

Damijan, Jože P.; Gregorič, Aleksandra; Prašnikar, Janez

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Jože P. Damijan
Aleksandra Gregorič
Janez Prašnikar



Katholieke Universiteit Leuven

LICOS Centre for Transition Economics
Huis De Dorlodot
Deberiotstraat 34
B-3000 Leuven
BELGIUM
TEL:+32-(0)16 32 65 98
FAX:+32-(0)16 32 65 99
<http://www.econ.kuleuven.ac.be/licos>

OWNERSHIP CONCENTRATION AND FIRM PERFORMANCE IN SLOVENIA

Jože P. Damijan¹

Aleksandra Gregorič²

Janez Prašnikar³

1. Introduction

Corporate governance traditionally refers to the resolution of conflict of interests between firms' stakeholders (and the society as a whole) and those running the corporations (agents or managers). The theory predicts that managers will act optimally, that is in the benefit of the firm, when product, labor and capital markets are fully competitive; with lack of competitiveness on either of these markets, the principals will make use of additional mechanisms in order to discipline the managers and alleviate the agency problem, such as managerial shareholdings, concentrated outside ownership, debt financing, outsiders' representation on board, managerial labor market (threat of displacement) and the market for corporate control⁴ (Fama, 1980; Fama and Jensen, 1985; Agrawal and Knoeber, 1996; Bohren and Odegaard, 2003). There are in principle two different strains of empirical work

¹ University of Ljubljana; Institute for Economic Research, Slovenia, and LICOS, KU Leuven.

² University of Ljubljana, Slovenia; ECGI and ISEE.

³ University of Ljubljana, Slovenia and ISEE.

⁴ As argued by Agrawal and Knoeber (1996), insider shareholding, outside representation on board, reliance on debt financing and external labour markets are all internal decisions (and should be hence chosen to maximise the firm value, namely at equality between marginal costs and marginal benefits of a given mechanism to the firm), while institutional shareholdings, outside blockholdings and market for corporate control are decisions made by outsiders (and could be hence sub-optimal). The relation between different mechanisms can be positive or negative. When optimally chosen, none of the mechanisms has significant impact on firm value. On the other hand, any cross-sectional variation on the use of these mechanisms could either reflect the differences in firms' underlying environments or a mistaken choice. Demsetz and Lehn (1985) on the other hand, consider the ownership structure – including outside shareholdings- to be determined by shareholders and hence in a way that maximises firm value (for more, see Agrawal and Knoeber, 1996).

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dealing with the effects of the several mechanisms on firm performance; one strain looks at the stock market reactions to the adoption of a certain mechanism within the firm (see for example Barclay and Holderness, 1991 and 1992, for stock price reactions to changes in the identity of large blockholders), while the other strain looks at the relation between performance and the use of one or many of the corporate governance mechanisms (Agrawal and Knoeber, 1996). Despite the increasing empirical evidence, the effect of different corporate governance mechanisms on firm performance is however still rather ambiguous.

Bearing in minds the interdependencies and substitutability of various corporate governance mechanisms, this paper mostly focuses on the outside blockholders' influence on firm performance. In fact, similarly to other Central and Eastern European countries (see Berglof and Pajuste, 2002) this mechanism of corporate control has been gaining importance also in Slovenian firms; ownership has been concentrating in the hands of outside investors, namely domestic non-financial firms, financial holdings and foreigners. The ongoing concentration realizes mainly through takeovers (in listed firms) and exchanges of large blocks of shares (on and off the market). However, except from the study by Gregoric and Vespro (2003), Slovenian empirical studies so far mostly measure the aggregate effect of different owners groups (insiders, privatization investment funds, etc.) and find no strong evidence that firm performance increases with increasing voting rights of any investor group (see for example Domadenik et al., 2000; Simoneti et al., 2001). The present study still falls under the same strain of research but it is unique since, on the contrary to the previous studies, measures the direct impact of the size of the singular largest shareholders on firm performance. Moreover, the data set used in our analysis refers to the period 1998-2002, that is the period in which all firms had completed the privatization process and had somehow established their own, more or less balanced corporate governance systems.

We find that increases of outside control have no significant effect on firm efficiency (measured by the total factor productivity growth – TPF growth) and that the latter mainly drives financial performance of firms (i.e. cash flow ratio and ROA). On average, firms with significantly lower financial performance are those with the largest owner holding controlling but less than majority stakes. This result and the non-significant impact of the second largest block on firm performance somehow lead to the conclusion that the presence of additional blockholdings within a firm actually tends to reduce the firm value rather than contributes to monitoring. While we observe no significant effect of the identity of the singular largest owner on firm performance, there is evidence that firms controlled by domestic non-financial owners and insider owners, when aggregately holding dominant ownership blocks, perform better than firms controlled by State-controlled Funds. Moreover, firms with the largest percentage of capital in the ownership of Privatization Investment Funds (PIFs from now on) and those under the dominant owners of Slovenian Development Fund perform worse.

Results are robust to different static and dynamic specifications of the empirical model and to different econometric techniques. We use static and dynamic specifications of the model and control for unobserved firm specific effects by estimating the models both in levels as well as in first-differences. Potential endogeneity between financial performance, TFP growth and ownership structure is controlled for by applying both the difference GMM method (according to Arellano and Bond, 1991) as well as the system GMM method (according to Blundell and Bond, 1998, 1999). We show that due to relatively low persistency of firm financial performance the difference GMM method serves, in most cases, as a more appropriate method of instrumentalisation.

The paper is structured as follows. Theoretical background and main hypotheses are presented in Section 2. Section 3 draws main statistics on the evolution of ownership and control in Slovenian corporations in the four-year period following the conclusion of Slovenian privatization (1998-2002). The data set, empirical model and estimation techniques are detailed in Section 4. Main empirical findings are discussed in Section 5. Last section concludes and states issues for further research.

II. Theoretical framework and main hypotheses

The importance of different corporate governance mechanisms in disciplining management, the culture, traditional financing options, legal frameworks, political and institutional environment are the most important factors that determine and distinguish each country's corporate governance system; despite the differences between the countries themselves, different classifications of corporate governance systems exist. Today, the distinction goes mainly between the outsider (market oriented or Anglo-American) and insider (blockholder or Continental European) governance system (Franks and Mayer, 1995; Becht and Barca, 2001). In the former, ownership and control are dispersed, stock markets more liquid, generate higher returns, provide higher possibilities of diversification for investors and facilitate financing to managerial entrepreneurships. In order to alleviate the 'collective action problem', shareholders rely on takeovers, outside directors on boards and shareholders' proxy fights; they tend to promote short-term goals (short-termism) and discourage managers to look for long-term firm performance. Insider or blockholder system, on the other hand, is the system of large shareholders (the blockholders), mostly families, holding companies, non-financial firms and banks. It ensures closer shareholders' monitoring over management and longer shareholders' time horizon. Capital markets are thinner than in the outsider system, liquidity of stocks rather low, while blockholders' control often results in rent extraction or the so-called private benefits of control. Consequently, the two systems have different incentive structures, entail different trade-offs between ownership concentration and liquidity, monitoring and management, while none of them is found to be superior to the other (Bratton and McCahery, 2002:26,27). At any rate,

large blockholdings are common all over the world and seem to be relatively stable in time (Holderness and Sheenan, 1998 and 2002). Furthermore, privatization, market conditions and institutional environment have mostly directed the evolution of corporate governance systems in Central and Eastern Europe towards concentrated ownership and voting power, namely the system of large blockholders.

