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Performance of closely held firms in Russia: evidence from firm-level data*

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This paper evaluates the impact of ownership concentration on firm performance in a weak institutional environment. Specifically, using new survey evidence, we seek to appraise quantitatively the performance of block-holder-controlled firms in Russia and to identify, within the domain of corporate governance theory, factors that may explain such performance. We find evidence of negative association between the size of the dominant owners' shareholding and performance parameters such as investment, capacity utilization, and profitability. At the same time, we establish that control structures with multiple, large shareholders increase efficiency. The ambiguity of the effects of ownership concentration suggests that country-specific factors play an important role.

Keywords: corporate governance; ownership structures; performance; Russia

1. Introduction and research focus

The issue of an efficient ownership structure is universally important, in particular, for transition economies in Central and Eastern Europe that face the challenge of achieving accelerated progress in order to narrow the gap with other European economies. In this paper, we investigate the situation in Russia, the largest of the post-communist countries. In Russia, as in other transition economies, great hopes were originally placed on the ability of mass privatization to create 'responsible' owners and to produce a foundation on which economic reconstruction and growth would flourish (Chubais and Vishnevskaya 1993). These expectations have failed to become a reality because restructuring in privatized firms has been slow, fixed production assets show a significant rate of wear and innovation activity is low, as is the competitiveness of domestic goods. In this context, the inability of new owners to lead has been consistently identified as one of the causes of the poor economic performance of Russian companies (Nellis 1999; Desai and Goldberg 2000).

Ownership structure may be seen as a part of the problem. Privatization was intended to create widely dispersed ownership along the lines of the Anglo-Saxon model. Instead, within just a decade, a different pattern has emerged. Ownership of Russian firms is characterized by the following three features: (a) it is highly concentrated (block-holder ownership); (b) dominant (block-holder) owners seek direct control over the firm by assuming managerial and board positions; (c) insiders prevail among the dominant shareholders. Theory makes a number of predictions regarding the performance of companies as a reflection of their ownership structures and the

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allocation of control. In conceptual terms, when block-holder ownership is included into the equation, the focus of the debate about ownership and control shifts from a two-way conflict between management and shareholders, which has been the centre of attraction ever since the publication of the classical work by Berle and Means, to a three-way conflict between block-holders, managers, and minority investors (Berglöf and von Thadden 1999). The literature argues that concentrated ownership reduces the classical owner–manager problem, but at the same time increases the possibility of an agency conflict between controlling shareholders and minority shareholders, in particular, when legal protection of outside investors is weak and transparency is low, *i.e.*, when firms operate in a weak institutional environment (Fama and Jensen 1983; Shleifer and Vishny 1997; Burkart, Panunzi, and Shleifer 2003).

There is substantial empirical literature on the impact of block-holder ownership on firm efficiency (Morck, Stangeland, and Yeung 2000; Anderson and Reeb 2003; Burkart, Panunzi, and Shleifer 2003; Caselli and Gennaioli 2003; Bartholomeusz and Tanewski 2006; Villalonga and Amit 2006). The findings, however, are not conclusive and the range of results is quite wide. For example, in the USA, the studies by Demsetz and Villalonga (2001) and Holderness (2003) reveal no relationship between ownership structure and performance, whereas Anderson and Reeb (2003) were able to identify noticeable gains from concentrated ownership in family-controlled firms. In Europe, Maury (2006), using a sample of 1672 non-financial firms from 13 Western European countries, shows that family control is responsible for 7% higher valuations and 16% higher profitability (return on assets) in relative terms when compared with firms controlled by non-family owners. By contrast, Kirchmaier and Grant (2005) maintain that, at least for Germany, Spain, and France, concentrated ownership is not the form of ownership that is associated with the best performing companies.

Multiplicity of results, in our view, reflects difficulties related to the choice of method and data. Attributing firms according to the type of control can be ridden with difficulties.¹ Nonetheless, despite the diversity of empirical findings, the soundness of major theoretical postulates hardly raises any doubts. There seems to be general agreement that the degree to which interests of block-holder owners are aligned with the interests of minority shareholders, their resolution to maintain control over the firm, the forms in which they seek to extract private benefits of control and their commitment to the firm would depend on the environment in which they operate, in particular, institutional settings and capital markets (La Porta, Lopez-de-Silanes, and Shleifer 1999; Johnson et al. 2000; Burkart, Panunzi, and Shleifer 2003; Bhattacharya and Ravikumar 2001). Conceptual models normally assign to block-holders the qualities of rational risk-averse economic agents, assuming that they would be interested in maintaining control as long as benefits outweigh costs. Market failings and institutional shortcomings can act as constraints, severely limiting strategic options available to block-holders and on occasion forcing them into a particular mode of operational behaviour.

