets matches the total assets entry in the balance sheet and that the subcategories of liabilities sum to the total liabilities entry.

than other variables so that managers have less reason to misrepresent it.¹⁸ As in the ROA regressions, the output growth regressions show joint stock companies to be significantly weaker performers than the limited liability companies in specifications 5 and 6.¹⁹ Hence, our expectations are confirmed. Those specifications also yield positive, although insignificant, coefficients for the foreign-owned limited liability companies, which provides weak support for the hypothesized benefits of foreign ownership. However, among the regressions using pooled data, only specifications 3 and 4 offer support for the hypothesis that foreign-owned joint stock companies outperformed Czech ones.

The results in Table 3 provide strong support for the hypothesis that Czech joint stock companies underperformed limited liability companies and weaker support for the hypothesis that foreign-owned companies outperformed Czech ones. One potential problem is that these results might be attributable to selection problems rather than to the relative governance capabilities of the ownership types. Czech owners of joint stock companies may have selected worse firms through the privatization process than did other types of owners. In the Czech Republic, in the period just after privatization, results from regressions of performance levels on ownership may reflect primarily the relative abilities of the ownership types to select firms that perform well.²⁰

¹⁸ Frydman et al. (1997) argue that another major advantage of the output growth rate is that it captures entrepreneurship better than other variables. The obvious drawback is that it ignores costs and thus provides information about only one aspect of economic performance.

¹⁹ In addition, we also controlled for liability growth rates in the output growth regressions but did not report the results. Firms might borrow for looting but they might also borrow to expand faster or to invest in improvements in efficiency. By including the liability growth rate in our output growth rate regressions, we test 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 needs to account for inputs. We lack reliable data on either capital accumulation or changes in labor input and thus must depend on liability growth as a proxy for these in our output growth regressions. Controlling for the rate at which new liabilities were incurred, we compare the performance of the ownership classes. Qualitative results do not differ substantially from those presented in specifications 5 and 6 of Table 3. We also included the liability growth rate in regressions in which the dependent variable was return on assets. The connection between the liability growth rate and that variable is less straightforward but again qualitative results were similar whether or not liability growth was included in the specifications.

²⁰ These selection effects should be less pronounced in regressions of changes in performance on ownership, e.g., the output growth regressions. Weiss and Nikitin (1998, p. 15) 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." Frydman et al. (1997) also use rates of change of revenues, employment, revenue per employee, and cost per unit of revenue in measuring performance.

TABLE 4
Regression Results, Cross-sections

Explanatory variable	Return on assets				Output growth	
	1993–1994	1996	1993–1994	1996	1993–1994	1996
	OLS White's SE ROA > -.5	OLS White's SE ROA > -.5	Robust Regression	Robust Regression	Robust Regression	Robust Regression
	(1)	(2)	(3)	(4)	(5) ^a	(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	-.049 (.030)	-.032 (.024)	-.020 (.019)	-.0001 (.022)	-.153* (.090)	-.143 (.094)
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

Note. Standard errors are in parentheses. All specifications include dummy variables for industry. Output growth = $(\text{output}(t) - \text{output}(t-1)) / \text{output}(t)$. Return on assets = $\text{pretax profits}(t) / \text{total assets}(t)$.

^a Specification also includes a dummy variable equal to one if the observation was from 1994. That dummy was significant at the $p = .01$ level.

* Statistical significance at the $p = 0.10$ level.

** Significance at the $p = 0.05$ level.

*** Significance at the $p = 0.01$ level.

We also estimate yearly cross-sectional regressions in Table 4, which indicate that Czech owners did purchase joint stock companies that performed relatively poorly in 1993 and 1994, the first years of the sample. By 1996, the gap between those Czech firms and other types of firms had grown larger. Estimated

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 because the time series is too short. For any given firm, the maximum number of observations for variables that measure changes in performance is three. In the vast majority of cases, the actual number is two because most firms had not been privatized by 1993. Moreover, only one firm in our sample experienced a change in ownership classification.

coefficients for non-foreign-controlled joint stock companies in 1996 are negative and significant; they are almost always larger in absolute value than those for 1993–1994.²¹ The joint stock companies owned by Czechs, especially those owned primarily by investment funds, experienced further deterioration relative to Czech limited liability companies.