Privatization provided firms with new owners but not necessarily with control over firm management; no monitoring can be expected until the owners are not in the position to properly oversee firms' management and don't have the right incentives to collect information and put effort into exert power over incumbent management. Concentration of ownership could provide such incentives since, with the ownership stake being large enough, benefits of improved performance (due to enhanced monitoring) accruing to the owner outweigh monitoring costs. However, it could also reduce managerial initiative and willingness to make firm-specific investments (Bukart, Gromb and Panunzi, 1997), absorb liquidity of firm shares (Becht, 1999; Bolton and Von Thaden, 1998), hamper informational value of firm share price and hence negatively influence firm performance (Holmstrom and Tirole, 1993).

With substantial ownership (and voting) stakes, large blockholders also gain the possibility to expropriate private benefits of control, namely to expropriate corporate funds on their own behalf but on the cost of small investors (or the firm itself). As claimed by Shleifer and Vishny (1995), the fundamental problem is that large owners represent their own interests, which need not coincide with the interests of other investors in the firm, or with the interests of employees and managers. In the process of using their control rights to maximize their welfare, the concentrated owners can therefore redistribute wealth in both efficient and inefficient way. Private benefits in fact refer to the latter and are defined as the 'psychic' value some shareholders attribute simply to being in control as well as to the possibility of enjoying some value without sharing it among all the shareholders (Dyck and Zingales, 2001); they make take the form of excessive compensation of those in control, large prerequisites on the cost of minority shareholders, freeze-out mergers, diversions of firm value through inefficient acquisitions of inputs from other companies in the ownership or large blockholders, etc. (Hart, 1995:192). These are the so-called pecuniary private benefits, to the contrary to synergies in production or individual prestige (non-pecuniary private benefits), and have been mostly emphasized in the literature (Barclay and Holderness, 1992).

Slovenian privatization introduced two main groups of owners: inside owners (employees, former employees and their relatives) and outside owners (mainly Privatization Investment Funds and State-controlled Funds). The former ended up holding about 40 percent of privatized capital and obtained majority stakes mostly in smaller, labor-intensive firms. About 25 percent of the capital went under the control of Privatization Investment Funds, 22 percent was given to State-controlled Funds (Capital and Restitution Funds), while the

remaining 13 percent were publicly sold or exchanged for certificates (Agency for Privatization, 1999). Within the stated groups, concentration of singular shareholder remains relatively low; for example, at the end of 1998, half of the firms with shares listed on Ljubljana Stock Exchange did not have an owner holding more than 20 percent of the voting rights, while the concentration of ownership and control in non-listed corporations was only slightly higher (Gregoric, 2003). Ownership changes in the post-privatization period differ; the distribution of ownership and control in the firms whose shares are listed on the capital market remained relatively stable with regards to the identity of the largest owners and the size of their shares. Since these are the largest Slovenian firms and rather limited in number, the existing shareholders (institutional shareholders in particular) do not want to exit (Pahor et al., 2003), while new individual shareholders have been trying to enter these firms and have been recently driving the positive trends in the share prices on the Ljubljana Stock Exchange. On the other hand, the evolution of control in non-listed firms follows two main directions. On the one side, insiders bought-out shares in well performing firms; these firms are now dominated by inside owners but, with regard to the size of singular stakes, still remain with rather dispersed ownership and control (except for the few cases where insider constituted the Workers' Associations). Empirical studies show that these firms on average give more importance to internationalization of activities, innovation and financial goals (Prasnikar et al., 2002). On the other side, worse performing firms mostly did not manage to conclude the buyout; part of their shares were hence transferred to Slovenian Development Fund and, later on auctioned to Privatization Investment Funds. The consolidation of control in these firms realizes either through takeovers (and here, we would expect a positive effect of ownership concentration on performance) or through trading of blocks between Privatization Investment Funds and State-controlled Funds. With this regard, Gregoric and Vespro (2003) find that these investors exchange large (but not majority) blocks of shares at on average 46 percent premium to the post-trade exchange price, reflecting relatively large private benefits of control. On the other hand, Gregoric and Vespro (2003) find no significant positive market perceptions on the role of new controlling owners for firm performance; the only one causing some positive trends in the expectations of the minority investors (the market) are the acquisitions of large blocks by non-financial firms of the same industry (potential bidders).

Hence,

Hypothesis 1: Given the relatively dispersed ownership structure in the firms on the Stock Exchange, the states peculiarities of the ownership changes in unlisted firm, and observed market reactions to entrance of new controlling owners in Slovenia, we do not expect the ownership (and control) concentration to have significant positive effects on firm productivity and financial performance.

As argued by Earle et al. (2003), effects of ownership concentration on firm performance may depend on how the blockholders interact among each other. The presence of a second large

blockholder might on one hand provide additional monitoring over management and limit the expropriation of private benefits by the largest shareholders, in particular where the latter holds less than majority share (Zwiebel, 1995; Earle et al. 2003). On the other hand, when the largest shareholders do not engage in forming monitoring coalitions, the quarrelling among blockholders reduces the firm value; if this is the case, additional blocks don't contribute anything to firm value and, in listed firms, hamper the liquidity of firm shares, reduce share informational value and increase the costs of takeovers (Earle et al., 2003).

The co-existence of many large shareholders within one firm is rather common in Slovenia. On the contrary to other Continental European countries, where the size of the first largest block largely exceeds the size of the second largest block, most of Slovenian firms have two-three large blockholders with relatively balanced voting power. However, voting pacts among the largest owners are rarely reported at the Shareholders' Assemblies, while the only organized gathering of proxies is organized by firms' managers in order to gather votes from inside owners (Gregoric, 2003). Hence,

Hypothesis 2: Rather than improving the monitoring over firms' management, additional large blocks create a competition for power and might not contribute to firms' value.