In this paper, we set out to evaluate the impact of ownership structure on company performance in a weak institutional environment, using Russia as an example. Russian institutional crisis is well documented in the literature (Black, Kraakman, and Tarasova 1999; Blanchard and Kremer 1997; Kuznetsov and Kuznetsova 2003a,b; Sperling 2000). During the 1990s, institutional weakness revealed itself mostly through the almost total absence of any contractual discipline. Wage arrears, non-payment of taxes, forced and fictitious bankruptcies, fraud, and corruption all established themselves as characteristic features of the Russian business environment in that period. There is a sizeable body of literature scrutinizing conceptual aspects of corporate governance in Russia (Aukutsionek et al. 1998; Berglöf and von Thadden 1999; Black 2001; Brown 1998; Fox and Heller 1999; Franklin 2005; Krivogorsky 2000; Kuznetsov and Kuznetsova 2003a,b; Muravyev

2003; Perotti and Gelfer 2001), but empirical evidence is conspicuously scarce. We seek to amend this situation by, first, providing a quantitative appraisal of the performance of block-holder-controlled firms in Russia; second, we seek to identify within the domain of corporate governance theory factors that may explain such performance. To preview our findings, we find evidence of negative association between the size of the dominant owners' shareholding and performance parameters such as profitability, investment, and capacity utilization. Our results, therefore, are in contradiction to a substantial body of the literature that has established a positive link between ownership concentration, in particular, in the guise of a family firm, and performance. At the same time, in line with Bennedsen and Wolfenzon (2000), we establish that control structures with multiple large shareholders increase efficiency. We believe that our findings reflect the insecurity of dominant shareholders in Russia in a situation where the legal system offers inadequate protection to legitimate owners, even when they hold a majority stake.

The paper is organized as follows: Section 2 reviews the literature on corporate governance and ownership relevant to our research question and present some stylized facts on corporate ownership in Russia. Sections 3 and 4 outline data and methodology. Section 5 summarizes the findings and draws conclusions.

2. Background to the study

Following the groundbreaking research by La Porta et al. (1997, 1998, 1999), one of the most discussed topics in literature has been the impact of legal arrangements on ownership concentration and corporate governance. Recently, in what Castaneda (2006) describes as the 'second generation' of studies, there has been a growing recognition that the legal framework, important as it is, is only one of the manifestations of a more inclusive category, which may be characterized as the institutional context. This approach implies that investors' decisions are shaped by the institutional environment and therefore differ from one economy to another. Institutions are action frameworks (laws, regulations, traditions, routines, customs, etc.) which constitute the procedures and practices that facilitate the resolution of economic conflicts and thus offer a solid and cost-effective foundation for market transactions by providing economic actors with universal and explicit rules that allocate responsibility and set up behavioural boundaries (North 1990). If the mechanisms of conflict resolution are well developed, the presence of large shareholders may offer benefits to small shareholders in the form of increased returns on investment and in the increase of value of the firm itself. Thus, in principle, firms with large dominating shareholders may achieve a closer monitoring of managers' performance because, on the one hand, for such shareholders the cost of monitoring per share is low compared to small owners whereas, on the other hand, they are more likely to associate their own interests with the interests of the firm they control. Also, when block-holders are unable to dilute their holdings, there are strong incentives to 'supervise' in a manner consistent with shareholders' long-term commitments (Burkart, Panunzi, and Shleifer 2003).

A weak institutional context can break this concurrence of interests of small shareholders and block-holders. The advantages that a dominant position gives to block-holders will not be balanced any more by means of protection that strong institutions offer to small shareholders, encouraging in dominant owners expropriating behaviour. The way in which benefits of control are extracted offers a good example of the link between institutional provisions and owners' behaviour. Such benefits come in two forms (Burkart, Panunzi, and Shleifer 2003; Kirchmaier and Grant 2005). One has to do with the 'amenity potential' of control and refers to the non-pecuniary private benefits, such as the social prestige of running a firm, that does not come at the expense of

profits.² The other benefit is ‘tunnelling’ and involves using control to extract material benefits through direct expropriation of outside investors and minority shareholders. This may range from transactions with related parties and transfer prices to outright theft (Johnson et al. 2000) and is possible in a systematic form only if outside investors and minority shareholders do not have adequate legal protection and the rules regarding the transparency and monitoring of business are either weak or not enforced. In other words, ‘tunnelling’ thrives in economies besieged with institutional failings.