By contrast, foreign owners also purchased joint stock companies that performed relatively poorly during the early years, but by 1996 those firms were relatively strong performers. In Table 4, the estimated coefficients for joint stock companies with foreign owners are negative and generally significant for 1993–1994; none are negative and significant for 1996, which indicates that they caught up to firms in the omitted category, the Czech limited liability companies. In the ROA regressions, the 1996 coefficient for foreign-owned joint stock companies in specification 4 is statistically larger than the 1993–1994 coefficient for that group in specification 3.²² This is the only firm type for which this difference is statistically significant. The changes in the ownership class performance rankings that are reflected in the yearly cross-sectional regressions indicate that selection alone is unlikely to be responsible for our results.

The cross-sectional results also confirm our expectations about foreign-owned limited liability companies. In the 1993–1994 cross-section, the coefficients for foreign limited liabilities are negative and the one in specification 3 is statistically significant. By 1996, estimated coefficients are all positive; in the output growth regression in specification 6 the coefficient is also significant. The results are consistent with the idea that foreign-owned limited liability companies started at an initial disadvantage, perhaps due to selection bias, because their owners had less information about firms. By 1996, these firms had improved sufficiently so that their performance levels were either statistically indistinguishable from Czech limited liability companies or they held a slight advantage.²³

We also expect joint stock companies controlled by investment funds to perform at least as poorly as other joint stock companies due, in part, to their closed ended nature. In Tables 3 and 4, coefficients are negative and larger in absolute value for fund-controlled companies than for any other subgroup of firms except for state-owned enterprises. Moreover, the yearly cross-sectional regressions in Table 4 indicate that, by 1996, the disparity between fund-controlled joint stock companies and all other firms was at its widest. For 1996, the coefficient for fund-controlled joint stock companies is statistically smaller than those for all other

²¹ Because we have only 29 observations in 1993, we combine them with the 1994 data in the regressions in Table 4. Qualitative results are nearly identical when those 29 observations are dropped.

²² That is, we reject the null hypothesis $H_0: \beta_{(\text{foreign JSC } 1996)} - \beta_{(\text{foreign JSC } 94)} \leq 0$, $F(1, 612) = 6.20$, $p\text{-value } 0.013$. We nearly reject the same hypothesis for specifications 1 and 2: $F(1, 605) = 2.04$, $p\text{-value} = .154$.

²³ By statistically indistinguishable, we mean that we fail to reject the null hypothesis that the two coefficients are equal at a 10% level or better. We use this terminology throughout the rest of the paper to describe all tests of whether two estimated coefficients are equal.

firms types at the 10% level or better, except for state-owned enterprises and those joint stock companies where no dominant owner could be identified. In summary, fund-controlled joint stock companies fell progressively further behind other firm types, which is consistent with looting rather than tunneling.

4.2. Leverage

For looting to occur, firms need a source of renewable funds. We offer indirect tests of the hypothesis that Czech joint stock companies had better access to soft lending than other firm types by analyzing the rate at which they incurred liabilities after privatization. Regression 4 in Table 5 indicates that Czech joint

TABLE 5
Regression Results, Financing

Explanatory variable	Leverage		Change in leverage	
	OLS White's SE (1)	OLS White's SE (2)	OLS White's SE (3)	Robust regression (4)
Return on assets [$t - 1$]		-.916*** (.152)		-.088 (.054)
Foreign LL	-.013 (.027)	-.069** (.029)	.094 (.092)	-.012 (.018)
JSC: Dominant owner foreign	-.399*** (.029)	-.397*** (.041)	.160** (.079)	.021 (.027)
JSC: Dominant owner non-bank domestic fund	-.330*** (.021)	-.350*** (.027)	.126*** (.064)	.045** (.022)
JSC: Dominant owner domestic bank fund	-.396*** (.023)	-.407*** (.028)	.197*** (.056)	.101*** (.024)
JSC: No dominant owner identified	-.329*** (.023)	-.343*** (.032)	.086 (.052)	.053** (.022)
State owned	-.368*** (.037)	-.395*** (.047)	.067 (.108)	.061* (.033)
Constant	.802*** (.056)	.734*** (.039)	.966*** (.093)	.948*** (.042)
Observations	1017	624	624	624
R-square	.41	.49	.03	
F	46.62	37.16	2.38	2.94
Prob > F	0.000	0.000	0.001	0.000

Note. Standard errors are in parentheses. All specifications include dummy variables for industry and year. Leverage = total liabilities/total assets. Change in leverage = leverage(t)/leverage($t - 1$). Return on assets = pretax profits(t)/total assets(t).

* Statistical significance at the $p = 0.10$ level.