Different types of shareholders may have distinct incentives and abilities to monitor management (Koke and Renneboog, 2003), different inclination to extraction of private benefits and hence different implications for firm performance. Given the many issues that Slovenian Privatization Investment Funds (PIFs from now on) had to deal with in the past years (such as privatization hole and the formal transformation into normal investment funds), we expect them to be less efficient in exercising control or/and more prone to extraction of private benefits of control. The same hypothesis applies to the role of State-controlled Funds, whose involvement in firms governance has been mostly guided by their liquidity needs (due to their obligations towards the beneficiaries of the pension system and de-nationalization) as well as political influence. Hence,

Hypothesis 3: State-controlled funds and Privatization Investment Funds as controlling shareholders perform worse than large individuals, non-financial firms or foreigners. We expect them to be more inclined to the extraction of private benefits than other large owners.

III. Ownership and control in Slovenian corporations

Aggregate percentages of shares held by different investor groups in 150 large and medium sized Slovenian firms are presented in Table 1. While there is clear evidence on the reduction of shares in the hands of State-controlled Funds (mostly due to the sale of shares by the

Development Fund) and inside owners, equity participation of domestic non-financial firms has been increasing. A slight increase is observed in the ownership of foreigners and managers; however, similarly to banks and minority shareholders, their role in Slovenian corporate governance remains rather limited. PIFs, on the other hand, have been holding to the percentages of capital attributed to them in privatization⁶.

- Table 1 about here-

Similar conclusions can be drawn when looking at Table 2 that indicates the number of firms with a given investor group as the dominant shareholders (that is with the aggregate ownership share higher than the aggregate ownership share of any other investor group within the same firm) in the year 1998 and at the end of 2002. While there is a sharp decrease in the number of employee-dominated firms, domestic non-financial firms and Privatization Investment Funds are becoming more common among the largest (aggregate) owners. While at the conclusion of privatization domestic non-financial firms held the largest aggregate stake in 16 firms (11 percent), they dominated 49 out of 146 firms (31.5 percent) at the end of 2002. Similarly, PIFs held the dominant aggregate stake in 23.9 percent of the firms in the sample (in comparison with 15 percent at the end of privatization). The observed increase in the dominance of domestic non-financial firms and PIFs can be partly explained by enterprise networks. As claimed by Pahor et al. (2002), ownership ties are much more common between companies that operate in the same industry, are geographically close or share the same (controlling) owners. Socioeconomic reasons thus seem to be the most important factor leading the creation of the ownership ties among Slovenian enterprises. In general, there are some similarities between Slovenian corporate networks and those of the Western economies. However, while banks and investment funds play the central role in corporate networks abroad, in Slovenia this role is given to Privatization Investment Funds.

- Table 2 about here-

When it comes to control, what really matters are the voting rights of each singular shareholders rather than the aggregate stakes of a given investor group (assuming that not necessarily all shareholders belonging to the same investor group always attend the shareholders' meeting and vote together). Ownership (voting)⁷ shares of the first (1st), second (2nd), third (3rd) largest shareholders are presented in Table 3. The numbers clearly

⁶ Twenty percent of firms' shares were given to the Development Fund for further sale (through auctions) to the Privatization Investment Funds, special institutional shareholders constituted within the privatization process. For ownership dynamics after privatization, see also Domadenik et al., 2000; Simoneti et al., 2001 and Gregorič, 2003.

⁷ Since one-share-one vote applies in Slovenia, there is normally no distinction between ownership and voting rights.

indicate the trend towards higher concentration of ownership (and control) in Slovenia; while at the end of 1998 more than half of the firms in the sample did not have a shareholder holding more than 25⁹ percent of the voting rights, the median voting block in the hands of the largest shareholder at the end of 2001 exceeded 33 percent. The growing controlling power of the first largest shareholder is further supported by the relatively stable stakes of the second and third largest shareholder; hence, most of the increase in the total size of the first five largest block in the last 4 years is due to increases in the size of the largest blocks.

- Table 3 about here-

Table 4 further reports the number of firms (N) and the average size of the voting block (calculated over N firms) with the indicated investor group as the largest shareholders. Again, we observe that foreigners and individuals have been increasing both the number of controlling blocks and their size. At the end of 2001, foreigners held the largest block in 10 firms in the sample; when being the largest blockholder, they normally hold majority stakes (average size = 63.8 8 percent). Similarly, the number of firms with domestic non-financial firms as largest owners increased from 12 to 43 in the last four years; as in the case of PIFs, the average stake held by domestic non-financial firms (when the largest owners) exceeds 25 percent. On the other hand, the representation of the State-controlled Funds among the largest blockholders has been declining; rather limited is also the involvement of banks.

- Table 4 about here-

Numbers drawn in the tables above clearly show that ownership and control of Slovenian corporations is concentrating in the hands of domestic non-financial firms, foreigners and individuals, while Privatization Investment Funds (or their formal successors) keep playing an important role in Slovenian corporate sector. If these investor groups have been gaining control power, what is then the consequence of such consolidation of control on firm performance?

⁸ Normally, one –share-one-vote applies in Slovenia. Hence, ownership concentration also leads to concentration of voting rights (control).

⁹ The 25-percent threshold is defined as ‘controlling’ by Slovenian Takeovers Act since any individual crossing the stated threshold is obliged to make the public bid.

IV. The data, empirical models and estimation methodology

1. The Data

The empirical analysis of the effects of ownership consolidation on firm performance in Slovenia is based on a sample involving 150 large and medium-sized firms, employing on average 500 employees and generating 10 billions of SIT of yearly income. The panel refers to the period 1998-2002 that is to the first four years following the conclusion of Slovenian privatization¹⁰. Data on ownership stakes of the five largest shareholders are obtained from the Shareholders' Register kept by the Central Securities Clearing Corporation. In order to obtain data on other corporate governance issues (aggregate ownership stakes by different investor groups; education, tenure and ownership of the Board of directors; composition and size of the Supervisory Board, etc.) questionnaires were sent to over 623 Slovenian firms with shares registered in the Shareholders' Register of the Central Clearing Securities Corporation (150 responses obtained). Data on firm financial performance were obtained from the Agency of the Republic of Slovenia for public legal records and related services.

We define several variables to measure ownership concentration: i) the size of the first largest block (C1); ii) the size of the second largest block (C2); iii) the percentage of shares tied up in blocks (C5). We further construct several dummy variables: i) dummy variable CONC25-50 that is attributed the value 1 for all firms with the largest blockholder holding above 25 and below 50 % (controlling but non majority stakes) and 0 otherwise; ii) dummy variable CONC50 that gets the value 1 for all firms with the largest blockholder holding at least the majority of voting rights and 0 otherwise; iii) dummy variable CONC50-75 that is attributed the value 1 for all firms with the largest blockholder holding above 50 and below 75 percent of the voting rights and 0 otherwise; and iv) dummy variable CONC75 that is attributed the value 1 for all firms with the largest blockholder holding above 75 percent of the voting rights (supermajority control).