The literature also indicates that, in such economies, formal income rights become less important for the allocation of value than control (Shleifer and Vishny 1997; Modigliani and Perotti 1997). Equally, the market for corporate control becomes less important than internal dealings (Mayer 1999). A weak institutional context both encourages dominant owners to internalize moral hazard and offers prospects to insulate them from disciplinary sanctions. This is best achieved if dominant shareholders either occupy managerial and board positions themselves or entrust these positions to close associates. At the same time, by internalizing moral hazard, closely held firms may get a relative performance advantage in economies in which the limitations of institutional settings make it difficult to arrange transactions on the basis of ‘generalized trust’ rather than ‘particularized trust’, to use the terms pioneered by Yamigichi and Yamigichi (1994). Institutions create the environment in which participants in a transaction by default have reasonable trust in most people rather than only the people they know personally. This reduces transaction costs in as much as confidence in the ability of institutions to enforce contracts and enforce property rights makes unnecessary meeting the cost of building the specific relationship of trust between individual members of the society, organizations, and firms (Uzzi 1997). If, however, institutions perform poorly, then ‘particularized trust’ grows in importance at the expense of ‘generalized trust’.

One implication particularly relevant to transition economies is that a lack of ‘generalized trust’ pushes most control transactions outside the official exchanges (Berglöf and von Thadden 1999). This effect is multiplied by the fact that capital markets in such economies are relatively undeveloped. They are small in size, have a liquidity problem, and offer only a limited range of investment opportunities. These constraints severely limit the strategic options available to block-holders, especially motives and ability to disinvest (Bhattacharya and Ravikumar 2001; Caselli and Gennaioli 2003). First, undeveloped markets make it problematic and costly to pull large investments out of the firm and diversify a portfolio. Second, if the owners want to transfer some of their wealth from shares into cash, they may find it difficult to sell the stock, provoking them into maintaining stock, and using their position of control to transfer company assets into cash through transactions with related parties, transfer pricing, excessive salaries, etc., *i.e.*, ‘tunnelling’.

Summarizing what the literature has to say about ownership and control in institutionally weak economies, we offer up with the following profile. The interests of large owners and small owners are likely to be disentangled. A lack of generalized trust and ineffective provisions for conflict resolution will stimulate block-holders to impose tight control over the firm and get directly involved in management in order to create conditions for realizing the benefits of control (entrenchment). They may not be particularly concerned with the market value of the firm because of the inefficiency of capital markets. Instead they may choose straightforward asset expropriation.

This analysis gives some pointers regarding the likely behavioural pattern of block-holders in economies such as Russia, but falls short of addressing the question as to whether or not they would be interested in improving the firm performance. In principle, their choice should depend on the strength of their commitment to their investment. It is not inevitable that institutional inefficiencies should necessarily undermine such commitment. There is a body of literature that points out that

supposedly inefficient ownership structures can, in fact, be efficient in the context of their specific institutional environment (Bebchuk and Roe 1999; Roe 2002; Stulz 2005). Ineffective market mechanisms are likely to be detrimental to the welfare of market-trading shareholders and their willingness to provide financing, but block-holders may be nonetheless sufficiently interested in keeping and increasing their private benefits to become concerned with the long-term growth of the firm. In fact, research points out that inadequate institutions and failures in financial markets contribute to ownership concentration and the longevity of closely held firms such as those owned by families (Castaneda 2006; Thomsen, Pedersen, and Kvist 2006).

In summary, available theory provides us with a useful insight into the general motives, constraints, and choices that affect block-holders exposed to ineffective institutions but is less specific when dealing with the impact of concentrated ownership on firm performance because such impact is very sensitive to actual conditions that exist in a particular institutional environment. This increases the cognitive value of country-focused research. In this paper, our aim is to contribute to knowledge by evaluating the effects of ownership concentration on the firm's performance in Russia as an example of a large transition economy.

