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CESIFO WORKING PAPER NO. 2801
CATEGORY 2: PUBLIC CHOICE
SEPTEMBER 2009

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Abstract

We analyze the extent of the integrated control of the state over privatized firms during the post-privatization decade (1995–2005) in the Czech Republic. During this period the integrated control potential of the state resembled a corporate pyramid. While pyramidal control was not fully utilized, the golden share in the hands of the state substantially enhanced its ability to control firms. In terms of corporate performance we show that state control resulted in declining and even negative corporate performance. Integrated state control was shown to be mostly inferior when compared with private types of ownership. State ownership positions are in striking contrast with the lack of capacity to push corporate performance in order to collect larger tax volumes. Lack of focus and inter-agency cooperation as well as the simple inefficiency of the state bureaucracy are the most likely reasons behind our findings.

JEL Code: C30, D21, D29, G30, L21.

Keywords: state ownership, control, corporate performance, privatization.

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A substantial part of this paper was written while Evžen Kočenda was a Visiting Fellow at the Center for Economic Studies (CES) at the University of Munich, whose hospitality is warmly acknowledged. We are grateful to Lucy Chernykh, Iraj Hashi, and presentation participants at CES (Munich, 2009) and 8th International Conference – Challenges for Europe (Split, 2009) for valuable comments. Financial support from GAČR grant No. 402/09/1595 is gratefully acknowledged. The usual disclaimer applies.

1. Introduction and Motivation

La Porta, Lopez-de-Silanes and Shleifer (1999) show that the ownership structure of vertically organized companies, known as corporate pyramids, are widespread around the world. However, these structures are more often present in emerging markets (Khanna and Yafeh, 2007). Morck (2009) highlights that it is the power of pyramids, which is disguised to outside observers. Most of the literature on the topic considers a wealthy family at the top of the pyramid, while much less attention has been paid to the state as the ultimate owner (see Morck, Wolfenzon and Yeung, 2005). We present evidence of the state being in control within a corporate pyramid in an emerging economy with a web of seemingly private companies. Our detailed analysis of the data shows that the direct control of the state was significant and was further enhanced via golden share holdings. However, we find that integrated state control had a detrimental effect on corporate performance, which declined over time and became negative. We conclude that integrated state control was not effectively used by the state, a finding that indicates the inefficiency of a state bureaucracy. Although the amount of state control is significant in the data, we do not find evidence of integrated state control employed to an extent similar to corporate structures in Russia or China.

The integrated control of the state may evolve from having direct control through a majority voting right, and increase with the increased influence of having a golden share, to the institution of a complex control structure like an ownership pyramid. In general, a corporate pyramid is a group of firms whose ownership structure follows a top-to-bottom direction of control, where the ultimate owner is at the top and exerts its control over firms at successive lower levels. This fractal-like pattern of ownership can proliferate to several levels.

Thus the key characteristics of a corporate pyramid are ownership and control, which lends the ultimate owner leveraged power over minority shareholders. Already in 1932 Berle and Means had pointed to the existence of a great discrepancy present in corporate pyramids between the ultimate owner's control and cash-flow rights. These control rights are typically high due to the controlling devices described in the previous paragraphs, while cash-flow rights may be considerably lower as articulated in Bebchuk, Kraakman and Triantis (2000). Traditionally it is assumed that pyramids are formed to

allow the ultimate owner to achieve control over a firm by using only a small cash flow stake. This arrangement inevitably leads to less-than-efficient corporate governance and associated agency problems. Further reasons for the existence of pyramidal groups include the limited liability of separately registered groups, more space for the promotion of managers to top positions as well as better monitoring of managers, and the provision of capital under favorable conditions to other firms within the structure (Morck, Wolfenzon and Yeung, 2005). However, despite the ubiquity of pyramidal business groups, no formal theory explains their existence (Almeida and Wolfenzon, 2006).

It is frequently assumed that the disparity stemming from the ownership and control characteristics of the pyramid combined with inadequate institutions and market regulations produce in many emerging markets conditions favorable to the expropriation of minority shareholders, also known as “tunneling”.¹ However, despite the almost axiomatic nature of the link between pyramids and minority shareholders’ expropriation in the literature, Khanna and Yafeh (2007, p. 346) argue that the link is unjustifiable since “the empirical evidence on the prevalence and severity of profit tunneling from minority shareholders within pyramidal groups is far from clear-cut”.

In most cases the literature concentrates on a wealthy family at the top of a pyramid. While various effects of pyramidal structures on corporate performance, firm value, etc. are considerably researched in the literature (see Morck, Wolfenzon and Yeung, 2005 for a survey), a pyramidal structure with the state at the top of the control chain is under-researched. Existing studies report a significant presence of the state in European firms (La Porta, Lopez-de Silanes and Shleifer, 1999; Faccio and Lang, 2002), whose control potential further increases when direct control is augmented by control through golden shares (Bortolotti and Faccio, 2006). The literature on the extent of state control in the pyramidal framework in transformation economies is scarce, but for example Chernykh (2008) provides evidence for a dramatically high level (37–48%) of state control over the sampled Russian firms. In China, Ma, Yao and Xi (2006) describe the emergence of business groups in which a state-owned firm as the largest shareholder can exert power over the rest of the companies in a business group. The formation of

¹ The term “tunneling” can be traced to the expropriation of minority shareholders following large-scale privatization in the Czech Republic and became widespread in the literature due to Johnson, La Porta, Lopez-de Silanes and Shleifer (2000).

these pyramid-like corporate structures was intentional to allow the state extensive control.

The identification of the extent of integrated state control is important because the state as ultimate owner can exert great political influence over the economy because the political influence is proportional to the extent of control and not to the extent of owned property (Morck, Stangeland, and Yeung, 2000; Morck and Yeung, 2004). The case of state ultimate ownership multiplies the control over a vast array of assets in combination with extensive political influence. A government formed by a strong party or coalition can then tap into extensive resources to finance re-election. Such an advantage may be dangerous in countries with less developed institutions and legal frameworks as it might yield to corruption and the misuse of assets. The power of the state to intervene in the economy and distribute regulatory and legal advantages to specific firms is well analyzed on a large set of transition economies by Hellman, Jones, and Kaufmann (2003).

This identification is also important due to the potential negative effects stemming from the conflict between political costs and agency costs (Shleifer and Vishny, 1994; Qian, 1996). For example, following other-than-economic objectives, firms with state control are less likely to innovate and restructure their line of production, as evidenced by Frydman, Hessel, and Rapaczynski (2006), or firms often intentionally delay restructuring (Bennett, Estrin, and Maw, 2005). Finally, soft budget constraints can be practiced between state-controlled credit providers and firms because they are hidden by less-than-evident links among firms and financial institutions under state control (Hanousek and Kočenda, 2008). Preferential treatment of state-controlled firms by state-controlled financial intuitions constitutes the emergence of a subsidy, whose effects in firms in Central Europe are shown in Frydman, Gray, Hessel, and Rapaczynski (2000).

In this paper we contribute to the literature by analyzing the extent of integrated state control, including a state pyramid, as well as the effects of this control on corporate performance. Integrated state control can emerge as a result of extensive privatization that leaves distinctive footprints on the performance of newly privatized firms, an issue that is extensively reviewed by Estrin, Hanousek, Kočenda, and Svejnar (2009) and that has occurred in numerous countries. Such an arrangement appeared in the Czech Republic, where industrial holding companies emerged out of the former centrally-

planned units, sometimes with 15–30 horizontally and vertically linked plants and subsidiaries.² These companies were voucher-privatized and restructured using government subsidies. The remaining shares were bought at a discount by the new management teams and consortia of Czech banks. Voucher privatization led to the creation of large, diversified investment funds, often indirectly run by banks, which control linked enterprises (Khanna and Yafeh, 2007). The switch from a command to a market economic system has provided a unique opportunity to study the behavior of the state in the role of the ultimate owner at the top of a pyramid.

The paper is structured as follows. First, we briefly describe the privatization program and data in Sections 2 and 3. Then we proceed with an analysis of the true extent of integrated state control in Section 4. We present evidence of the effects of state control on corporate performance in Section 5. In the concluding section we summarize our findings and chart potential further research.

