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Abstract

We analyze the effects of ownership type and concentration on performance of a population of firms in a model large-scale privatization economy (Czech Republic). Using specifications based on first-differences and unique instrumental variables, we find that few types of private ownership improve dynamic post-privatization performance. Concentrated foreign (but not domestic) ownership improves some measures of performance relative to state ownership. Foreign investors engage in strategic restructuring by increasing the rate of change of sales, while domestic private owners reduce the rate of change of sales and labor cost without increasing profitability. The effects of concentrated foreign ownership support the agency theory and go against theories stressing the positive effects of managerial autonomy and initiative. Our results are also consistent with the thesis that large domestic stockholders are not improving performance because they loot the firms. We find some support for the hypothesis that firms restructure by first lowering and later increasing the rate of change of employment. The state as a holder of the golden share has a positive effect on employment, while stimulating profitable restructuring. The state hence appears as a more economically and socially helping agent than in some recent studies.

Keywords: ownership, performance, privatization, corporate governance, panel data, endogeneity, industrial organization

JEL Classification: C33, D20, G32, G34, L20

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1. Introduction

One of the fundamental and most controversial economic questions is whether private firms perform better than state-owned enterprises (SOEs) and whether privatization improves firm performance. There is now a large literature on the subject of ownership structure and firm performance, and the issue has gained currency as large-scale privatizations have taken place in many of the former command economies and developing countries. The issue is also of interest because the most populous and rapidly growing countries, China and India, are in the process of privatizing their state-owned firms. Unfortunately, the literature has generated surprisingly diverse findings and many results are questionable because of serious data limitations and inability of researchers to control adequately for endogeneity of ownership. In this paper, we address these issues by analyzing the performance effects of ownership changes in a population of firms in a model large-scale privatization economy (Czech Republic), using instrumental variables (IVs) from a rich data set on pre-market initial conditions of these firms.

Interestingly, while privatization is based on the premise that it will improve corporate performance and help countries grow, the effect has been surprisingly hard to identify. At the macro level, one observes that some of the fastest large-scale privatizers (e.g., Russia, Ukraine and the Czech Republic) experienced a decline or slow growth after privatization in the 1990s, while some of the fastest growing transition economies in the 1990s (e.g., China, Poland and Slovenia) were among the slowest to privatize. In a cross-country aggregate study, Sachs, Zinnes and Eilat (2000) find that privatization does not by itself increase GDP growth, but they suggest that a positive effect is present when privatization is accompanied by in-depth institutional reforms. Careful micro-

econometric studies date back to Caves and Christensen's (1980) classic study that found private and state-owned Canadian railways performing equally efficiently in a head-on competition. Recent surveys of privatization studies based on micro data come up with assessments that range from finding a large variation of outcomes but no systematically significant effect of privatization on performance (Bevan, Estrin and Schaffer, 1999), to cautiously concluding that privatization around the world improves firm performance (Megginson and Netter, 2001), to being fairly confident that privatization tends to improve performance (Shirley and Walsh, 2000, and Djankov and Murrell, 2002).[1]

In part, the variation in results is brought about by the fact that the early studies had access to different and often very limited data on firm ownership.[2] For these reasons, most studies treat ownership as a relatively simple categorical concept (e.g., private v. state or state v. foreign, domestic private outsider v. domestic private insider), and they are often unable to distinguish the exact extent of ownership by individual owners or even relatively homogeneous groups of owners. As we discuss below, the inability to distinguish the extent of different forms of ownership also prevents many studies from providing evidence on a lively theoretical debate about the desirability of concentrated vs. dispersed ownership on corporate performance.[3]

Equally important, the diversity of findings is generated by three types of interrelated analytical problems that may be expected in early studies, especially those in the context of the rapidly changing transition economies. First, the early studies rely on short time periods with observations concentrated immediately before and after

[1] A theoretical analysis and overview of privatization and firm performance in transition is provided by Roland (2000).
[2] See for example Pohl, Anderson, Claessens, and Djankov (1997), Smith, Cin, and Vodopivec (1997), Claessens and Djankov (1999), and Frydman, Hessel, and Rapaczynski (2000).

privatization.[4] They may hence at best capture the short–term effects of privatization, namely those associated with defensive (reactive) restructuring of firms, rather than the medium and long-term effects of a switch from state to a relatively stable form of private or mixed ownership.[5] Second, the early studies (a) use small and often unrepresentative samples of firms, (b) are frequently unable to identify accurately ownership because privatization is still ongoing or because the frequent post-privatization changes of ownership are hard to detect, and (c) often combine panel data from different accounting systems.[6] Third, many of the early studies have not been able to control adequately for endogeneity of ownership (firms not being selected for privatization at random), and their estimates of the effects of privatization may hence be biased (Gupta, Ham and Svejnar, 2000).[7]

In this paper, we advance the literature by estimating the performance effects of key ownership patterns that we construct from detailed information on the extent of firm ownership by various owners. We exploit the fact that we know the identity of all firms in our large data set and have detailed information about their ownership and key indicators of performance. We are hence able to estimate the effects of ownership forms and degrees of ownership concentration that could not be examined before.

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[3] An important recent exception is Grosfeld and Tressel (2001).
[4] For example, Frydman, Gray, Hessel and Rapaczynski (1999) use a 1990-93 sample of about 200 firms pooled from the Czech Republic, Hungary and Poland; D'Souza and Megginson (1999) analyze 85 companies from 28 countries; Boubakri and Cosset (1998) use a 79 firm sample covering 29 countries; Barberis, Boycko, Shleifer, and Tsukanova (1996) use a sample of 260-340 Russian shops during the 1992-93 period; Bilsen and Konings (1998) use survey data for 1990–94 on about 260 firms divided among Bulgaria, Romania, and Hungary; Grosfeld and Nivet (1997) use a sample of 173 of the largest 500 companies in Poland during the 1988-1994 period; and Claessens and Djankov (1999) use data on approximately 700 manufacturing firms from the Czech Republic during 1993-97.
[5] See Grosfeld and Roland (1997) and Aghion and Carlin (1996) for discussions of defensive and reactive restructuring.
[6] See also Claessens (1997) and Filer and Hanousek (2002) for a discussion of these issues.
[7] Gupta et al.'s (2000) econometric evidence indicates that better performing firms tend to be privatized first.

Moreover, we address systematically the three types of above-mentioned problems found in existing studies. In particular, we (a) use panel data on a virtually complete population of medium and large firms that went through large-scale privatization in a model economy (Czech Republic) and that constitute the bulk of the country's economic activity,[8] (b) cover a four-year period after privatization when accounting rules conforming to the international (IAP) standard were already in place, (c) control for possible endogeneity of ownership using a first-difference as well as IV estimators, and (d) estimate the effects of ownership and changes in ownership after large-scale privatization. Compared to other studies, our paper also has the advantage of being based on more detailed data on ownership and an unusual set of instrumental variables capturing pre-market firm-level conditions. We also develop a more systematic analytical framework that allows us to evaluate the performance effect of initial post-privatization ownership as well as to distinguish between instantaneous and permanent effects of ownership changes. Finally, unlike other studies, we estimate the principal effects in both linear and nonlinear form.[9]

[8] Since we use data on virtually the entire population of large and medium sized firms in the Czech Republic, one may think of our data as a country sample drawn from the population of centrally planned economies that went through large-scale privatization. The Central European economies have served as models for other transition countries in that early on they carried out important reforms and policy makers from other countries and international institutions such as the World Bank and the International Monetary Fund have used them as examples to follow. In this context, the Czech Republic has served as the example of rapid large-scale privatization in a previously unreformed and virtually completely state-owned economy, while Hungary has been the example of piece-meal privatization of individual firms in a previously reformed and partially privately owned economy.

[9] The present paper belongs to a second generation of empirical studies that are being carried out to analyze corporate performance in the post-privatization period and employ large samples or populations of firm-level data from specific types of privatization in a given country. These studies are able to avoid some of the aforementioned problems and take into account specific institutional settings. Thus, Bornstein (2001) for instance examines the post-privatization restructuring of former SOEs, including examples from the Czech Republic, Hungary and Poland. Angelucci, Estrin, Konings and Zólkiewski (2002) use a large representative panel of manufacturing firms covering the years 1997-98 for Bulgaria and Romania, and 1994 and 1998 for Poland. Carlin, Fries, Schaffer and Seabright (2001) employ an EBRD cross-sectional survey of 3,300 firms in 25 transition countries to identify factors that influence restructuring by firms and their subsequent performance as measured by growth in sales and in sales per employee over the 1996-1998

In addition, the fact that we use data from a model large-scale privatization economy that started almost completely state-owned and within a short time span underwent virtually complete privatization and large subsequent changes in ownership means that we are analyzing a population of firms that experienced one of the greatest recorded changes in ownership. Since a number of other countries, including Russia and Ukraine, started from almost complete state ownership and have carried out large-scale privatizations and subsequent changes in ownership, obtaining an understanding of the effects of this process and its aftermath is of considerable interest. Unlike studies of partial privatization, we also benefit from a large variation in the variables whose effect we analyze.

Finally, by carrying out a detailed study of one model economy, we are able to take into account specific legal and institutional features that relate to ownership and control, and avoid the problem of not being able to control adequately for complex cross-country differences in the institutional and legal frameworks that confront comparative studies with a limited number of country-specific observations.[10]

The structure of the paper is as follows. In Section 2, we provide information on the privatization process that generates our data, while in Section 3 we discuss the relevant features of the legal system and the hypothesized implications of different types of ownership on firm performance. In Section 4, we describe the data and basic statistics and in Section 5 we outline our empirical strategy. We present our empirical estimates in Section 6 and we draw conclusions in Section 7.

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period. Lizal and Svejnar (2002) use 1992-98 panel data on the population of medium and large Czech industrial firms to examine investment behavior and the extent of credit rationing and soft budget constraints by ownership and corporate form of firms.

2. Privatization in the Czech Republic

The privatization program in the Czech Republic was carried out in the first half of the 1990s under three different schemes: restitution, small-scale privatization and large-scale privatization. The first two schemes started in 1990 and were most important during the early years of the transition. Large-scale privatization, by far the most important scheme, began in 1991 and was completed in early 1995.[11] The privatization program allowed various privatization techniques. Small firms were usually auctioned or sold in tenders. Many medium businesses were sold in tenders or to pre-determined buyers in direct sales. Most large and many medium firms were transformed into joint stock companies and their shares were distributed through voucher privatization (almost one-half of the total number of all shares of all joint stock companies was privatized in the voucher scheme), sold in public auctions or to strategic partners, or transferred to municipalities.

The voucher scheme was part of the large-scale privatization process and it attracted considerable interest and publicity.[12] Two waves of voucher privatization took place in 1992-93 and 1993-94, respectively. The early post-privatization ownership structure emerged as shares from the second wave were distributed in early 1995. Rapid reallocation of shares across new owners took place in 1995-96 during the so-called "third wave" of privatization as new owners, including the investment privatization funds (IPFs), reshaped their initial post-privatization portfolios of acquired companies.

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[10] The leading studies in this area (e.g.,Boubakri and Cosset, 1998, Frydman et al., 1999, D'Souza and Megginson, 1999) are forced by paucity of data to use pooled cross-country calculations and regressions to derive their key findings.

[11] The privatization process has been extensively described and analyzed. See e.g., Svejnar and Singer (1994), Kotrba (1995), Coffee (1996), and Kočenda (1999).

Depending on the investor, the swapping of shares in 1995-96 was aimed at (a) optimal portfolio diversification, (b) obtaining concentrated ownership in specific firms and industries and (c) achieving conformity with legal requirements aimed at preventing excessive stakes being held by privatization funds.[13]

The 1995-96 ownership changes were massive, unregulated and frequently unobservable to outsiders, including researchers. Investors, especially the IPFs, engaged in direct swaps of large blocks of shares, and off-market share trading was common. More stable and, from the standpoint of firm performance, more meaningful patterns of ownership emerged in 1996. We analyze the 1996-99 performance effects of various patterns of ownership and their changes after the dust of large-scale privatization and early post-privatization ownership swaps settled.

3. Forms of Ownership and Hypothesized Effects on Performance

Concentrated or Dispersed Ownership?

The link between firm performance and ownership is often viewed as going through the interaction and power distribution between the owners and managers of firms. In this context, the issue that has received major renewed attention, without resulting in a consensus, is whether concentrated or dispersed ownership is more conducive to good corporate governance and performance. The literature that focuses on

[12] The voucher scheme is sometimes erroneously referred to as the large-scale privatization program itself.
[13] The regulation of IPFs evolved gradually through Decree no. 383/1991, its Amendment No. 62/1992, and Act No. 248/1992. The most important clauses restricted each privatization fund from investing more than 10% of points acquired in the voucher scheme in a single company and obtaining in exchange more than 20% of shares in any company. Privatization funds established by a single founder were allowed to accumulate up to 40% of shares in a given company, but this cap was later reduced to 20%. Many privatization funds circumvented the cap through mergers. The Act also prohibited IPFs founded by financial institutions from purchasing shares of other financial institutions to prevent excessive concentration of financial capital (for details see Kotrba and Svejnar, 1994).

the agency problem arising from the separation of ownership and control usually argues for the desirability of concentrated ownership because it results in superior monitoring of managers, maximization of shareholder value and availability of external finance for the firms (see e.g., a survey by Shleifer and Vishny, 1997). As Burkart, Gromb and Panunzi (2000) have shown, the agency problem may exist even when a large (minority) shareholder is present -- if this shareholder loots the firm at the expense of small shareholders. On the other hand, models of asymmetric information and optimal delegation of authority (e.g., Aghion and Tirole, 1997) point to the importance of managerial initiative and incentives to acquire information, highlighting the fact that concentrated ownership with little delegation of formal authority to managers may be deleterious to firm performance.[14] Similarly, the literature pioneered by Holmstrom and Tirole (1983) points out that concentrated ownership reduces market liquidity and hence lowers the benefits of market monitoring on corporate performance. Finally, Bolton and von Thadden (1998) argue that concentrated ownership *per se* may or may not be desirable, showing that a reasonable alternative is ownership dispersion with trading in secondary markets or ease of takeovers generating concentration whenever necessary for intervention in managerial decision-making.