** Significance at the $p = 0.05$ level.

*** Significance at the $p = 0.01$ level.

stock companies have become substantially more leveraged than foreign-owned joint stock companies and limited liability companies, with firms controlled by bank-sponsored investment funds the most heavily leveraged. Firms that performed the worst were able to incur the most additional liabilities as specification 4, and to a lesser extent specification 3, in Table 5 indicate.²⁴ Because it confronts the data problems, we prefer specification 4 for interpretation. The results are consistent with the hypothesis that the typical joint stock company that was owned by a bank-sponsored investment fund was also a traditional client of that bank and thus had better access to soft lending than other firms.

We measure leverage as the ratio of total liabilities to total assets. Much of these liabilities was in the form of bank loans, and state influence in the banking sector remained strong throughout this period. Because they expected to be compensated for their nonperforming loans, the banks had incentives to assist these firms. When we control for current and lagged performance, as measured by ROA, the results are unchanged.²⁵ Despite their relatively low profitability, Czech joint stock companies took on new liabilities at a much faster rate than other firms. Again, the statistical comparisons with Czech limited liability companies can be read directly from Table 5; the comparisons with other firm types come from separate hypothesis tests.

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 at joint stock companies than at other companies.²⁶ In other words, the joint stock companies, which are the 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.²⁷ Recall that these were the firms in which output growth rates and ROA lagged substantially behind those of other firm types. What sort of intangibles might they have been acquiring? The financial structure regressions lend support to the premise that looting was present, especially when combined with the productivity regressions.

One might argue that the joint stock companies had artificially low leverage ratios due to the voucher privatization process and that we may be witnessing only the equilibration process. The regressions in levels in specifications 1 and 2 indicate that joint stock companies were less leveraged on average during the period than limited liability companies. However, lending to poorly performing firms to equilibrate them with well-performing firms would not be a rational decision for a

²⁴ The increased leverage ratios were not attributable to asset reduction because total reported assets at joint stock companies tended to increase slightly over this period.

²⁵ Results controlling for current performance are not reported.

²⁶ Results are not reported but are available from the authors.

²⁷ Regression results for changes in the shares of fixed assets and cash are also available from the authors.

bank manager if the bank faced market competition, stringent regulation, and the threat of serious penalties for defaults.

Lower initial leverage may have been an advantage to joint stock companies and this could be reflected in higher ROA and greater output growth. To bias our results against our hypothesis that joint stock companies underperformed, we did not include initial leverage in our base performance regressions in Tables 3 and 4. Including leverage and capital intensity strengthens the support for our hypotheses, as we will demonstrate in the next section.

5. ROBUSTNESS CHECKS

Although the performance and leverage measures lend support to our hypotheses, some might object that the results are driven by the timing of the privatization or that the comparisons between relatively large joint stock companies and smaller limited liability companies are misleading. Hence, we redo the regressions with subsamples to address these objections.

5.1. Sample Selection Stemming from Timing of Privatizations

Companies were privatized at different times and, if the timing of privatizations were nonrandom, changes in the composition of the sample may be driving our results. For example, the 1996 cross-sectional results in Table 4 indicate that fund-controlled joint stock companies performed poorly relative to other ownership types and substantially worse than they had in 1993–1994. However, that result may be attributable to the late addition of a number of fund-controlled joint stock companies to the sample. These companies may not have had sufficient time to establish effective governance.

To control for this possibility, specifications 1 and 2 in Table 6 include observations from a balanced panel of the 214 firms for which we have data from 1994 through 1996. The results are largely unchanged. The coefficients for fund-controlled joint stock companies and those companies for which no dominant owner was identified are negative and significant for 1994. Coefficients for other firm types, including foreign joint stock companies, are insignificant but they are statistically indistinguishable from those for the fund-controlled and other joint stock companies. For 1996, the coefficient for fund-controlled joint stock companies is negative, significant, and larger in absolute value than for 1994. Most important, that coefficient is statistically smaller than those for foreign joint stock companies and foreign limited liability companies. By contrast, the coefficient for joint stock companies with no dominant owner does not change from 1994; it achieves significance at only the 10% level and is not statistically distinguishable from those of foreign ownership types. Hence, 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.