2. Privatization Program

After the “velvet revolution” in 1989, the Czech Republic emerged from their centrally-planned economy to re-instate a market economy and democracy. A massive privatization program was administered in the Czech Republic in the first half of the 1990s under three different schemes: restitution, small-scale privatization, and large-scale privatization. We only reiterate the main aspects of the Czech privatization that are relevant for this study since the process has been extensively described in the literature, e.g., Hanousek and Kroch (1998) and Kočenda (1999). The first two schemes began 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, was completed in early 1995, and allowed for various privatization techniques. Small firms were usually auctioned off or sold in tenders. Many medium-sized businesses were sold in tenders or to predetermined buyers in direct sales. Most large and many medium-sized firms were transformed into joint stock companies and their shares were distributed through voucher privatization (almost one-half of the total number of all the shares of all joint stock

² Cull, Matesova, and Shirley (2002) describe control pyramids in the Czech Republic.

companies were privatized in the voucher scheme), sold in public auctions or to strategic partners, or transferred to municipalities.³

The voucher scheme was part of the large-scale privatization process. Two waves of voucher privatization took place, in 1992–93 and 1993–94. Both waves were administered in the same manner and there were no differences in their set-up. During the scheme, a total of 1664 firms were privatized: 988 in the first wave and 676 in the second wave; from this number 185 firms were privatized in both waves in various proportions of their assets. All Czech citizens over the age of 18 who resided in the Czech Republic could participate in the voucher process. For each wave every eligible citizen was authorized to buy a voucher book that contained 1000 investment “points” for 1000 Czech crowns (CZK), about a week’s wage. Before the privatization started, individuals had the option of assigning none, some, or all of their points to Privatization Investment Funds (PIFs): newly established financial firms vaguely similar in their scope of activity to closed-end mutual funds.⁴ Aggarwal and Harper (2000) persuasively document that share valuation and demand in the early stage of this auction were based on firm characteristics (return on sales, sales growth) and ownership structure. Share prices and trading volumes from prior rounds increased in importance as determinants in later stage of the auction, though.

At the beginning it was the Ministry of Privatization that executed the privatization process. The privatization authorities had rough goals regarding how much property they wanted to include in the voucher program, and hence how much control should stay with the state. To administer the property that remained in the state’s possession, the National Property Fund (NPF) was established as a state institution that

³ The method of the privatization of each state-owned firm was decided on the basis of an officially accepted privatization project. According to the law, all state-owned enterprises were selected for either the first or the second privatization wave, or they were temporarily exempted. Each selected firm had to submit an official privatization proposal that was usually crafted by the firm’s management under the tutelage (and responsibility) of its sectoral ministry. Any domestic or foreign corporate body or individual was allowed to present a competing project that was to be considered on an equal footing with the official one.

⁴ The regulation of PIFs 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 the points acquired in the voucher scheme in a single company and obtaining in exchange more than 20% of the 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 PIFs founded by financial institutions from purchasing the shares of other financial institutions to prevent excessive concentration of financial capital (for details see Kotrba and Svejnar, 1994).

was entitled with legal power to exercise property rights over companies that were fully or partially owned by the state. By the end of the scheme in 1994 the NPF held on average about a 25% stake in privatized firms, but the extent varied greatly. The NPF was dissolved at the end of 2005 and the remaining agenda was transferred to the Ministry of Finance.⁵ In our analysis we uncover the true extent of state control over the seemingly private economy resulting from this privatization procedure.

3. Data and Control in the Pyramid

We have assembled a large data set on the extent of ownership in a large sample of Czech firms over the period 1996–2005. The beginning of our data sample starts one year after the privatization scheme officially ended (February 1995). The end of our sample coincides with the end of the NPF as an institution. The data come from the archives of the NPF, the former Ministry of Privatization, the Prague Stock Exchange, the Center for Securities in Prague, the commercial database *Aspekt*, and the Commercial Register of the Czech Republic. For all the firms in our sample we also precisely identify their ownership structure. Therefore we are working with a uniquely large sample of firms that is near the total population of medium-sized and large firms in the economy. More detailed information on the sample size in each period is provided in Section 4 along with our results on the extent of state control.

From our data we are able to isolate the specific extent of ownership represented by the state corporate pyramid as well as distinguish various means of state direct and indirect control and the amount of assets under control. In this respect we are able to trace the development of state control in a number of firms and also control over their assets over time.

The interrelated ownership structure within the state pyramid is illustrated in Figure 1. On the top layer we identify three main institutions through which the state is able to execute control. The key institution is the National Property Fund (NPF) that was set up to administer the property that remained in the hands of the state after the privatization scheme was concluded. Municipalities received various ownership stakes as free property transfers and became stakeholders in numerous companies, mainly in

⁵ Hanousek and Kočenda (2008) provide additional details.

utilities and transportation. In many firms the stakes of municipalities were parallel with the stakes of the NPF. Finally, other state agencies became stakeholders in firms where the state needed to protect its interests. The description of the multiple presence of the state via different authorities is similar to that in Russia where Chernykh (2008) finds that federal as well as regional governments participate extensively in traded companies. A similar situation exists in China, where the state induced the emergence of business groups in state-owned sectors that have much in common with the classical corporate pyramid. These structures possess control over subsidiary companies and serve as government instruments to facilitate ownership reform and economic transformation as discussed in Ma and Lu (2005) and Yiu, Bruton and Lu (2005).

The next layer down shows industrial and financial businesses in which the state is an owner. These are standard industrial, manufacturing or trading companies labeled as firms, various financial institutions labeled as banks, and privatization investment funds specifically set up during the privatization scheme labeled as investment funds. The ownership rights of the state with respect to the businesses in the three categories are denoted by directional arrows. As a general rule, the NPF and municipalities had stakes in firms and banks but not in investment funds. Other state agencies had stakes exclusively in firms.

The lowest layer allows us to begin unveiling the extent of the state pyramid. As a general rule firms own stakes in other firms but do not own stakes in banks or investment funds. This is a result of the post-privatization arrangements and does not have any natural economic rationale behind it. Although some ownership links do exist that go against this rule, we do not consider them in our stylized picture in order to keep it lucid. However, we do consider them when computing ownership shares below. A further result of the privatization scheme is the dominant presence of banks in investment funds because it was primarily banks that established the investment funds as a tool to acquire ownership stakes in privatized firms. Stakes of investment funds in banks are less frequent and have developed over time through the process of investment funds rearranging their portfolios. Both banks and investment funds own stakes in firms as a rule, either directly or indirectly. The indirect link of a bank having a stake in firm through an investment fund is more common than the bank being in the middle.

Arrows pointing from banks and investment funds towards firms at the top (first) and lowest (third) levels denote the potential of cross ownership: control in the third-level firm via the first-level firm. Of course, the stylized nature of the arrangement does not preclude the possibility of a stake in a firm on the second level as well.

Formally, we describe the chain of control via voting rights in a manner similar to that developed by Chapelle and Szafarz (2005, 2007) who, among others, voiced the idea that direct control by any type of owner could be complemented by additional control rights within a corporate structure like a pyramid. To analyze the full extent of a control mechanism, an integrated ownership right should be constructed. The difference in our approach is that we proceed from the top of the control chain—the apex of the pyramid—toward each firm, while Chapelle and Szafarz (2005, 2007) develop their algorithm in the opposite direction, from a firm toward the ultimate owner.

First, let d_{ij} denote the share of direct cash-flow rights that firm i holds in firm j . Then the n -square matrix $D = (d_{ij})$ represents the *direct cross-ownership rights* in the data set of n firms. In many cases we do not have information about ownership links below a certain control-right threshold. This is often an indication of dispersed ownership in a firm. We acknowledge this limitation by stating that:

$$\sum_{i=1}^n d_{ij} \leq 1 \text{ for } i = 1, \dots, n. \quad (1)$$

An integrated ownership via a structure such as a corporate pyramid can be constructed as a sum of all direct and indirect ownership links. Integrated ownership is crucial for the consolidation of the ownership structure and it has strong implications for corporate governance issues, namely effective control and firm behavior. It can be constructed via a matrix approach or by using recursive algorithms.