Since we are able to identify all owners with ownership stakes of 10 percent or more, we can classify all firms into categories that allow us to test the validity of the competing predictions from the above theories. Depending on their stakes, different blockholders have different capacity to influence corporate governance. In particular, the Czech law provides important rights of ownership and control to owners with *majority*

[14] See Grosfeld and Tressel (2001) for an articulation of this and the following interpretations.

ownership (more than 50 percent of shares), *blocking minority* ownership (more than 33 percent but not more than 50 percent of shares) and what we define as *legal minority* ownership (at least 10 but not more than 33 percent of shares).[15] Majority ownership grants the owner the right to staff management and supervisory boards, to alter and/or transfer firms' assets and to adopt most crucial strategic decisions at general shareholders' meetings. Through management and supervisory boards, majority ownership allows also more direct executive control over the company. The blocking minority ownership gives the right to block a number of decisions, such as those related to increasing or reducing assets and implementing major changes in business activities that the majority shareholder may strive to implement at the general shareholders' meeting. Finally, legal minority ownership can be considered a form of dispersed ownership since its concentration is low and its direct impact on routine business decisions is limited. On the other hand, it is potentially important since the law entitles the holder of such a stake to call the general shareholders' meeting and obstruct its decisions by delaying their implementation through lengthy court proceedings. Effective legal minority shareholders (including the state) may thus use their ownership position to delay or completely block the implementation of decisions by stronger shareholder(s).[16]

[15] In principle, we cannot fully trace ownership stakes of less than 10 percent since their reporting is not required by law. This limitation is not particularly constraining for our analysis for two reasons. First, by having data on all owners with 10 percent or more ownership, we are able to estimate the effects of the most relevant degrees of concentration and dispersion of ownership, ranging from a single owner having majority ownership, to no single owner having the legal (10 percent) minority ownership. Second, as we discuss below, we are able to trace even ownership stakes of less than 10 percent (reported voluntarily) in firms that are of particular analytical interest to us.

[16] Interesting effect is observed in the case of portfolio companies that are primarily interested in capital gains. These companies have been observed to buy 10 percent positions in firms where they can sell the stake at a premium to the dominant shareholder whose business strategy is to avoid excessive scrutiny by an institutionally strong minority shareholder.

Overall, the majority and blocking minority represent different degrees of concentrated ownership, while the legal minority may be viewed as a form of moderately dispersed ownership. Highly dispersed ownership arises when the stake of the largest holder held does not reach legal (10 percent) minority. We are also able to distinguish whether the government keeps a golden share that gives it the right to veto certain managerial decisions, such as the subject of business activities, termination of provided services, sales of assets, etc., and indirectly to influence all managerial decisions. Institutional evidence suggests that the golden share may be an important mechanism enabling the state to exert a degree of influence over firms in which it no longer holds a sufficient ownership stake.[17]

Types of Ownership

Most empirical work has focused on relatively broad categories of ownership such as government versus private, domestic versus foreign and insiders (managers and workers) versus outsiders. While useful as a first-order approximation, it is desirable to assess if finer distinctions that reflect the different goals and business activities of owners provide a clearer understanding of the effects of different types of ownership and corporate governance. In our analysis, we take a step in this direction by examining six types of domestic and two types of foreign ownership that are hypothesized to have differing implications for corporate objectives, constraints and governance.

[17] The golden share was introduced by Act No. 210/1993, modifying Act No. 92/1991. The act set the conditions for property transfer from the state to others with the aim of protecting special interests of the state in firms privatized in large-scale privatization. The veto rights associated with the golden share usually relate to the scope and line of business activity and depend on each company's charter. When the state sells its golden share, it gives up its rights in the company and the golden share ceases to exist. The instrument of the golden share in the Czech Republic does not conform fully to that found in other countries since it is limited to being solely an instrument of state control and does not serve as a means of attracting free or less expensive credit.

The six types of domestic owners are industrial company, bank, investment fund, individual, portfolio company, and state, while the two types of foreign owners are industrial company and all other owners.[18] The ownership of a firm by an industrial company is normally expected to increase profitability through cost cutting, vertical or horizontal integration of activities, and possibly expansion aimed at exploiting economies of scale. However, in the incomplete legal and institutional framework of transition, one might observe an opposite effects if the parent company's management appropriates the acquired company's profits and/or assets (i.e., tunnels) or if it uses the company for tax evasion or other private purposes.

A significant bank ownership or credit exposure to a firm should impose pressure on the firm's management to improve profitability (Cornelli, Portes, and Schaffer, 1996). However, the newly-created banks found themselves holding large credit and ownership positions in hundreds of firms and had only limited ability to staff the firms' management and supervisory boards with capable individuals.[19] Moreover, the banks' ownership role was weakened by their lending relationship with the firms they owned and by laws and regulations that limited their authority and tolerated corruption (see Lízal and Kočenda, 2001). The direction of the effect of bank ownership on performance is hence an empirical question.

Investment funds were created during large-scale privatization as diversified mutual funds. They are expected to pursue profitable opportunities and can take

[18] Since insiders have not been important in the Czech Republic, we do not analyze this type of ownership. We also do not examine whether a given owner belongs to a larger ownership group. With considerable additional data collection, this could be an interesting topic for future research.

[19] Ownership involvement of Czech banks in other companies resembles the situation in Germany. Allen and Gale (1995), with reference to the German financial market, argue that the fact that the market for corporate control collapses when stock markets are thin could be made up for by the role of banks as

significant equity positions even in large firms. This may in turn translate into emphasis on sound corporate governance and restructuring of firms. In the short term, however, the funds may focus on increasing the value of the stocks held in their portfolios by strategic trading rather than by pursuing issues of corporate governance at the level of individual firms.[20] Moreover, a number of observers have pointed out that the corporate governance of many of the funds themselves has been weak (e.g., Iskander and Chamlou, 2000). Thus, the fund managers could use controlling ownership stakes to extract benefits from the company at the expense of minority shareholders, and enrich themselves at the expense of fund depositors.[21]

Individual ownership is widely perceived as an ideal form of corporate governance with the residual claimant having very strong incentives to monitor the management. The impact of these incentives should become even stronger when the individual owner is part of management.

The portfolio companies in the Czech Republic are diversified investment companies that engage in business with both corporate and private customers. Their ownership positions in large individual firms are more limited than that of the funds, and their goal is to realize short-term capital gains. As such, they normally do not participate in corporate governance. While the experience in advanced market economies indicates that portfolio companies own significant stakes and often force management to become more profitable, it is not clear that this aspect of performance would be found in the post-privatization period.

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delegated monitors holding equity and exercising their voting rights. Czech banks, with their numerous holdings, were given the above option; however, their ability to cope with it might not be strong.

[20] Jensen (2000, p.220) for instance argues that mutual funds tend to survive when they hold securities of firms that trade at low valuations in secondary markets.

The state, as an owner, may pursue various goals, including economic efficiency, tax revenues, or social goals such as employment. The results of Gupta et al. (2000) suggest that revenue maximization was important in the privatization phase, but other goals, such as employment generation, may be important in the post-privatization phase when unemployment was on the rise.

Finally, in a country with low labor cost and favorable profit repatriation rules, foreign owners are likely to aim at generating profits and, if the local products can be sold through their transnational network, also on increasing output and hence employment.

4. The Data and Basic Statistics

4.1 Performance Data

Profitability is widely viewed as the best ultimate measure of corporate performance, and we use two measures of profitability as our dependent variables: the annual rate of change of operating profit on sales (profit/sales or return on sales) and the annual change in the return on assets (ROA), measured as the ratio of the change in operating profit between periods *t-1* and *t* to total assets in period *t-1*. By using assets in period *t-1*, our measure of change in ROA has the advantage that it is not affected by the phenomenon of newly privatized companies writing off unproductive assets with everything else remaining constant. Our measure would provide a biased indicator of change in ROA, however, if productive assets were sold and, as a result, both assets and profit (rather than just assets) diminished. However, only about 5% of the firms in our

[21] However, the infamous tunneling (looting) of firms by some investment funds that occurred during large scale privatization is reported to have been less of a phenomenon by 1996.

sample actually reduced their assets.[22] Our other measure of profitability, the profit/sales ratio, has the advantage that it is based on two flow measures that are less sensitive to inflation and accounting conventions than ROA. In addition to examining profitability, we provide an understanding of whether corporate restructuring proceeds more on the revenue or cost side (the two main components of profit) by using the rate of change in sales revenue and in labor cost as two additional indicators of performance.[23] . It is notable that since wages in public and private firms moved in tandem during this period (Munich, Svejnar, and Terrell, 2002), the rate of change of labor cost reflects primarily an effect on employment.

Our working data set contains 2,529-2,949 observations on an unbalanced panel of 1,371-1,540 medium and large firms from all economic sectors during the period 1996-1999. As we indicate in Table 1, the exact number of observations and firms varies slightly across the four performance indicators. The observations represent a cleaned data set from the entire population of firms that were listed on the Prague Stock Exchange (PSE) in 1996. Since virtually all large and medium-sized firms privatized in large scale privatization were listed on PSE, the data set contains most of these firms. In addition to performance variables, our data set contains detailed measures of ownership structure, sector in which the firm operates, and the firm's privatization history (including performance and institutional data from the pre-privatization period). The data sample was compiled by the authors from information provided by Aspekt, a commercial

[22] Firms that substantially reduced assets significantly were removed from our sample when we eliminated outliers, as we discuss below.
[23] We do not use other measures of performance, such as material costs, because the sample size would be substantially reduced due to limited information on other variables in the data.

database, the PSE, The National Property Fund (the privatization agency) of the Czech Republic, and the Business Register of the Czech Republic.

It is well known that firm-level data from transition and emerging market economies often suffer from accounting deficiencies and usually contain missing values and outlier observations that may bias the estimated coefficients (e.g., Filer and Hanousek, 2002). Firms operating in the Czech Republic started adopting international accounting (IAP) standards in 1992, and our discussions with international accounting firms located in the country indicate that this process was by and large completed in 1995. Our 1996-99 data are hence from a period in which IAP already dominated local accounting standards. Moreover, the data are reported by firms that had to conform to the standards demanded in the second half of the 1990s by the main regulatory institutions, namely the PSE, the National Property Fund and the Czech National Bank. The data are hence relatively reliable and free from the accounting deficiencies that plague earlier studies.

We have adopted a three-step approach to handling missing observations and outliers in the original data set of 2682, 3050, 2648, and 2972, year-to-year rate of change observations for profit/sales, ROA, sales, and labor costs, respectively. First, we eliminated the few (rate of change) observations that were based on inconsistent values in the levels of variables, such as negative values of sales or labor cost. This resulted in 2679, 3050, 2644, and 2972 observations for the rate of change of profit over sales, ROA, sales, and labor cost, respectively.

Second, since the data still contained a number of observations with fairly extreme values, we examined the sensitivity of parameter estimates to the trimming of

these extreme values of variables, identifying points where the results became relatively insensitive to further trimming. We found that the estimates ceased being sensitive to trimming at the point where the year-to-year rate of change in the performance indicators was constrained to the wide interval of (-300%, 300%) for profit over sales, (-40%, 40%) for ROA and (-100%, 300%) for sales and labor costs.[24] Imposing these wide limits led to a relatively modest reduction in the number of observations and resulted in 2168 observations for the rates of change in profit over sales, 2905 for ROA, 2592 for sales, and 2949 for labor cost. We have used Heckman's (1979) procedure to correct for the possible sample selection bias brought about by the two-step data cleaning procedure.[25]

Third, we explored the possibility of creating a balanced data set with the same firm-year pairs across the four performance indicators. We found that this would require reducing the number of observations for the rate of change of profit over sales, ROA, sales, and labor costs by 148 (7%), 885 (30%), 572 (22%), and 929 (31%), respectively, resulting in a sample with only 1210 firms and 2020 observations. We have considered this further reduction in the number of observations to be excessively large. We have hence used the larger sample from step two above, but we have also generated Heckman-corrected estimates based on the balanced sub-sample for comparison (not reported here). The findings based on the balanced sub-sample are broadly similar to those based on the larger sample.

On average, within the four-year (1996-99) period we have data for three consecutive years to compute annual rates of change of performance variables (Table

[24] In contrast, the estimated coefficients change dramatically and non-monotonically as we add the outlying observations beyond this borderline to the sample.

[25] In particular, using the original set of observations we first ran a Heckman-type probit equation, predicting the probability that a given observation is included in the subsample on the basis of the

1).[26] In terms of the number of firms and observations, our sample is larger than samples used in previous and most ongoing studies in this area. More detailed summary statistics of performance indicators by ownership type and ownership extent are presented in appendix tables A1 and A2. We have also carried out a number of checks against official and private records to verify that our ownership information is reliable and that we hence meet the criticism of earlier privatization studies raised by Filer and Hanousek (2002).

4.2 Ownership Data

In section 3 we have described types of owners and categories of ownership that we are able to identify. As may be seen in Table 2, domestic industrial companies are the most frequent single largest owners (SLOs) with 1, 244 observations, followed by domestic investment funds (423 observations), domestic individuals (335) and the Czech state (174). Foreign industrial companies are by far the most frequent SLOs among the foreign investors (236 observations), with the total number of foreign SLO observations being 303. Ownership concentration, measured by the average stake held by a SLO, is between 38 and 59 percent, which is rather high in comparison to ownership concentration in developed countries (Demsetz and Lehn, 1985) and it resembles more the continental European than Anglo-American ownership concentration patterns.[27]

Foreign owners as a group tend to hold majority ownership stakes in firms (panel B of Table 2). The situation is just the opposite for domestic private owners and the state, both of which have average stakes around 43-45 percent and display absolutely and relatively more cases of blocking and legal minority ownership than majority ownership.

