KnE Social Sciences

EBEEC Conference Proceedings
The Economies of Balkan and Eastern Europe
Countries in the Changed World (2016), Volume 2017

Knowledge E
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Conference Paper

When is Blockholding Growth Enhanced?

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Abstract

In this paper we test productivity differences among groups of firms with multiple controls. By using an exceptionally reach database, consisting of more than 4,000 Slovenian firms, each employing at least 50 employees or having their assets larger than two million euros (two criteria defining a small firm), and containing the information of firms' ten largest owners and their financial statements for the period 2006-2014, we design all possible minimal controlling coalition types up to three dominant owners and examine which minimal controlling coalition type generates the highest expected total factor productivity (TFP). We show that the optimal blockholding coalition type, consisting of two members coalitions without dominant owners, was able to attain short-term efficiency of dispersed owners. Other blockhold ingcoalition types stayed behind. A simple behavioristic principle is observed: short term efficiency of controlling coalition type decreases with the number of dominant owners and increases with the number of potential controlling (minimal) coalitions with different dominant owners.

Keywords: multiple shareholders, minimal controlling coalition, corporate governance, productivity of firm

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Received: 19 January 2017
Accepted: 2 February 2017
Published: 19 March 2017

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the EBEEC Conference Committee.

OPEN ACCESS

1. Introduction

Blockholding or concentrated ownership in the hands of one single owner or a few large owners (multiple controls) has been in the last decades in the focus of corporate governance research [17] (The term blockholding (and blockholders) is commonly used in economic literature, dealing primarily with the problems arising from more/less concentrated ownership and agency problems (see [17]). Blockholding refers to a situation of having large owners present, whereby the limits to what is large are set differently. For example, in [8] suggest using largest 5 to 20 shareholders, while in [29] suggest a 5% limit [10]. The notion of a block refers primarily to the "power to impact", therefore the definition can differ by country (institutional characteristics) or industry. Type, size and number of blockholders matters for firm structure, strategy and long-run performance [15, 32]). It is found that blockholding relates more to Continental European governance structure (insider governance structure) than to Anglo-American governance structure market-oriented or outsider governance structure [5, 12]. Empirical literature also indicates prevailing formation of blockholding after privatization in transition countries of Central and Eastern Europe (See for example, Earle, Kuscera,

and Telegedy (2004) for Hungary; [25] for Slovenia; and [26] for Bosnia and Herzegovina). Private benefits of control or expropriating minority shareholders generating inefficiency has most often been emphasized as causing the problem for blockholding and multiple controls [16, 30] (Other potential costs of blockholding could be due to decreased liquidity of equity [23] and misguided corporate strategic alignment [31]. The reduced liquidity could also lower the informational value of the firm's share price as a measure of managerial performance [18]. Concentrated ownership (blockholding), however, may improve performance by increasing monitoring and alleviating the free-rider problem in takeovers [29]).

Small but nevertheless growing theoretical literature studying the role of multiple blockholders, on the other hand, stresses that multiple blockholdersdo not necessarily need to be inefficient when they establish proper mechanisms of restricting (enabling) the possession of small shareholders. Conversely, when few blockholders create a coalition, multiple controls may even increase the firm's information capital and its efficiency. Coalitions may either be established as a result of cooperation [3, 24, 33], or based on the non-cooperative game [5, 14]. In fact, as stated in the above models, a stable coalition can eliminate (limit) the leading shareholder in seizing all benefits of control. In addition, large blockholders coalitions may also establish risk sharing instruments [5], reduce the initiative of the largest blockholders to overmonitor [14, 24] or undermonitor, due to the presence of bargaining [14].

Empirical studies of the firm performance-ownership relationship have produced ambiguous results. Some studies find no or negative effect of the ownership concentration on the firm performance. In some studies the negative effects of the ownership concentration outweigh the positive effects over some range of concentration. In some studies the results are positive. The usual measure of ownership concentration in this kind of works is to use the Herfindahl index of outstanding voting stocks, or alternatively, the percentage stake of the largest shareholder (see for example, [21] for exposition). Studies then typically evaluate how the share of four (five) largest owners effects the firm's performance and whether this effect changes after the second, third, or the fourth owner's shares are added to the share of the first owner. Earle, Kuecsera and Telegdy (2004) extend this approach by taking into account the notion that large blockholdings often co-exist within a single firm, having different strategies. Using a panel data of Hungarian firms traded on the BSE (Budapest Stock Exchange), they estimated fixed-effect panel regressions, where these within-estimators control for unobserved heterogeneity and therefore permit to compare the effect of an increase in the largest shareholdings with an increase in the shareholding of all blockholders. However, this approach does not measure the impact that possible control coalitions have on the firm's performance. In our paper we are eliminating these shortcomings. By using an exceptionally reach database, consisting of more than 4,000 Slovenian firms, each employing at least 50 employees or having their assets larger than two million euros (two criteria defining a small firm) and containing the information of firms' ten largest owners and their financial statements for the period 2006-2014, we have designed all possible three-member minimal controlling coalitions (by analogy, the model could be extended to any favorable number of members), which enables

the control (i.e., the coalitions that have a combined ownership share of more than 50%) and examined at which control coalition the expected total factor productivity (TFP) is the highest.

Our paper reveals several important contributions for the literature on corporate governance in general and multiple controls in particular. Regarding the latter, by combining minimal controlling coalitions with the productivity measure (TPF) during the large period of observations, we have firstly documented that firms with different minimal controlling coalitions exhibit substantial differences in productivity through the whole observation period. Secondly, comparing those groups of firms to firms with dispersed ownership (as a norm) we have shown that the group of firms (optimal blockholding coalition) consisting of two members and no dominant owners could attain short term efficiency of dispersed owners. Other blockholding groups stayed behind. And thirdly, a simple behavioristic principle is observed in our research: short term efficiency of controlling coalition decreases with the number of dominant owners and increases with the number of potential controlling (minimal) coalitions with different dominant owners. Concerning the first, we also find evidence that government owned firms and firms owned by financial holding companies, which were in many cases used as a vehicle for a "quick withdrawing of the state from the economy" before the Great Recession, display below average productivity. The findings complement [9] on lower efficiency of government owned companies due to the higher share of politically connected supervisory board members.

The paper is organized as follows. In the next section we compare theoretical models with multiple controls. In Section 3 we outline the heuristic model of ownership coalitions and the productivity of firms. In Section 4 we discuss our data and data collection process. In Section 5 we present our empirical results and in the last section we draw our conclusions.