3. Stylized facts on ownership structure in Russia

In Russia, institutional settings provide a vivid case of a business environment which makes control more important than formal income rights because of the weak legal protection of shareholders, underdeveloped capital markets, and the restricted role of institutional investors (Vasilyev 1999). Throughout the immediate post-privatization period, shares did not offer any real benefits to most shareholders as they had low liquidity and dividends were not paid. In addition, corporatization coincided with a period of a profound economic crisis in the country which had, as its most notable manifestations, demonetization and barterisation of the economy. Both circumstances had a long-lasting impact on corporate governance and set preconditions for block-holder ownership. First, they diluted the strength of monetary signals and incentives, and hampered the informational content of prices, making it difficult for both shareholders and investors to determine the value of shares or identify the investment potential of individual firms. Open market competition for financial resources was problematic and the investment markets were extremely depressed. Second, these circumstances worked as incentives for substituting networking and other informal arrangements for the market. Managers had to rely on successful networking as they sought to compensate for the poor performance of formal institutions with arrangements based on personal contacts. The role of networks was controversial. On the one hand, informal relations provided a means to create zones of trust within a general environment of distrust, thus reducing transaction costs. On the other hand, in the context of economic crisis and weak institutional arrangements, networks often conspired against outsiders and avoided legal control over financial and other transactions, rather than getting better knowledge of business partners and their needs (Radaev 1998).

Corporate ownership in Russia has been influenced by the bias in the allocation of shares built into the privatization program: originally the majority of equity (51%) was distributed among workers and managers of privatized enterprises. Initially this caused widespread concern that voucher privatization would put too much power into the hands of employees, which then might hinder firm-level restructuring and performance improvement. The reality, however, has been quite different with research indicating that the 'work collective' has in fact had little impact (Filatotchev, Wright, and Bleaney 1999; Kapelyushnikov 2001). Statistics show a very speedy erosion of the employees' share of the stock of privatised firms that would have not been possible

Table 1. Ownership allocation within Russian firms based on REB survey results.

	1995	1997	1999	2001	2003	2005	2007 (forecast)
Insiders, total	54.8	52.1	46.2	48.2	46.2	46.6	54.0
Managers	11.2	15.1	14.7	21.0	25.6	31.5	40.0
Employees	43.6	37.0	31.5	27.2	21.0	15.1	14.0
Outsiders, total	35.2	38.8	42.4	39.7	44.8	41.0	40.1
Non-financial outsiders, total	25.9	28.5	32.0	32.4	35.6	33.5	29.3
Individual investors	10.9	13.9	18.5	21.1	20.1	18.0	15.0
Other firms	15.0	14.6	13.5	11.3	15.5	15.5	14.3
Financial outsiders, total	9.3	10.3	10.4	7.3	9.2	7.5	9.8
The State	9.1	7.4	7.1	7.9	4.3	7.3	4.1
Other shareholders	0.9	1.7	4.3	4.2	4.9	5.2	2.8
Total	100	100	100	100	100	100	100
Number of firms	136	135	156	154	104	108	71

had their position been strong. Our own estimates indicate that as much as 15% of shares were changing hands in a typical Russian firm every year between 1995 and 2003 (see Table 1). The redistribution of shares proceeded according to the following pattern: ownership shifted from workers to managers; from insiders to outsiders; and from the state to private owners.

Managers have come out as the biggest winners. Their equity stake has increased from less than 10% in 1994 to over 30% at present. According to the Russian Economic Barometer (REB, see Section 3.1 for more detail on the database), by 2003 in an average industrial firm the managers had accumulated more shares than the rest of the employees put together and by 2007 they were expected to control 40% of all shares against 14% held by the workers. Even these impressive figures, however, are believed to underestimate the degree of concentration of ownership in the hands of managers. The secretive nature of the Russian corporate world makes it very difficult to quantify the structure of ownership. According to expert evaluation based on in-depth empirical studies, senior management is in control of no less than 50% of firms because many shareholders-outsiders are just a façade for managers (Dolgopyatova 2001; Sizov 2004). Within the population covered by REB surveys, the proportion of firms that have their senior manager as the largest shareholder increased from 24% in 1999 to 39% in 2005. It is also typical that the stake of the largest shareholder tends to grow (currently it is close to 40% of the average authorized capital) (see Table 2). As far as outsiders are concerned, an important feature of the modern ownership structure, from the point of view of corporate governance, is that they are mostly industrial firms and individuals. The share of banks, financial companies, investment funds, etc. remains stable and relatively low at about 10%.

A considerable volume of shares has been transferred between shareholders who received their shares as members of working collectives during mass privatization and those who bought or received their shares from the original owners at a later stage. Some of the latter have managed to consolidate their acquisitions into blocks that allowed them to dislodge the old 'red director' and step into his place. According to our own estimates, in 2005 among firms controlled by top managers as a group, 44% were controlled by their former 'red directors', whereas 56% were controlled by teams that were formed after privatization. Among firms in which the CEO was the largest shareholder, the proportion was 36 and 64%.

In most countries, companies with concentrated ownership grew and developed as family firms, often from entrepreneurial origins. In Russia, in which private ownership of industrial assets has

Table 2. Ownership concentration (%) within Russian firms based on REB survey results.