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following variables: the initial values of the performance indicators and their squares and products, as well as dummy variables capturing the presence of a given firm in a particular privatization wave.

[26] There are 34 sales and 28 labor cost observations for which the rate of growth is equal to -1. This means that only a minor number of firms in our sample ended production during the analyzed period.

[27] For development of ownership structures in voucher-privatized firms, see Kočenda and Valachy (2002).

Moreover, the state retains a golden share primarily in firms in which it or domestic private owners are the SLO. Finally, there are 33 observations with highly dispersed ownership in the sense that no type of owner has even a legal (10 percent) minority ownership. These observations come from 25 firms that are larger than average in terms of total assets, but otherwise tend to have quite diverse characteristics.[28]

In panels A and B of Table 3, we present two transition matrices depicting the 1996-99 changes in firm ownership by extent and type of ownership, respectively. The flows by the extent of state, domestic private and foreign ownership (Panel A) show that majority foreign and majority domestic ownership forms are stable in that 73 percent and 68 percent of firms that were in these two categories in 1996, respectively, were in the same categories also in 1999. Together with the category of blocking minority domestic firms, these two categories are also the main ownership forms to which firms switched from other categories, especially from blocking and legal minority state ownership, legal minority foreign ownership and neither majority nor minority ownership. When measured by the type of SLO (Panel B), domestic and foreign industrial companies are the most stable forms, retaining respectively 69 and 75 percent of their 1996 firms in 1999. Together with the domestic investment funds and individually owned companies, these two ownership forms are also the main recipients of firms from other categories, especially domestic portfolio companies and banks and foreign other (non-industrial) firms. Overall, there was hence a substantial amount of ownership changes even during the relatively stable, post-privatization period under study. In terms of the categories in

[28] The firms belong to various sectors, with 7 being in trade and 4 in construction and building materials sectors. In 5 firms foreign owners have the largest, albeit relatively small, stakes. The state holds the golden share in two of these firms, both of which are water supply utilities.

Table 3, 15 to 31 percent of our sample changed category by extent of ownership and 7 to 48 percent by type of SLO, with the greatest (smallest) shift being toward an industrial company (bank) as the SLO. The ownership changes were relatively evenly distributed over the 1996-99 period, with no single year showing unusually pronounced shifts.

4.3 Selection Bias and Endogeneity of Ownership

As is the case in several other studies (e.g., Frydman et al. 1999), we use firm-specific fixed effects (first-differencing) as a panel data treatment evaluation procedure to control for the possibility that firms are not assigned to different ownership categories at random and certain types of owners (e.g., foreigners) may acquire firms that are inherently superior performers. This approach is not adequate, however, if the firm-specific unobserved characteristics that are correlated with ownership and performance are time-varying rather than fixed. We therefore also use IV estimators as an alternative approach to control for possible endogeneity of post privatization (1996) ownership. Unlike other studies that use the IV approach in this context (see e.g., Megginson and Netter, 2001, and Djankov and Murrell, 2002 for reviews), we are able to control for ownership endogeneity using a unique set of firm-specific instrumental variables from the pre-privatization (pre-1992) period. The instrumental variables reflect economic, institutional, industry and geographic characteristics of the SOEs in the pre-market period, and we use them to instrument the initial post-privatization ownership that we observe in the market economy in 1996.

For each firm selected for privatization, we have detailed information derived from all the proposed privatization projects that were submitted to the government before

privatization.[29] The number of privatization projects *per se* is an important IV since for many SOEs there were several privatization projects submitted, reflecting the degree of investor interest and expected future performance of the firm.[30] Moreover, for each privatized firm we use as IVs the pre-privatization data on registered (share) capital, net asset value, total number of shares, number of shares entering voucher privatization, number of shares allocated through voucher privatization, value of shares allocated through voucher privatization in voucher points, geographic and industry location of the firm, and the structure of share ownership among various domestic and foreign parties as proposed in the winning privatization project. The share ownership variables include the share that the government intended to keep for the short vs. long term. Short-term government ownership reflects the expectation of the government of being able to sell appreciated shares shortly after privatization, while long-term government ownership indicates an expectation of slower appreciation of the value of the privatized firm and/or its strategic character in the economy. Parts of the shares retained by the government were also classified as intended for restitution or future sale through an intermediary. Finally, our IV dataset contains annual observations on the SOE's sales, profit, debt, and employment for three consecutive years prior to privatization. The three year nature of these data permits us to capture short-term trends in enterprise performance before

[29] Privatization of each enterprise was based on an officially accepted privatization project. The management of each enterprise had to submit a privatization proposal, but any domestic or foreign firm, institution or individual could present a competing privatization project. All proposals were to be considered on an equal footing by the privatization authorities, which worked with the investors to ensure that the final submitted proposals reflected at least in part government objectives in terms of ownership structure and other characteristics. Each project proposals had to contain recent economic and financial information about the enterprise and describe the proposed method of privatization, as well as the proposed organization of the privatized enterprise. See Kotrba and Svejnar (1994) for a description of the privatization projects.

[30] In the case of larger firms, a number of proposals were submitted for privatizing a particular small asset that was not connected with the firm's production process (e.g., the firm's recreational facility in a national

privatization. For the sake of comparability across firms, we scale these indicators by the total number of shares. The list of the instrumental variables along with their summary statistics is contained in Appendix Tables A3-A5.

5. The Econometric Model

5.1 Model Specification

Our main goal is to analyze the performance effects of the principal types of ownership that were established during large-scale privatization (1992-95) and immediately thereafter (1995-96). In addition, we want to control for and estimate the effects of the substantial changes in ownership that took place in the 1996-99 post-privatization period that we analyze. In order to carry out this analysis, we first adapt the Ashenfelter and Card (1985) and Heckman and Hotz (1989) panel data treatment evaluation procedure for this context.

Let X_{ijt} be a given performance indicator, with subscript *i* denoting an individual firm under ownership type *j*, in year *t*, and let y_{ijt} be the percentage change of X_{ijt} from *t - 1* to *t*. Moreover, let P_{ijt} denote ownership type *j* of firm *i* in year *t*. A logarithmic model of performance may be specified as

$$\ln X_{ijt} = \alpha_i + \alpha\ t + (P_{ij1}t)\beta_j + (X_{ij1}t)\gamma_j + P_{ij\tau}\delta_j + [P_{ij\tau}(t-\tau)]\phi_j + D_t'\varphi + \upsilon_{ijt} \qquad (1)$$

which may be expressed in the annual rate of change (first-difference) specification as[31]

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park). In order to avoid mixing these privatizations with those covering principal productive activities, we only consider projects aiming at privatization 10% or more of the enterprise's assets.

[31] Equation (2) may also be viewed as coming from a framework such as that invoked in the endogenous growth literature (e.g., Temple, 1999; Barro and Sala-i-Martin, 1995), where the rate of change of the dependent variable may depend on its initial level (e.g., rate of change of performance being related to an initial level of investment) and some other variables. In the context of the debate about the performance effects of ownership vs. competition, we therefore focus on the effects of ownership, while controlling for the extent of competition by the firm-specific fixed effects, the effect of initial performance interacted with the time trend, and the industry-specific and annual time dummy variables interacted with time.

$$y_{ijt} = \alpha + P_{ij1}\beta_j + X_{ij1}\gamma_j + \Delta P_{ij\tau}\delta_j + P_{ij\tau}\phi_j + D_t\varphi + \varepsilon_{ijt} \quad . \qquad (2)$$

In equation (1), the vector of coefficients α_i controls for firm-specific (fixed effect) differences in performance across firms, α represents the base, time-varying effect of state ownership, column vector β_j captures the time varying effects of other types of initial post-privatization ownership P_{ij1} that are measured relative to the base effect α of state ownership. Vector γ_j controls for the effect of initial post-privatization level of performance X_{ij1} on the future rate of change of performance, vector δ_j captures the contemporaneous (instantaneous) effect observed in any year τ after 1996 if a firm changed its 1996 ownership to a new ownership category -- $\Delta P_{ij\tau}$. Vector ϕ_j reflects the permanent effect associated with a new type of ownership $P_{ij\tau}$ established at time τ after large-scale privatization. Vector φ represents the effect of the annual, industry and form of privatization dummy variables. Finally, D_t is a vector of annual and industry/sector dummies, and dummy variables indicating whether the firm was privatized in the first or second wave of the voucher scheme or outside of it ($D_t = D'_t - D'_{t-1}$ and $\varepsilon_{ijt} = \upsilon_{ijt} - \upsilon_{ijt-1}$).[32]

Coding the dummy variables so that the effects of non-state ownership forms is measured relative to the effect of state ownership is useful because firms in which the state retains ownership and control are the least privatized and on average probably also the least transformed ones. The approach also accords with our desire to investigate change in performance as firms switch from state to private ownership.

[32] An analogous approach, focusing on firm performance immediately before and immediately after privatization, was employed by Frydman et al. (1999). In particular, Frydman et al. (1999) used the Ashenfelter and Card (1985) and Heckman and Hotz (1989) approach to estimate an ownership-group fixed effects model of the form $y_{ijt} = \alpha_j + P_{ijt}\beta_j + X_{ijt-1}\gamma + D_{ct}\delta_{ct} + \varepsilon_{ijt}$, where D_{ct} denoted a vector of annual country and dummy variables, as well as a firm-specific fixed-effects model:

Our specification controls for the effects on the rate of change of performance of fixed differences among firms that were or were not part of the voucher scheme, inter-firm differences in the initial post-privatization performance, industry-specific fixed effects (proxying for factors such as the degree of competition or differences in technology), and annual economy-wide shifts (such as macro shocks or degree of openness to trade). As we discuss below, these variables also control for potential endogeneity of ownership as firms with different performance may have been channeled to different parts of the privatization program, which in turn may have affected their initial performance after privatization. Finally, we control for possible endogeneity problems associated with changes in ownership in the 1996-99 period by including ownership group fixed effects δ_j for firms undergoing these ownership changes.[33] These δ_j effects may also reflect the instantaneous effects of new ownership on performance.

An important issue that arises in the context of post-privatization behavior of firms is the dynamics of their restructuring and performance. The performance effect of short-term (defensive or reactive) restructuring is for instance often hypothesized to differ from the medium-term (strategic) restructuring associated with different forms of ownership (e.g., Blanchard, 1997, Roland, 2000, and Carlin et al., 2001). Moreover, strategic restructuring may take time to carry out and it may hence have a performance effect that varies over time. Blanchard (1997) has for example hypothesized that the effect of privatization would tend to have a U-shaped effect on employment and we conjecture that there may be non-linear effects on other dependent variables as well. We

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$y_{ijt} = \alpha_i + P_{ijt}\beta_j + D_{ct}\delta_{ct} + \varepsilon_{ijt}$. The estimates from these two models are unfortunately not directly comparable since the latter model omits X_{ijt-1} and is hence not a direct extension of the former one.

hence also estimate a model that allows the performance effects of the various ownership forms to vary linearly and quadratically with time, where time is measured as the number of years since 1996 and since any subsequent change of ownership at time τ.[34]

$$y_{ijt} = \alpha + \alpha' t + \alpha'' t^2 + P_{ij1}\beta_j + (P_{ij1} t)\beta_j' + (P_{ij1} t^2)\beta_j'' + X_{ij1}\gamma_j + \Delta P_{ij\tau}\delta_j + \\ + P_{ij\tau}\phi_j + [P_{ij\tau}(t-\tau)]\phi_j' + [P_{ij\tau}(t-\tau)^2]\phi_j'' + \delta D_t + \varepsilon_{ijt} \qquad (3)$$

An interesting feature of our data is that we are able to explore the effect of ownership forms in two key directions. First, we can examine whether majority, blocking minority and legal minority ownership of a particular type affects the firm's post-privatization performance. We can also assess if the state can affect performance by retaining a golden share that gives it the right to block certain managerial decisions. Second, we can evaluate the performance effects associated with different types of single largest owners, and whether the SLOs have a majority, blocking minority, or legal minority stake. The ability to distinguish these ownership forms enables us to provide evidence with respect to the key issues discussed earlier.

Extent of Ownership

As we discussed in Section 3, the analysis of the effect of majority and blocking minority ownership is important because these categories of ownership are widely believed to have major effects on corporate governance and performance of firms. Assessing the effect of legal minority is also important because it is an easier ownership stake to obtain and it gives the owner legal rights that enable him to influence corporate governance and performance.

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[33] Analogously to including X_{ij1} as a regressor, we have also estimated models controlling for $X_{ij\tau}$, the effect of performance achieved by the previous owner at the time of change of ownership τ on future performance. This specification did not produce materially different results from those of equation (2).

Since the relative performance of state, domestic private and foreign ownership is one of the major issues in the privatization debate, we first focus our analysis on these three categories of ownership. In particular, we allow corporate performance to depend on whether private domestic owners as a group, foreign owners as a group or the state have a majority, blocking minority or legal minority share ownership in the firm, and we also account for the effect of the state retaining a golden share.

The Single Largest Owner

In the above analysis of the extent of ownership, we focus on the effects of majority and blocking or legal minority ownership, irrespective of how many different owners of the same type comprise the majority or minority groups. Highly concentrated and widely dispersed ownership within a given group is hence assumed to have the same effect on performance, a feature that may be too restrictive. In the second prong of our analysis, we therefore focus on the effects of the single largest owner (SLO) and we exploit the fact that our data permit us to distinguish among eight different types of SLOs as well as the extent of their ownership.