In order to evaluate the impact of the identity of the largest owners, we categorize them into several investor groups. First, we look at the identity of the first largest shareholder and distinguish between: i) individuals; ii) foreign individuals and legal persons; iii) State; iv) domestic non-financial firms; v) banks and insurance companies; vi) Capital Fund; vii) Restitution Fund; viii) Privatization Investment Funds; ix) Authorized Workers' Associations as common representative of inside owners; and x) Slovenian Development Fund. Upon this

¹⁰The Agency for Restructuring and Privatization gave its first approval of a program of ownership transformation on 29 July 1993 and its last approval on 30 October 1998.

¹¹ We tried alternative specifications with Herfindal index (H) as concentration measure and the dummy variable DISP that is attributed the value 1 for all firm with the largest shareholder holding less than 20% but do not report the results since they turned out non-significant.

distinction, we define the variable $IDENTITY_i$ as a dummy variable that equals 1 when the largest shareholder belongs to the investor group i , and 0 otherwise. Following Koke and Reeneboog (2003), we further define the dummy variable $SHARE_i$ that equals one if the aggregate stake of all the shareholders belonging to group i exceeds the aggregate stake of other investor groups within a given firm. At last, we test the impact of the shareholder identity by regressing firm performance directly to the aggregate stakes held by a given investor group ($AGGREGATE_i$). With regard to the latter, we identified 8 different investor groups: State-controlled Funds (Capital Fund, Restitution Fund); Privatization Investment Funds (PIFs); foreigners (private and individuals); domestic banks; domestic non-financial firms; inside owners (employees, former employees and their relatives); Development Fund; and minority shareholders.

2. Empirical model

Most of the studies investigate the impact of corporate governance on firm total factor productivity (TFP). Most common approach is to consider firm i TFP growth using a Cobb-Douglas production function with two inputs in a panel data setup:

$$(1) \quad \begin{aligned} y_{it} &= a_{it} + \alpha k_{it} + \beta l_{it} + \delta_t + (\eta_i + v_{it} + m_{it}), & r = \alpha + \beta \neq 1 \\ v_{it} &= \rho v_{i,t-1} + e_{it} & |\rho| < 1 \\ e_{it}, m_{it} &\sim \text{MA}(0) \end{aligned}$$

where a_{it} is a productivity (TFP) shock that depends on various factors (such as ownership structure and changes in ownership structure), y_{it} is log value added, k_{it} and l_{it} are log capital stock and log labor inputs (there is no restriction on constant returns to scale), δ_t is a year specific intercept. Of the error components, η_i is an unobserved firm-specific effect, v_{it} is an autoregressive (TFP) shock, and m_{it} represents serially uncorrelated measurement errors. Note that both labor (l_{it}) and capital (k_{it}) are potentially correlated with firm-specific effects (η_i) as well as with both productivity shocks (e_{it}) and measurement errors (m_{it}).

The central point of most corporate governance studies is focused on estimating the TFP shock a_{it} where it is believed that it is largely determined by the impact of the ownership structure and changes in ownership structure. Suppose that the firm's TFP shocks a_{it} are determined as:

$$(2) \quad a_{it} = f[\text{CG}_{it}]$$

where elements of CG_{it} are different corporate governance variables in each time period. In order to get rid of the unobserved firm-specific effect η_i , (1) is efficiently estimated by first-differencing the data.

In our case, however, the problem is that (1) is not affected by (2) at all. In other words, as shown in the correlation matrix in Table 6, the output growth measured in terms of sales (dY) and value added (dVA) as well as real changes in TFP ($dTFP$) of the firms in our sample are affected neither by structure of ownership nor by the control shares or changes in both. It seems that corporate governance does not have a direct impact on real (TFP) growth of selected Slovenian firms. On the other side, Table 6 reveals that output growth as well as TFP growth is correlated with financial performance of selected firms, such as ROA and cash flow ratio (CF). Productivity growth might drive financial performance of firm, but then again as revealed by Table 6, financial performance is also affected by ownership structure and control.

We therefore omit estimating model (1) as a base model for assessing the impact of ownership structure and control (2) on firm TFP growth. Instead, we estimate firm financial performance FP_{it} :

$$(3) \quad \begin{aligned} FP_{it} &= \pi_{it} + \phi dTFP_{it} + \sigma SIZE_{i,t-1} + \lambda LEV_{i,t-1} + \delta_i + (\eta_i + v_{it} + m_{it}) \\ v_{it} &= \rho v_{i,t-1} + e_{it} & |\rho| < 1 \\ e_{it}, m_{it} &\sim \text{MA}(0) \end{aligned}$$

subject to

$$(4) \quad \pi_{it} = g [\mathbf{CG}_{i,t-1}]$$

where FP_{it} is a measure of financial performance. We use two indicators of financial performance, ROA (EBITDA¹² over Total Assets) and Cash Flow Over Fixed Assets (CF)¹³ as an alternative measure for firm financial performance, which has proved to be a good measure of firm financial performance in other empirical studies of Slovenian enterprises (see Prašnikar et al., 2001)¹⁴.

π_{it} represents unexplained financial shocks that firms may be subject to due to the structure and changes in the ownership and control ($\mathbf{CG}_{i,t-1}$). $\mathbf{CG}_{i,t-1}$ is a matrix of different corporate governance variables (concentration of control, identity of the largest owners, aggregate ownership stakes, dummy for firms listed on the capital market, etc.).

¹² EBITDA stays for Earnings before Interest Taxes and Depreciation .

¹³ When estimating firm performance empirical studies mostly refer to use Tobin Q and market to book ratio. However, these measures rely on the assumption that the share price correctly reflects the value and performance of the firm (which is not the case in the low liquid capital markets such in Slovenia).

¹⁴ Fixed assets are used as the approximation of firm size, since it corrects for the cyclical component with could influence for example firm total sales. There is an additional reason for comparing cash flow over fixed assets (rather than total assets of total sales); banks normally relate to the value of fixed assets when estimating the credit risk (fixed assets represent the value of collaterals).

The error term again consists of the unobserved firm-specific effect η_i , autoregressive financial shock v_{it} , and serially uncorrelated measurement errors m_{it} . We believe that financial performance is mainly driven by economic performance ($dTFP$), i.e. growth in productivity that cannot be attributed to capital or labor and should approximate firm's investments in knowledge, new technologies, etc. TFP is measured as a Solow residual after estimating (1) and included into (3) in the first-difference form. In estimating (3) we also control for firm size ($SIZE$) proxied by the log of total assets ($\ln TA$), indebtedness (LEV) proxied by the log of debt to assets ($\ln DA$). Of course, we also control for industry specific effects and economic policy shocks by including industry and time dummies. All the explanatory variables (industry dummies and listing dummy excluded) are entered in the model with one-year lag.