The proportion of firms in which the largest shareholder holds	1999	2001	2003
Fewer than 10% of shares	21	16	9
10–25% of shares	28	33	35
25–50% of shares	26	26	30
More than 50% of shares	25	25	26
Total	100	100	100
Average stake of the largest shareholder	32.9	34.5	37.2
Average stake of the second largest shareholder	–	–	17.2

its origins in mass voucher privatization, medium and large firms neither originated with some innovative ideas of the founder-owners, nor could they become a family affair. Nonetheless, the majority of them are closely held firms: shares are usually concentrated in the hands of two to seven individuals tied with informal links and a common background. Indeed, the owners of such firms usually go back together a long time. Often they already knew each other professionally before the market reforms started, took their first steps as businessmen together, and today own comparable stakes in the firm. This model of ownership may be found in the most successful of Russian companies. It is often characterized by the deliberate complexity of ownership rights with the aim to conceal the identity of true owners. The lack of transparency in relation to property rights is artificially maintained by the owners of many companies as a barrier to possible interference by the state or capture by market raiders (Pappe 2002).

4. Empirical analysis

Our literature review and the analysis of the business environment in Russia can be summarized in two main hypotheses: (H1) In transition economies, the larger the shareholding held by the largest shareholder, the poorer will be firm performance; (H2) in transition economies, the larger the shareholding held by the second largest shareholder, the better will be the firm's performance. To corroborate these hypotheses and verify ownership concentration effects on investment and performance, we have carried out a number of formal tests. This section contains details of the survey data used for the empirical analysis, the dependent and explanatory variables used in the regression models, and the estimation techniques and tests performed.

4.1 The sample data

The data are generated by regular microeconomic surveys organized by the REB, an independent research centre located in Moscow.³ REB is probably the only regular source of survey data on the evolution of ownership in Russia. REB's respondents are executive managers of 700 industrial enterprises in almost all regions of Russia. The normal response rate is close to 30%. The REB sample is reasonably representative of the whole population of Russian medium- and large-size industrial enterprises (see Tables 3 and 4) in terms of firm size, sector affiliation, and methods of privatisation. Every 2 years since 1995, REB has conducted specialized surveys dedicated to the issues of ownership and corporate governance, effectively covering the period from the completion of mass privatization till present. From 1997, the bi-annual survey has contained a

Table 3. Distribution of enterprises (%) in the REB surveys by industry.

Industries	1995	1997	1999	2001	2003	1999 Goskomstat ^a
Power	4	2	1	1	—	1
Fuels	6	2	3	2	1	1
Metals	4	2	6	6	4	2
Machinery	29	28	29	26	25	36
Chemicals	3	5	7	6	3	4
Woodworking, pulp-and-paper	7	8	14	12	13	13
Construction materials	13	17	12	11	12	6
Light industry	12	13	12	21	17	12
Food	17	20	15	15	21	14
Other industries	5	3	1	1	2	10

^aGoskomstat – the official data of the State Statistics Committee of the Russian Federation.

Table 4. Distribution of employees (%) in the REB surveys by industry.

Industries	1995	1997	1999	2001	2003	1999 Goskomstat ^a
Power	7	3	1	> 0	0	7
Fuels	12	2	3	1	1	6
Metals	8	4	3	11	14	9
Machinery	27	36	37	31	43	36
Chemicals	6	7	21	16	6	6
Woodworking, pulp-and-paper	3	5	13	16	12	8
Construction materials	9	17	7	4	7	5
Light industry	13	8	7	12	6	7
Food	11	10	6	8	8	11
Other industries	3	18	1	2	3	6

^aGoskomstat – the official data of the State Statistics Committee of the Russian Federation.

question on the largest shareholder and, from 2003, a question on the second largest shareholder. We were thus able to construct an unbalanced panel covering 3 years (1999, 2001, and 2003) to test H1 regarding the impact of the largest shareholder. But we could only use a cross-section to test H2 regarding the impact of the second largest shareholder. Finally, it should be noted that the numbers of observations are not the same for every regression for two reasons: (a) not all variables were included in all three surveys and (b) certain respondents chose to ignore some of the variables.

In order to test the stability of our results, we applied several estimation techniques robust to different descriptions of the error structure. In addition to OLS (or Logit regressions for models with binary dependant variables), we used random and fixed effects estimation techniques, which allowed us to control for unobserved individual (firm-specific) effects. We employed the Hausman test to establish if fixed or random effects specification was preferable. To account for a possible nonlinearity of relations between the firm's performance and its ownership structure (Morck, Shleifer, and Vishny 1988), we tried various versions of piecewise and polynomial regressions. However, all nonlinear specifications proved to be ineffective, so only results for the linear ones are reported in this paper.