2. Comparison of Theoretical Models with Multiple Controls

In Table 1 we are showing an overview of theoretical models with multiple controls. Multiple controlsare supposed to limit the largest shareholder(s) in extracting private benefits at the expense of minority shareholders. The mechanism of how to do this differs in the described models. In [3] model the emergence of higher number of larger owners lowers the probability of a single owner (dominant owner) or a few of them taking advantage of minority owners. Similarly, in [24] model. In [14] the share control is present, especially when the outside owner cannot verify the presented investment possibilities proposed by the entrepreneur with good enough quality. At that moment the outside owner steps on board and starts negotiating with the inside owner (entrepreneur) about accepting investment projects. In [5] the competition between the core owners works as the mechanism for protecting the interests of minority owners. The outcome of their strategic performance on one hand depends on the size of their ownerships and, on the other hand, it depends on the quality of their strategic proposals (contestability). In order for the challenger's threat to be credible, his or her

Authors	Types of coalitions among multiple blockholders (1)	Blocks (2)	Information gathered (3)	Efficiency (4)	Stability (5)	Most likely in (6)
Zwiebel, 1995	Control benefits are divided to the relative size of blocks. If one block is much larger than the rest, the private benefits of the rest are reduced.	Two types of firms in equilibrium: 1) only one large blockholder (or with many small shareholders); 2) numerous small blockholders with no dominant blockholder.	Lower when the leading blockholder creates "its own space". Larger when a controlling coalition of small blockholders is built.	No when there is one large block-holder. Coalitions of small sharehold-ers could deter the leading share-holder in seizing all benefits of control.	Stable when there is one leading blockholder: a threshold level above which a leading blockholder is not challenged.	Firms and industries having high private benefits of control could be identified.
[24]	The controlling blockholder is monitored by other large shareholders. Multiple blockholders protect minority owners.	Two or more large blockholders have controlling shares.	Multiple blockholders increase information.	Free riding among large block-holders reduces the initiative of the largest blockholder to overmonitor.	Stable if blockholders are able to cooperate.	A design of the ownership structure when a private firm goes public.
[3]	Different large shareholders form coalitions that compete to seize the control of the firm.	The probabilities of collusion determine the size of the coalition.	The largest ownership stake coalition guarantees the highest level of information, due to the "alignment effect" (ex-ante optimal coalition).	A larger coalition allows less extraction.	Not stable. In order to have the largest minority groups to expropriate, the smallest ownership stake to win prevails (ex-post preferred coalition).	Many examples in real life.
[5]	Large blockholders competition, based on the relative size of shares and heterogeneous competencies to create value (contestability).	Two large blockholders with low differences in block size.	High if there are comple-mentarities in competencies among blockholders.	Multiple blockhold-ings limit extraction of rents and secure voting of minority sharehold-ers. Possible risk sharing among multiple blockholding	Not stable: the existence of the second blockholder allows for a contingent shift in control.	Relationship banking. A design of IPOs to young firms or a design of privatization.

Table 1: Controlling coalitions withmultiple large shareholders.

[14]	In sharing control blockholders might undertake projects that are not against collective interests.	Two largest blockholders hold the controlling shares.	The level of information increases with the outside investor, joining the board of directors.	Large blockholders could eliminate the risk of losing valuable projects due to the presence of bargaining.	If costs of disagreements are not too high, the stability is preserved and the minority owners protected.	If investment opportunities are hard for outsiders to evaluate (family firms, joint ventures).

Table 1: Table continued.

ownership share must be as high as the ownership share of the largest owner. In the Zwiebel (1995) model two types of equilibrium exist: 1) a single owner; 2) plurality of small owners (coalition) without the dominant blockholder. The latter in the model works as a buffer, since it may eliminate the risk of the dominant owner taking over all benefits of control.

These models can also be seen in the context of game theory. The game should be set in such a way that in the multitude of ownership relation choices (ownership coalitions) we search for the one which ensures the (equilibrium) value of the game (for instance, in terms of TFP as a payoff function). The coalition ownership is set when the mutual ownership share of the players is larger than 0.5. Three features of coalition have influence on the expected value of the game (TFP) of the topical control coalition based on the knowledge of the game theory: 1) the level of common information (on the firm and its environment) of the control coalition (the higher the number of players, the higher the level of information); 2) efficiency of the control coalition (the more players there are, the lower the efficiency of the coalition in executing its control is, unless the expected payoff functions of the players are proportional or equal, which corresponds to cooperative coalition or collusion); 3) stability of the existence of control coalition, which depends on the number of potential control coalitions (meaning the coalitions with other players): the larger the set of potential coalitions is, the less stable the control coalition is.

In fact, all presented models in some way rely on the above features. In the Zwiebel (1995), [3, 24] models the cooperative game (collusion) of the largest blockholders is given as granted. Coalition designed in such a way should enable a higher level of information but lesser efficiency and stability in comparison to firms with a single dominant owner. In [5] model is based on a competitive game between the dominating owner and his or her followers on the basis of quality of the alternative strategies (offered by alternative coalitions). If the strategy provided by the largest owner is not satisfying, the follower can design a new coalition with minority owners. This mechanism leads towards higher coalition efficiency. The [14] model, similarly to [1], treats share control in the frame of a bargaining game between the initial entrepreneur and the outside investor, where both players have veto power. In case both have the ability to execute transfer payments (side payments), through which the one to whom the acceptance of investment decision brings potentially higher benefits, compensates the other, they make a decision that is in collective interest (also in the interest of

the minority owners). This ensures higher efficiency. Coalition's stability in this model depends on the disagreement costs, which occur as the ex-post bargaining problems if efficient projects fail to pass the hurdle of investments.

3. The Heuristic Model of Ownership Coalitions and the Productivity of Firms

The main disadvantage of the presented models is that they are commonly dealing with the two-member coalitions and have only core (leading) players. However, a coalition can be established also by more than two core players and can include additional non-core (supporting) players. It would also be difficult to carry out the comparison (ranking) of the outcomes of the presented models of the control coalitions. Taking into consideration the explained features of coalitions, we could perhaps classify (rank) firms with dominating single owner (one owner has more than 50 percent ownership share) and firms, where the largest owner reaches the dominating ownership share together with the second largest owner. However, including the possibility that the largest owner would achieve the dominating control share together with the third largest owner, or that this share would be achieved by the second and the third largest owner, would make the comparison (ranking) difficult.

Classification (ranking) based on empirical data is possible if we dispose good enough data about the ownership structure of firms and data about their operating results and their financial positions in a longer period of time. Since, as we will see later, we dispose such data, we display in Table 2 all minimal controlling coalitions made by maximum three players, although the same logic of ordering coalitions could be extended also to larger coalitions.It is however necessary to make concepts more clear-cut. In what follows, controlling coalition of firm owners is a coalition of owners with the common share higher than 50%. Minimal controlling coalitions are those controlling coalitions which have the lowest number of members.Dominant owner in a coalition is defined as an owner which could not be replaced by any other owner without losing the (over 50%) control of the corresponding coalition. All minimal controlling coalition types with up to three owners are documented in the Table 2. Studied firms are arranged in groups according to the coalition types they have. All firms which do have larger minimal coalitions are classified in the dispersed group. As mentioned, based on the analogy we could extend our analysis to larger coalitions, however, as it is shown in our empirical analysis, positive influence of increasing minimal coalitions on firms' productivity dropped already in minimal coalitions with three large players. The effect of enhanced information due to a larger coalition is namely neutralized by lower inefficiency in executing control, caused by a much more difficult consensus built among a larger number of coalition members. Therefore, minimal controlling coalitions with more than three large players in our analysis are not analyzed.