We tested alternative specifications of (3) subject to (4) by including other variables in the model, such as: i) managerial ownership (percentage of shares held by the Management Board); ii) tenure (the number of years the General Manager has been on position) and education of the General Manager; iii) concentration of bank loans to the firm (percentage of loans provided by a single bank; number of banks providing loans to the firm); iv) characteristics of the Supervisory Board (board size, share of independent experts on board, share of employee representatives on board), etc. However, we don't include them in the final models due to multicollinearity problems. Descriptive statistics and correlation matrix for the variables used in the analysis are presented in the Table 5 and Table 6.

- Table 5 about here-
- Table 6 about here-

As evidenced in Table 5, the largest shareholder in the firms in our sample holds slightly above 34 percent of the ownership (and voting) rights. The average size of the second and the third largest block is 14.04 and 11.9 percent. On average, the majority of the firms' voting rights are tied up in blocks (61.31 percent). The average aggregate stake in the ownership of different investor groups vary from 1.5 percent (for banks) to 30.43 percent (for insider owners). On average, a unit of fixed assets in our sample firms generates 0.02 of cash flow and a unit of total assets about 0.1 unit of gross operating profit (Earnings before interests and taxes).

3. Methodology

Financial performance model (3) is estimated using different econometric techniques in order to check for the robustness of results. Our basic model is a static model (we refer to it as Model 1 in our results) estimated in levels by OLS. As we deal with the panel structure of data, we have to account for unobserved firm-specific effect η_i . We get rid of it by estimating our model in first differences (Model 2), which is close to the fixed effects model.

Another issue here is the importance of dynamic processes in the economy since many economic relationships are dynamic in nature and should be modeled as such. This is especially true for financial performance of firms since owners require persistent growth of profits and firm value, where present financial performance is correlated with the past performance of the firm. In other words, notwithstanding the static specification of our model we might observe strong autoregressive financial component v_{it} when dealing with panel structure of the data. This is usually reflected in the significant serial correlation of the first and second order (AR(1) and AR(2)). The time dimension of our panel data enables us to capture this dynamics by inclusion of lagged dependent as well as lagged independent variables. We first estimate a dynamic version of model (3) in levels and first differences (Model 3 and Model 4). In some cases inclusion of the lagged financial performance helps to minimize the serial correlation problem.

However, when estimating dynamic financial performance models that depend heavily on TFP growth, one should take into account the inherent endogenous structure of the model. This means that not only present and lagged dependent variables are correlated, but lagged dependent variable (financial performance) might be correlated with present independent variables (TFP growth); i.e. past financial performance may as well determine demand for inputs in the present period and hence affect the TFP growth. This simultaneity problem should be explicitly controlled for in econometric estimations.

The OLS estimator is unbiased and consistent when all explanatory variables are exogenous and are uncorrelated with the individual specific effects. This, however, is not the case in our model, which includes lagged variables. One can show that the OLS estimator will be seriously biased due to correlation of the lagged dependent variable with the individual specific effects as well as with the independent variables. This is due to the fact that FP_{it} is a function of η_i in (3), and then $FP_{i,t-1}$ is also a function of η_i . As a consequence, $FP_{i,t-1}$ is correlated with the error term, which renders the OLS estimator biased and inconsistent, even if the v_{it} and m_{it} in (3) are not serially correlated. This holds also whether the individual effects are considered fixed or random (see Hsiao 1986, Baltagi 1995, Wooldridge 2002). There are several ways of controlling for this unobserved heterogeneity and simultaneity. One way is to include exogenous variables into the first-order autoregressive process. This, in turn, reduces the bias in the OLS estimator, but its magnitude still remains positive.

Another way of controlling for the simultaneity is apply the Anderson-Hsiao instrumental variable approach. We may first-differentiate our model (3) in order to eliminate η_i , which is the source of the bias in the OLS estimator. Then we may take the second lag of the level ($FP_{i,t-2}$) and the first difference of this second lag ($\Delta FP_{i,t-2}$) as possible instruments for $\Delta FP_{i,t-1}$, since both are correlated with it ($\Delta FP_{i,t-1} = FP_{i,t-1} - FP_{i,t-2}$) but uncorrelated with the error term Δu_{it} ($= u_{it} - u_{i,t-1}$). This approach, though consistent, is not efficient since it does not take into account all the available moment conditions (i.e. restrictions on the covariances between regressors and the error term).

Hence, a natural choice of approach that allows for controlling for the unobserved heterogeneity and simultaneity in (3) is the application of GMM (general method of moments) estimators. As shown by Arellano and Bond (1991, 1998), Arellano and Bover (1995) and Blundell and Bond (1998, 1999), an application of the system GMM estimators is more appropriate than using difference GMM estimators when we deal with highly persistent dynamic panel data. When persistency is not that high, lagged levels might serve as good instruments for the equations in first-differences, and hence difference GMM estimator might turn out more appropriate than system GMM estimator. We apply both estimators to the dynamic version of our model (3) and experiment with different lags of instruments (Models 5 through 7). Using a variety of estimation methods helps us to confirm the robustness of our results. We consider our hypotheses as confirmed if applying the variety of estimation methods to the data does not alter significantly the sign and size of the parameters of our empirical models.

V. Regression results

Regression results are presented in Tables 7-10. We estimate a number of alternative model specifications with ROE, ROA or cash flow as dependent variables and alternative definitions of control (including DISP, Herfindal index, the size of the three largest blocks, ect.) as explanatory variables but do not report the results since they turned out non-significant. We do not report the results for the TFP model (1) since as indicated in Table 6 none of the relations between corporate governance characteristics (concentration of control and identity of the largest owners) turned out to have statistically significant influence on firm output and TPF growth.

In the first specification (Table 7), we regress the cash flow ratio on the concentration of control, measured with the size of the first largest blockholder, the size of the block held by the second largest shareholder and the aggregate percentage of shares tied up in blocks. As evidenced by other empirical studies (see for example Earle et al., 2003) the estimated effect of ownership concentration might depend on how the blockholders interact among each other; if there are multiple relatively large owners that manage to form a coalition, a group

concentration variable might be a better measure than the size of the largest owner. We find that the percentage of shares tied up in blocks (variable C5) has a negative effect on firm financial performance; the effect on the performance level (but not also for growth in the cash flow ratio) is negative in all specifications of the regression models and is robust and significant also after controlling for individual effects and endogeneity problem using GMM instrumentalization (Model 1 and Model 5 in Table 7). On the other hand, the coefficients for the first largest blockholder (C1) is prevalently positive, while the second largest blockholder (C2) has no significant effect on firm performance. Hence, the conclusion is that while the concentration of the largest blockholder might have some positive effect on firm performance, additional blocks within the same firm reduces this positive effect. These findings are somehow similar to the ones for Hungary, reported by Earle et al. (2003).