Using the matrix approach, the matrix of integrated ownership $P = (p_{ij})$ is defined as:

$$P = \text{diag}\{I - \sum_{i=1}^n d_{ij}\} \sum_{s=1}^{\infty} D^s = \text{diag}\{I - \sum_{i=1}^n d_{ij}\} (I - D)^{-1} . \quad (2)$$

In the above equation the diagonal matrix factor is a necessary scaling factor of $\sum_{s=1}^{\infty} D^s = (I - D)^{-1}$ that could otherwise suffer from a double counting of voting rights. In real firm level data we observe various ownership cycles as well as a combination of direct and indirect links of length s that may stretch across several levels or layers as described earlier. For this reason we need a scaling factor rather than a simple summation

of voting rights to avoid an implausible extent of control greater than one hundred percent.

We suggest measuring the direct control over companies by using a conservative majority threshold of 50% in accordance with Bebchuk, Kraakman and Triantis (2000) and specify the following ownership-control matrix:

$$c_{ij} = \begin{cases} 1 & \text{if } d_{ij} > 0.5 \\ 0 & \text{if } \exists k \neq i: d_{kj} > 0.5 \\ d_{ij} & \text{otherwise} \end{cases} \quad . \quad (3)$$

In the above definition we also control for the existence of a majority owner k and this way we eliminate the double counting of controlling stakes. Simply said, in the case of a 50% majority owner, other stakes have no real controlling power. The rule can be generalized to different controlling thresholds employed in the literature (as in La Porta, Lopez-de-Silanes and Shleifer, 1999) and as such it describes the ownership links in a clear and simple manner. Following the matrix approach we finally define the control extent P of the integrated, or ultimate, owner in a corporate pyramid as:

$$P = \text{diag}\{I - \sum_{i=1}^n c_{ij}\} \sum_{s=1}^{\infty} C^S = \text{diag}\{I - \sum_{i=1}^n c_{ij}\} (I - C)^{-1} \quad . \quad (4)$$

The above approach is versatile enough to enable analysis of the true extent of control of any type of owner, including that of the state in incompletely privatized companies.

The empirical application of the matrix methodology is extremely demanding since with representative samples of firm level data exceeding several thousand firms and subjects the matrices are very large and their mathematical inversions require large amounts of computer memory and time. In the empirical part of our analysis we therefore implement inverse matrices and compute the integrated ownership via the recursive SQL algorithm described in detail in Bena, Hanousek and Fons-Rosen (2009).

In practice we consider the state to be an owner, at the zero level, in all companies where the state holds equity via the NPF. Being at zero level means that there is no other owner that owns the state. Companies may also have other zero-level owners in cases where the state does not hold a 100% stake. In this case owners may be truly private entities or another state agency or municipality as shown in Figure 1. Further, we define one-level owners as those who are owned by zero-level owners; in the majority of cases the zero-level owner is the state via the NPF. Two-level owners are those that are owned

by one-level owners. We also check for cases where a two-level owner may have a zero-level owner besides a one-level owner(s). We continue this distinction among the ownership levels down to the final potential level (ranging between eight to 12 levels) in a manner similar to Khanna and Yafeh (2007), who consider nine levels. The effect of pyramidal control across various levels is chiefly possible through banks and privatization investment funds (investment companies). A state owning a decisive control stake in a bank is able to exert its control on firms in which the bank holds a substantial stake. Banks own also investment companies that in turn hold shares of other firms. These channels constitute the basis for the pyramidal control of the state.

We follow the approach of La Porta, Lopez-de-Silanes, and Shleifer (1999) and measure the control by total voting rights since control over a company is primarily a matter of voting power. In order to gauge the true control of the state we distinguish two categories of ownership concentration, depending on the number of shares held by the state in privatized companies. In the divisions of stakes that allow for effective control we follow Hanousek, Kočenda, and Svejnar (2007) and use first a 50% threshold as the law provides important rights of ownership and control for owners with majority ownership (more than 50% of shares) and it also conforms to the practice in the literature based on International Financial Reporting Standards (IFRS). Simply speaking, a 50% threshold cannot be contested and in empirical work it also prevents potential miscalculations of two majority owners. The second and less conservative threshold is 25%, which is in line with the relatively high ownership concentration present in Czech firms as well as with the methodological approach by the Bureau Van Dijk (2007, p.18). Still, when using the 25% threshold we are slightly more conservative than La Porta, Lopez-de-Silanes, and Shleifer (1999), who opt for 20%. When using the 25% threshold we verify that there is no other owner with an exceeding stake who could override the control of the state.

Besides direct control through voting rights associated with the number of shares held, state control over a firm may also be executed by other means. The most effective one is the “golden” share.⁶ Such an instrument, in the form of a single share with special

⁶ 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 the special interests of the state in firms privatized in large-scale privatization. The veto rights associated with the golden share

status, allows the state to prevent any major changes in a company where the state holds such a share.⁷ Utility companies are a typical example of state control through the golden share, but not the only example, as the golden share has been part of the ownership structure in other industries as well.

4. Extent of State Control

An earlier assessment of the extent of state control over privatized firms was performed by Hanousek and Kočenda (2008) over the period 1994–2005 based on a complete data set on assets as well as the means of control in voucher privatized firms in the Czech Republic. The assessment was performed on the first layer of ownership of the NPF. This means that an assessment of the control over firms where the state had a direct stake through its agency has been made, but pyramidal structure was not considered. The extent of the broadly defined state—that is, including municipalities—was not considered, either. Despite this limitation the state control potential was found to be extensive and certainly larger than has been found by earlier research. The privatized firms became truly private only after the sale of the remaining shares possessed by the state, the liquidation of golden shares and the consequent decline of the direct state control potential.

4.1 State Control over Firms

We now turn to providing the results of the analysis that accounted for the pyramidal control of an integrated owner and reporting the extents of control obtained via the matrix methodology described in Section 3. The control potential of the state pyramid is presented in several Tables.⁸ We begin with a simple account and in the first two columns of Table 1, panel A we show the number of firms in which the state, represented by the

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 (Bortolotti and Faccio, 2004).

⁷ Chernykh (2008) shows that the Russian state is using this valuable channel to exert its control in numerous companies.

⁸ In the Tables describing the level of state control we exhibit numbers for state-controlled firms only, while the remaining sample of privately-held firms without state control is not included.

National Property Fund, had any voting rights. The number in each year constitutes a hundred percent base for a relative comparison, which is presented in parentheses immediately following the absolute numbers throughout the Table. As the transformation progressed the absolute number of firms with a state presence decreases. In the third column we show that the number of firms that the state controlled directly through its (at least) 50% majority voting rights decreases over time as well. The relative proportion increases, though. The control ability of the state in the pyramid is essentially the same as its direct control, both in absolute and relative terms. This indicates that control through the pyramid did not deliver control enhancement over direct control. However, the control ability doubles when golden shares are accounted for. In panel B of Table 1 we present the results of the control potential when a 25% voting-right threshold is considered. As one might expect the direct control of the NPF increases with the less conservative threshold. The increase is considerable during the second half of the 1990's but after 2000 it is only moderate. Pyramidal control is surprisingly not enhanced by the lower threshold. The golden share on other hand exhibits a strong effect so that the control potential of the NPF over time at least doubles with respect to its direct control (with the exception of 1996). One point we can learn from Table 1 is that the pyramid structure in which the NPF represents the state as the ultimate owner does not seem to add much to its direct ability to control. On the other hand, the instrument of the golden share is an important mechanism that enhances the control of the state considerably.