In studying the influence of ownership coalitions on the productivity of firms, we first need to get the measure of productivity (ϖ_{it}). Probably the most common approach is to use value added per employee as a proxy of productivity. However, as pointed

1	Firms in which minimal controlling coalition has one member.
1*	Firms in which minimal controlling coalition has two members and one of them is the largest owner.
12	Firms which have only one minimal two-member controlling coalition.
12*	Firms which have three-member minimal controlling coalitions, where two of the members are the first two largest owners.
12, 1*, *2	Firms with two-member minimal controlling coalitions, where all possible coalitionsinclude the three largest owners.
123, 123*	Firms with three or four-member minimal controlling coalitions all of which include the three largestowners.
1, 2, 3 denote first, second and third largest owners.	
* denotes additional owners, necessary to achieve control.	

Table 2: Types of controlling coalitions with up to three dominant owners (A separate treatment of 123 (a three member minimal controlling coalition) or 123* (a four member minimal controlling coalition) coalitions is, due to a very small number of firms in these groups, in our sample not necessary.)

out by many authors, this measure has many disadvantages, one being that it does not take into account the influence of capital on productivity. Taking this into account we use, as a proxy of productivity, estimated total factor productivity using the [22] methodology.

Let us suppose that the technology of the firm*i* in the period *t* can be written with the Cobb-Douglas production function:

$$ln(VA_{it}) = \beta_0 + \beta_l \cdot ln(LC_{it}) + \beta_k \cdot ln(TFA_{it}) + \beta_m \cdot ln(CGMS_{it}) + \varpi_{it} + \mu_{it}, \quad (1)$$

where VA_{it} is the value added, LC_{it} is the labor cost, TFA_{it} is the tangible fixed assets (proxy for capital), $CGMS_{it}$ is cost of goods, material and services, ϖ_{it} measures unobserved productivity, and μ_{it} is the error term with the expected value of zero. μ_{it} can be due to the measurement error in variables or the unexpected shock in the productivity to which LC_{it} does not respond. The variable ϖ_{it} as well as the variable μ_{it} are unobserved. The main difference between them is that productivity (ϖ_{it}) has an effect on the decision making process in the firm. As a result, ϖ_{it} is correlated with the variable inputs and also with the capital.

In order to obtain consistent estimates of the parameters of the production function, we need to control the effect of the unobserved productivity on the input choices. We apply the methodology developed by [22], which allows us to get unbiased estimates of the number of employees, fixed assets, and the cost of material coefficients. Taking those estimates, we can calculate productivity measure of the firm *i* in the time *t* as:

$$\widehat{\omega_{it}} = exp\left[ln\left(VA_{it}\right) - \widehat{\beta_l} \cdot ln\left(LC_{it}\right) - \widehat{\beta_k} \cdot ln\left(TFA_{it}\right) - \widehat{\beta_m} \cdot ln(CGMS_{it})\right] \quad (2)$$

After normalization with net worth, estimated $\widehat{\omega_{it}}$ is used in furtherempirical comparisons of productivity for firms with different ownership structures.

4. The Sample

4.1. Data Collection

In our paper we are dealing with an exceptionally rich data on Slovenian firms during the period 2006-2014 (The year 2006 was chosen as the beginning year of the analysis due to the changes in the accounting system made in 2005 in order to make data comparable). The selection of firms in the sample was based on at least one of the criteria from The Companies Act on micro, small, medium, and large companies - whether they were employing at least 50 employees or the company had at least two million euro of total assets. The lowest criterion prevailed if criteria contradicted. A firm with at least two million euro of total assets was selected even if it employed less than 50 employees and vice versus.

For each year and for each observed firm that was included in the sample, we first collected the names and the percentage share of the first ten largest owners. In most of the cases, these ownership shares differed from year to year, therefore, a lot of caution needed to be present during the data collection. All the data on the ownership structure was publicly available and it was gathered from different sources: 1) GVIN.com companies' ownership web database; 2) the annual reports of the observed companies or 3) reliable sources published on the Internet. The database of the observed firms and their changing ownership structure was then matched with the financial data from the balance sheet and income statements, provided by the Agency of the Republic of Slovenia for Public Legal Records and Related Services (AJPES). On average, information on 4,448 firms was captured yearly throughout the whole period 2006-2014.

However, due to the missing data on the ownership structure and missing data from income statements and balance sheets, and due to the enormous variations in main variables (VA_{it}, LC_{it}, TFA_{it}, $CGMS_{it}$) and therefore 0.5% exclusion of outliers,(The outlier selection was carefully made by defining the upper and the lower 0.5% value of all four main variables (VA_{it}, LC_{it}, TFA_{it}, $CGMS_{it}$). These firms were the cut off from the observed sample). the number of firms shrank as presented in Table 3. These firms were then used in the empirical analysis.

4.2. Descriptive Statistics of Companies and Main Variables used in the Empirical Research

We present the descriptive statistics for companies and main variables used in the empirical research in Table 4. On average, out of 3,249 firms included in the research in the period 2006-2014, 925 (25.5%) are classified as industrial firms and 1,700 (52%) as services firms. Firms from electricity, gas and steam supply (D range in the official Slovenian SDK classification), and water supply, sewerage, waste management and remediation (E range) are included in the group of all firms but not in the group of industrial firms. Companies from the whole sample have on average 93 employees. The industrial firms are larger than services firms, which is shown in all variables used (number of employees, value added, labor costs and material costs), except in the

Year	All firms	Manufacturing	Services
2006	3,051	858	1,597
2007	3,285	913	1,723
2008	3,411	949	1,788
2009	3,484	981	1,814
2010	3,418	972	1,783
2011	3,342	952	1,746
2012	3,225	924	1,701
2013	3,064	900	1,611
2014	2,957	879	1,534
Total	29,237	8,328	15,297

TABLE 3: Number of the firms presenting each of the three samples on which further estimations were performed during the period 2006-2014.

value of total fixed assets where the value for the average services firm is higher. Due to the character of services firms (for example, firms in telecommunication, hotel and similar industries are included as well), the distribution of this variable is very dispersed.

Blockholding groups of companies are the bulk of the whole sample in an average year. By excluding government owned and holding companies, which are, as it will be shown later, a subject to a special treatment, they represent 84% of companies in the average year. The majority of these companies (76.5%) belong to the group of firms where the first largest owner (dominant owner) alone holds at least a 50% share of the ownership (group 1). Looking at the values of the total fixed assets variable for this group, high standard deviation is observed. This might be related to different types of owners in this group (foreign owned firms, firms being part of a larger conglomerate structure, single private owner firms, etc.). Among other minimal controlling coalition firms, as depicted in Table 2, the data dispose that the number of firms declines as the number of dominant members in the minimal controlling coalition increases. However, the values of the main variables increase, as such firms are on average bigger. After the minimal controlling coalition reaches four members, firms with such coalitions in our sample disappear and only much larger (non-blockholding) coalitions take place.

The data on government owned and financial holding companies reveals that these are in general larger firms, although a high standard deviation on the variable total fixed assets in the group of government owned firms shows again the presence of high dispersion. We excluded these groups of firms from the blockholding firms due to the special status that both groups of firms have in the Slovenian economy. On one hand, it is well known that Slovenian privatization process was slow and government owned companies still play an important role in the economy. Due to high interference of political parties in the corporate governance of such companies, their efficiency is lower as in the case of private firms (See [9]). On the other hand, "The plan of the quick withdrawing of the state from the economy", reached in 2006, just before the Great Recession, resulted in a non-transparent privatization which in many cases involved financial holding companies (See [27]).We carefully selected companies where one

or two government institutions (government firms) or one or two financial holding institutions (financial holding firms) hold more than 50% share and handled them separately.