5.2 Methods of Estimation

As mentioned earlier, the firms in our sample may display systematic heterogeneity because they were privatized in the large-scale privatization program, both within and outside the voucher scheme that occurred in two waves, and because Gupta et al. (2000) find that better performing firms tended to be privatized in the first wave. Moreover, firms privatized earlier have a longer post-privatization period before we observe them in our data in 1996. To control for the potential endogeneity bias stemming

[34] Since the time period is short, we use this second-order Taylor series approximation for the underlying nonlinear form.

from these phenomena, we account for firm-specific fixed effects by running the regressions in a first-difference form and including as regressors dummy variables for whether the firm was privatized in the first or second wave of the voucher scheme or outside of it (within large-scale privatization in general), the level of performance of the firm after large-scale privatization in 1996, and industry/sector and annual dummy variables (vector *D*).[35] Moreover, we also carry out estimations in which we instrument the 1996 ownership using the IVs described in Section 4.3 above.[36] We use the Hausman (1978) specification test for assessing endogeneity of this initial post-privatization ownership, comparing the results of first-difference OLS estimation assuming the original ownership is exogenous with the first-difference IV method in which we treat ownership as potentially endogenous and instrument it by the set of IVs described above. The test is carried out by differencing the two sets of parameter estimates and standardizing the vector of differences by the difference in the covariance matrices of the two sets of estimates. The resulting quadratic form is asymptotically chi-squared with degrees of freedom equal to the number of parameters being tested.[37] We report estimates that are generated by the Huber (1967)--White (1982) procedure to provide heteroskedasticity adjusted residuals without and with instrumental variables for origin of ownership. Finally, we have also checked that the residuals are free from serial correlation.

[35] When expressed as a model of the determinants of the level of firm performance, along the lines of equation (3), it is clear that the present specification controls for firm-specific fixed effects and allows the above dummy variables and the 1996 performance variable to control for systematic linear differences in post-privatization performance over time.

[36] We have also employed the Kruskal-Wallis (1952) test to check for differences in the 1996-99 variation of the performance variables of firms from the first and second wave of the voucher scheme, as well as the difference in each of these sets of firms and those privatized outside of the voucher scheme. The test does not find the variation in the growth rates of variables for the three sub-samples to be different from one another.

[37] In practice, some diagonal elements of the covariance matrix are negative. As usual, we carry out the test only for parameters corresponding to the positive diagonal elements, with a corresponding correction to the degrees of freedom, using the generalized inverse matrix (procedure YINVO in TSP 4.5).

6. Empirical Results

Our empirical strategy is to start from the broad model that incorporates the time-varying effects (equation (3)) and test restrictions implying that the effect of ownership on the performance indicators is constant over time (equation (2)). In particular, for each type of ownership we first test whether the coefficients on the ownership dummy variable and its linear and quadratic interaction with time are jointly statistically significant. When the F-test indicates that the three coefficients are jointly significant, we test whether the two coefficients on ownership interacted with time and with time squared are jointly significant. If this hypothesis cannot be rejected, we report the mean effect of the given ownership, calculated from the three estimated coefficients and from the mean values of the three variables. Next to the reported coefficients, we also indicate whether the underlying effect is convex, or U-shaped (∪), or concave, inverted U-shaped (∩), with time. When the three coefficients are jointly not significant or when they are significant but the effect of the linear and quadratic interaction of ownership with time is insignificant, we report the coefficient on the ownership dummy variable from a specification that constrains the coefficients on the linear and quadratic terms in time to be zero. In order to make the estimates easily interpretable, we report the associated p-values from the relevant F-test or t-test in parentheses.

In Tables 4-7, we present the estimated coefficients of equations (2) or (3) as determined by the aforementioned model selection tests. We start with the performance effects of the initial post-privatization extent of ownership in Table 4 and then turn to the permanent effects of subsequent changes in the extent of ownership in Table 5. We next

present results for the single largest owner (SLO) – the effects of initial post-privatization ownership in Table 6 and permanent effects of subsequent changes in Table 7. In every table, we present the first-difference OLS estimates that are analogous to the existing literature and the first-difference IV results that we view as yielding a superior way to control for endogeneity of ownership. Presenting the two sets of estimates also provides a check on whether the first-difference approach adequately controls for endogeneity. Results of the Hausman test confirm that the 1996 initial ownership should be treated as endogenous.[38] The complete set of regression estimates is provided in Appendix Tables A6-A9.

Effects of the Extent of State, Private and Foreign Ownership

In Tables 4 and 5, each performance variable is related to whether domestic private owners, foreign owners or the state have a majority, blocking minority, legal minority, or less than legal minority ownership, and whether the state keeps a golden share in the firm. The constant reflects the 1996-97 rate of change in performance of firms that have majority state ownership, were partially privatized outside of the voucher scheme, and operate in the miscellaneous ("other") category of the nineteen industries for which we control. The estimated coefficients on the various forms of ownership represent the average annual ownership effects relative to the above effect of majority state ownership.

Initial Post-privatization Ownership

[38] We reject the null hypothesis of ownership being exogenous in regressions including all performance variables but profit/sales (significant on 7% test level). However, in the case of profit/sales neither model shows a good fit of the data. This fact may to a large extent explain the non-rejection of the null hypothesis.

As may be seen from Table 4, there are few significant effects of the extent of different types of initial post-privatization ownership on performance. Starting with profitability, we see that majority foreign ownership has a positive effect on ROA in the OLS but not in the IV model. Similarly, legal minority foreign ownership has a negative effect on ROA in the OLS but not the IV specification. In terms of the profit/sales ratio, we register a positive OLS but not IV effect of blocking minority foreign ownership and, as in the case of ROA, a negative OLS but not IV effect of legal minority foreign ownership. Hence, while the OLS estimates suggest that foreign ownership has some effects on profitability, the IV specification indicates that these effects are statistically insignificant and that different types and extent of initial ownership do not affect the two measures of profitability. Since the IVs have a relatively good predictive power (the R^2s in the IV regressions ranging from 0.1 to 0.3), the OLS results appear to be driven by foreign firms acquiring local firms with particular characteristics rather than affecting the acquired firms' performance.[39]

In terms of sales revenue, reported in the third set of columns of Table 4, initial majority state ownership (the base) is associated with a negative effect in the IV model and firms with majority foreign ownership and those with highly dispersed ownership constitute the only groups that display a strong positive coefficient that counteracts this negative base effect.

In both the OLS and IV models, we observe a negative effect of initial majority domestic ownership on the rate of change of labor cost, an effect that is also detected for blocking minority domestic ownership in the IV model (the fourth set of columns in

[39] The R^2 was derived for the extent of each type of ownership from a linear probability model and a logit model (scaled R2). The two sets of R2s are similar. The tables in the paper are based on the logit

Table 4). In the first-difference OLS model, we also find marginally significant positive effects of majority state and highly dispersed ownership, but these effects disappear in the IV model. As mentioned earlier, since wages in public and private firms moved in tandem during this period (Munich, Svejnar, and Terrell, 2002), the negative effect of concentrated domestic ownership on labor cost is primarily an effect on employment.

Overall, the effects of initial post privatization ownership obtained from the first-difference OLS and IV estimations indicate that foreign owners tend to acquire high stakes in firms whose characteristics predispose them to be relatively profitable, differences in ownership *per se* do not affect profitability, concentrated foreign ownership as well as highly dispersed ownership increase sales revenue, and highly as well as moderately concentrated domestic owners reduce labor cost (mostly by defensively cutting employment) relative to others. The asymmetric findings with respect to sales and labor cost effects of concentrated domestic and foreign owners are provocative because it has been generally presumed that both domestic and foreign private ownership, especially in highly concentrated forms, leads to substantial strategic restructuring and increases in sales -- domestically and/or on the world markets. We have checked the sensitivity of these results to sample trimming and find that they are robust in that even in the OLS model majority foreign ownership generates a positive effect on sales with additional trimming of about 10% of observations with the most extreme values of sales.

As may be seen from the last row of Table 4, firms in which the state retains a golden share register a positive effect on ROA but not profit/sales. They also generate an increase in the annual rate of increase in labor costs and in the IV regression also in sales.

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specification of the IV regression.

These effects suggest that the state pursues an objective of increasing employment and output (revenue), while also inducing profit-oriented restructuring relative to assets. Since the state retains golden shares primarily in state-owned and domestic private firms (Table 2), the effect of a golden share moderates the IV effects of firms with majority state ownership to reduce output (sales) and the IV as well as OLS effect of domestic majority and blocking minority owners to reduce labor cost (employment).

Changes in Post-Privatization Ownership

In Table 5, we report our estimates of the permanent effects of ownership changes that took place during 1996-99.[40] Conceptually, these estimates correspond to the estimates of the effect of initial 1996 ownership reported in Table 4. As may be seen from the table, the first-difference OLS and IV estimates are broadly similar.

Starting with the ROA and profit/sales ratio, we see from both the OLS and IV models that a switch to majority domestic ownership results in a (weakly significant) positive permanent effect on both measures of profit. The instantaneous OLS (and less significantly the IV) effects reported in the appendix Table A6 (A7) indicate that majority domestic owners also tend to acquire firms that perform below average in ROA and bring up their ROA in the following years. Interestingly, positive permanent effects on ROA are also observed with shifts to blocking minority foreign and legal minority domestic ownerships in both specifications and for shifts to majority foreign ownership in the OLS specification. Moreover, the relatively rare shifts to legal minority state ownership also generate sizable positive effects on profit/sales. Finally, while the three OLS estimates of the positive effects on ROA are U- or inverted U-shaped, the nonlinear effect disappears in the IV estimates.

The estimated effects of subsequent ownership on sales and labor cost are virtually all constant rather than U- or inverted U-shaped. A post-1996 shift to majority foreign ownership has a positive effect on the rate of change of sales revenue that is not accompanied by a parallel increase in labor cost. This suggests that foreign owners that acquire majority stakes in firms after privatization engage in productivity-enhancing strategic restructuring. In contrast, shifts to blocking minority state and domestic ownership bring about negative effect on both sales and labor cost, indicating that these somewhat less concentrated owners react defensively by downsizing the newly acquired companies. Finally, shifts to legal minority state and foreign ownership, as well as highly dispersed ownership, tend to decrease the rate of increase of sales revenue in the OLS model, but only the very last effects carries over to the IV specification. Finally, highly dispersed ownership and in the OLS case also blocking minority foreign ownership are associated with positive effects on the rate of change of labor cost.

Effects of Different Types of SLOs

The performance effects of a given owner being or becoming the single largest owner (SLO) of the firm are reported in Tables 6 and 7.

Initial Post-privatization Ownership

The only initial post-privatization ownership that has a positive effect on profitability is that by a foreign industrial company on ROA in the OLS model and on profit/sales in the IV specification (Table 6). All five types of domestic non-state SLOs have effects that are not statistically different from the insignificant effect of the state SLO, while foreign non-industrial ownership has negative effects on ROA and profit/sales in the OLS but not IV specifications.

[40] The mostly insignificant instantaneous effects are reported in Appendix Tables A6 and A7.

The positive profit effects of initial ownership by foreign industrial company are accompanied by a positive effect on the rate of change of sales revenue. In contrast, the domestic industrial company ownership is associated with a negative effect on the rate of growth of labor cost and, in the OLS case, also sales. On average, the post-privatization foreign industrial owners thus increase profitability by enhancing the rate of growth of sales without changing the rate of growth of labor cost. Their domestic counterparts do not raise profitability but they reduce the rate of growth of labor cost and, together with the state- and otherwise-owned firms, also sales revenue. The restructuring carried out by foreign industrial firms is hence of a strategic nature, while that performed by the domestic industrial firms is of a defensive type. The other type of SLO that engages in significant defensive restructuring is the investment fund as it lowers significantly the rate of increase of labor cost but does not generate an increase in sales and profitability.

The effect of the state retaining a golden share is similar for the extent of ownership and SLO with respect to the increase in labor cost (employment), but the positive effect of the golden share on sales and ROA is absent in the SLO specification. (In the OLS estimates, the positive effect of the golden share on the change in ROA remains.)

Changes in Post-Privatization Ownership

Post-privatization changes in the type of SLO generate a somewhat larger number of significant effects than initial post-privatization ownership. As may be seen from Table 7, there are relatively few significant effects on profitability, with the most notable one being a positive effect of bank ownership on both ROA and profit/sales. In the case of ROA this long-term effect in part offsets a negative instantaneous effect observed at the

time of the shift to bank ownership (Tables A8 and A9 in the Appendix). The fact that the instantaneous effect is negative for ROA and not for profit/sales permits us to infer that the banks acquire firms with (a) normal performance in terms of profit/sales and increase this measure of profitability over time and (b) relatively large and unproductive assets, as measured by below average ROA, and raise the value of this indicator over time.

Interestingly, as foreign industrial companies become SLOs in the post-privatization period, they bring about increased rates of growth of both sales and labor cost, thus suggesting that in this phase foreign companies acquire firms to expand production but they no longer hold back the rate of growth of labor cost (employment). In contrast, firms in which a domestic industrial firm becomes the single largest owner continue to reduce the rate of growth in labor costs. Finally, investment funds that become SLOs in the 1996-99 period acquire firms with a high rate of increase in labor cost (Tables A8-A9), but they reduce the rate of growth of both labor cost and sales revenue thereafter (Table 7).

7. Concluding Observations

Compared to other studies of the effects of ownership on corporate performance, we (a) have detailed information on the forms and concentration of ownership in a virtually complete population of medium and large firms in a model large-scale privatization economy, (b) use a four-year panel of data from the post privatization period when one can observe both short- and medium-term effects corresponding to defensive (reactive) and strategic restructuring, (c) have data conforming to the international accounting system, and (d) control systematically for endogeneity of ownership.

We estimate the effect of ownership along two important dimensions: (i) the extent of concentration of private domestic, private foreign, and state ownership, irrespective of the number of owners within each category and (ii) the particular type of owner in terms of eight principal categories of single largest owners (SLOs).

Our empirical findings yield the following conclusions:

1. Many types of private ownership do not generate superior dynamic performance relative to state ownership after large-scale privatization.

2. When analyzing firm performance by the extent of concentration of ownership, foreign majority owners are found to be the only group that increases the rate of change of sales revenue (possibly as the foreign firms engage in strategic restructuring or sell the acquired firm's product through their worldwide distribution channels) relative to majority state-owned firms. When we classify firms by the SLO, the firms that display this behavior are foreign industrial companies, with the caveat that when foreign industrial companies become the SLO during the post-privatization period, they tend to expand production by increasing both sales revenue and labor cost.