4.2 The dependent variables

There are various measures of ‘firm performance’ relevant to our purpose. Most studies appear to focus on net profit, stock market returns, and cash flow. In effect, ‘performance’ is measured by the income generated by the firm and available for distribution among the claimants to the firm as expressed by various accounting ratios (Clark and Wójcik 2005). As far as transition economies are concerned, experts question the reliability of traditional performance measures (Hoskisson et al. 2000). In the Russian context, we have found it more appropriate to replace accounting ratios with other parameters: first, because only about 10% of Russian firms use either US GAAP or IAS rules in accounting (Guriev et al. 2003: 16) and second, because traditional accounting measures tend to be either unavailable or unreliable in Russia as a result of chronic income underreporting, payments in kind and barter transactions. Furthermore, many companies in the REB sample are not listed, and so the use of stock market performance indicators such as ROE (return on equity) or Tobin’s Q are not feasible. Instead, we have chosen six alternative measures of performance in such a way that they could be sourced from the data provided by REB surveys:

- INV – capital investment in equipment or technology as a share of total capital stock in the previous year. This is an important synthetic indicator of restructuring behaviour within the firm (Sim 2001);
- EXT – the percentage of investment financed from external sources (debt and equity) in total annual investment. We interpret a greater share of external finance as an acknowledgement by creditors of the growth record/potential of the firm. Similar assumption was made by Black, Loveb, and Rachinsky (2006) study on corporate governance indices in Russia;
- CAP – an index of productive capacity, which expresses changes in the accumulated stock of fixed factors of production to the previous year and is used as a measure of aggregate performance;
- PM – the profit margin, which was defined as annual profit divided by annual sales;
- PROFIT – a binary variable, which equals 1 if the firm declared profits in the previous year, and 0 otherwise (Filatotchev et al. 2001);
- UR – the capacity utilisation rate, defined as the share of actual production compared to perceived maximum production in a particular year.

We felt it necessary to use multiple parameters because of the acknowledged problems in applying any single measures to processes in transition economies (Buck et al. 2003). Descriptive statistics and pairwise correlation coefficients for the dependent variables and controls can be found in Table 5.

Table 5. Descriptive statistics and pairwise correlation coefficients for the six dependent variables.

	Mean	Std	UR	PM	INV	EXT	CAP	PROFIT
UR	62.81	29.05	1.0					
PM	3.25	9.72	0.23	1.0				
INV	44.47	48.79	0.28	0.18	1.0			
EXT	17.57	31.34	0.18	-0.08	0.13	1.0		
CAP	97.12	12.48	0.33	0.17	0.38	0.11	1.0	
PROFIT	0.59	-	0.19	0.38	0.24	-0.11	0.17	1.0

4.3 *Independent variables and controls*

We measure ownership concentration as the percentage of shares held by the largest shareholder (CON1). We further make a distinction between different categories of block-holders. REB data include 11 different categories of owners. We have grouped them into four groups: ‘insiders’ (INS): employees, managers, and firms owned by managers; ‘non-financial outsiders’ (NONFIN): individuals and firms not affiliated with the company they own; ‘financial outsiders’ (FIN): banks, investment funds, holding companies, and foreign investors; and ‘the state’ (STATE).

To deal with the possibility that a variety of factors may jointly affect performance and ownership variables and thus induce spurious correlations, we introduced a number of control variables. Firm-size factors are widely acknowledged as driving the performance of the firms (Boubakri, Cosset, and Guedhami 2005; Wincent 2005). We have, therefore, introduced the control variable SIZE measured by the total number of employees in the firm. A number of authors suggest that managerial opportunism and entrenchment may be associated with the firm maturity and age (Morck, Shleifer, and Vishny 1988). Accordingly, we have established a control variable AGE measured as the number of years since the firm was founded. We use industry dummies to control for industry effects (the reference category was ‘other industries’) and dummies for calendar years when particular surveys were conducted. Finally, some enterprises may be more seriously affected by the break-up of the centrally planned economy and disintegration of the former system of production and distribution than others. To control for this systemic factor, we have introduced a control variable ORDER that is measured as number of orders the firm received in a particular year as the percentage of the previous year.