The final group consists of firms with non-blocking (much larger) minimal controlling coalitions. We will call them firms with dispersed ownership. The average number of these firms in the period 2006-2014 is 299, which represents a 9% share of the whole sample. They are on average smaller than government owned and financial holding companies, however, they are more dispersed as financial holding companies. They are on average bigger than firms with two-core-member controlling coalition and smaller than firms with three or four-member controlling coalitions.

5. Results

5.1. The Whole Sample

The median values of the estimated parameters of equation (2) are reported in Table 5 and shown in Figure 1. We provide estimates for each year separately due to the turbulent and changing environment during the observation period (We have also calculated pooled and panel regression models. However, due to the changing environment in years of recession, the regression coefficients change substantially in each year of the observation period (see also, [6]). The results of pooled and panel (random effect) regressions are given in the Appendix). Figure 1 shows plotted values of TFP for a median firm in each group of firms for the period 2006-2014. Two main features are observable from the data: 1) groups of firms with a different coalition structure (set of potential minimal controlling coalitions) exhibit substantial differences in productivity which are consistent through the whole observation period; 2) the differences in productivity among groups are getting smaller through the whole period. The deviations among firms with different types of controlling coalitions were the largest in year 2006. However, the results reveal that since then the TFP of the best performing groups of firms has been sharply converging towards the worst performing groups of firms, in a sense that the productivity of the most efficient groups has started to fall down. Besides that it also seems that the process of convergence did not finish in 2014, hence the process may still be running.

It is also shown in Table 5 and in Figure 2 that four groups of firms haven't faced any change in productivity during the analyzed period. Two of them area group of government owned firms and a group of financial holding owned firms. Firms from both groups had much lower productivity before the crisis. However, after the crisis the productivity lag dropped a lot. Financial holding group is a group with the lowest TFP. This is about to be expected due to the problems that the Slovenian government owned firms are facing in their governance and due to the problems in providing a quick privatization of government owned firms before the Great Recession.

However, the differences in TFP among groups of firms might not be as great as it is seen from the above picture, since they lack data on statistical significance. To evaluate statistical relevance (significance) of the differences in productivity, statistical

DOI 10.18502/kss.v1i2.651

		All firms	Manufact.	Services	1	1*	12	12, 1*, *2	12*	123, 123*	Gov.	Hold.	Dispersed
N	Mean	3,249	925	1,700	2,487	164	63	182	36	14	134	103	299
Number of empl.	Mean	93	144	72	91	91	87	47	181	274	258	257	125
	SD	333	323	380	267	306	204	126	334	110	790	446	683
VA	Mean	3,745	5,351	2,959	3,668	3,025	3,038	1,917	6,564	8,876	13,400	10,300	5,477
	SD	14,900	19,300	13,700	12,400	8,109	5,929	6,067	12,000	31,400	37,200	15,800	31,400
TFA	Mean	8,665	7,702	8,358	9,002	5,518	6,355	2,786	11,300	18,000	73,800	31,600	10,900
	SD	99,800	26,300	133,000	111,000	26,000	24,800	9,225	24,500	90,700	462,000	98,100	64,300
LC	Mean	2,195	3,237	1,728	2,154	1,978	1,920	1,209	4,076	5,758	7,164	6,325	2,926
	SD	7,842	9,149	7,961	6,741	5,934	3,918	4,521	7,095	19,700	20,300	10,700	15,100
CGMS	Mean	12,900	15,100	12,300	11,900	10,000	13,200	6,025	20,800	32,900	27,800	35,200	22,300
	SD	68,400	51,900	77,500	46,200	40,200	44,500	12,200	54,100	134,000	111,000	109,000	167,000
1, 2, 3 denote first, second and third largest owners.													
* denotes additional owners, necessary to achieve control.													

Table 4: Description of groups of firms and main variables (VA, TFA, LC, and CGMS values are expressed in 1,000).

Year	1	1*	12	12, 1*, *2	12*	123, 123*	Gov.	Hold.	Dispersed
2006	1.289	0.962	0.776	1.501	0.423	0.191	0.444	0.279	2.006
2007	1.172	1.107	0.744	1.431	0.482	0.529	0.393	0.281	1.773
2008	1.023	0.948	0.656	1.252	0.513	0.286	0.401	0.274	1.428
2009	0.831	0.822	0.628	1.038	0.352	0.263	0.385	0.259	1.014
2010	0.8	0.7	0.534	1.024	0.352	0.324	0.463	0.218	0.918
2011	0.741	0.659	0.594	0.884	0.365	0.31	0.43	0.206	0.902
2012	0.67	0.628	0.589	0.907	0.405	0.288	0.426	0.205	0.831
2013	0.619	0.602	0.541	0.808	0.443	0.237	0.443	0.207	0.788
2014	0.618	0.582	0.591	0.77	0.464	0.209	0.414	0.214	0.735

Table 5: Median values of estimates of production functions coefficients for groups of firms with minimal controlling coalitions for the whole sample of firms (based on equation (2)).

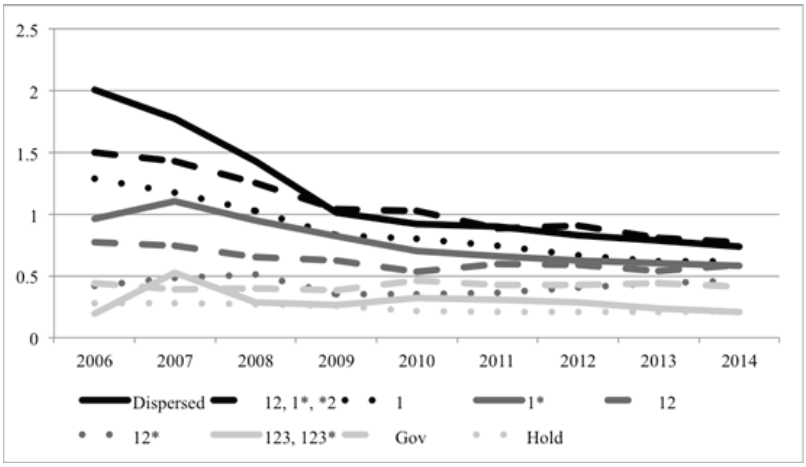

Figure 1: Median values of estimates of production functions coefficients for groups of firms with minimal controlling coalitions for the whole sample of firms (based on equation (2)).

regression analysis has been made. The results are presented in Table 6 and plotted in Figure 2. We defined firms with a dispersed ownership structure as the control group of firms, so regression coefficients present the TFP differences between the corresponding (coalition structure defined) groups of firms and firms with dispersed ownership. Since our focus is not on government owned and financial holdings groups of companies but rather on groups of firms with minimal controlling coalitions as defined in Table 2, we excluded both groups from the presentation in Figure 2.