TABLE 6
Robustness Checks

Explanatory variable	Balanced panel (cross-sectional models)		Small firms (all years included in estimation)		Controlling for capital intensity and initial leverage (all years included in estimation)	
	ROA (>- .5) OLS, White's SE 1994 (1)	ROA (>- .5) OLS, White's SE 1996 (2)	ROA (>- .5) OLS, White's SE Firms w/assets < sample median (3)	ROA (>- .5) OLS, White's SE Firms w/assets in third quartile (4)	ROA (>- .5) OLS, White's SE (5)	ROA (>- .5) OLS, White's SE Firms w/assets in third quartile (6)
Total assets (millions)	-.001 (.001)	-.001 (.001)			-.0004 (.0005)	
Foreign LL	-.025 (.019)	.003 (.022)	.009 (.013)	-.006 (.016)	-.005 (.009)	-.018 (.015)
JSC: Dominant owner foreign	-.034 (.025)	-.0004 (.022)	-.016 (.044)	.007 (.048)	-.063*** (.019)	-.037 (.046)
JSC: Dominant owner any domestic fund	-.044*** (.014)	-.057*** (.017)	-.064*** (.019)	-.050** (.021)	-.091*** (.012)	-.110*** (.024)
JSC: No dominant owner identified	-.033** (.017)	-.033* (.018)	-.038*** (.014)	-.018 (.015)	-.083*** (.012)	-.075*** (.020)
State owned	-.031 (.037)	.004 (.030)	-.024 (.028)	-.018 (.031)	-.081*** (.016)	-.124*** (.043)
Capital intensity					-.112*** (.017)	-.062** (.028)
Initial leverage					-.147*** (.017)	-.159*** (.037)
Constant	.036*** (.000)	.035*** (.000)	.030 (.030)	.059** (.027)	.213*** (.023)	.210*** (.044)
Observations	214	214	504	250	1007	250
R-square	.16	.15	.08	.13	.22	.24
F	2.67	2.85	3.32	3.21	9.61	4.97
Prob > F	0.001	0.000	0.000	0.000	0.000	0.000

Note. Standard errors are in parentheses. Specifications 3–8 include dummy variables for industry and year. Specifications 1–2 include dummy variables for industry only. Output growth = $(\text{output}(t) - \text{output}(t-1)) / \text{output}(t)$. Return on assets = $\text{pretax profits}(t) / \text{total assets}(t)$. Capital intensity = $\text{fixed assets} / \text{total assets}$. Initial leverage = $\text{total assets}(t=1) / \text{total liabilities}(t=1)$.

* Statistically significant at the $p = 0.10$ level.

** Significance at the $p = 0.05$ level.

*** Significance at the $p = 0.01$ level.

5.2. *Firm Size*

Aside from their performance, the most striking difference between the joint stock companies and the limited liability companies is their size. Whether measured in total liabilities, total assets, or employees, joint stock companies tend to be much larger than limited liability companies. The median joint stock company is roughly seven times larger, as measured in total assets, than the median limited liability company (Table 2). Within the subset of joint stock companies those controlled by bank-sponsored investment funds are the largest, but size differences within the subset are much smaller than the differences between joint stock companies and limited liability companies. Among limited liability companies, those controlled by foreigners are typically much larger than those controlled by Czech citizens but not nearly as large as the typical joint stock company. In summary, different governance mechanisms were associated with firms of different average size and size alone may have had an impact on performance. Therefore, we control 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. Therefore, we may still be offering misleading comparisons between limited liability companies and joint stock companies in our regressions. To address this concern, we rerun the regression with only small firms in specifications 3 and 4 in Table 6.²⁸ Specification 3 includes only firms with assets below the sample median; specification 4 includes only firms whose assets ranked in the third quartile of the sample. Specification 4 is probably more relevant because there are no fund-controlled joint stock companies ranked in the lowest quartile in assets; hence, we are comparing larger limited liability firms with similar sized joint stock companies in this column. Among all firm types, the negative coefficient for fund-controlled joint stock companies is the only one that is significant in both specifications. In specification 3, that coefficient is also significantly smaller than those for each of the other firm types, except for joint stock companies without a dominant owner and state-owned enterprises. However, in specification 4, the coefficient for joint stock companies without a dominant owner is both significantly larger than that for fund-controlled joint stock companies and not significantly smaller than those for other firm types. Thus, it does not appear that firm size can account for our results.

5.3. *Capital Intensity*

Another difference between joint stock and limited liability companies is that the 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

²⁸ The relationship between firm size and ownership type is a potential source of multicollinearity that we try to address through these specifications. In addition, we reran our base regressions in Table 3 without the total assets variable. Qualitative results were unchanged.

for sector of operations and size.²⁹ If joint stock companies had to invest more heavily and if it takes several years for capital investments to come on-line fully, it may take those companies longer to improve their performance. Consequently, they might have only begun to generate improvements after the period included in our sample.