3. Domestic private owners with relatively concentrated holdings reduce labor cost and in some cases also sales revenue relative to majority state-owned firms, thus reflecting defensive restructuring. When domestic private owners acquire majority stakes from the initial post-privatization owners, they tend to have a positive effect on profitability of the firm.

4. The above results provide support for the agency theory prediction that concentrated ownership results in superior corporate performance. The findings are counter to models that view concentrated ownership as being deleterious to firm performance because

excessive control stifles managerial initiative and incentives to acquire information in situations of asymmetric information and high uncertainty or because it results in insufficient liquidity of the company's stock. Finally, the lack of a positive profit and sales effect among virtually all types of domestic owners is consistent with the thesis that the presence of a large stockholder may not result in superior performance if this shareholder "loots" the firm at the expense of small shareholders – a phenomenon that has been documented in many case studies of firms in transition and emerging market economies.

5. When we classify firms by the extent of ownership, we find support for (a rate of change form of) the hypothesis that firms restructure by lowering and later increasing employment.

6. All specifications suggest that the state induces a higher rate of increase of the labor cost in firms where it retains a golden share. In the regressions based on the extent of ownership concentration (and to a lesser extent also in the SLO regressions) the golden share also generates a positive effect on ROA and sales revenue. With this form of managerial control, the state hence appears to pursue both a social (employment generating) objective and corporate restructuring. Since our analysis covers the period of rising unemployment, the state appears as a more economically and socially beneficial agent than has been argued in some other recent studies of the emerging market economies (e.g., Djankov and Murrell, 2002, and Shleifer and Vishny, 1994).

Overall, our study shows that after large-scale privatization of a completely state-owned economy, foreign ownership leads to superior economic performance relative to all types and concentrations of domestic private and state ownership. Initial domestic

private ownership is not superior to state ownership, and in some categories (e.g., the most numerous category of ownership by an industrial company) it does not result in significantly higher profit, while reducing labor cost (employment) and in some specifications also sales. Yet, there are indications that some types of owners display different behavior in their capacity of initial post-privatization owners and subsequent owners. In particular, as initial post-privatization owners, majority domestic private owners reduce labor cost without generating a positive effect on sales or profit. However, as owners that acquire their stake later, majority domestic private owners increase profit without a negative effect on labor cost (employment). The behavior of domestic private owners may hence be evolving over time.

References

Allen, F. and D. Gale. 1995. "A welfare comparison of intermediaries in Germany and the US." *European Economic Review*, 39(2): 179-209.

Angelucci, M., S. Estrin, J. Konings, and Z. Zólkiewski. 2002. "The Effect of Ownership and Competitive Pressure on Firm Performance in Transition Countries: Micro Evidence from Bulgaria, Romania and Poland," *The William Davidson Institute Working Paper No. 434*, Ann Arbor, MI.

Aghion, P., and W. Carlin. 1996. Restructuring Outcomes and the Evolution of Ownership Patterns in Central and Eastern Europe. *Economics of Transition*, 4(2), 371-88.

Aghion, P., and J. Tirole. 1997. "Formal and Real Authority in Organizations," *Journal of Political Economy*, 55: 1-27.

Ashenfelter, O., and Card, D. 1985. "Using the Longitudinal Structure of Earnings to Estimate the Effect of Training Programs". *Review of Economics and Statistics* 67(4), 648-60.

Barberis, N., M. Boycko, A. Shleifer and N. Tsukanova. 1996. "How Does Privatization Work? Evidence from the Russian Shops." *Journal of Political Economy* 104, 764-90.

Barro, Robert J. and Sala-i-Martin, Xavier. 1995. *Economic growth*. Advanced Series in Economics. New York, London and Montreal: McGraw-Hill.

Bevan, Alan, Saul Estrin and Mark Schaffer. 1999. *Determinants of Enterprise Performance during Transition*. Centre for Economic Reform and Transformation (CERT) Working Paper 99/03.

Bilsen, V. and J. Konings. 1998. "Job Creation, Job Destruction, and Growth of Newly Established, Privatized, and State-Owned Enterprises in Transition Economies: Survey Evidence from Bulgaria, Hungary, and Romania," *Journal of Comparative Economics*, 26 (1998): 429-445

Blanchard, O. 1997. *The Economics of Post-Communist Transition.* Oxford: Oxford University Press.

Bolton, Patrick, and Ernst-Ludwig von-Thadden. 1998. "Blocks, Liquidity, and Corporate Control." *Journal of Finance*, 53(1), 1-25.

Bornstein, M. 2001. "Post-privatization enterprise restructuring," *Post-Communist Economies* 13: (2) 189-203.

Boubakri, N. and J.C. Cosset. 1998. "The Financial and Operating Performance of Newly Privatized Firms: Evidence from Developing Countries," *Journal of Finance*, 53 (3) 1081-1110.

Burkart, Michael, Dennis Gromb and Fausto Panunzi, 2000. "Agency Conflict in Public and Negotiated Transfer of Corporate Control." *Journal of Finance*, 55 (2) 647-677.

Carlin, W., S. Fries, M.E. Schaffer, and P. Seabright. 2001. "Competition and Enterprise Performance in Transition Economies: Evidence from a Cross-country Survey," *CEPR Discussion Paper* DP2840, London.

Caves, D.W. and L. Christensen. 1980. "The Relative Efficiency of Public and Private Firms in a Competitive Environment: The Case of Canadian Railroads," *Journal of Political Economy*, 88 (5), 958-76.

Claessens, S. 1997. "Corporate Governance and Equity Prices:Evidence from the Czech and Slovak Republics," *Journal of Finance*, 52 (4) 1641-1658.

Claessens, S. and S. Djankov. 1999. "Ownership Concentration and Corporate Performance in the Czech Republic." *Journal of Comparative Economics* 27 498-513.

Coffee, J. 1996. Institutional Investors in Transitional Economies: Lessons from the Czech Experience. In: Frydman, R., Gray, C., and Rapaczynski, A. (eds.): *Corporate governance in Central Europe and Russia.* Volume 1. Banks, funds, and foreign investors. Budapest, Central European University Press 1996, s. 111-86.

Cornelli, F., Portes R., and Schaffer M. E. 1996. The Capital Structure of Firms in Central and Eastern Europe. *CEPR Discussion Paper No. 1392*.

Demsetz, Heinz and Karl Lehn. 1985. The Structure of Corporate-Ownership - Causes and Consequences. *Journal of Political Economy* 93: (6) 1155-1177.

Djankov, S. and Murrell, P. 2002. "Enterprise Restructuring in Transition: A Quantitative Survey." *Journal of Economic Literature*, XL (3) 739-792.

D'Souza, J. and W. Megginson. 1999. "The Financial and Operating Performance of Privatized Firms during the 1990s," *Journal of Finance*, 54 (4) 1397-1438.

Filer, R. K. and J. Hanousek. 2002. "Data Watch: Research Data from Transition Economies." *Journal of Economic Perspectives* 16, 1, 225-240.

Frydman, R., C.W. Gray, M. Hessel and A. Rapaczynski. 1999. "When does Privatization Work? The Impact of Private Ownership on Corporate Performance in Transition Economies." *Quarterly Journal of Economics* 114: 1153-91.

Frydman, R., M. Hessel and A. Rapaczynski. 2000. Why Ownership Matters? Entrepreneurship and the Restructuring of Enterprises in Central Europe. C.V. Starr Center for Applied Economics Working Paper, NYU, New York.

Grosfeld, I. and J.F. Nivet. 1997. "Firm's Heterogeneity in Transition: Evidence From a Polish Panel Data Set," *William Davidson Institute Working Paper No.47*, 1997.

Grosfeld, I. and Roland, G. 1997. "Defensive and Strategic Restructuring in Central European Enterprises." *Journal of Transforming Economies and Societies*, 3(4): 21-46.

Grosfeld, I. and T. Tressel. 2001. "Competition and Corporate Governance: Substitutes or Complements? Evidence from the Warsaw Stock Exchange," *William Davidson Institute WP No. 369*.

Gupta, N., J. C. Ham, and J. Svejnar. 2000. Priorities and Sequencing in Privatization: Theory and Evidence from the Czech Republic. *William Davidson Institute WP No. 323*.

Hausman, J. 1978. "Specification Tests in Econometrics." *Econometrica* 46 (6):1251-1271.

Heckman, J. 1979. "Sample selection bias as a specification error." *Econometrica* 47: 153-161

Heckman, J., and Hotz, V. 1989. "Choosing among Alternative Nonexperimental Methods for Estimating the Impact of Social Programs: The Case of Manpower Training." *Journal of the American Statistical Association* 84(408), 862-74.

Holmström, B., and J. Tirole. 1983. "Market liquidity and performance monitoring," *Journal of Political Economy*, 101: 678-709.

Huber, P. J. 1967. The behavior of maximum likelihood estimates under nonstandard conditions. *Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability*, 221-223. Berkeley, CA: University of California Press.

Iskander, Magdi R. and Chamlou, Nadereh. 2000. *Corporate governance: A framework for implementation*. World Bank, Washington, D.C.

Jensen, Michael C. 2000. *A theory of the firm: Governance, residual claims, and organizational forms*. Cambridge and London: Harvard University Press.

Kočenda, E. 1999. Residual State Property in the Czech Republic. *Eastern European Economics*, 37, 5, 6-35.

Kočenda, E., and Valachy, J. 2002. Firm Ownership Structures: Dynamic Development. *Prague Economic Papers*, 11, 3, 255-268.

Kotrba, J.: Privatization Process in the Czech Republic: Players and Winners, pp. 159-198. In Svejnar, J., *The Czech Republic and economic transition in Eastern Europe*. San Diego; London and Toronto: Harcourt Brace, Academic Press, 1995.

Kotrba, J. and J. Svejnar. 1994. Rapid and Multifaceted Privatization: Experience of the Czech and Slovak Republics. *Nomisma/Most*, 147-185.

Kruskal, W. H. and W.A. Wallis. 1952. Use of ranks in one-criterion variance analysis. *Journal of the American Statistical Association* 47: 583-621.

Lízal, L. and E. Kočenda. 2001. State of Corruption in Transition: The Case of the Czech Republic. *Emerging Markets Review*, 2, 2, 138-160.

Lízal, L. and J. Svejnar. 2002. "Investment, Credit Rationing, and the Soft Budget Constraint: Evidence from Czech Panel Data," *The Review of Economics and Statistics*, 84(2), 353-370.

Megginson, W.L. and Netter J.R. 2001. "From state to market: A survey of empirical studies on privatization", *Journal of Economic Literature* 39: (2) 321-389, June 2001.

Munich, D., J. Svejnar and K. Terrell. 2002. Returns to Human Capital under the Communist Wage Grid and During the Transition to a Market Economy. *The William Davidson Institute Working Paper No*. 272.

Pohl, G., R. Anderson, S. Claessens, and S. Djankov. 1997. Privatization and Restructuring in Central and Eastern Europe: Evidence and Policy Options. *World Bank Technical Paper No. 368*.

Roland, G. *Transition and Economics: Politics, Markets and Firms.* Cambridge, MA: MIT Press, 2000.

Sachs, Jeffrey, Clifford Zinnes and Yair Eilat. 2000. *The Gains from Privatization in Transition Economies: Is Change of Ownership Enough?* CAER II Discussion Paper 63, Harvard Institute for International Development, Cambridge, MA.

Shirley, Mary and Patrick Walsh. 2000. *Public versus Private Ownership: The Current State of the Debate*. The World Bank, Washington, DC, 2000.

Shleifer, A., and Vishny, R. 1994. "Politicians and Firms," *Quarterly Journal of Economics*, CIX(4) 995-1023, November.

Shleifer, A., and Vishny, R. 1997. "A Survey of Corporate Governance," *Journal of Finance*, 52(2): 737-783.

Smith, S., B. Cin, and M. Vodopivec. 1997. Privatization Incidence, ownership Forms, and Firm Performance: Evidence from Slovenia. *Journal of Comparative Economics*, 25, 158-179.

Svejnar, J. and M. Singer. 1994. Using Vouchers to Privatize an Economy: The Czech and Slovak Case. *Economics of Transition* 2, 43-64.

Temple, Jonathan. 1999. The New Growth Evidence. *Journal of Economic Literature*, 37(1): 112-56.

White, H. 1982. Maximum likelihood estimation of misspecified models. *Econometrica* 50: 1-25.

Table 1
Summary Statistics of Performance Indicators: 1996-1999

	Mean	Std. Dev.	Min	Max	No. Firms	No.Obs.
ROA	0.001	0.098	-0.393	0.387	1540	2905
Rate of Growth						
Profit / Sales	-0.267	0.982	-2.995	2.985	1289	2164
Sales	0.009	0.426	-1.000	2.820	1371	2592
Labor Costs	0.010	0.364	-1.000	2.842	1539	2949

The ratio of the number of observations to number of firms varies due to an unbalanced nature of the panel.
ROA is defined as a ratio of change in profits between two consecutive periods
to total assets at the beginning period. Formally: [(Profit(t)-Profit(t-1))/Total Assets(t-1)].

Table 2
Ownership Extent and Categories: Summary Statistics

Panel A: Ownership Extent

Type of aggregate ownership	Num. of obs.	Mean size of stake (%)	Number of observations				
			Majority held by SLO	Blocking Minority held by SLO	Legal Minority (Moderately Dispersed Ownership)	Other (Highly Dispersed Ownership)	Golden Share held by State
Domestic	2115	44.84	758	679	656	22	80
Foreign	303	57.14	165	86	45	7	9
State	174	43.18	49	63	58	4	66
Total	2592	46.16	972	828	759	33	155

Panel B: Type of Ownership by Single Largest Owner (SLO)

Type of single largest owner (SLO)	Num. of obs.	Mean size of stake (%)	Number of Observations				
			Majority held by SLO	Blocking Minority held by SLO	Legal Minority (Moderately Dispersed Ownership)	Other (Highly Dispersed Ownership)	Golden Share held by State
Domestic Ownership							
Industrial Co.	1244	48.83	547	412	272	13	42
Bank	33	46.42	11	14	7	1	1
Invest. Fund	423	37.61	96	119	205	3	19
Individual	335	38.92	82	99	150	4	13
Portfolio Co.	80	45.06	22	35	22	1	5
State	174	43.18	49	63	58	4	66
Foreign Ownership							
Industrial Co.	236	58.81	139	60	30	7	6
Others	67	51.23	26	26	15	0	3
Total	2592	46.16	972	828	759	33	155

Note: This table contains basic ownership statistics associated with the performance variable of sales. Statistics for other performance indicators are similar. Ownership concentration categories include majority (more than 50% of shares), blocking minority (from more than 33 to 50% of shares), legal minority (at least 10% but not more than 33% of shares), and other (less than 10% of shares). All ownership categories are mutually exclusive. The golden share is an additional measure that is not associated with any particular extent of ownership.