The results suggest that firms where any of the two-member coalitions out of the three largest owners could be minimal controlling (minimal controlling coalition, 12, 1*, *2) (Firms with the minimal two-member controlling coalition could only be: A) minimal controlling coalition, 1*; B) minimal controlling coalition, 12; or C) minimal controlling coalition, 12, 1*, *2. It is trivial to show that group C could only consist of three possible coalitions 12; 13; and 23), were reaching lower productivity in comparison to the firms with a dispersed ownership structure only in years 2007 and 2008, and were performing better in all the observed years after the crisis outbreak, but in no year the difference was significantly different from zero. Firms where the largest

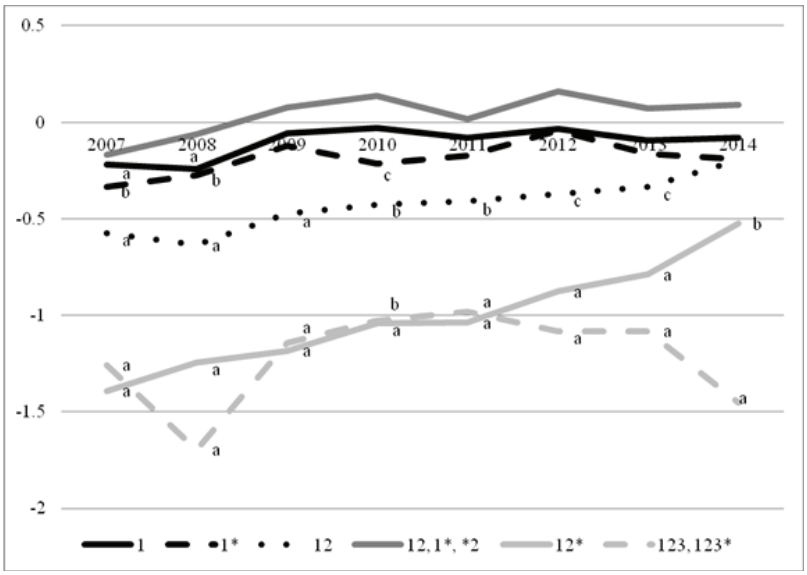

Figure 2: Estimates of production function coefficients for all firms operating in groups of firms with different ownership coalitions for the whole sample of firms based on equation (2). (a), (b), and (c) represent statistical significance of coefficients for the level of risk of 1%, 5%, and 10%.

owner alone holds the majority of ownership (minimal controlling coalition, 1), and firms where the dominant owner needs only one additional owner to form the coalition (minimal controlling coalition, 1*), showed similar behavior and reached slightly lower productivity than firms with a dispersed ownership structure during the whole period 2006-2014, but the difference was significantly different from zero only before the crisis. Lower productivity was also reached by the firms where the first two largest owners alone form the minimal controlling coalition (minimal controlling coalition, 12), however, their productivity has been slowly converging in the last years. The group of firms where the first two largest owners need one additional owner to form the coalition (minimal controlling coalition, 12*) was the next among coalition structure groups in (falling) productivity order, but with the most visible convergence through all the years. Firms where at least three owners are needed to form the minimal controlling coalition (minimal controlling coalition,123, 123*) performed the worst.

A very simple heuristic conclusion could be made regarding productivity performance of blockholding groups of firms. Namely, productivity performance decreases with the number of members of minimal controlling coalitions if the alphabetic principle of ordering is used for the number of (dominant and non-dominant) owners in the minimal controlling coalition. Productivity performance decreases with the increasing number of minimal coalition members ordering groups first by dominant and then by non-dominant owners! It means that groups without dominant owners are better in productivity performance than all other groups of firms; groups of firms with one dominant owner are better than groups with more than one dominant owner, etc. Among groups of firms with the same number of dominant owners the best are those with no non-dominant owner, followed by groups with one non-dominant owner, the next are groups with two non-dominant owners, etc.

	2007	2008	2009	2010	2011	2012	2013	2014
VARIABLES	Omega	Omega	Omega	Omega	Omega	Omega	Omega	Omega
1	-0.221[a]	-0.243[a]	-0.0553	-0.0296	-0.0792	-0.0338	-0.0946	-0.0818
	(0.0824)	(0.0830)	(0.0798)	(0.0800)	(0.0832)	(0.0857)	(0.0829)	(0.0819)
1*	-0.333[b]	-0.275[b]	-0.122	-0.214[c]	-0.173	-0.0455	-0.163	-0.191
	(0.135)	(0.134)	(0.130)	(0.128)	(0.131)	(0.130)	(0.126)	(0.124)
12	-0.574[a]	-0.636[a]	-0.472[a]	-0.426[b]	-0.410[b]	-0.371[c]	-0.333[c]	-0.195
	(0.186)	(0.193)	(0.180)	(0.181)	(0.183)	(0.191)	(0.181)	(0.179)
12, 1*, *2	-0.168	-0.0616	0.0779	0.139	0.0180	0.158	0.0703	0.0916
	(0.125)	(0.128)	(0.125)	(0.123)	(0.129)	(0.131)	(0.127)	(0.123)
12*	-1.391[a]	-1.244[a]	-1.183[a]	-1.041[a]	-1.037[a]	-0.875[a]	-0.788[a]	-0.526[b]
	(0.259)	(0.270)	(0.229)	(0.222)	(0.227)	(0.215)	(0.224)	(0.218)
123, 123*	-1.258[a]	-1.695[a]	-1.145[a]	-1.028[b]	-0.979[a]	-1.084[a]	-1.082[a]	-1.452[a]
	(0.353)	(0.380)	(0.350)	(0.410)	(0.357)	(0.376)	(0.366)	(0.383)
Gov.	-1.319[a]	-1.187[a]	-1.022[a]	-0.778[a]	-0.734[a]	-0.718[a]	-0.626[a]	-0.577[a]
	(0.126)	(0.126)	(0.119)	(0.118)	(0.119)	(0.118)	(0.110)	(0.106)
Hold.	-1.433[a]	-1.324[a]	-1.305[a]	-1.281[a]	-1.275[a]	-1.213[a]	-1.061[a]	-1.069[a]
	(0.136)	(0.135)	(0.132)	(0.135)	(0.139)	(0.139)	(0.134)	(0.131)
Constant	-8.670[a]	-8.796[a]	-9.157[a]	-9.232[a]	-9.258[a]	-9.377[a]	-9.424[a]	-9.502[a]
	(0.0773)	(0.0782)	(0.0748)	(0.0752)	(0.0783)	(0.0810)	(0.0784)	(0.0777)
Observation	3,215	3,314	3,358	3,279	3,208	3,095	2,913	2,829
R-squared	0.077	0.066	0.059	0.050	0.045	0.044	0.039	0.041

(a), (b), and (c) represent statistical significance of coefficients for the level of risk of 1%, 5%, and 10%, Standard errors are in parentheses.

Table 6: OLS regression coefficient assessment for all firms operating in groups of firms with different ownership coalitions for the whole sample of firms based on equation (2).

5.2. Industry vs. Services Sector

To test the robustness of the results two additional experiments have beenmade. Firstly, we ran the same regressions for the manufacturing firms and, separately, for the services firms. Secondly, we estimated the same productivity model also in a pool and panel version for the whole period and all firms. In all tests of robustness we kept the firms with a dispersed ownership structure as the control group, so that TFP of other groups was compared to TFP of the dispersed group of firms. In what follows, we comment only the results of the yearly's OLS regressions for manufacturing and services firms, while pool and panel model results are presented without comments in the Appendix.