To address this concern, we add the measure of capital intensity as an explanatory variable in the regressions. Specification 5 in Table 6 includes the full sample; specification 6 includes only those firms ranked in the third quartile in terms of assets. We also include initial leverage as an explanatory variable in those specifications because high leverage may have reduced a firm's ability to borrow and thus impaired its subsequent performance. As expected, capital intensity is negative and significant in both specifications. The coefficient for fund-controlled joint stock companies is negative and significant in both specifications and it is the largest, in absolute value, for any firm type except state-owned enterprises. In the small firms specification, the fund-controlled coefficient is statistically smaller than those for all types of private firms at the 10% level or better, including the coefficient for Czech joint stock companies where no dominant owner was identified. The coefficient for initial leverage is negative and significant in both specifications, as expected. In summary, performance results are similar even after controlling for capital intensity, initial leverage, sector, and size.

6. CONCLUSION

Two perverse incentives were present in the voucher privatization experiences in the Czech Republic. One was the potential to capture greater income through borrowing, looting, and defaulting than could be earned by maximizing the firm's economic net worth. The other was the chance for dominant owners and/or managers to tunnel resources from a firm that they own in part and transfer them to a firm that they own in whole or even to their personal accounts. The critical enabling factors that made tunneling and looting possible may have been the weak enforcement of rules pertaining to disclosure, to protection of minority shareholders, and to good corporate conduct, coupled with implicit government guarantees and biases in the allocation of credit by state controlled banks.

The skeptic might attribute the underperformance of fund-controlled joint stock companies to general failures in corporate governance rather than to an increased incentive to loot. We provide evidence to question that interpretation. Yearly cross-sectional results show that, while the other firm types generally improved relative to Czech limited liability companies, fund-controlled joint stock companies fell further behind in performance. Although this may be attributable to more general

²⁹ We caution the reader that the book values of fixed assets may be unreliable during this period. More accurate indicators of capital intensity would be available once trading had occurred and assets had found their real values. Similar results are obtained 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; thus we present the results based on fixed assets as a percentage of total assets.

failures in corporate governance, at least for a short period, the key question is why the funds retained control of these firms if they were systematically underperforming over an extended period. Shouldn't they have sold the firms to more capable owners?

Our most compelling piece of evidence in favor of the looting hypothesis comes from regressions using the subset of small firms. Controlling for industry, capital intensity, and initial leverage, fund-controlled joint stock companies underperformed all other firms. This includes not only foreign-owned joint stock companies but also those Czech joint stock companies that are not controlled by funds. Therefore, there was nothing endemic to the structure of joint stock companies that ensured poor performance. In addition, during this period 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 fully these results. Rather, looting is a likely contributing factor.

REFERENCES

- Akerlof, George, and Romer, Paul, "Looting: The Economic Underworld of Bankruptcy for Profit." *Brookings Pap. Econ. Act.* **0**, 2:1–60, 1993.
- Bonin, John, and Wachtel, Paul, "Lessons from Bank Privatization in Central Europe." In Harvey Rosenblum, Ed., *Bank Privatization: Conference Proceedings of a Policy Research Workshop Held at the World Bank, March 15–16, 1999*, pp. 35–51. Dallas, TX: Federal Reserve of Dallas, 2000.
- Brom, Karla, and Orenstein, Mitchell, "The Privatized Sector in the Czech Republic: Government and Bank Control in a Transitional Economy." *Europ. Asia Stud.* **46**, 6:893–928, Dec. 1994.
- Buchtíková, Alena, and Capek, Ales, "Financial Structure, Performance and the Banks." In Marvin Jackson and Valentijn Bilsen, Eds., *Company Management and Capital Market Development in the Transition*, Vol. 2, pp. 83–116. Aldershot, UK/Brookfield, VT/Sydney: Ashgate, 1994.
- Capek, Ales, "The Bad Debts Problem in the Czech Economy." *Moct-Most* **4**, 3:59–70, Dec. 1994.
- Claessens, Stijn, and Djankov, Simeon, "Ownership Concentration and Corporate Performance in the Czech Republic." *J. Comp. Econ.* **27**, 3:498–513, Sept. 1999.
- Claessens, Stijn, Djankov, Simeon, Fan, Joseph P. H., and Lang, Larry H. P., "Expropriation of Minority Shareholders: Evidence from East Asia." Working Paper No. 2088. Washington, DC: World Bank, March 1999.
- Claessens, Stijn, Djankov, Simeon, and Lang, Larry H. P., "The Separation of Ownership and Control in East Asian Corporations." *J. Finan. Econ.* **58**, 1-2:81–112, Oct.–Nov. 2000.
- Claessens, Stijn, Djankov, Simeon, and Pohl, Gerhard, "Ownership and Corporate Governance: Evidence from the Czech Republic." Working Paper No. 1737. Washington, DC: World Bank, March 1997.
- Coffee, John C. Jr., "Institutional Investors in Transitional Economies: Lessons from the Czech Experience." In Roman Frydman, Cheryl W. Gray, and Andrzej Rapaczynski, Eds., *Corporate Governance in Central Europe and Russia*, Vol. 1, pp. 111–186. Budapest: Central European University Press, 1996.
- Coffee, John C. Jr., "Privatization and Corporate Governance: The Lessons from Securities Market Failure." *J. Corp. Law* **25**, 1:1–39, Fall 1999.
- Demsetz, Harold, and Lehn, Kenneth, "The Structure of Corporate Ownership: Causes and Consequences." *J. Polit. Econ.* **93**, 6:1155–1177, Dec. 1985.
- Desai, Raj M., "Reformed Banks and Corporate Governance in the Czech Republic, 1991–1996." *Post-Soviet Geogr. Econ.* **37**, 8:463–494, Oct. 1996.