Table 3
Movement of Firms across Ownership Categories: 1996-1999

Panel A: Extent of State, Private Domestic and Foreign Ownership

	Majority State	Majority Domestic	Majority Foreign	Blocking Minority State	Blocking Minority Domestic	Blocking Minority Foreign	Legal Minority State	Legal Minority Domestic	Legal Minority Foreign	Other than Majority or Minority	
Majority State	*46%*	29%	5%	2%	11%	4%	0%	2%	0%	0%	100%
Majority Domestic	0%	*68%*	6%	0%	19%	1%	0%	4%	1%	0%	100%
Majority Foreign	0%	13%	*73%*	0%	4%	9%	0%	1%	1%	0%	100%
Blocking Minority State	1%	21%	5%	*15%*	34%	3%	2%	9%	3%	6%	100%
Blocking Minority Domestic	0%	41%	3%	1%	*37%*	3%	1%	12%	1%	0%	100%
Blocking Minority Foreign	0%	21%	19%	0%	21%	*35%*	0%	2%	2%	0%	100%
Legal Minority State	1%	24%	2%	1%	27%	2%	24%	18%	1%	1%	100%
Legal Minority Domestic	0%	28%	2%	1%	34%	2%	1%	30%	1%	0%	100%
Legal Minority Foreign	0%	13%	18%	0%	17%	15%	0%	14%	22%	0%	100%
Other than Majority or Minority	0%	20%	5%	0%	19%	4%	3%	28%	3%	17%	100%

Panel B: Type of Ownership by the Single Largest Owner (SLO)

	Dom. Industrial Co.	Dom. Bank	Dom. Invest. Fund	Dom. Individual	Dom. Portfolio Co.	State	For. Industrial Co.	For. Other	Total
Dom. Industrial Co.	*69%*	1%	11%	10%	2%	1%	6%	1%	100%
Dom. Bank	47%	*5%*	25%	8%	1%	1%	12%	2%	100%
Dom. Invest. Fund	50%	4%	*28%*	9%	2%	2%	4%	1%	100%
Dom. Individual	39%	1%	9%	*43%*	1%	1%	6%	1%	100%
Dom. Portfolio Co.	56%	2%	18%	14%	*2%*	2%	5%	1%	100%
State	47%	1%	8%	9%	1%	*26%*	7%	1%	100%
For. Industrial Co.	15%	0%	1%	3%	1%	0%	*75%*	5%	100%
For. Other	35%	1%	8%	15%	1%	0%	33%	*8%*	100%

Table 4

Effects of Initial Post-Privatization Ownership Extent on Performance

First - Difference OLS and Instrumental Variable (IV) Estimates; (P-values in parentheses)

	ROA		Profit/Sales		Sales		Labor Cost	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Majority State (Constant)	-0.002	0.005	-0.176	-0.192	-0.111	-0.175	0.077 U	0.026
	(0.875)	(0.731)	(0.311)	(0.282)	(0.193)	(0.089) 10	(0.078) 10	(0.633)
Initial Ownership Size (P_{ij1})								
Majority Domestic	0.007	0.001	-0.051	-0.001	-0.056	-0.067	-0.052	-0.077
	(0.518)	(0.945)	(0.700)	(0.992)	(0.303)	(0.552)	(0.097) 10	(0.032) 5
Majority Foreign	0.022	0.015	-0.022	-0.044	0.076	0.299	0.039	0.015
	(0.058) 10	(0.231)	(0.884)	(0.797)	(0.225)	(0.011) 1	(0.283)	(0.743)
Blocking Minority State	0.008	0.001	-0.115	-0.145	-0.028	0.083	0.010	-0.017
	(0.483)	(0.930)	(0.449)	(0.388)	(0.611)	(0.438)	(0.731)	(0.608)
Blocking Minority Domestic	-0.003	-0.009	-0.062	-0.069	-0.060	0.014	-0.029	-0.065
	(0.755)	(0.456)	(0.646)	(0.623)	(0.269)	(0.895)	(0.321)	(0.051) 5
Blocking Minority Foreign	0.011	-0.013	0.082 ∩	0.063	-0.019	-0.098	-0.002	-0.063
	(0.441)	(0.470)	(0.044) 5	(0.766)	(0.753)	(0.714)	(0.958)	(0.181)
Legal Minority State	-0.005	-0.012	0.006	-0.051	-0.051	-0.091	0.002	-0.030
	(0.677)	(0.408)	(0.970)	(0.747)	(0.390)	(0.507)	(0.961)	(0.510)
Legal Minority Domestic	-0.001	-0.010	-0.148	-0.153	-0.043	0.058	-0.018	-0.049
	(0.916)	(0.382)	(0.257)	(0.261)	(0.428)	(0.569)	(0.520)	(0.131)
Legal Minority Foreign	-0.002 U	0.003	-0.086 U	0.222	-0.002	-0.075	0.052	0.015
	(0.035) 5	(0.887)	(0.004) 1	(0.266)	(0.979)	(0.701)	(0.341)	(0.870)
Other than Majority or Minority	-0.001	-0.020	0.090	0.141	0.168	0.358	0.084	0.068
	(0.926)	(0.284)	(0.607)	(0.468)	(0.100) 10	(0.092) 10	(0.095) 10	(0.245)
Golden Share	0.013 ∩	0.012	-0.012	-0.002	0.018	0.036	0.055	0.058
	(0.001) 1	(0.048) 5	(0.895)	(0.984)	(0.441)	(0.100) 10	(0.003) 1	(0.003) 1

Note: The dependent variables are the change in ROA and the rate of change of profit/sales, sales revenue and labor cost, respectively. Numbers in parenthesis are p-values. Number 1, 5 and 10 denote significance at 1%, 5% and 10% level, two-tail test, respectively. Industry, privatization, and year dummies are included. Symbol U denotes a U-shape effect over time (convex function). Symbol ∩ denotes an inverse U-shape effect over time (concave function).

Table 5

Permanent Effect of Subsequent Ownership Extent on Performance

First - Difference OLS and Instrumental Variable (IV) Estimates; (P-values in parentheses)

	ROA		Profit/Sales		Sales		Labor Cost	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Subsequent Ownership Size (P_{ijt}) - Permanent Effect								
Majority Domestic	0.017	0.015	0.152	0.164	-0.027	-0.030	-0.022	-0.017
	(0.060) [10]	(0.099) [10]	(0.103) [10]	(0.088) [10]	(0.497)	(0.432)	(0.550)	(0.642)
Majority Foreign	0.007 ∪	0.009	-0.154	-0.145	0.085	0.086	0.022	0.037
	(0.080) [10]	(0.629)	(0.316)	(0.374)	(0.074) [10]	(0.083) [10]	(0.420)	(0.198)
Blocking Minority State	-0.050	-0.054	0.726 ∩	0.552	-0.128	-0.171	-0.141	-0.136
	(0.373)	(0.385)	(0.004) [1]	(0.611)	(0.099) [10]	(0.048) [5]	(0.100) [10]	(0.155)
Blocking Minority Domestic	0.005	0.006	0.017	0.008	-0.060	-0.056	-0.046	-0.045
	(0.567)	(0.482)	(0.857)	(0.929)	(0.073) [10]	(0.084) [10]	(0.098) [10]	(0.101) [10]
Blocking Minority Foreign	0.020 ∩	0.015	0.093	0.079	0.038	0.067	0.056 ∪	0.052
	(0.053) [10]	(0.100) [10]	(0.557)	(0.607)	(0.657)	(0.434)	(0.086) [10]	(0.186)
Legal Minority State	-0.026	-0.025	0.475	0.568	-0.126	-0.106	0.353	0.353
	(0.380)	(0.433)	(0.026) [5]	(0.022) [5]	(0.072) [10]	(0.176)	(0.180)	(0.208)
Legal Minority Domestic	0.014 ∩	0.017	0.025	0.045	0.012	0.006	-0.027	-0.018
	(0.120) [10]	(0.050) [5]	(0.845)	(0.715)	(0.792)	(0.890)	(0.323)	(0.482)
Legal Minority Foreign	-0.004	-0.003	-0.028	-0.049	-0.162	-0.120	-0.009	-0.007
	(0.839)	(0.870)	(0.856)	(0.722)	(0.062) [10]	(0.136)	(0.786)	(0.840)
Other than Majority or Minority	0.070	0.073	0.385 ∪	0.445	-0.641	-0.387	0.439	0.440
	(0.208)	(0.224)	(0.003) [1]	(0.306)	(0.012) [5]	(0.075) [10]	(0.048) [5]	(0.067) [10]

Note: Same as in Table 4

Table 6

Effect of Initial Single Largest Owner Type on Performance

Difference OLS and Instrumental Variable (IV) Estimates; (P-values in parentheses)

	ROA		Profit/Sales		Sales		Labor Cost	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
State (Constant)	0.003	0.004	-0.165	-0.197	-0.114	-0.141	0.111 ∩	0.034
	(0.802)	(0.709)	(0.225)	(0.161)	(0.133)	(0.063) 10	(0.008) 1	(0.519)
Initial Ownership Size (P_{ij1})								
Domestic Ownership								
Industrial Co.	-0.001	-0.002	-0.049	0.015	-0.061	-0.027	-0.071	-0.063
	(0.794)	(-0.810)	(0.507)	(-0.850)	(0.099) 10	(0.360)	(0.007) 1	(0.007) 1
Bank	0.014	0.015	-0.072	0.005	0.060	0.025	0.052	0.043
	(0.268)	(-0.290)	(0.588)	(-0.973)	(0.348)	(0.750)	(0.266)	(0.437)
Invest. Fund	-0.003	-0.006	-0.081	-0.080	-0.005	0.015	-0.055	-0.071
	(0.674)	(-0.404)	(0.314)	(-0.363)	(0.853)	(0.650)	(0.028) 5	(0.005) 1
Individual	0.001	0.001	-0.112	-0.081	0.004	0.022	-0.019	-0.027
	(0.836)	(-0.934)	(0.213)	(-0.395)	(0.909)	(0.545)	(0.504)	(0.376)
Portfolio Co.	0.000	-0.005	-0.098	-0.098	-0.014	0.042	-0.021	-0.012
	(0.970)	(-0.685)	(0.429)	(-0.465)	(0.799)	(0.535)	(0.612)	(0.821)
Foreign Ownership								
Industrial Co.	0.016	0.013	0.086	0.180	0.072	0.107	0.030	0.026
	(0.029) 5	(-0.129)	(0.388)	(0.101) 10	(0.069) 10	(0.011) 1	(0.239)	(0.405)
Others	-0.008 ∪	-0.006	-0.278	-0.221	0.009	0.003	-0.034	-0.055
	(0.019) 5	(0.710)	(0.114) 10	(0.249)	(0.899)	(0.971)	(0.522)	(0.452)
Golden Share	0.011 ∩	0.009	-0.032	-0.017	0.006	0.014	0.052	0.062
	(0.025) 5	(0.145)	(0.724)	(0.855)	(0.821)	(0.577)	(0.030) 5	(0.001) 1

Note: Same as in Table 4

Table 7
Permanent Effect of Subsequent Single Largest Owner Type on Performance
Difference OLS and Instrumental Variable (IV) Estimates; (P-values in parentheses)

	ROA		Profit/Sales		Sales		Labor Cost	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Subsequent Ownership Size ($P_{ij\tau}$) - Permanent Effect								
Domestic Ownership								
Industrial Co.	0.003	0.004	-0.005	0.011	-0.040	-0.026	-0.074	-0.041
	(0.696)	(0.637)	(0.956)	(0.903)	(0.160)	(0.336)	(0.086) 10	(0.101) 10
Bank	0.086	0.118	0.388 ∩	0.338	-0.169	-0.167	-0.090	-0.094
	(0.075) 10	(0.025) 5	(0.081) 10	(0.101) 10	(0.199)	(0.264)	(0.264)	(0.299)
Invest. Fund	-0.013 ∪	0.004	0.060	0.062	-0.140 ∩	-0.096	-0.131	-0.104
	(0.003) 1	(0.789)	(0.628)	(0.614)	(0.092) 10	(0.061) 10	(0.014) 5	(0.003) 1
Individual	0.009	0.004	0.020	0.025	0.054	0.050	-0.053	-0.054
	(0.508)	(0.753)	(0.897)	(0.872)	(0.524)	(0.562)	(0.316)	(0.307)
Portfolio Co.	0.022	0.021	-0.088	-0.091	-0.175	-0.116	0.089	0.089
	(0.271)	(0.303)	(0.679)	(0.674)	(0.099) 10	(0.045) 5	(0.349)	(0.357)
Foreign Ownership								
Industrial Co.	0.012	0.007	0.118	0.094	0.057	0.061	0.110	0.087
	(0.255)	(0.493)	(0.451)	(0.538)	(0.100) 10	(0.087) 10	(0.010) 1	(0.001) 1
Others	0.007	0.009	-0.421	-0.391	-0.088	-0.072	-0.024	-0.015
	(0.693)	(0.587)	(0.057) 10	(0.003) 1	(0.372)	(0.466)	(0.740)	(0.843)

Note: Same as in Table 4

Table A1
Summary Statistics of Performance Indicators by Ownership Type: 1996-1999