In Table 2 we present data in the same structure as in Table 1, but here the state is defined broadly and covers the NPF, other state agencies, and municipalities. The numbers in Table 2, panel A are in a sharp contrast to those presented in Table 1. The extent of state presence is greater and decreases at a much slower rate over time. More importantly, the number of firms that are under the direct control of the state steadily increases and the proportion of these firms in the sample reaches 56% in 2005. Again (as in Table 1), control through the pyramid with a 50% voting right threshold enhances the control ability of the state only marginally. Again, the golden share drives considerable increases in control. In panel B we present the control potential for the 25% threshold, where the direct control in the early period is doubled when compared to the 50% benchmark, but declines somewhat towards the end of the research period. The

importance of pyramidal control is only marginal throughout the period but the golden share enhances the control over about an additional 10% of firms. These findings are in line with evidence from both developed (Bortolotti and Faccio, 2006) as well as transformation (Chernykh, 2008) economies.

4.2 State Control over Total Assets and Sales of Firms

The numbers in Tables 1 and 2 do not reflect one important fact, which is the size of firms. By size we mean the importance of a company in terms of its ability to generate taxes and dividends, to provide employment and therefore tax income, and to provide economic opportunities for suppliers, which also provide employment and generate taxes. Hence, control over large companies creates a potential for achieving various economic and non-economic objectives. Indeed, the state has controlling voting rights in companies that differ by the size and extent of activities. In order to evaluate the extent of state control, taking the size and importance of the companies into account, we calculate the various degrees of state control using total assets and sales volumes. The total assets of a firm can be considered as a proxy for the size of each firm controlled by the state. Hence, it allows inferring the extent of state control over the large and important firms in the economy. Sales on other hand can be seen as an indication of the potential amount of taxes the state collects from controlled firms. These two proxies enable us to derive a perception of the economic power of the companies and consequently the extent of wealth that is controlled by the state through direct as well as pyramidal ownership channels.

For each extent of control we calculate separately the summary values of total assets under various degrees of state control. We begin with the sum under direct control based on majority voting rights. Specifically, $V_t^D = \sum_{j=1}^N A_{jt} [State \geq 50\%]$ defines the sum of the absolute values of the total assets of firms in year t in which the state held more than a 50% share (A_{jt} is the accounting value of the total assets of firm j where the state has such a direct stake in year t). Second, $V_t^P = \sum_{j=1}^N A_{jt} [Pyramid \geq 50\%]$ defines the sum of the absolute values of the total assets of the firms in year t that were under integrated state control via a pyramid structure. Finally, we define a similar value for a

structure that combines control via the pyramid and golden share together as $V_t^{PG} = \sum_{j=1}^N A_{jt} \{ [Pyramid \geq 50\%] \wedge [GoldenShare] \}$. The number of degrees of state control we consider (three) does not change over time but the number of firms where the state holds a controlling position differs from year to year. The overall value of these assets V in a given year t is the sum of the absolute values of the total assets of firms where a state position exists ($V_t = \sum_{j=1}^N V_t^j$).

In terms of the volume of assets of firms where the state had voting rights a decreasing trend can be seen in Tables 3 and 4. This pattern is paralleled in the evolution of assets over which the state as the NPF had majority voting rights (Table 3). Needless to say, the broadly-defined state manages to directly control a larger extent of those assets (Table 4). We see that the volumes of assets the state was able to control directly were decreasing over time from initially very high levels. The gradual decrease was at a slower rate in the case of the state defined broadly (Table 4) when compared to the position of the NPF (Table 3). An increase in controlled assets is evidenced only in 1996 for both voting thresholds; otherwise the extent of control remains on par with direct control. Increases in the property controlled through the pyramid and golden share are found to be more important, especially over the years 1997–2002. This finding hints at the preferences of the state to control the largest and most important firms directly rather than to engage in complicated schemes.

When we use the 25% threshold the general results are similar to those for the 50% one (Panel B in Tables 3 and 4). A specific feature to note is that the volumes of assets under state control are expectedly higher in the early years of the period under research but decrease to almost the same volumes as those measured with a 50% threshold of voting rights. In both threshold cases the decrease is gradual during the 1990's and rapid after 2000.

The pattern of control described above is very similar when we inspect the control potential over the extent of activity of the firms measured by sales. The values presented in Tables 5 and 6 are calculated in the same manner as those based on total assets. Again we see a stable decrease in the amount of sales over time as the number of firms where the state has voting rights drops as well (recall Tables 1 and 2). The direct control of the

state over the volume of sales decreases as well. This decrease is much slower when compared to total assets (Tables 5 and 6) and especially in the case of the broadly defined state it is marginal (Table 6). One explanation may be the stable increases in the productivity of Czech firms because since 1998 inflation has been low and stable with a declining trend, being managed under an inflation targeting regime (Orlowski, 2008). The extent of the control increases quite considerably when a pyramid is complemented with the golden share in the earlier stages but such a control enhancement is less than marginal during 2004–2005. The patterns of control inferred from Tables 5 and 6 are the same for both voting right thresholds considered.

The extensive results on direct as well as integrated control of the state over the firms in the Czech Republic provides evidence that the state was primarily engaged in direct control. Arguably, the intention of the state to create special structures to effectively control firms and, hence, the economy was limited as opposed to empirical evidence from other transformation economies. Or an even more realistic explanation could be that the state was less than optimally organized and therefore did not exploit all means of control that, for example, a corporate pyramid offers. Surely, the integrated control of the state via a pyramid as well as its enhancement by the golden share was found to be less extensive than for example in Russia or China. These two large countries have run truly centralized economies, while centralization in the Czech Republic was less strict. These conditions might also be causes behind our findings as the Czech state bureaucracy apparently developed less efficient control enforcement than these two strictly centralized countries. Nevertheless, the control potential of the state remained substantial for a long period of time since we document that the state has been giving up its positions in firms only gradually and through a lengthy process.

5. Effect of State Control on Corporate Performance

In this section we complement our findings on the extent of state control by analyzing how various extents of state control affect the performance of controlled firms. In a similar manner as in the detailed studies of Hanousek, Kočenda and Svejnar (2007), Bortolotti and Faccio (2004), and Grosfeld and Tressel (2002), among others, we analyze the effects of specific levels of state control contrasted to several types of private owners.

Our goal is to provide evidence of whether there is an effect of a specific level of state control on firms' performance and if so what is its magnitude.

In this respect we aim to perform an econometric analysis in the spirit of Angrist, Imbens, and Rubin (1996) and Angrist and Pischke (2009), whose approach we follow. Our model to be estimated is specified as a firm's performance being a function of ownership structures and some controls. Our specification, which exploits the intensively panel structure of our data and allows for fixed effects, bears the following form:

$$\Delta\pi_{jt} = \alpha + \beta_j IO_j + \gamma_j \Delta TO_{jt} + \delta F_{jt} + \theta Ind_{jt} + \varepsilon_{jt} . \quad (5)$$

In the above specification index j denotes firms and t time periods. The dependent variable $\Delta\pi_{jt}$ is a measure of the corporate performance of firm j during 1995–2005. The performance is calculated as an unweighted average over the sequence of periods 1995–1997, 1998–2000, 2001–2003, and 2004–2005. We use the period averages, calculated in the spirit of Kothari, Leone and Wasley (2005), in order to avoid potential fluctuations in data derived from the annual accounts of each firm. This is due to the fact that, for example, changes in bank loans and the total liabilities of firms might affect the values of performance indicators. Therefore, performance is measured as a difference in firm mean performance over a specific period with respect to the base period (1995–1997). We use two measures of performance: operating profit and sales; both measures are scaled by the firm's total assets. In line with the corporate finance literature we employ gross operating profit from which taxes are not yet subtracted. This allows a standard comparison of the performance of state-controlled and privately held firms. Both types of firms will attach a different priority on tax optimization because in the case of state-controlled firms, taxes will end up in the state budget anyway.

Further, variable IO_{jt} measures the initial ownership structure of each firm j in the base period following privatization that was officially concluded in February 1995. Variable ΔTO_{jt} measures the subsequent changes in the type of ownership structure of each firm j in period t . Following our earlier exposition we distinguish direct and integrated control of the state as well as several types of private ownership (individual, industrial, and financial firms). Variable F_{jt} controls for changes in the capital structure of each firm j (total liabilities and bank loans scaled by total assets) that would not be eliminated by performance averages, and variable Ind controls for industrial sectors in

which firm j is categorized. Finally, constant α captures the remaining dispersed or unidentified ownership and ε_{it} is the error term. The above specification yields the marginal effects of specific types of owners and for our aim it delivers the effects of state control on corporate performance in percentages.