In Table 7 we present the results of OLS regression performed on the sample of manufacturing firms, which we plotted in Figure 3. Firms with two-member minimal controlling coalition, such that all possible coalitions out of the first three greatest owners can be formed (minimal controlling coalition, 12, 1*, *2), again outperformed dispersed group of firms by reaching higher TFP levels during the observed period of

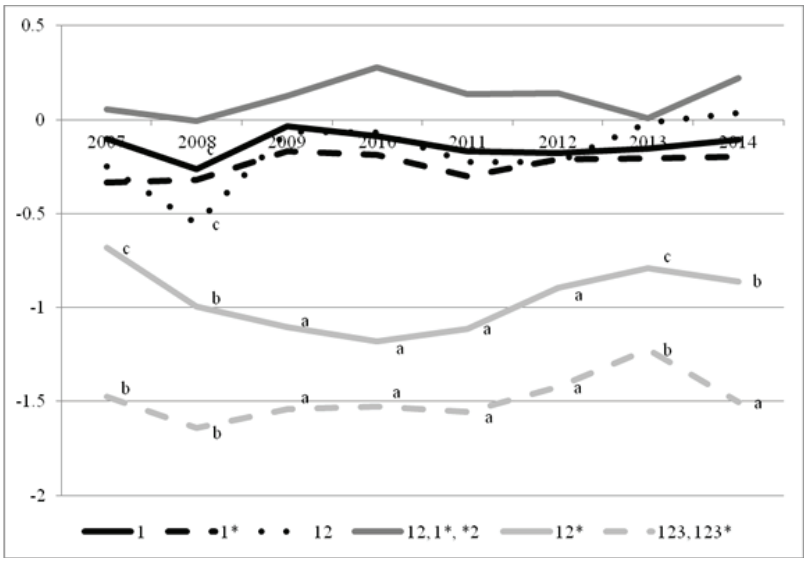

Figure 3: Estimates of production function coefficients for manufacturing firms operating in groups of firms with different ownership coalitions for the whole sample of firms based on equation (2). (a), (b), and (c) represent statistical significance of coefficients for the level of risk of 1%, 5%, and10%.

time, except in year 2008, when their achieved level of TFP was slightly lower. However, the difference is again not significant. Firms having only one- member minimal controlling coalition (minimal controlling coalition, 1), joined the two other groups of firms – the one in which the dominant owner needs only one additional owner to form the coalition (minimal controlling coalition, 1*), and the one in which the first two largest owners alone form the minimal controlling coalition (minimal controlling coalition, 12) – by displaying a similar pattern of behavior during the observed period of time. All three groups of firms were namely achieving marginally lower productivity in comparison to firms with a dispersed ownership structure, apart from the year 2014, when firms having first two largest owners alone form the minimal controlling coalition (minimal controlling coalition, 12) outperformed the controlled group of firms by attaining higher productivity.

A similar pattern of performance can also be noticed comparing group of firms having three- member minimal controlling coalitions, with (the first) two largest dominant owners (minimal controlling coalition, 12*) and group of four-member minimal controlling coalitions with three largest dominant owners (minimal controlling coalition, 123, 123*). They both performed worse than firms with a dispersed ownership structure during 2006-2014 and without any visible convergence in the recovery period of the economy.

In Table 8 we present the results of OLS regression performed on the subsample of services firms, which we plotted in Figure 4. The group of firms, for which we claimed that was in total the most efficient one, while observing the results received from the whole sample of firms and from the manufacturing firms (minimal controlling coalition, 12, 1*, *2), this time outran the TFP of controlled group only in years 2010 and 2012. This means that the group of firms where the first three owners can form the minimal controlling two-member coalitions in all three combinations, turned out to be less efficient

	2007	2008	2009	2010	2011	2012	2013	2014
VARIABLES	Omega_ma	Omega_ man	Omega_ man	Omega_ man	Omega_ man	Omega_ man	Omega_ man	Omega_ man
1	-0.100	-0.263[c]	-0.0341	-0.0883	-0.168	-0.178	-0.155	-0.106
	(0.147)	(0.147)	(0.133)	(0.136)	(0.141)	(0.149)	(0.136)	(0.144)
1*	-0.334	-0.320	-0.169	-0.188	-0.303	-0.213	-0.207	-0.197
	(0.234)	(0.231)	(0.218)	(0.214)	(0.219)	(0.218)	(0.202)	(0.214)
12	-0.248	-0.553[c]	-0.0625	-0.0681	-0.227	-0.227	-0.0168	0.0348
	(0.329)	(0.327)	(0.300)	(0.297)	(0.330)	(0.380)	(0.315)	(0.321)
12, 1*, *2	0.0548	-0.00751	0.125	0.280	0.135	0.141	0.00793	0.221
	(0.253)	(0.260)	(0.239)	(0.237)	(0.244)	(0.247)	(0.227)	(0.237)
12*	-0.682[c]	-0.995[b]	-1.105[a]	-1.181[a]	-1.112[a]	-0.894[a]	-0.790[c]	-0.860[b]
	(0.375)	(0.415)	(0.326)	(0.313)	(0.329)	(0.327)	(0.412)	(0.400)
123, 123*	-1.475[b]	-1.639[b]	-1.540[a]	-1.526[a]	-1.554[a]	-1.424[a]	-1.224[b]	-1.503[a]
	(0.600)	(0.664)	(0.523)	(0.573)	(0.524)	(0.516)	(0.512)	(0.522)
Gov.	-1.796[a]	-1.804[a]	-1.686[a]	-1.709[a]	-0.948[b]	-1.024[b]	-1.063[a]	-0.541
	(0.406)	(0.402)	(0.365)	(0.401)	(0.396)	(0.410)	(0.354)	(0.343)
Hold.	-1.500[a]	-0.991[a]	-0.833[a]	-0.846[a]	-0.960[a]	-0.822[a]	-0.755[a]	-0.687[a]
	(0.251)	(0.222)	(0.215)	(0.232)	(0.239)	(0.224)	(0.218)	(0.205)
Constant	-9.895[a]	-9.886[a]	-10.28[a]	-10.26[a]	-10.24[a]	-10.30[a]	-10.40[a]	-10.47[a]
	(0.138)	(0.138)	(0.124)	(0.127)	(0.133)	(0.141)	(0.129)	(0.137)
Observation	890	921	946	934	915	891	857	840
R-squared	0.072	0.058	0.058	0.057	0.046	0.039	0.035	0.035
(a), (b), and (c) represent statistical significance of coefficients for the risk levels of 1%, 5%, and 10%, Standard errors are in parentheses.								

Table 7: OLS regression coefficient assessment for manufacturing firms operating in groups of firms with different ownership coalitions for the whole sample of firms based on equation (2).

than firms with a dispersed ownership structure in all the other years. However, the difference was significant only in 2007.Comparable movement can be spotted for the group of firms with a single dominant owner (minimal controlling coalition,1), however, it did not exceeded the level of TFP control group of firms achieved in any year during the period 2006-2014, although the difference was significant only in 2007. All other groups lag in productivity behind the dispersed group of firms even further.