4.4 *Econometric analysis*

The results of formal tests for investment are presented in Table 6. OLS regression reveals ownership concentration to be negatively and significantly associated with investment (at $P \leq 0.01$). To verify the importance of the shareholder’s identity, we regressed investment on identities of the largest shareholders (insiders, financial outsiders, and the state; the reference group is ‘financial outsiders’). Results obtained are less coherent: all regression coefficients are insignificant except the category ‘insiders’. These findings suggest that investment in these Russian companies is negatively related to ownership concentration, but this relationship does not depend on the identities of large block-holders. This conclusion is supported by results of our last test that incorporates both types of ownership variables – concentration equity measures as well as identities of the largest shareholders: the regression coefficients for ownership concentration continue to be negative and significant, whereas the identity of block-holders exerts no visible impact on firms’ investment behaviour.

In terms of the control variables, the regression coefficients for the SIZE are positive and significant. This could be a sign that large firms in the sample have better investment capabilities. The firm’s AGE has proved to be insignificant, suggesting that investment activity in new firms is not higher than in the old ones. However, there is a strong and significant (at $P \leq 0.01$) positive relationship between investment and the level of orders. This is to be expected, bearing in mind that the level of orders may be considered as a proxy for the firm’s competitive position and financial health in general. We have also introduced industry dummies, but, surprisingly, they are mostly insignificant. This pattern of relationships between the investment and control variables is generally consistent with the results reported elsewhere (see, *e.g.* Filatotchev et al. 2001). As far as individual (firm-specific) effects are concerned, we see that the random effects specification looks

Table 6. The impact of ownership on investment activities of the firm based on REB survey results, 1999–2003 (panel data).

	1			2			3		
	OLS	RE	FE	OLS	RE	FE	OLS	RE	FE
<i>Ownership variables:</i>									
CON1	−0.520 (3.83)**	−0.505 (2.90)**	−0.407 (1.23)				−0.56 (0.21)**	−0.58 (0.27)**	−0.49 (0.56)
<i>ID of the largest:</i>									
INS				5.44 (0.58)	2.04 (0.21)	−15.13 (1.11)	−4.21 (15.67)	−5.85 (16.00)	−18.52 (26.29)
FIN				3.94 (0.33)	−0.54 (0.04)	−20.66 (1.16)	5.09 (17.85)	−1.47 (22.04)	−37.43 (37.38)
STATE				−3.85 (0.28)	−4.97 (0.34)	−12.03 (0.51)	25.74 (27.14)	22.00 (28.65)	−12.30 (47.15)
<i>CON1*ID largest:</i>									
CON1*INS							0.23 (0.40)	0.24 (0.43)	0.18 (0.76)
CON1*FIN							0.03 (0.37)	0.15 (0.61)	0.61 (1.41)
CON1*STATE							−0.33 (0.43)	−0.28 (0.52)	0.11 (0.94)
<i>Controls:</i>									
ORDER	0.390 (3.06)**	0.377 (2.98)**	0.279 (1.25)	0.35 (2.67)**	0.34 (2.39)**	0.26 (1.14)	0.39 (0.15)**	0.37 (0.13)**	0.26 (0.24)
SIZE	8.840 (2.46)*	8.922 (2.18)*	24.550 (1.10)	8.81 (2.11)*	8.97 (1.91)***	20.43 (0.89)	7.65 (4.04)*	7.87 (4.41)***	21.41 (23.83)
AGE	0.092 (1.15)	0.104 (0.87)		0.12 (1.04)	0.13 (1.02)		0.14 (0.09)	0.15 (0.12)	
2001	10.725 (1.21)	10.204 (1.22)	9.060 (1.02)	8.50 (0.91)	8.07 (0.95)	7.46 (0.84)	12.03 (9.11)	11.31 (8.63)	8.46 (9.21)
2003	12.897 (1.36)	11.890 (0.99)	9.255 (0.82)	5.36 (0.51)	4.11 (0.42)	2.24 (0.21)	15.13 (10.33)	13.65 (10.14)	6.20 (12.11)

(continued)

Table 6. Continued.