We present the estimates of the above specification in Tables 7–10. Tables 7 and 8 contain the results of the effects of ownership structure on performance measured by growth in operating profit scaled by total assets. In Table 7 the majority threshold of 50% voting rights is used to define the benchmark of direct control, while the 25% threshold is applied in Table 8. In the upper part of each table we present the effects of various types of initial ownership that characterized each firm after its privatization. In the middle part we show how changes in ownership affected subsequent performance over time. For each period we show in separate columns the effects of the gradually increasing extent of state control from direct control by the NPF (columns marked C1) to fully integrated control: e.g. the broadly defined state (pyramid) having its control potential further enhanced by the golden share (columns marked C3). In the middle columns (C2) we report the effects of NPF direct control enhanced by a golden share. The effects of several types of private owners are reported for each period in the middle column as these ownership categories induce only marginal effects on coefficients related to the level of state control. In each column at the bottom of each table we also present the total number of observations of the performance indicator used in regressions, as well as the division of observations among the state-controlled or privately held firms.

The combined evidence from both tables is derived from an estimation in which we control for fixed effects and standard errors are heteroskedasticity consistent. Intertemporal changes in state control show a declining effect on operating profit, which even turns out to be negative for direct NPF control in the period that marked the end of the existence of this institution (2004–2005). Further, firms under the direct control of the broadly-defined state (C3) exhibit better results than firms under the control of the narrowly-defined state (C1 and C2). From our data we infer that the decline has been driven by the negative results of firms belonging chiefly to the machinery sector.

Changes in ownership of industrial firms exhibit an increasing effect, albeit a moderate one when compared with the average influence of the state. This effect is also

positive and larger for financial companies but only during the third period (2001–2003). This temporary effect may well be connected with the launch of the so-called Revitalization Program introduced by the government following the recession in 1998–1999 to aid firms in financial distress (for details see Lízal, 2002). Among other results stands out the effect of the initial ownership of industrial firms that during the periods from 2001–2005 shows an increasing positive effect. When put together with the previously-reported positive effect of changes in ownership by industrial firms, this finding points at a consolidation and restructuring process initiated by industrial firms after privatization. The time frame of these effects is in accord with the restructuring that was delayed and did not begin immediately after privatization but substantially advanced in the late 1990's (Hanousek and Kočenda, 2008). It is also evidence of the positive effect of foreign owners on performance because 94% of the industrial firms in our sample are foreign-held. The timing of the found effects coincides with the near-completion of restructuring.

In Tables 9 and 10 we present the results of the effects of ownership structure on performance measured by growth in sales scaled by total assets. The structure of both tables is the same as that of the two described earlier. The evidence in the form of statistically significant coefficients is more frequent than in the case of operating profit. A striking finding is the negative effect of state control in the form of initial ownership on firms' performance, which is deepening with time. This is also evidenced by coefficients related to changes in state ownership, as the state loses its grip. A potential reason for the worsening performance may lie in the state selling the best performing firms first. An alternative explanation of these patterns comes from the early post-privatization period when firms controlled by the NPF had better access to various tenders commissioned by the state, chiefly through informal networks and unofficial preferential access to tender conditions. These practices have been described by Lízal and Kočenda (2001) and criticized by Mlčoch (1998; p.952), who stressed that “the government should not meddle in a company's microeconomic choices”. This environment enabled NPF-controlled firms to affect sales during the first period immediately following privatization, mainly through orders born from tenders. This was occurring without pressure on cost reduction, the feature that is in accord with our previous findings related to operating profit.

In sharp contrast to the state ownership impact on performance, private initial ownership exhibits a positive effect that is steadily increasing for industrial firms but decreasing for individual owners. The effects of changes in these types of ownership are much less frequent but also positive. An exception is the negative effect of initial ownership by financial companies during the 1998–2000 period, complemented by the uniformly negative effects of changes of this specific type of ownership. This finding is in full accord with the results of Hanousek, Kočenda, and Svejnar (2007), who document a negative time-varying effect of the changes in ownership by investment funds and portfolio companies on sales already during the period 1996–1999. Reasons behind our findings may rest in lesser focus of financial firms on the core business of firms in which they hold stakes. This attitude is in contrast to the aim of industrial firms to increase profitability through cost cutting, integration of activities and expansion aimed at exploiting economies of scale.

We can summarize our findings to say that integrated state control does not yield superior performance. We document that the impact of various levels of state control resulted in declining and even negative corporate performance in firms where the state was engaged through various means of control. These results are the first evidence of the inferior effect of the corporate pyramid with the state at its apex. They also indirectly extend the findings of Hellman and Schankerman (2000), who showed that good state governance was not established across many transformation economies by 1999. Finally, the results are in sharp contrast to those found in other transformation economies where similar structures enabling effective state control emerged. However, usually these corporate structures were established by the state as a pragmatic tool to control the economy despite the economy's publicly proclaimed private nature (e.g. Chernykh, 2008; Ma, Yao and Xi, 2006; Bortolotti and Faccio, 2006; Liu and Sun, 2005).

6. Concluding Remarks

In this paper we analyze the extent of the integrated control of the state over privatized firms during the post-privatization decade (1995–2005) in the Czech Republic. During this period the integrated control potential of the state resembled a corporate pyramid, a business structure found worldwide. We find that the control potential that a corporate

pyramid offers is not large when the Czech state is considered as the ultimate owner at the top of the pyramid. The state favored direct control provided by voting rights measured by a 50% threshold and such control increased when a less conservative 25% threshold was adopted. The use of the less conservative benchmark has been fully justified since no other subject with an exceeding extent of voting rights was detected at the same time. While pyramidal control was not fully utilized, the golden share in the hands of the state substantially enhanced its ability to control firms in terms of their numbers as well as in terms of the assets or sales they represent.

The state pyramid in the Czech Republic, to the extent of its existence, likely suffered from the dispersed nature of the state at the top of the pyramid where various state bodies could not efficiently interact to pursue the control. This is in opposite to, for example, institutional arrangements in China where state-owned business groups, when compared to government agencies, have direct rights to collect the economic income generated by their affiliated companies and also have greater incentives and capability to closely and effectively monitor managers of the group members (Ma, Yao and Xi, 2006).

We also analyze the effect of direct and integrated state ownership on corporate performance. We find that state control resulted in declining and even negative corporate performance in firms where the state was engaged through various means of control. Integrated state control was shown to be mostly inferior when compared with private types of ownership.

The numbers in our extensive data set provide hard evidence that the state indeed remained an important owner of privatized firms for a considerable period of time. Its reluctance to vacate its ownership positions is in striking contrast with the lack of capacity to push corporate performance in order to collect larger tax volumes. Lack of focus and inter-agency cooperation as well as the simple inefficiency of the state bureaucracy are the most likely reasons behind our findings.