It is worth noting the interesting difference in performance of the groups of firms with larger minimal coalitions. Namely, threemember minimal coalitions with two dominant members fell behind dispersed groups of firms considerably at the beginning of the period but later strongly converged to performance of groups of firms with much smaller minimal controlling collations. On the other hand, firms with at least three dominant members of minimal controlling coalitions (minimal controlling coalition, 123, 123*) had a much better performance at the beginning of the observation period, while later they strongly diverged from the best performers.

	2007	2008	2009	2010	2011	2012	2013	2014
VARIABLES	Omega_ser	Omega_ser	Omega_ser	Omega_ser	Omega_ser	Omega_ser	Omega_ser	Omega_ser
1	-0.260[b]	-0.179	-0.0914	-0.0265	-0.0209	-0.0153	-0.0796	-0.0890
	(0.113)	(0.114)	(0.113)	(0.111)	(0.113)	(0.118)	(0.117)	(0.113)
1*	-0.370[c]	-0.287	-0.200	-0.295	-0.192	-0.0594	-0.347[c]	-0.337[c]
	(0.193)	(0.191)	(0.184)	(0.186)	(0.181)	(0.186)	(0.187)	(0.178)
12	-0.633[b]	-0.519[c]	-0.759[a]	-0.456[c]	-0.336	-0.340	-0.350	-0.174
	(0.262)	(0.276)	(0.247)	(0.248)	(0.231)	(0.248)	(0.247)	(0.240)
12, 1*, *2	-0.317[b]	-0.0808	-0.0343	0.0387	-0.0273	0.0370	-0.0244	-0.0437
	(0.162)	(0.164)	(0.166)	(0.160)	(0.164)	(0.171)	(0.168)	(0.160)
12*	-1.788[a]	-1.322[a]	-1.229[a]	-0.867[a]	-1.044[a]	-1.050[a]	-0.909[a]	-0.479
	(0.364)	(0.357)	(0.332)	(0.321)	(0.315)	(0.310)	(0.300)	(0.296)
123, 123*	-0.345	-1.519[a]	-1.330[b]	-0.929	-0.941	-1.193[c]	-1.464[b]	-2.308[a]
	(0.489)	(0.494)	(0.622)	(0.770)	(0.587)	(0.672)	(0.569)	(0.684)
Gov.	-1.984[a]	-1.778[a]	-1.711[a]	-1.500[a]	-1.700[a]	-1.653[a]	-1.629[a]	-1.578[a]
	(0.263)	(0.253)	(0.235)	(0.233)	(0.232)	(0.237)	(0.224)	(0.220)
Hold.	-1.172[a]	-1.275[a]	-1.116[a]	-1.002[a]	-0.927[a]	-0.831[a]	-0.780[a]	-0.764[a]
	(0.193)	(0.194)	(0.188)	(0.192)	(0.196)	(0.212)	(0.198)	(0.198)
Constant	-8.350[a]	-8.565[a]	-8.839[a]	-8.956[a]	-9.032[a]	-9.102[a]	-9.148[a]	-9.235[a]
	(0.106)	(0.107)	(0.106)	(0.105)	(0.107)	(0.112)	(0.110)	(0.108)
Observations	1,686	1,737	1,750	1,722	1,673	1,624	1,521	1,466
R-squared	0.069	0.063	0.063	0.048	0.053	0.048	0.055	0.053
(a), (b), and (c) represent statistical significance of coefficients for the level of risk of 1%, 5%, and 10%,								
Standard errors are in parentheses.								

Table 8: OLS regression coefficient assessment for all services firms operating in groups of firms with different ownership coalitions for the whole sample of firms based on equation (2).

6. Discussions and Conclusions

Studies have shown mixed results about the role of blockholdings in corporate governance subject to organisational development. Is it a substitute for legal protection in institutionally poor environments [20, 30], or is it a foundation for strategic coordination between different stakeholders [4, 7]? Moreover, different theoretical models on multiple controls still did not come to an end on which mechanism could best provide the resolution of the conflict which exists between several large and minority owners. Since blockholding (multiple controls) in the reality does exist and many studies, such as studies of well-developed countries, including Scandinavia and Germany, show that it actually serves different functions [13, 15, 19], we took a different approach to analyze these questions in our paper. By defining minimal controlling coalitions and taking a heuristic approach in applying it to a large base of Slovenian firms in the period 2006-2014, we evaluated relative efficiency of each minimal controlling coalition versus the control group, i.e. firms with diversified ownership.

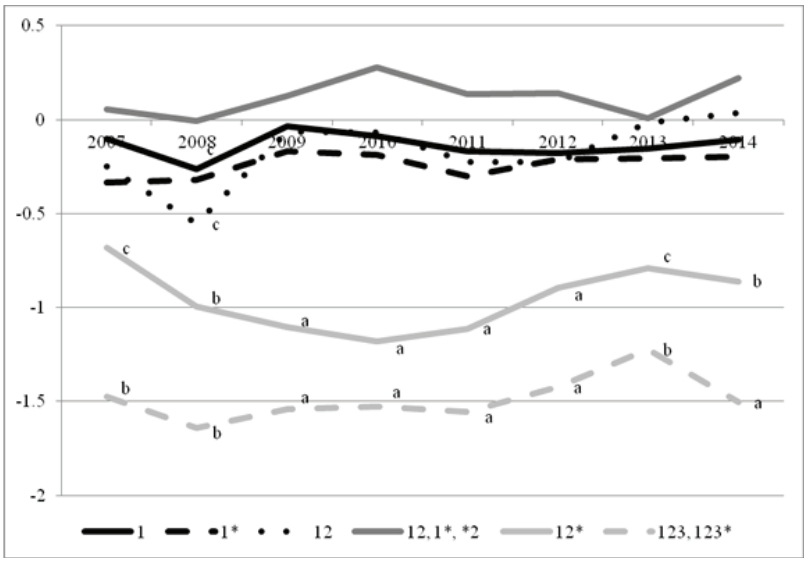

Figure 4: Estimates of production function coefficients for services firms operating in groups of firms with different ownership coalitions for the whole sample of firms based on equation (2). (a), (b), and (c) represent statistical significance of coefficients for the level of risk of 1%, 5%, and 10%.

Our research shows that firms with different minimal controlling coalitions exhibit substantial differences in productivity through the whole period 2006-2014, however, the differences were systematically much larger in the boom than in the bust period. Also, firms owned by the government or financial holding institutions perform with the lowest productivity among all groups of firms.

Among the groups of firms consisting of less than or equal to four-member minimal controlling coalition, we found that only those firms which have two-member minimal controlling coalitions, where all possible coalitions out of the first three largest owners can be formed (it means that none of the owners is dominant, that is indispensable), reachedsimilar TFP in comparison to firms with a dispersed ownership structure.

An important conclusion from our research is that productivity of group of firms systematically decreases with the number of dominant owners in the minimal controlling coalitions. This is documented for all studied groups of firms. But the lag behind the control (dispersed) group of firms is relatively small for groups of firms in which minimal controlling coalition has one or two members, with at least one dominant member. Those groups of firms are highly present in our sample of firms during the whole period of time. However, the last two groups of firms, with three or four-member controlling coalitions and at least three dominant owners performed considerably worse.