In the second specification of the model (Table 8) we rely on CONC dummies when measuring ownership concentration. According to the results, the relation between ownership concentration and firm performance is non-monotonic. Firms with the largest owner holding below 25 percent of the voting rights seem to perform better than firms with a controlling (although non-majority) owner. The negative impact is significant (for the OLS, FD, dynamic OLS and Diff GMM model) for the 25-50 percent threshold, after which the relation loses significance (although remains prevalently negative). The significantly worse performance of firms with the largest owners holding controlling but less than majority share somehow confirms the previous finding that (as argued by Earle et al., 2003) 'to many cooks spoil the goulash'. The positive correlation coefficient between CONC25-50 and the size of the second and third largest block (see Table 6) implies that in these firms, the presence of relatively powerful second and third largest blockholders might lead to eventual quarreling with the largest owner or among themselves and consequently hamper the firm's value¹⁶.

The un-explained increase in firm productivity (which could be due to innovations, new knowledge and innovations) has in all specification a positive effect on the level of firm financial performance (or growth in performance for first difference models). Similarly, firms with shares listed on the free or capital market of the Ljubljana Stock Exchange generate higher cash flow than non-listed firms. While no strong conclusion can be made upon the effect of leverage, larger firms have lower cash-flow ratios. Consistent with the expectations is also the statistically significant relation between the increase in firm size and the growth in their cash flows (see differenced Models 2 and 4 through 7).

In terms of cash flow ratio, we find no significant impact of the identity of the largest owners; non-significant is also the influence of the owners' identity on both cash flow and ROA when

¹⁶ We tried similar specifications also with ROA as dependent variable but do not report the tables since we found no significant results.

measuring the identity according to the first largest owner ($IDENTITY_i$; Results not reported). However, we find some evidence when regressing ROA on the dummy variable $SHARE_i$ (Table 9) and the aggregate percentage of shares held by different investor group ($AGGREGATE_i$), see Table 10. When dominant, domestic non-financial firms, banks and insider owners have a better impact on growth in ROA than State-controlled Funds (used as the reference group), while PIFs influence on growth in firm financial performance is prevalently negative and statistically significant (see Models 2, 3 and 4). The latter conclusion finds confirmation also in the last specification, where we regress ROA on the aggregate percentages of capital owned by different investor groups (see Table 10). Consistent with the expectations, negative and statistically significant is also the effect of Slovenian Development Fund; the latter had been anyway managing the worse performing firms and has exited Slovenian corporate sector by 2002.

VI. Conclusions

Slovenian privatization model allowed firms to chose between two main options: they could either decide to privatize internally (through the internal buyout of the remaining 40 percent of firm shares) or externally (by public sale of shares and listing on the Stock Exchange). Consequently, it introduced two main groups of owners, inside owners (employees, former employees and their relatives) and outside owners (Privatization Investment Funds and State-controlled Funds). The different ways of privatization also determined the post-privatization changes in the ownership and control of Slovenian corporations; on the one side, the ownership of the firms on the Stock Exchange stays relatively dispersed, while co-existence of several blocks hampers the decision-making in the firms (and hence their performance), limits the transfer of control and reduces the liquidity of their shares. Non-listed firms on the other hand evolved either towards insider domination (and hence, remain with a relatively dispersed ownership and control) or ended up in the ownership of other non-financial firms (upon takeovers) and Privatization Investment Funds. The latter have started to consolidate their portfolios only recently, exchange their shares at relatively large premium (reflecting high private benefits of control) and probably do not contribute much to firm performance.

Regression results confirm our initial hypothesis and are consistent with the peculiarities of Slovenian privatization and the evolution of ownership and control in the post-privatization period. First, the absence of any significant influence of control (measured by the size of the largest owner) on firm productivity is probably due to the fact that most of the better performing firms lack controlling owners and have other sources of growth, such as the accumulation of knowledge and human capital. The latter also largely determine firm financial performance. Second, the non-monotonic relation between ownership

concentration and firm performance and, most importantly, the significantly worse performance of firms with controlling but less than majority owners reflect the current 'fight for control' among the blockholders, which hampers firm productivity rather than improves the control over the managers. The observed 'balance of power' could be better captured by the Shapley values, which measure the probability of a singular shareholder to be pivotal for a controlling coalition. Applying the Shapleys, while taking into account the insiders as one major player, might also correct for the dispersion of shares in the insider-dominated firms that can not be capture by simply looking at the size of the first largest blockholder. Moreover, adding new firms to our sample (listed firms in particular) would largely contribute to the robustness of our results and provide further explanations to our conclusions. These are certainly issues for our further research.

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Appendix: Tables

Table 1: Aggregate ownership stakes by investor group

	1988	1999	2000	2001	2002
State-controlled Funds	20.13	18.92	14.99	12.68	10.24
PIFs	18.74	20.00	20.46	19.39	19.17
Banks	1.06	1.26	1.18	2.22	1.85
Foreigners	3.03	2.80	3.86	5.51	6.72
Domestic firms	7.80	11.60	17.80	22.45	26.79
Inside owners	37.52	33.83	29.11	26.80	26.17
Managers	2.29	2.26	2.26	2.98	3.58
Minority shareholders	3.39	3.60	4.63	3.58	4.10
N	128	136	136	146	148

Table 2: Number of firms with the indicated investor group as the dominant group at the end of 1998 and 2002

	1998	2002
State-controlled Funds	12	11
PIFs	22	35
Banks	1	1
Foreigners	4	9
Domestic firms	16	49
Inside owners	74	26
Managers	2	4
Minority shareholders	3	2
Other (State)	12	9
N	146	146

Table 3: Mean and median stake of the first, second, third and first five largest shareholders
(150 firms)

	1998		1999		2000		2001	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
1st	31.75	24.43	36.68	35.03	35.00	29.65	38.50	33.37
2nd	12.98	11.36	13.55	11.72	14.64	12.42	14.69	12.26
3rd	8.38	18.95	7.97	8.90	7.72	8.73	7.63	7.64
C5	58.56	53.19	59.03	56.64	61.86	62.39	64.95	65.02

Table 4: Number of firms (N) with a given investor group as the largest shareholders and the average voting (ownership) stake held by the indicated investor group (across N firms)

	1998		1999		2000		2001	
	N	Median Stake	N	Median Stake	N	Median Stake	N	Median Stake
Capital Fund	15	18.48	20	19.64	17	19.77	13	20.019
Restitution Fund	3	33.33	5	15.28	4	24.3	7	15.28
PIFs	41	23.31	53	22.27	50	24.97	38	31.39
Foreigners	3	25.03	8	51.5	9	52.00	10	63.80
Domestic	12	34.04	21	33.04	31	49.9	43	44.61
Workers' A.	5	52.54	5	39.10	6	46.16	8	43.16
Individuals	4	25.15	8	18.18	10	16.78	10	21.57
Banks	0	0	0	0	2	24.97	4	37.30
Total	106		149		151		151	