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Figure 1

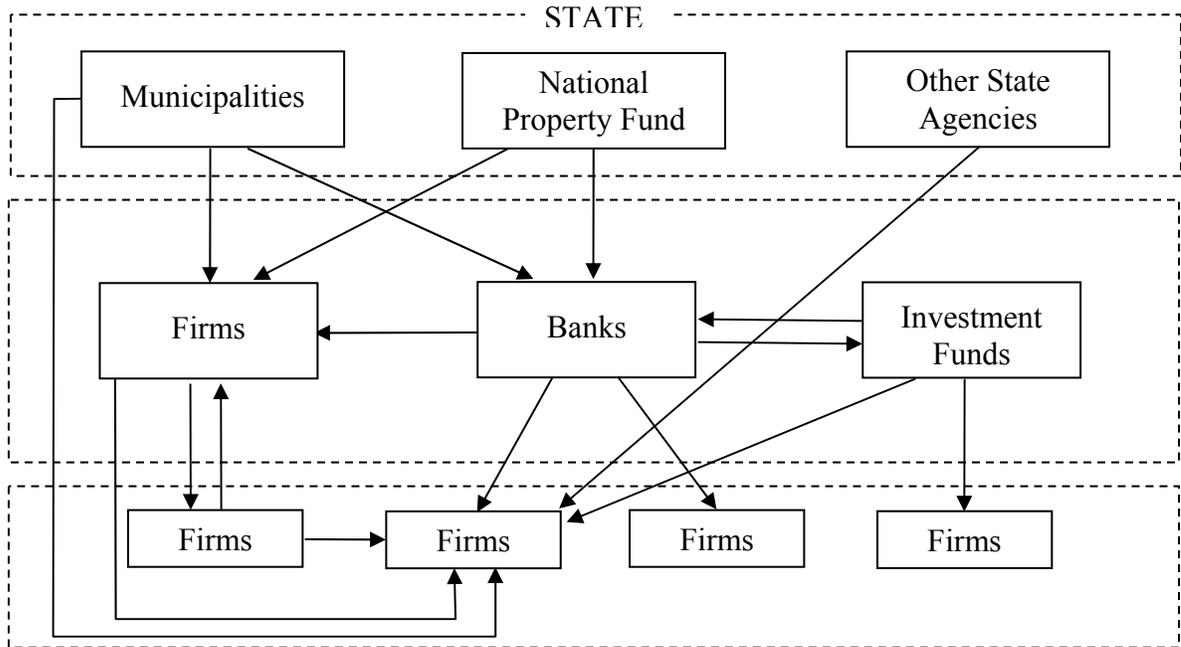


Table 1
 State Control over Firms
 (State Represented by the National Property Fund)

Panel A: Majority Voting Rights of at least 50 percent				
Year	Total Number	Extent of the control		
		Direct	Pyramid	Pyramid and Golden Share
1996	814 [100%]	102 [13%]	103 [13%]	NA [NA]
1997	479 [100%]	70 [15%]	70 [15%]	158 [33%]
1998	321 [100%]	54 [17%]	54 [17%]	139 [43%]
1999	269 [100%]	53 [20%]	53 [20%]	134 [50%]
2000	241 [100%]	52 [22%]	52 [22%]	130 [54%]
2001	193 [100%]	41 [21%]	42 [22%]	94 [49%]
2002	159 [100%]	35 [22%]	35 [22%]	73 [46%]
2003	143 [100%]	30 [21%]	31 [22%]	63 [44%]
2004	122 [100%]	26 [21%]	26 [21%]	55 [45%]
2005	104 [100%]	25 [24%]	25 [24%]	54 [52%]

Panel B: Voting Rights of at least 25 percent				
Year	Total Number	Extent of the control		
		Direct	Pyramid	Pyramid and Golden Share
1996	814 [100%]	210 [26%]	210 [26%]	NA [NA]
1997	479 [100%]	145 [30%]	146 [30%]	225 [47%]
1998	321 [100%]	96 [30%]	96 [30%]	168 [52%]
1999	269 [100%]	80 [30%]	80 [30%]	150 [56%]
2000	241 [100%]	76 [32%]	76 [32%]	146 [61%]
2001	193 [100%]	63 [33%]	63 [33%]	107 [55%]
2002	159 [100%]	46 [29%]	46 [29%]	82 [52%]
2003	143 [100%]	37 [26%]	38 [27%]	73 [51%]
2004	122 [100%]	31 [25%]	31 [25%]	62 [51%]
2005	104 [100%]	29 [28%]	29 [28%]	60 [58%]

Note: Total Number denotes number of firms where state has any voting rights. Direct defines control through 50 and 25% voting rights respectively. Numbers in brackets denote percentages with respect to the base that is Total Number in respective year.

Pyramid defines control through chain of successive voting rights of 50 and 25% respectively. Golden Share defines control through this instrument.

Table 2
 State Control over Firms
 (State Defined Broadly: NPF, Municipalities, and State Agencies)

Panel A: Majority Voting Rights of at least 50 percent				
Year	Total Number	Extent of the control		
		Direct	Pyramid	Pyramid and Golden Share
1996	889 [100%]	133 [15%]	136 [15%]	NA [NA]
1997	570 [100%]	122 [21%]	125 [22%]	213 [37%]
1998	436 [100%]	128 [29%]	131 [30%]	217 [50%]
1999	406 [100%]	143 [35%]	147 [36%]	228 [56%]
2000	413 [100%]	163 [39%]	166 [40%]	244 [59%]
2001	411 [100%]	180 [44%]	184 [45%]	237 [58%]
2002	404 [100%]	194 [48%]	197 [49%]	236 [58%]
2003	417 [100%]	206 [49%]	209 [50%]	241 [58%]
2004	411 [100%]	215 [52%]	218 [53%]	245 [60%]
2005	394 [100%]	221 [56%]	224 [57%]	253 [64%]

Panel B: Voting Rights of at least 25 percent				
Year	Total Number	Extent of the control		
		Direct	Pyramid	Pyramid and Golden Share
1996	889 [100%]	262 [29%]	262 [29%]	NA [NA]
1997	570 [100%]	213 [37%]	214 [38%]	296 [52%]
1998	436 [100%]	188 [43%]	188 [43%]	262 [60%]
1999	406 [100%]	191 [47%]	191 [47%]	262 [65%]
2000	413 [100%]	214 [52%]	215 [52%]	282 [68%]
2001	411 [100%]	236 [57%]	237 [58%]	279 [68%]
2002	404 [100%]	240 [59%]	242 [60%]	276 [68%]
2003	417 [100%]	251 [60%]	254 [61%]	288 [69%]
2004	411 [100%]	260 [63%]	262 [64%]	291 [71%]
2005	394 [100%]	260 [66%]	263 [67%]	293 [74%]

Note: Total Number denotes number of firms where state has any voting rights. Direct defines control through 50 and 25% voting rights respectively. Numbers in brackets denote percentages with respect to the base that is Total Number in respective year.

Pyramid defines control through chain of successive voting rights of 50 and 25% respectively. Golden Share defines control through this instrument.

Table 3
 State Control over Total Assets of Firms
 (State Represented by the National Property Fund)

Panel A. Control using simple majority (50 percent) rule					
Year	Extent of the control				
	State Present	Direct	Pyramid	Pyramid and Golden Share	
1996	2310 [75%]	888 [29%]	895 [29%]	NA [NA]	
1997	2230 [74%]	446 [15%]	446 [15%]	830 [28%]	
1998	1850 [63%]	455 [16%]	455 [16%]	624 [21%]	
1999	1780 [48%]	855 [23%]	855 [23%]	1020 [27%]	
2000	1410 [33%]	966 [23%]	966 [23%]	1140 [27%]	
2001	837 [18%]	520 [11%]	533 [12%]	676 [15%]	
2002	768 [18%]	494 [12%]	494 [12%]	607 [14%]	
2003	638 [13%]	438 [9%]	439 [9%]	484 [10%]	
2004	552 [10%]	439 [8%]	439 [8%]	469 [9%]	
2005	504 [7%]	395 [5%]	395 [5%]	426 [6%]	

Panel B. Control using 25 percent rule					
Year	Extent of the control				
	State Present	Direct	Pyramid	Pyramid and Golden Share	
1996	2310 [75%]	1440 [47%]	1460 [47%]	NA [NA]	
1997	2230 [74%]	1910 [63%]	1910 [63%]	1960 [65%]	
1998	1850 [63%]	1650 [57%]	1650 [57%]	1710 [59%]	
1999	1780 [48%]	1460 [39%]	1460 [39%]	1660 [45%]	
2000	1410 [33%]	1090 [26%]	1090 [26%]	1330 [31%]	
2001	837 [18%]	721 [16%]	721 [16%]	782 [17%]	
2002	768 [18%]	565 [13%]	565 [13%]	670 [16%]	
2003	638 [13%]	453 [9%]	454 [9%]	552 [11%]	
2004	552 [10%]	440 [8%]	440 [8%]	471 [9%]	
2005	504 [7%]	396 [5%]	396 [5%]	427 [6%]	

Note: Total Number denotes number of firms where state has any voting rights. Direct defines control through 50 and 25% voting rights respectively. Numbers in brackets denote percentages with respect to the base that is Total Number in respective year.