- Frydman, Roman, Gray, Cheryl, Hassel, Marek, and Rapaczynski, Andrzej, "Private Ownership and Corporate Performance: Some Lessons from Transition Economies." Working Paper No. 1830. Washington, DC: World Bank, Sept. 1997.
- Frydman, Roman, Gray, Cheryl, Hassel, Marek, and Rapaczynski, Andrzej, "When Does Privatization Work? The Impact of Private Ownership on Corporate Performance in the Transition Economies." *Quart. J. Econ.* **114**, 4:1153–1191, Nov. 1999.
- Glaeser, Edward L., Johnson, Simon, and Shleifer, Andrei, "Coase Versus the Coasians." *Quart. J. Econ.* **116**, 3:853–899, Aug. 2001.
- Hrncir, Miroslav, "Financial Intermediation in Former Czechoslovakia: Lessons and Progress Evaluation." *Econ. Systems* **17**, 4:301–327, Dec. 1993.
- Jensen, Michael C., and Meckling, William H., "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure." *J. Finan. Econ.* **3**, 4:305–360, Oct. 1976.
- Johnson, Simon, Boone, Peter, Breach, Alasdair, and Friedman, Eric, "Corporate Governance in the Asian Financial Crisis." *J. Finan. Econ.* **58**, 1–2:141–186, Oct.–Nov. 2000.
- Johnson, Simon, La Porta, Rafael, Lopez-de-Silanes, Florencio, and Shleifer, Andrei, "Tunneling." *Amer. Econ. Rev.* **90**, 2:22–27, May 2000.
- Johnson, Simon, and Shleifer, Andrei, "Coase v. the Coasians." National Bureau of Economic Research Working Paper No. 7447, Cambridge, MA: NBER, Dec. 1999.
- La Porta, Rafael, Lopez-de-Silanes, Florencio, and Shleifer, Andrei, "Corporate Ownership Around the World." *J. Finan.* **54**, 2:471–517, April 1999.
- La Porta, Rafael, Lopez-de-Silanes, Florencio, Shleifer, Andrei, and Vishny, Robert W., "Law and Finance." *J. Polit. Econ.* **106**, 6:1113–1155, Dec. 1998.
- Meyendorff, Anna and Snyder, Edward A., "Transactional Structures of Bank Privatizations in Central Europe and Russia." *J. Comp. Econ.* **25**, 1:5–30, Aug. 1997.
- Morck, Randall, Shleifer, Andrei, and Vishny, Robert W., "Management Ownership and Market Valuation: An Empirical Analysis." *J. Finan. Econ.* **20**, 1–2:293–315, Jan.–March 1988.
- Shafik, Nemat, "Making a Market: Mass Privatization in the Czech and Slovak Republics." *World Devel.* **23**, 7:1143–1156, July 1995.
- Weiss, Andrew and Nikitin, Georgiy, "Performance of Czech Companies by Ownership Structure." IED Discussion Paper No. 85, Boston, MA: Institute for Economic Development, Boston University, May 1998.
- World Bank, *Czech Republic Capital Market Review*. Washington, DC: World Bank, 1998.