Table 5: Descriptive statistics for the variables used in the regression models

	N	Mean	Median
N Employees	903	503.8	165.3
Total Sales	912	11.1 Mio SIT	2,611,520 SIT
Fixed Assets	909	7,540,105 SIT	1,581,664 SIT
Total Assets	909	10.1 Mio SIT	2,672,449 SIT
Debt to Assets Ratio	909	0.37	0.33
Largest Block C1 %	559	34.71	28.91
Second Largest Block C2 %	556	14.04	11.89
Third Largest Block C3 %	556	7.89	8.87
% Shares Tied in Blocks C5	556	61.31	59.25
State-controlled Funds (Aggregate stake in %)	694	15.17	13.00
PIFs (Aggregate stake in %)	694	19.55	16.92
Banks (Aggregate stake in %)	694	1.53	0
Foreigners (Aggregate stake in %)	694	4.41	0
Non-financial firms (Aggregate stakes in %)	912	14.41	0
Insider owners (Aggregate stakes in %)	632	30.43	28.6
Minority owners (Aggregate stake in %)	693	3.87	0
Others (Aggregate stake in %)	696	8.69	0
Cash flow Ratio	760	0.02	0.02
ROA	909	0.095	0.098

Table 6: Correlation matrix for the variables used in the regression models

	dY	dVA	CF	ROA	dTFP	LIST	lnTA	lnDA	lnZ	C1_1	C2_1	C3_1	C5_1	CONC 25-50_1	CONC 50-75_1	CONC 75_1	DISP_1
dY	1																
dVA	0.53**	1															
CF	0.01	0.07*	1														
ROA	0.01	0.32*	0.15**	1													
dTFP	0.48**	1.00*	0.07*	0.32**	1												
LIST	-0.03	0.02	0.13**	-0.05	0.02	1											
lnTA	-0.04	0.00	0.03	-0.04	0.002	0.44**	1										
lnDA	0.05	0.03	-0.07	0.04	-0.001	-0.001	-0.02	1									
lnZ	-0.04	-0.04	-0.06	-0.08**	-0.05	0.32**	0.75**	0.09**	1								
C1(-1)	-0.02	-0.02	-0.08*	-0.06	-0.02	-0.21**	-0.004	-0.07	-0.11**	1							
C2 (-1)	-0.02	-0.02	-0.04	0.08**	-0.02	-0.11**	-0.14**	-0.12**	-0.13**	-0.10**	1						
C3(-1)	0.03	0.01	-0.03	0.08*	0.01	0.04	-0.05	0.01	-0.09**	-0.41**	0.46**	1					
C5(-1)	-0.02	-0.01	-0.13**	0.01	-0.01	-0.22**	-0.06	-0.09**	-0.20**	0.69**	0.46**	0.20**	1				
CONC25-50(-1)	0.00	0.02	-0.09**	0.11**	0.03	-0.05	-0.07	0.07**	-0.08**	0	0.32**	0.20**	0.22**	1			
CONC50-75(-1)	-0.01	-0.03	0.01	-0.01	-0.01	-0.18**	-0.08**	-0.03	-0.18**	0.57**	0.01	0.22**	0.38**	-0.22**	1		
CONC75 (-1)	-0.01	-0.02	-0.04	-0.09**	-0.04	-0.04	-0.03	-0.08**	-0.46**	0.61**	-0.28**	-0.27**	0.33**	-0.37**	-0.27**	1	
DISP (-1)	0.05	0.02	0.12**	0.03	0.03	0.13**	0.15**	0.04	0.14**	-0.59**	-0.20**	0.06	-0.56**	-0.29**	-0.21**	-0.34**	1

* Significant at 10 percent

** Significant at 5 percent

(_1) indicates variable lagged by one year

Table 7: Determinants of corporate cash flow ratio

Dependent variable: Cash flow ratio = Cash flow/fixed assets; Regressions with robust standard errors

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	OLS	OLS	Dynamic OLS	Dynamic OLS	SYS GMM	SYS GMM	DIF GMM
Transformation used	Levels	First differences	Levels	First differences	First differences	First differences	First differences
Lagged instruments					<i>t</i> -2	<i>t</i> -3	<i>t</i> -3
CF (-1)			0.269**	-0.517***	-0.343***	-0.335*	-0.535***
dTFP	0.054***	0.081***	0.066**	0.058**	0.088**	0.0084**	0.081
C 1(-1)	0.002*	-0.001	0.001	0.002**	0.002	-0.0002	0.004*
C 2 (-1)	-0.009	0.003	0.002	0.001	-0.001	-0.0003	0.008
C 5 (-1)	-0.002**	-0.001	-0.002**	-0.0001	-0.003*	-0.002	-0.002
LIST	0.015	0.036*	0.013*	0.044*	0.055	0.069	0.057
LnTA (-1)	0.011	-0.476***	0.007	-0.288***	0.005	0.015	--0.263
LnDA (-1)	-0.009	0.054*	-0.007	0.047	-0.019	-0.018	0.040
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of observations	540	390	540	390	537	537	390
Adj. R ²	0.14	0.138	0.200	0.32			
Wald χ^2 (joint)	5657**	651.2**	8626**	927.5**	71.88**	73.13**	154.3**
Wald χ^2 (dummy)	2.324	5.610	2.150	0.317	0.477	0.48	0.74
Wald χ^2 (time)	0.474	5.610	1.051	0.317	0.280	0.207	0.74
AR(1) N [0,1]	2.124*	-3.025**	-0.836	-2.928**	0.938	0.858	1.051
AR(2) N [0,1]	0.83	-1.125	-0.195	2.004*	0.938	0.860	0.81
Sargan test χ^2 [prob.]					2.374 [1.00]	3.972 [1.00]	9.77 [1.00]

* Significant at 10 percent

** Significant at 5 percent

*** Significant at 1 percent

Table 8: Determinants of corporate cash flow ratio**Dependent variable: Cash flow ratio = Cash flow/fixed assets; Regressions with robust standard errors**