Pyramid defines control through chain of successive voting rights of 50 and 25% respectively. Golden Share defines control through this instrument.

Table 4
 State Control over Total Assets of Firms
 (State Defined Broadly: NPF, Municipalities, and State Agencies)

Panel A. Control using simple majority (50 percent) rule				
Year	Extent of the control			
	State Present	Direct	Pyramid	Pyramid and Golden Share
1996	2430 [79%]	1000 [32%]	1010 [33%]	NA [NA]
1997	2350 [78%]	563 [19%]	563 [19%]	946 [31%]
1998	2020 [69%]	618 [21%]	620 [21%]	789 [27%]
1999	1980 [53%]	1040 [28%]	1040 [28%]	1200 [32%]
2000	1680 [40%]	1210 [29%]	1210 [29%]	1380 [33%]
2001	1130 [24%]	778 [17%]	792 [17%]	935 [20%]
2002	1090 [26%]	741 [18%]	743 [18%]	855 [20%]
2003	1020 [20%]	732 [15%]	735 [15%]	777 [16%]
2004	929 [17%]	735 [14%]	737 [14%]	763 [14%]
2005	935 [12%]	784 [10%]	785 [10%]	812 [11%]

Panel B. Control using 25 percent rule				
Year	Extent of the control			
	State Present	Direct	Pyramid	Pyramid and Golden Share
1996	2430 [79%]	1570 [51%]	1580 [51%]	NA [NA]
1997	2350 [78%]	2030 [67%]	2030 [67%]	2080 [69%]
1998	2020 [69%]	1820 [62%]	1820 [62%]	1880 [64%]
1999	1980 [53%]	1650 [44%]	1650 [44%]	1850 [50%]
2000	1680 [40%]	1350 [32%]	1350 [32%]	1590 [38%]
2001	1130 [24%]	998 [22%]	998 [22%]	1060 [23%]
2002	1090 [26%]	836 [20%]	836 [20%]	940 [22%]
2003	1020 [20%]	771 [15%]	772 [15%]	869 [17%]
2004	929 [17%]	760 [14%]	760 [14%]	788 [15%]
2005	935 [12%]	802 [11%]	802 [11%]	828 [11%]

Note: Total Number denotes number of firms where state has any voting rights. Direct defines control through 50 and 25% voting rights respectively. Numbers in brackets denote percentages with respect to the base that is Total Number in respective year.

Pyramid defines control through chain of successive voting rights of 50 and 25% respectively. Golden Share defines control through this instrument.

Table 5
 State Control over Sales Produced by Firms
 (State Represented by the National Property Fund)

Panel A. Control using simple majority (50 percent) rule				
Year	Extent of the control			
	State Present	Direct	Pyramid	Pyramid and Golden Share
1996	803 [26%]	248 [8%]	248 [8%]	NA [NA]
1997	681 [23%]	188 [6%]	188 [6%]	334 [11%]
1998	588 [20%]	184 [6%]	184 [6%]	314 [11%]
1999	512 [14%]	221 [6%]	221 [6%]	340 [9%]
2000	467 [11%]	234 [6%]	234 [6%]	360 [9%]
2001	476 [10%]	267 [6%]	277 [6%]	377 [8%]
2002	414 [10%]	214 [5%]	214 [5%]	287 [7%]
2003	252 [5%]	160 [3%]	160 [3%]	175 [4%]
2004	224 [4%]	173 [3%]	173 [3%]	178 [3%]
2005	167 [2%]	124 [2%]	124 [2%]	129 [2%]

Panel B. Control using 25 percent rule				
Year	Extent of the control			
	State Present	Direct	Pyramid	Pyramid and Golden Share
1996	803 [26%]	452 [15%]	463 [15%]	NA [NA]
1997	681 [23%]	499 [17%]	501 [17%]	529 [18%]
1998	588 [20%]	471 [16%]	472 [16%]	501 [17%]
1999	512 [14%]	373 [10%]	373 [10%]	443 [12%]
2000	467 [11%]	323 [8%]	323 [8%]	422 [10%]
2001	476 [10%]	410 [9%]	410 [9%]	441 [10%]
2002	414 [10%]	269 [6%]	269 [6%]	317 [8%]
2003	252 [5%]	166 [3%]	166 [3%]	204 [4%]
2004	224 [4%]	173 [3%]	173 [3%]	180 [3%]
2005	167 [2%]	124 [2%]	124 [2%]	129 [2%]

Note: Total Number denotes number of firms where state has any voting rights. Direct defines control through 50 and 25% voting rights respectively. Numbers in brackets denote percentages with respect to the base that is Total Number in respective year.

Pyramid defines control through chain of successive voting rights of 50 and 25% respectively. Golden Share defines control through this instrument.

Table 6
 State Control over Sales Produced by Firms
 (State Defined Broadly: NPF, Municipalities, and State Agencies)

Panel A. Control using simple majority (50 percent) rule				
Year	Extent of the control			
	State Present	Direct	Pyramid	Pyramid and Golden Share
1996	840 [27%]	271 [9%]	271 [9%]	NA [NA]
1997	713 [24%]	210 [7%]	210 [7%]	357 [12%]
1998	667 [23%]	254 [9%]	254 [9%]	385 [13%]
1999	591 [16%]	291 [8%]	291 [8%]	410 [11%]
2000	560 [13%]	310 [7%]	310 [7%]	435 [10%]
2001	575 [12%]	342 [7%]	352 [8%]	452 [10%]
2002	519 [12%]	278 [7%]	278 [7%]	351 [8%]
2003	419 [8%]	259 [5%]	260 [5%]	275 [6%]
2004	392 [7%]	273 [5%]	274 [5%]	278 [5%]
2005	316 [4%]	234 [3%]	234 [3%]	239 [3%]

Panel B. Control using 25 percent rule				
Year	Extent of the control			
	State Present	Direct	Pyramid	Pyramid and Golden Share
1996	840 [27%]	476 [15%]	487 [16%]	NA [NA]
1997	713 [24%]	524 [17%]	525 [17%]	554 [18%]
1998	667 [23%]	543 [19%]	545 [19%]	574 [20%]
1999	591 [16%]	446 [12%]	446 [12%]	516 [14%]
2000	560 [13%]	403 [10%]	403 [10%]	503 [12%]
2001	575 [12%]	492 [11%]	492 [11%]	523 [11%]
2002	519 [12%]	340 [8%]	341 [8%]	389 [9%]
2003	419 [8%]	273 [5%]	273 [5%]	313 [6%]
2004	392 [7%]	283 [5%]	284 [5%]	291 [5%]
2005	316 [4%]	239 [3%]	240 [3%]	246 [3%]

Note: Total Number denotes number of firms where state has any voting rights. Direct defines control through 50 and 25% voting rights respectively. Numbers in brackets denote percentages with respect to the base that is Total Number in respective year.

Pyramid defines control through chain of successive voting rights of 50 and 25% respectively. Golden Share defines control through this instrument.