This special ranking of groups of firms according to minimal controlling coalitions is appealing. It shows that there is not only a choice between two mechanisms in limiting private benefits of control and achieving high efficiency, dispersed ownership and monitoring of decisions by outside owners, but also that a particular design of multiple controls could bring to superior results. In particularly, if three members of the coalition compete for efficient control in the firm, allowing each other to build a winning coalition of two, based on superiority of strategic proposals, the outcomes,

as shown in our study, are at least in the same range as achieved by firms with dispersed ownership. Only such ownership structure namely enables that control coalition is cooperative (no owner is indispensable), as well as that the decision set is large enough. Obviously this group of firms has the smallest blockholding coalition structure which generates cooperation between members of coalition as well as large enough decision making space (brought about by the number of different potential controlling coalitions).The same logic explains also the slight underperformance of the group of firms with one controlling dominant owner, which is the third best performer among the studied groups of firms. Such one-member controlling coalition, namely, enables efficient implementation of decisions (because bargaining with other members of coalition is not necessary), which increases efficiency, but less efficient decision making because of a much smaller decision set caused by limited information available to a single owner.

We also examine the extent of diversity in productivity between groups of firms based on the constitution of minimal controlling coalitions for industrial and services sectors. Robustness testing additionally supported the above results. While observing only manufacturing firms, the results revealed that the group of firms having two-member minimal controlling coalitions without any dominant owners outperformed the control (dispersed) group of firms in almost all years. All other groups of firms performed either marginally worse or much worse that the control group of firms. For the firms from services sectors, productivity order of (minimal controlling coalition) groups of firms is only slightly changed. Namely, the group of firms having two-member minimal controlling coalitions without core owners was almost in all years outperformed by the control dispersed group of firms, although the difference was not significant. But even in services sectors other studied (minimal controlling coalition) groups of firms reached lower TFP in comparison to the group of firms with a dispersed ownership structure.

In summing up, three results of our study are crucial. Firstly, it is documented that blockholding ownership could not outperform dispersed ownership by nontrivial margin. At best, it could be of the same performance or slightly better. But it could also be considerably worse. Namely, only an optimal blockholding structure (two-member coalition without any dominant owners) could attain short term efficiency of dispersed ownership. Secondly, the paper empirically documents that short term efficiency of controlling coalition decreases with the number of the dominant owners and increases with the number of potential controlling (minimal) coalitions with different dominant owners. Heuristically, the first effect results from the less efficient execution of the chosen strategies (decisions), caused by the non-cooperativeness (bargaining) of the controlling coalition dominant owners, while the second effect results from larger information on the possible decision (strategy) set, generated by a larger number of potential controlling coalitions with different core owners. Thirdly, empirical evidence shows that none of the studied controlling coalition types of firms was able to avoid huge boom-bust productivity swing. Future research could build from this study and further investigate the dynamics behind the above mentioned effects. Differences in

strategic performances of different controlling coalition (ownership) structure have to be tackled as well.

7. Acknowledgements

Research in this paper was in part supported by the Slovenian Research Agency's grant No. J5 - 227 and No.JP - 4169.

8. Appendix

	All firms		Manufacturing		Services	
	Pooled	Panel	Pooled	Panel	Pooled	Panel
VARIABLES	Omega	Omega	Omega	Omega	Omega	Omega
1	-0.126[a]	-0.101[a]	-0.129[a]	-0.0888[c]	-0.128[a]	-0.139[a]
	(0.0277)	(0.0311)	(0.0477)	(0.0459)	(0.0381)	(0.0478)
1*	-0.217[a]	-0.154[a]	-0.255[a]	-0.222[a]	-0.292[a]	-0.180[a]
	(0.0439)	(0.0438)	(0.0739)	(0.0671)	(0.0626)	(0.0685)
12	-0.462[a]	-0.200[a]	-0.208[c]	-0.150[c]	-0.481[a]	-0.143[c]
	(0.0621)	(0.0543)	(0.108)	(0.0814)	(0.0838)	(0.0864)
12, 1*, *2	0.00452	-0.0914[b]	0.119	-0.0746	-0.102[c]	-0.219[a]
	(0.0424)	(0.0431)	(0.0818)	(0.0710)	(0.0548)	(0.0629)
12*	-1.066[a]	-0.211[a]	-0.969[a]	-0.200[b]	-1.141[a]	-0.261[b]
	(0.0793)	(0.0635)	(0.120)	(0.0857)	(0.111)	(0.101)
123, 123*	-1.272[a]	-0.212[a]	-1.598[a]	-0.146	-1.180[a]	-0.260[b]
	(0.123)	(0.0777)	(0.188)	(0.104)	(0.186)	(0.119)
Gov.	-0.925[a]	-0.352[a]	-1.362[a]	-0.0505	-1.757[a]	-0.624[a]
	(0.0398)	(0.0699)	(0.130)	(0.129)	(0.0802)	(0.127)
Hold.	-1.280[a]	-0.379[a]	-0.971[a]	-0.270[a]	-1.021[a]	-0.384[a]
	(0.0455)	(0.0501)	(0.0759)	(0.0712)	(0.0656)	(0.0793)
2008	-0.163[a]	-0.180[a]	-0.124[b]	-0.155[a]	-0.184[a]	-0.188[a]
	(0.0288)	(0.0124)	(0.0506)	(0.0200)	(0.0390)	(0.0180)
2009	-0.354[a]	-0.333[a]	-0.308[a]	-0.296[a]	-0.381[a]	-0.354[a]
	(0.0286)	(0.0125)	(0.0501)	(0.0199)	(0.0390)	(0.0181)
2010	-0.396[a]	-0.360[a]	-0.331[a]	-0.297[a]	-0.428[a]	-0.397[a]
	(0.0289)	(0.0126)	(0.0503)	(0.0201)	(0.0392)	(0.0182)
2011	-0.461[a]	-0.400[a]	-0.378[a]	-0.321[a]	-0.501[a]	-0.446[a]
	(0.0291)	(0.0128)	(0.0507)	(0.0203)	(0.0395)	(0.0185)
2012	-0.525[a]	-0.444[a]	-0.434[a]	-0.368[a]	-0.554[a]	-0.489[a]
	(0.0294)	(0.0129)	(0.0511)	(0.0205)	(0.0399)	(0.0187)
2013	-0.619[a]	-0.497[a]	-0.516[a]	-0.424[a]	-0.664[a]	-0.544[a]
	(0.0300)	(0.0132)	(0.0518)	(0.0208)	(0.0408)	(0.0192)
2014	-0.680[a]	-0.550[a]	-0.532[a]	-0.464[a]	-0.751[a]	-0.623[a]
	(0.0303)	(0.0134)	(0.0521)	(0.0210)	(0.0413)	(0.0195)
Constant	-8.747[a]	-8.785[a]	-9.888[a]	-9.928[a]	-8.431[a]	-8.437[a]
	(0.0300)	(0.0352)	(0.0519)	(0.0556)	(0.0411)	(0.0517)
Observations	28,177	28,177	8,03	8,03	14,728	14,728
R-squared	0.082	3,911	0.071	1,063	0.090	2,035
(a), (b), and (c) represent statistical significant of coefficients for the level of risk of 1%, 5%, and 10%,						
standard errors are in parentheses.						

TABLE 9: Pooled and panel (random effect) regression for all firms, manufacturing firms, and services firms operating in groups of firms with different ownership coalitions for the whole sample of firms based on equation 2.

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