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	OLS	OLS	Dynamic OLS	Dynamic OLS	SYS GMM	SYS GMM	DIF GMM
Transformation used	Levels	First differences	Levels	First differences	First differences	First differences	First differences
Lagged instruments					t -2	t -3	t -3
CF (-1)			0.290***	-0.500***	-0.310***	-0.283*	-0.465***
dTFP	0.041*	0.064***	0.064**	0.059**	0.064*	0.067*	0.044
CONC25-50 (-1)	-0.058**	-0.046**	-0.053***	-0.024	-0.057	-0.048	-0.073*
CONC50-75 (-1)	-0.009	0.026	-0.008	0.033	0.0032	0.003	-0.047
CONC75 (-1)	0.001	-0.024	-0.010	-0.001	-0.005	-0.008	-0.074
LIST	0.015*	0.02*	0.012*	0.044*	-0.045	0.044	0.316
LnTA (-1)	0.006	-0.353***	0.004	-0.253***	-0.054	-0.027	-0.283
LnDA (-1)	0.006	0.056**	-0.001	0.040	-0.034	-0.027	0.049
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of observations	731	580	590	439	588	588	439
Adj. R ²	0.137	0.119	0.219	0.310			
Wald χ^2 (joint)	1048**	226**	3071**	=620**	34.51	29.52	143.8**
Wald χ^2 (dummy)	5.432	4.442	2.074	= 0.072	0.117	0.157	0.953
Wald χ^2 (time)	5.042	4.442	1.104	= 0.072	0.116	0.092	0.953
AR(1) N [0,1]	2.921**	-3.578**	-1.240	-3.011**	0.85	0.921	0.734
AR(2) N [0,1]	1.899	-1.174	0.189	-2.289*	0.85	0.928	0.715
Sargan test χ^2 [prob.]					0.499 [1.00]	0.773 [1.00]	5.974 [1.00]

* Significant at 10 percent

** Significant at 5 percent

*** Significant at 1 percent

Table 9: Identity of the dominant group and firm performance

Dependent variable: ROA = EBITDA/total assets; Regressions with robust standard errors

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	OLS	OLS	Dynamic OLS	Dynamic OLS	SYS GMM	SYS GMM	DIF GMM
Transformation used	Levels	First differences	Levels	First differences	First differences	First differences	First differences
Lagged instruments					<i>t</i> -2	<i>t</i> -3	<i>t</i> -3
ROA (-1)			0.793**	0.064	0.511***	0.528***	0.037
dTFP	0.070**	0.073***	0.116***	0.078***	0.104***	0.105***	0.062***
SHARE _{PIF} (-1)	-0.014	-0.020*	-0.017**	-0.020*	-0.010	-0.006	-0.009
SHARE _{BANKS} (-1)	-0.026	0.022**	0.002	0.023**	0.055**	0.044*	0.003
SHARE _{FOREIGN} (-1)	-0.002	0.004	0.001	0.004	0.001	0.003	0.004
SHARE _{DOMESTIC} (-1)	0.001	0.025*	0.005	0.026*	0.035	0.032	0.028*
SHARE _{INSIDER} (-1)	0.002	0.014*	0.005	0.014	0.013	0.013	0.016*
SHARE _{RESTITUT.F} (-1)	-0.042	-0.029	-0.022*	-0.027	-0.033	-0.034	-0.037
SHARE _{OTHERS} (-1)	0.005	0.009	0.015**	0.010	0.0375***	0.035***	-0.026
LnTA (-1)	-0.002	0.002	-0.001	0.001	-0.011**	-0.010**	-0.003
LnDA (-1)	0.002	0.016**	0.005***	0.017***	0.004	0.005	0.025*
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of observations	731	580	731	580	730	730	580
Adj. R ²	0.25	0.39	0.698	0.395			
Wald χ^2 (joint)	26720**	704.9**	23000**	781.3**	315.6**	566.4**	292.5**
Wald χ^2 (dummy)	14.21*	6.243	9.089	6.140	13.19*	13.91	4.068
Wald χ^2 (time)	3.197	6.243	3.053	6.140	5.603	5.425	4.068
AR(1) N [0,1]	5.707**	-1.459	-0.89	-2.590**	0.74	-0.587	2.220*
AR(2) N [0,1]	5.203	-2.754**	-1.754	-2.478*	1.573	1.739	2.275*
Sargan test χ^2 [prob.]					19.04 [1.00]	39.82 [1.00]	38.83 [1.00]

* Significant at 10 percent

** Significant at 5 percent

*** Significant at 1 percent

Table 10: Aggregate stakes per investor group and firm performance

Dependent variable: ROA = EBITDA/total assets; Regressions with robust standard errors, Reference group: State-controlled Funds

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	OLS	OLS	Dynamic OLS	Dynamic OLS	SYS GMM	SYS GMM	DIF GMM
Transformation used	Levels	First differences	Levels	First differences	First differences	First differences	First differences
Lagged instruments					<i>t</i> -2	<i>t</i> -3	<i>t</i> -3
ROA (-1)			0.664***	-0.204*	0.258***	0.316****	-0.108
dTFP	0.069***	0.076***	0.111***	0.063***	0.086***	0.093***	0.060***
AGREGATE _{PIF} (-1)	-0.001*	-0.0002	-0.0006***	-0.0001	-0.0001	-0.0005	-0.0002
AGREGATE _{BANKS} (-1)	-0.0002	0.0006	-0.0004	0.001	-0.0001	-0.0005	0.002
AGGREGATE _{FOREIGN} (-1)	-0.0003	0.001	-0.0001	0.001	-0.0001	-0.0002	0.003
AGREGATE _{DOMESTIC} (-1)	-0.001*	0.001	-0.0004	0.0007	-0.0001	-0.0001	0.001
AGREGATE _{INSIDER} (-1)	-0.001	0.0002	-0.0003*	0.001	-0.001	-0.0004	0.001
AGREGATE _{RESTITUT.F} (-1)	-0.002***	-0.001**	-0.001***	-0.001*	-0.002***	-0.002***	-0.0005
AGREGATE _{OTHERS} (-1)	-0.001	-0.0001	-0.0003	-0.0001	-0.0002	-0.0001	0.0006
LnTA (-1)	0.002	-0.015	3.68e-005	-0.019	-0.009	-0.008	-0.012
LnDA (-1)	0.003	0.0143	0.007**	0.011	0.007	0.005	-0.008
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No of observations	235	172	235	172	233	233	172
Adj. R ²	0.56						
Wald χ^2 (joint)	13400**	1170**	18300**	821.5**	701.7**	1059 **	1522**
Wald χ^2 (dummy)	6.19	1.571	5.530	1.347	7.107	7.658	1.810
Wald χ^2 (time)	3.227	1.571	2.653	1.347	2.06	χ^2 2.460	1.810
AR(1) N [0,1]	2.817**	-2.068*	-0.99	-1.672	-2.18*	-2.361*	1.431
AR(2) N [0,1]	1.681	-1.136**	-0.42	-1.308	1.31	0.81	1.863
Sargan test χ^2 [prob.]					53.39 [0.917]	81.78 [0.930]	33.27 [0.991]

* Significant at 10 percent

** Significant at 5 percent

*** Significant at 1 percent