		Mean	Std. Dev.	Min	Max	Num. Firms	Num. Obs
Domestic Ownership							
Industrial Co.	ROA	0.002	0.100	-0.393	0.386	852	1389
	Profit / Sales	-0.278	1.013	-2.921	2.985	619	911
	Sales	-0.009	0.418	-1.000	2.431	766	1244
	Labor Costs	-0.014	0.353	-1.000	2.732	860	1410
Bank	ROA	0.008	0.121	-0.377	0.373	40	45
		-0.141	0.907	-2.200	2.329	38	48
	Sales	0.101	0.720	-1.000	2.820	29	33
	Labor Costs	0.083	0.453	-0.782	1.876	39	43
Invest. Fund	ROA	0.006	0.109	-0.369	0.387	332	474
	Profit / Sales	-0.327	1.030	-2.995	2.954	280	397
	Sales	0.016	0.444	-1.000	2.726	297	423
	Labor Costs	0.024	0.401	-1.000	2.842	338	488
Individual	ROA	-0.001	0.102	-0.385	0.387	258	380
	Profit / Sales	-0.308	0.992	-2.987	2.674	187	259
	Sales	0.016	0.522	-1.000	2.691	224	335
	Labor Costs	-0.015	0.398	-1.000	2.248	252	379
Portfolio Co.	ROA	-0.017	0.105	-0.349	0.367	88	98
	Profit / Sales	-0.289	1.111	-2.970	2.866	79	89
	Sales	-0.134	0.365	-1.000	0.987	72	80
	Labor Costs	-0.008	0.496	-1.000	2.750	88	100
State	ROA	-0.006	0.052	-0.250	0.164	125	178
	Profit / Sales	-0.177	0.827	-2.947	2.621	192	250
	Sales	0.026	0.217	-0.994	1.325	122	174
	Labor Costs	0.081	0.238	-0.989	2.219	128	183
Foreign Ownership							
Industrial Co.	ROA	-0.001	0.077	-0.298	0.235	154	259
	Profit / Sales	-0.129	0.871	-2.967	2.744	109	173
	Sales	0.105	0.380	-1.000	2.795	140	236
	Labor Costs	0.091	0.284	-1.000	1.643	157	265
Others	ROA	-0.006	0.094	-0.368	0.257	68	82
	Profit / Sales	-0.413	0.757	-2.552	1.705	41	48
	Sales	-0.004	0.290	-0.902	0.868	57	67
	Labor Costs	0.033	0.333	-0.800	1.613	68	81

Table A2
Summary Statistics of Performance Indicators by Extent of Ownership: 1996-1999

		Mean	Std. Dev.	Min	Max	Num. Firms	Num.Obs
Majority State	ROA	-0.013	0.046	-0.154	0.098	34	46
	Profit / Sales	-0.167	0.906	-2.209	2.415	44	58
	Sales	0.017	0.235	-0.880	0.567	35	49
	Labor Costs	0.073	0.180	-0.742	0.541	36	50
Majority Domestic	ROA	0.006	0.101	-0.385	0.386	554	870
	Profit / Sales	-0.269	0.958	-2.987	2.636	350	517
	Sales	-0.005	0.431	-1.000	2.820	480	758
	Labor Costs	-0.014	0.406	-1.000	2.732	553	880
Majority Foreign	ROA	0.002	0.084	-0.298	0.257	111	185
	Profit / Sales	-0.234	0.821	-2.967	2.646	75	119
	Sales	0.089	0.360	-1.000	1.707	99	165
	Labor Costs	0.057	0.285	-1.000	1.643	113	188
Blocking Minority State	ROA	-0.003	0.049	-0.250	0.164	50	67
	Profit / Sales	-0.169	0.854	-2.947	2.621	71	96
	Sales	0.015	0.140	-0.552	0.291	48	63
	Labor Costs	0.077	0.155	-0.682	0.641	50	67
Blocking Minority Domestic	ROA	-0.004	0.099	-0.367	0.387	531	748
	Profit / Sales	-0.261	1.047	-2.905	2.813	371	484
	Sales	-0.005	0.441	-1.000	2.405	478	679
	Labor Costs	-0.021	0.339	-1.000	2.842	527	754
Blocking Minority Foreign	ROA	-0.001	0.063	-0.248	0.226	67	97
	Profit / Sales	-0.084	0.978	-2.868	2.744	45	56
	Sales	0.055	0.413	-0.929	2.795	58	86
	Labor Costs	0.094	0.319	-0.765	1.568	68	100
Legal Minority State	ROA	-0.005	0.060	-0.231	0.151	40	60
	Profit / Sales	-0.186	0.768	-2.559	2.269	74	92
	Sales	0.047	0.273	-0.994	1.325	39	58
	Labor Costs	0.094	0.343	-0.989	2.219	41	61
Legal Minority Domestic	ROA	0.001	0.108	-0.393	0.387	483	743
	Profit / Sales	-0.330	1.047	-2.995	2.985	480	669
	Sales	0.005	0.471	-1.000	2.726	437	656
	Labor Costs	0.018	0.380	-1.000	2.750	491	759
Legal Minority Foreign	ROA	-0.024	0.095	-0.368	0.102	34	50
	Profit / Sales	-0.190	0.816	-2.627	2.432	30	40
	Sales	0.102	0.310	-0.469	0.917	32	45
	Labor Costs	0.090	0.276	-0.558	1.613	34	49
Other than Majority or Minority	ROA	0.015	0.088	-0.248	0.245	31	39
	Profit / Sales	-0.276	0.739	-1.304	1.619	33	44
	Sales	-0.059	0.301	-1.000	0.283	25	33
	Labor Costs	0.149	0.398	-0.463	2.073	31	41

Table A3
Pre-Privatization Characteristics of Firms

Variable	Mean	Std. Dev.	Min	Max
Panel A				
Registered Capital (in thousands of korunas)	419,607	1,877,644	3,141	49,200,000
Net Asset Value (in thousands of korunas)	489,480	2,178,180	3,490	56,000,000
Total Number of Shares	412,827	1,870,709	3,141	49,200,000
Number of Shares Entering Voucher Privatization	220,490	656,943	2,202	14,800,000
Number of Shares Allocated through Voucher Privatization	204,935	629,464	1,537	13,800,000
Value of Shares in Terms of Voucher Points	6,903,206	24,200,000	67,300	611,000,000

Regions	Mean	Std.Dev.	Min	Max
Panel B				
Prague	15.83%	0.3651	0	1
Central Bohemia	8.14%	0.2735	0	1
Southern Bohemia	7.77%	0.2677	0	1
Western Bohemia	10.28%	0.3038	0	1
Northern Bohemia	11.32%	0.3169	0	1
Eastern Bohemia	12.72%	0.3333	0	1
Southern Moravia	18.71%	0.3902	0	1
Northern Moravia	15.24%	0.3595	0	1

Industrial Sectors				
Panel C				
Agriculture	18.20%	0.3859	0	1
Heavy Machinery	29.88%	0.4579	0	1
Light Machinery	17.46%	0.3797	0	1
Constructions	13.02%	0.3366	0	1
Transportation	4.07%	0.1976	0	1
Trade	9.10%	0.2877	0	1
R & D	1.48%	0.1208	0	1
Services	4.29%	0.2027	0	1
Financial	0.96%	0.0976	0	1
Other	1.55%	0.1237	0	1

Note: The number of observation is 1352 for each variable

Table A4
Proposed Allocation of Shares Among Parties (in %)

Variable	Mean	Std Dev.	Min.	Max
Foreign Owner	1.3225	7.6277	0	75
Domestic Owner	3.7663	12.8294	0	74
Restitution	0.5222	3.0640	0	58
Fund of National Property (Temporary)	8.4615	16.6760	0	84
Fund of National Property (Permanent)	0.1709	2.3046	0	51
Sale Through Intermediary	2.0666	8.5860	0	75
Municipality Transfer	3.4379	13.3587	0	94
Other	3.0377	8.0087	0	81
Total Number of Privatization Projects	3.0178	7.0905	1	77

Note: The number of observation is 1352 for each variable

Table A5
Perfomance Indicators prior to Privatization

Variable per Share		No. of observations	Mean	Std.Dev.	Min	Max
Sales						
	3 years to privatization	1210	3.6350	40.3716	0.001050	1297.0630
	2 years to privatization	1210	3.5091	46.8384	0.000000	1614.1270
	1 year to privatization	1346	2.3407	7.0245	0.001787	200.0090
Profit						
	3 years to privatization	1196	0.2650	1.8867	-1.587883	43.7188
	2 years to privatization	1269	0.3058	3.5251	-2.234356	117.8678
	1 year to privatization	1338	0.1919	1.3306	-10.135990	38.4093
Debt						
	3 years to privatization	916	0.6610	2.0698	0.000249	31.8724
	2 years to privatization	1021	0.6183	1.8527	0.000121	38.1252
	1 year to privatization	1155	0.6284	2.1576	0.000092	32.1283
Employment						
	3 years to privatization	1221	0.0061	0.0150	0.000002	0.4177
	2 years to privatization	1281	0.0057	0.0142	0.000002	0.3998
	1 year to privatization	1348	0.0050	0.0132	0.000002	0.3812

Table A6
Effect of Ownership Extent on Performance
Non-instrumented Estimates (P-values in parentheses)

	ROA	Profit / Sales	Sales	Labor Cost
Majority State (Constant)	-0.002	-0.176	-0.111	0.077 ∪
	(0.875)	(0.311)	(0.193)	(0.078) 10
Initial Ownership Size (P_{ij1}) - Initial Effect				
Majority Domestic	0.007	-0.051	-0.056	-0.052
	(0.518)	(0.700)	(0.303)	(0.097) 10
Majority Foreign	0.022	-0.022	0.076	0.039
	(0.058) 10	(0.884)	(0.225)	(0.283)
Blocking Minority State	0.008	-0.115	-0.028	0.010
	(0.483)	(0.449)	(0.611)	(0.731)
Blocking Minority Domestic	-0.003	-0.062	-0.060	-0.029
	(0.755)	(0.646)	(0.269)	(0.321)
Blocking Minority Foreign	0.011	0.082 ∩	-0.019	-0.002
	(0.441)	(0.044) 5	(0.753)	(0.958)
Legal Minority State	-0.005	0.006	-0.051	0.002
	(0.677)	(0.970)	(0.390)	(0.961)
Legal Minority Domestic	-0.001	-0.148	-0.043	-0.018
	(0.916)	(0.257)	(0.428)	(0.520)
Legal Minority Foreign	-0.002 ∪	-0.086 ∪	-0.002	0.052
	(0.035) 5	(0.004) 1	(0.979)	(0.341)
Other than Majority or Minority	-0.001	0.090	0.168	0.084
	(0.926)	(0.607)	(0.100) 10	(0.095) 10
Subsequent Ownership Size (P_{ijt}) - Permanent Effect				
Majority Domestic	0.017	0.152	-0.027	-0.022
	(0.060) 10	(0.103) 10	(0.497)	(0.550)
Majority Foreign	0.007 ∪	-0.154	0.085	0.022
	(0.080) 10	(0.316)	(0.074) 10	(0.420)
Blocking Minority State	-0.050	0.726 ∩	-0.128	-0.141
	(0.373)	(0.004) 1	(0.099) 10	(0.100) 10
Blocking Minority Domestic	0.005	0.017	-0.060	-0.046
	(0.567)	(0.857)	(0.073) 10	(0.098) 10
Blocking Minority Foreign	0.020 ∩	0.093	0.038	0.056 ∪
	(0.053) 10	(0.557)	(0.657)	(0.086) 10
Legal Minority State	-0.026	0.475	-0.126	0.353
	(0.380)	(0.026) 5	(0.072) 10	(0.180)
Legal Minority Domestic	0.014 ∩	0.025	0.012	-0.027
	(0.120) 10	(0.845)	(0.792)	(0.323)
Legal Minority Foreign	-0.004	-0.028	-0.162	-0.009
	(0.839)	(0.856)	(0.062) 10	(0.786)
Other than Majority or Minority	0.070	0.385 ∪	-0.641	0.439
	(0.208)	(0.003) 1	(0.012) 5	(0.048) 5
Ownership Change (ΔP_{ijt}) - Instantaneous Effect				
Majority Domestic	-0.017	-0.065	0.059	0.007
	(0.084) 10	(0.576)	(0.218)	(0.858)
Majority Foreign	-0.010	0.110	-0.063	-0.051
	(0.667)	(0.628)	(0.369)	(0.280)
Blocking Minority State	0.034	-1.340	0.020	-0.024
	(0.568)	(0.179)	(0.825)	(0.870)
Blocking Minority Domestic	-0.014	0.132	0.071	0.033
	(0.134)	(0.239)	(0.076) 10	(0.315)
Blocking Minority Foreign	-0.020	-0.107	0.024	0.074
	(0.117)	(0.598)	(0.833)	(0.289)
Legal Minority State	0.025	-0.603	-0.016	-0.400
	(0.479)	(0.118)	(0.888)	(0.149)
Legal Minority Domestic	-0.017	-0.103	-0.035	-0.032
	(0.128)	(0.515)	(0.571)	(0.380)
Legal Minority Foreign	-0.035	0.072	0.340	0.003
	(0.233)	(0.776)	(0.010) 1	(0.955)
Other than Majority or Minority	-0.070	0.136	0.232	-0.172
	(0.235)	(0.716)	(0.278)	(0.530)
Golden Share	0.013 ∩	-0.012	0.018	0.055
	(0.001) 1	(0.895)	(0.441)	(0.003) 1
Initial value (X_{ij1})	-3.2E-01	0.000	0.000	0.000
	(0.000) 1	(0.051) 10	(0.413)	(0.082) 10
Voucher-Privatization Dummies				
First Wave	0.001	0.041	0.062	-0.094
	(0.902)	(0.740)	(0.357)	(0.068) 10
Second Wave	-0.008	0.032	0.075	-0.119
	(0.419)	(0.801)	(0.269)	(0.020) 5
Both Waves	0.006	-0.011	0.089	-0.099
	(0.585)	(0.937)	(0.207)	(0.067) 10
Adj. R square	0.141	0.051	0.014	0.034
Num. of Obs.	2905	2168	2592	2949

Note: The dependent variables are the change in ROA and the rate of change of profit/sales, sales revenue and labor cost, respectively. Numbers in parenthesis are p-values. Number 1, 5 and 10 denote significance at 1%, 5% and 10% level, two-tail test, respectively. Industry, privatization, and year dummies are included. Symbol U denotes a U-shape effect over time (convex function). Symbol ∩ denotes an inverse U-shape effect over time (concave function).