Table 7. Performance: Operating profit/total assets (50% control)

Variable	1998-2000			2001-2003			2004-2005		
	C1	C2	C3	C1	C2	C3	C1	C2	C3
<i>Initial post privatization ownership</i>									
State	-0.006 (0.026)	0.008 (0.015)	0.003 (0.015)	-0.113 (0.092)	-0.004 (0.020)	-0.034 (0.025)	0.150 (0.289)	0.019 (0.012)	0.011 (0.014)
Financial Co.		-0.044 (0.029)			-0.058 (0.090)			0.089 (0.193)	
Big industrial Co.		-0.020 (0.018)			0.040* (0.021)			0.223* (0.123)	
Individual Owner		-0.049*** (0.018)			0.044 (0.079)			-0.504 (0.551)	
<i>Subsequent changes in ownership (w.r. to the first period: 1995-1997)</i>									
State	0.108* (0.061)	0.134** (0.055)	0.114** (0.050)	0.048 (0.058)	0.018 (0.027)	-0.012 (0.029)	-0.055 (0.044)	0.003 (0.026)	-0.008 (0.021)
Financial Co.		-0.037 (0.035)			0.158** (0.080)			-0.008 (0.027)	
Big industrial Co.		-0.021 (0.014)			0.011** (0.005)			0.014** (0.071)	
Individual Owner		-0.078 (0.062)			-0.000 (0.033)			0.008 (0.018)	
<i>Changes in capital structure</i>									
Liabilities/assets		0.142 (0.127)			0.018 (0.029)			0.027 (0.024)	
Bank loans/assets		-0.370*** (0.118)			-0.008 (0.013)			-0.012 (0.011)	
Constant		0.019 (0.014)			-0.001 (0.012)			-0.014 (0.011)	
Industrial dummies		YES			YES			YES	
Control for missing		YES			YES			YES	
R ² adjusted		0.118			0.079			0.045	
No. of observations		1646			773			1082	
State controlled	31	115	115	4	13	13	6	34	34
Privately held	84	1531	1531	769	769	769	1076	1048	1048

Note: Categories of the state control are FNM Direct (C1), FNM Direct plus Golden share (C2), and State pyramid plus Golden share (C3). Standard errors are given in parentheses. ***, **, and * denote statistical significance of coefficients at 1, 5, and 10%.

Table 8. Performance: Operating profit/total assets (25% control)

Variable	1998-2000			2001-2003			2004-2005		
	C1	C2	C3	C1	C2	C3	C1	C2	C3
<i>Initial post privatization ownership</i>									
State	-0.002 (0.019)	-0.001 (0.018)	0.043 (0.035)	-0.013 (0.039)	-0.002 (0.031)	0.110 (0.098)	-0.024 (0.018)	0.024* (0.013)	0.075* (0.041)
Financial Co.		-0.022 (0.021)			-0.031 (0.054)			0.011 (0.017)	
Big industrial Co.		0.006 (0.015)			0.025** (0.010)			0.033** (0.015)	
Individual Owner		-0.003 (0.028)			0.019 (0.035)			0.016 (0.030)	
<i>Subsequent changes in ownership (w.r. to the first period: 1995-1997)</i>									
State	0.110* (0.061)	0.132** (0.057)	0.138** (0.057)	0.037* (0.029)	0.015* (0.009)	0.112* (0.069)	-0.056** (0.027)	0.001 (0.026)	0.039* (0.022)
Financial Co.		-0.027 (0.035)			0.202* (0.116)			-0.011 (0.021)	
Big industrial Co.		-0.015 (0.014)			0.004* (0.003)			0.023* (0.014)	
Individual Owner		-0.066 (0.061)			0.011 (0.029)			0.019 (0.017)	
<i>Changes in capital structure</i>									
Liabilities/assets		0.145 (0.126)			-0.007 (0.014)			-0.012 (0.011)	
Bank loans/assets		-0.369*** (0.117)			0.118*** (0.040)			0.034* (0.019)	
Constant		0.011 (0.018)			-0.020 (0.017)			-0.031** (0.016)	
Industrial dummies		YES			YES			YES	
Control for missing		YES			YES			YES	
R ² adjusted		0.116			0.075			0.051	
No. of observations		1646			773			1082	
State controlled	60	131	132	4	13	13	7	36	36
Privately held	1586	1515	1514	769	760	760	1075	1046	1046

Note: Categories of the state control are FNM Direct (C1), FNM Direct plus Golden share (C2), and State pyramid plus Golden share (C3). Standard errors are given in parentheses. ***, **, and * denote statistical significance of coefficients at 1, 5, and 10%.

Table 9. Performance: Sales/total assets (50% control)

Variable	1998-2000			2001-2003			2004-2005		
	C1	C2	C3	C1	C2	C3	C1	C2	C3
<i>Initial post privatization ownership</i>									
State	-0.409 (0.292)	-0.528*** (0.135)	-0.608*** (0.214)	-0.225 (0.416)	-0.501** (0.226)	-0.892** (0.160)	-0.704** (0.279)	-0.875*** (0.095)	-0.92*** (0.101)
Financial Co.		-0.705*** (0.188)			-0.066 (0.600)			0.598 (0.916)	
Big industrial Co.		0.288** (0.145)			0.442*** (0.163)			0.458*** (0.106)	
Individual Owner		1.234*** (0.195)			0.895*** (0.234)			0.714*** (0.127)	
<i>Subsequent changes in ownership (w.r. to the first period: 1995-1997)</i>									
State	-0.039 (0.278)	-0.882 (0.646)	-0.930 (0.584)	0.588 (0.427)	0.197 (0.235)	-0.212 (0.163)	-0.296 (0.298)	-0.383*** (0.108)	-0.46*** (0.086)
Financial Co.		-0.673*** (0.162)			-0.663* (0.372)			-0.112 (0.490)	
Big industrial Co.		0.196** (0.087)			0.112 (0.106)			0.044 (0.086)	
Individual Owner		0.152 (0.185)			0.319 (0.200)			0.327** (0.160)	
<i>Changes in capital structure</i>									
Liabilities/assets		-0.149 (0.389)			0.143 (0.238)			0.032 (0.048)	
Bank loans/assets		-0.005 (0.334)			-0.067 (0.108)			-0.016 (0.022)	
Constant		0.065 (0.120)			0.002 (0.192)			-0.005 (0.275)	
Industrial dummies		YES			YES			YES	
Control for missing		YES			YES			YES	
R ² adjusted		0.131			0.068			0.052	
No. of observations		1646			773			1082	
State controlled	31	115	115	4	13	13	6	34	34
Privately held	1615	1531	1531	769	769	769	1076	1048	1048

Note: Categories of the state control are FNM Direct (C1), FNM Direct plus Golden share (C2), and State pyramid plus Golden share (C3). Standard errors are given in parentheses. ***, **, and * denote statistical significance of coefficients at 1, 5, and 10%.

Table 10. Performance: Sales/total assets (25% control)

Variable	1998-2000			2001-2003			2004-2005		
	C1	C2	C3	C1	C2	C3	C1	C2	C3
<i>Initial post privatization ownership</i>									
State	-0.263** (0.130)	-0.052 (0.097)	-0.445** (0.115)	-0.286* (0.162)	-0.221** (0.103)	-0.695** (0.107)	-0.335** (0.105)	-0.110* (0.066)	-0.69*** (0.069)
Financial Co.		-0.503*** (0.132)			-0.414 (0.296)			-0.201 (0.275)	
Big industrial Co.		0.065 (0.124)			0.309** (0.126)			0.407*** (0.091)	
Individual Owner		0.901*** (0.160)			0.788*** (0.156)			0.766*** (0.104)	
<i>Subsequent changes in ownership (w.r. to the first period: 1995-1997)</i>									
State	0.196 (0.143)	-0.770 (0.647)	-0.811 (0.587)	0.040*** (0.016)	0.052 (0.157)	-0.064 (0.128)	-0.017 (0.149)	-0.131 (0.099)	-0.24*** (0.080)
Financial Co.		-0.566*** (0.162)			-0.652* (0.333)			-0.447* (0.264)	
Big industrial Co.		0.219** (0.089)			0.136* (0.077)			0.044 (0.083)	
Individual Owner		-0.018 (0.185)			0.205 (0.206)			0.261 (0.161)	
<i>Changes in capital structure</i>									
Liabilities/assets		-0.156 (0.395)			0.090 (0.239)			0.024 (0.062)	
Bank loans/assets		0.003 (0.337)			-0.043 (0.108)			-0.013 (0.028)	
Constant		0.065 (0.120)			0.002 (0.192)			-0.005 (0.275)	
Industrial dummies		YES			YES			YES	
Control for missing		YES			YES			YES	
R ² adjusted		0.092			0.067			0.045	
No. of observations		1646			773			1082	
State controlled	60	131	132	4	13	13	7	36	36
Privately held	1586	1515	1514	769	760	760	1075	1046	1046

Note: Categories of the state control are FNM Direct (C1), FNM Direct plus Golden share (C2), and State pyramid plus Golden share (C3). Standard errors are given in parentheses. ***, **, and * denote statistical significance of coefficients at 1, 5, and 10%.

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