Table A7
Effect of Ownership Extent on Performance
Instrumented Estimates (P-values in parentheses)

	ROA	Profit / Sales	Sales	Labor Cost
Majority State (Constant)	0.005	-0.192	-0.175	0.026
	(0.731)	(0.282)	(0.089) 10	(0.633)
Initial Ownership Size (P_{ij1}) - Initial Effect				
Majority Domestic	0.001	-0.001	-0.067	-0.077
	(0.945)	(0.992)	(0.552)	(0.032) 5
Majority Foreign	0.015	-0.044	0.299	0.015
	(0.231)	(0.797)	(0.011) 1	(0.743)
Blocking Minority State	0.001	-0.145	0.083	-0.017
	(0.930)	(0.388)	(0.438)	(0.608)
Blocking Minority Domestic	-0.009	-0.069	0.014	-0.065
	(0.456)	(0.623)	(0.895)	(0.051) 5
Blocking Minority Foreign	-0.013	0.063	-0.098	-0.063
	(0.470)	(0.766)	(0.714)	(0.181)
Legal Minority State	-0.012	-0.051	-0.091	-0.030
	(0.408)	(0.747)	(0.507)	(0.510)
Legal Minority Domestic	-0.010	-0.153	0.058	-0.049
	(0.382)	(0.261)	(0.569)	(0.131)
Legal Minority Foreign	0.003	0.222	-0.075	0.015
	(0.887)	(0.266)	(0.701)	(0.870)
Other than Majority or Minority	-0.020	0.141	0.358	0.068
	(0.284)	(0.468)	(0.092) 10	(0.245)
Subsequent Ownership Size (P_{iit}) - Permanent Effect				
Majority Domestic	0.015	0.164	-0.030	-0.017
	(0.099) 10	(0.088) 10	(0.432)	(0.642)
Majority Foreign	0.009	-0.145	0.086	0.037
	(0.629)	(0.374)	(0.083) 10	(0.198)
Blocking Minority State	-0.054	0.552	-0.171	-0.136
	(0.385)	(0.611)	(0.048) 5	(0.155)
Blocking Minority Domestic	0.006	0.008	-0.056	-0.045
	(0.482)	(0.929)	(0.084) 10	(0.101) 10
Blocking Minority Foreign	0.015	0.079	0.067	0.052
	(0.100) 10	(0.607)	(0.434)	(0.186)
Legal Minority State	-0.025	0.568	-0.106	0.353
	(0.433)	(0.022) 5	(0.176)	(0.208)
Legal Minority Domestic	0.017	0.045	0.006	-0.018
	(0.050) 5	(0.715)	(0.890)	(0.482)
Legal Minority Foreign	-0.003	-0.049	-0.120	-0.007
	(0.870)	(0.722)	(0.136)	(0.840)
Other than Majority or Minority	0.073	0.445	-0.387	0.440
	(0.224)	(0.306)	(0.075) 10	(0.067) 10
Ownership Change (ΔP_{ijt}) - Instantaneous Effect				
Majority Domestic	-0.016	-0.066	0.059	0.004
	(0.111)	(0.571)	(0.219)	(0.925)
Majority Foreign	-0.012	0.088	-0.052	-0.060
	(0.598)	(0.705)	(0.462)	(0.211)
Blocking Minority State	0.037	-1.385	0.073	-0.029
	(0.581)	(0.235)	(0.452)	(0.856)
Blocking Minority Domestic	-0.015	0.140	0.069	0.033
	(0.112)	(0.213)	(0.089) 10	(0.319)
Blocking Minority Foreign	-0.019	-0.101	0.019	0.069
	(0.145)	(0.614)	(0.872)	(0.313)
Legal Minority State	0.023	-0.609	-0.024	-0.398
	(0.536)	(0.138)	(0.848)	(0.175)
Legal Minority Domestic	-0.017	-0.110	-0.027	-0.042
	(0.131)	(0.482)	(0.668)	(0.244)
Legal Minority Foreign	-0.034	0.078	0.344	0.012
	(0.283)	(0.780)	(0.006) 1	(0.821)
Other than Majority or Minority	-0.072	0.145	0.263	-0.171
	(0.250)	(0.760)	(0.252)	(0.560)
Golden Share	0.012	-0.002	0.036	0.058
	(0.048) 5	(0.984)	(0.100) 10	(0.003) 1
Initial value (X_{ij1})	-3.2E-01	0.000	0.000	0.000
	(0.000) 1	(0.084) 10	(0.293)	(0.164)
Voucher-Privatization Dummies				
First Wave	0.001	0.053	0.053	-0.089
	(0.898)	(0.671)	(0.473)	(0.089) 10
Second Wave	-0.008	0.051	0.077	-0.115
	(0.411)	(0.697)	(0.292)	(0.027) 5
Both Waves	0.006	0.001	0.062	-0.096
	(0.588)	(0.995)	(0.425)	(0.079) 10
Adj. R square	0.108	0.008	0.019	0.038
Num. of Obs.	2905	2168	2592	2949

Table A8
Effect of the Single Largest Owner (SLO) Type on Performance
Non-instrumented Estimates (P-values in parentheses)

	ROA	Profit / Sales	Sales	Labor Cost
State (Constant)	0.003	-0.165	-0.114	0.111 ∩
	(0.802)	(0.225)	(0.133)	(0.008) [1]
Initial Ownership Size (P_{ij1}) - Initial Effect				
Domestic Ownership				
Industrial Co.	-0.001	-0.049	-0.061	-0.071
	(0.794)	(0.507)	(0.099) [10]	(0.007) [1]
Bank	0.014	-0.072	0.060	0.052
	(0.268)	(0.588)	(0.348)	(0.266)
Invest. Fund	-0.003	-0.081	-0.005	-0.055
	(0.674)	(0.314)	(0.853)	(0.028) [5]
Individual	0.001	-0.112	0.004	-0.019
	(0.836)	(0.213)	(0.909)	(0.504)
Portfolio Co.	0.000	-0.098	-0.014	-0.021
	(0.970)	(0.429)	(0.799)	(0.612)
Foreign Ownership				
Industrial Co.	0.016	0.086	0.072	0.030
	(0.029) [5]	(0.388)	(0.069) [10]	(0.239)
Others	-0.008 ∪	-0.278	0.009	-0.034
	(0.019) [5]	(0.114) [10]	(0.899)	(0.522)
Subsequent Ownership Size (P_{iit}) - Permanent Effect				
Domestic Ownership				
Industrial Co.	0.003	-0.005	-0.040	-0.074
	(0.696)	(0.956)	(0.160)	(0.086) [10]
Bank	0.086	0.388 ∩	-0.169	-0.090
	(0.075) [10]	(0.081) [10]	(0.199)	(0.264)
Invest. Fund	-0.013 ∪	0.060	-0.140 ∩	-0.131
	(0.003) [1]	(0.628)	(0.092) [10]	(0.014) [5]
Individual	0.009	0.020	0.054	-0.053
	(0.508)	(0.897)	(0.524)	(0.316)
Portfolio Co.	0.022	-0.088	-0.175	0.089
	(0.271)	(0.679)	(0.099) [10]	(0.349)
Foreign Ownership				
Industrial Co.	0.012	0.118	0.057	0.110
	(0.255)	(0.451)	(0.100) [10]	(0.010) [1]
Others	0.007	-0.421	-0.088	-0.024
	(0.693)	(0.057) [10]	(0.372)	(0.740)
Ownership Change (ΔP_{iit}) - Instantaneous Effect				
Domestic Ownership				
Industrial Co.	-0.001	0.042	0.050	-0.014
	(0.870)	(0.692)	(0.136)	(0.631)
Bank	-0.150	-0.109	0.065	-0.042
	(0.007) [1]	(0.768)	(0.693)	(0.705)
Invest. Fund	-0.012	0.087	0.100	0.151
	(0.439)	(0.571)	(0.140)	(0.003) [1]
Individual	-0.017	0.133	-0.064	-0.087
	(0.289)	(0.457)	(0.522)	(0.163)
Portfolio Co.	-0.044	0.231	-0.061	-0.171
	(0.052) [5]	(0.394)	(0.412)	(0.100) [10]
Foreign Ownership				
Industrial Co.	-0.024	0.103	0.067	-0.032
	(0.133)	(0.597)	(0.335)	(0.535)
Others	-0.009	0.211	0.032	-0.007
	(0.686)	(0.317)	(0.777)	(0.933)
Golden Share	0.011 ∩	-0.032	0.006	0.052
	(0.025) [5]	(0.724)	(0.821)	(0.030) [5]
Initial value (X_{ij1})	-0.316	0.000	0.000	0.000
	(0.000) [1]	(0.046) [5]	(0.307)	(0.147)
Voucher-Privatization Dummies				
First Wave	-0.001	0.028	0.039	-0.096
	(0.942)	(0.821)	(0.563)	(0.064) [10]
Second Wave	-0.009	0.037	0.056	-0.119
	(0.379)	(0.771)	(0.403)	(0.020) [5]
Both Waves	0.004	-0.012	0.068	-0.098
	(0.718)	(0.932)	(0.324)	(0.072) [10]
Adj. R square	0.019	0.029	0.048	0.074
Num. of Obs.	2905	2168	2592	2949

Note: Same as in Table A7.

Table A9
Effect of the Single Largest Owner (SLO) Type on Performance
Instrumented estimates (P-values in parentheses)

	ROA	Profit / Sales	Sales	Labor Cost
State (Constant)	0.004	-0.197	-0.141	0.034
	(0.709)	(0.161)	(0.063) 10	(0.519)
Initial Ownership Size (P_{ij1}) - Initial Effect				
Domestic Ownership				
Industrial Co.	-0.002	0.015	-0.027	-0.063
	(0.810)	(0.850)	(0.360)	(0.007) 1
Bank	0.015	0.005	0.025	0.043
	(0.290)	(0.973)	(0.750)	(0.437)
Invest. Fund	-0.006	-0.080	0.015	-0.071
	(0.404)	(0.363)	(0.650)	(0.005) 1
Individual	0.001	-0.081	0.022	-0.027
	(0.934)	(0.395)	(0.545)	(0.376)
Portfolio Co.	-0.005	-0.098	0.042	-0.012
	(0.685)	(0.465)	(0.535)	(0.821)
Foreign Ownership				
Industrial Co.	0.013	0.180	0.107	0.026
	(0.129)	(0.101) 10	(0.011) 1	(0.405)
Others	-0.006	-0.221	0.003	-0.055
	(0.710)	(0.249)	(0.971)	(0.452)
Subsequent Ownership Size ($P_{ii\tau}$) - Permanent Effect				
Domestic Ownership				
Industrial Co.	0.004	0.011	-0.026	-0.041
	(0.637)	(0.903)	(0.336)	(0.101) 10
Bank	0.118	0.338	-0.167	-0.094
	(0.025) 5	(0.101) 10	(0.264)	(0.299)
Invest. Fund	0.004	0.062	-0.096	-0.104
	(0.789)	(0.614)	(0.061) 10	(0.003) 1
Individual	0.004	0.025	0.050	-0.054
	(0.753)	(0.872)	(0.562)	(0.307)
Portfolio Co.	0.021	-0.091	-0.116	0.089
	(0.303)	(0.674)	(0.045) 5	(0.357)
Foreign Ownership				
Industrial Co.	0.007	0.094	0.061	0.087
	(0.493)	(0.538)	(0.087) 10	(0.001) 1
Others	0.009	-0.391	-0.072	-0.015
	(0.587)	(0.003) 1	(0.466)	(0.843)
Ownership Change ($\Delta P_{ii\tau}$) - Instantaneous Effect				
Domestic Ownership				
Industrial Co.	-0.002	0.043	0.047	-0.015
	(0.807)	(0.691)	(0.159)	(0.612)
Bank	-0.152	-0.099	0.072	-0.037
	(0.012) 1	(0.797)	(0.693)	(0.760)
Invest. Fund	-0.012	0.087	0.106	0.154
	(0.445)	(0.571)	(0.120)	(0.002) 1
Individual	-0.013	0.133	-0.062	-0.087
	(0.425)	(0.462)	(0.539)	(0.164)
Portfolio Co.	-0.044	0.235	-0.057	-0.166
	(0.051) 5	(0.392)	(0.444)	(0.123)
Foreign Ownership				
Industrial Co.	-0.021	0.112	0.066	-0.032
	(0.178)	(0.558)	(0.344)	(0.539)
Others	-0.013	0.223	0.030	-0.009
	(0.547)	(0.288)	(0.787)	(0.913)
Golden Share	0.009	-0.017	0.014	0.062
	(0.145)	(0.855)	(0.577)	(0.001) 1
Initial value (X_{ij1})	-0.315	0.000	0.000	0.000
	(0.000) 1	(0.088) 10	(0.199)	(0.161)
Voucher-Privatization Dummies				
First Wave	0.000	0.024	0.036	-0.093
	(0.994)	(0.847)	(0.592)	(0.072) 10
Second Wave	-0.009	0.040	0.057	-0.117
	(0.395)	(0.761)	(0.391)	(0.022) 5
Both Waves	0.004	-0.022	0.064	-0.097
	(0.676)	(0.871)	(0.354)	(0.074) 10
Adj. R square	0.110	0.008	0.017	0.044
Num. of Obs.	2905	2168	2592	2949

Note: Same as in Table A7.

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