	1			2			3		
	OLS	RE	FE	OLS	RE	FE	OLS	RE	FE
Industries	y	y		y	y		y	y	
Constant	-210.262 (1.35)	-232.616 (0.98)	-110.427 (0.88)	-282.59 (1.23)	-303.97 (1.17)	-87.98 (0.68)	-291.86 (185.51)	-305.67 (245.09)	-78.93 (134.78)
No. of obs	155	155	155	157	157	157	155	155	155
Hausman test		1.1			5.7			6.38	
R2	0.24	0.24	0.14	0.18	0.18	0.07	0.26	0.26	0.11

Reported are robust standard errors (in parentheses). Explanatory variables are defined as in Section 3.2. The Hausman test is used to test for orthogonality of the random effects and the regressors. Given a model and data in which fixed effects estimation would be appropriate, a Hausman test tests whether random effects estimation would be almost as good. In a fixed-effects kind of case, the Hausman test is a test of H0: that random effects would be consistent and efficient, versus H1: that random effects would be inconsistent. Under the null hypothesis, the test has a limited χ^2 distribution with $K-1$ degrees of freedom, where K is the number of regressors excluding constant terms (AGE, industries, and constant). Large values of the test statistic argue in favour of a fixed effects model over a random effects model.

*Statistically significant at the 5% level.

**Statistically significant at the 1% level.

***Statistically significant at the 10% level.

more preferable (see the results of the Hausman tests in Table 7 that support this conclusion). Large values of the test statistics argue in favour of the fixed effects model over the random effects model. In the presence of unobservable individual effects, the OLS estimator should be inconsistent for all models. In our case for INVEST and PROFIT MARGIN, both RE and FE specifications are consistent, but the FE specification is inefficient, thus leaving RE as a preferable choice. For UR unobservable, individual effects are correlated with regressors, therefore the only consistent (reliable) estimator is FE. For the binary variable PROFIT, both RE and conditional FE specifications are consistent, but the latter is inefficient as it is based on a restricted sample that includes only the firms whose financial condition has changed in the period under observation.

In our analysis, we have aimed further to examine the relationship between ownership concentration and the various performance proxies defined earlier. Table 7 reports the main results for this regression analysis (we include in this table only the results for those regressions that incorporate both ownership variables, *i.e.*, ownership concentration and the identity of the largest shareholders).

The regression coefficients for the largest single shareholding are significant and have negative sign for all performance proxies. This supports H1: other things being equal, the greater the block of shares held by the largest owner, the less the capacity utilization, the smaller the profit margin and the higher the probability of loss-making. These results are robust to alternative regression measurements as we can see from the columns for random and fixed effects models where we controlled for firm-specific effects.

The regression coefficients for identity variables are insignificant for all identities except INS: in regressions with capacity utilization (UR) and profit margin (PM) as dependant variables the regression coefficients for INS turn out to be significant (at $P \leq 0.01$) and have a negative sign. This implies that companies with the largest block of shares belonging to insiders (virtually to managers) tend to have greater spare capacities and lower profit margins. However, as interaction terms demonstrate, the relationship between insider ownership and enterprise performance depends upon the size of the stock controlled by the insider: if the stock is very large, the impact is positive.

SIZE and AGE are significant only for capacity utilization (other things being equal older firms have more spare capacities). The level of orders is strongly and positively associated with performance, indicating that firms that managed to preserve their traditional trade relationships are generally performing better. Again we have found that in most cases random effects estimators are preferable to fixed effects ones.

As the literature suggests that control structures with multiple large shareholders may act differently comparing with firms with just one large owner (Bennedsen and Wolfenzon 2000), we ran an additional series of cross-section regressions employing the independent variable CON2 to designate the second largest shareholder. We ran this analysis on the basis of the 2003 REB survey, which for the first time made available information on the second largest block of shares. Results of this exercise are provided in Table 8. It shows that the regression coefficients for the largest single shareholding in most specifications are significant and have a negative sign; however, regression coefficients for the second largest single shareholding are significant but have a positive sign! Additional regressions for two other investment variables – proportion of investment financed from external sources and the index of capacity utilization – confirm that the first and the second largest stakes exert opposite and statistically significant impacts on investment characteristics. Moreover, the variable CON2 has positive regression coefficients in equations for all other performance proxies (capacity utilization, profit margin, and the incidence of profit-making) as dependant variables. In other words, as was predicted by H2, sizable stakes held

Table 7. The impact of ownership on the firm's performance based on REB survey results, 1999–2003 (panel data).

	UR			Profit margin			Profit		
	OLS	RE	FE	OLS	RE	FE	Logit	Logit RE	Conditional Logit
<i>Ownership variables:</i>									
CON1	-0.19 (0.12)***	-0.22 (0.13)*	-0.45 (0.17)*	-0.19 (0.10)	-0.26 (0.08)**	-0.41 (0.09)**	-0.02 (0.01)***	-0.03 (0.02)***	-0.43 (0.25)***
<i>ID of the largest:</i>									
INS	5.22 (6.91)	-7.52 (6.82)	-24.17 (8.35)**	-6.01 (3.54)	-7.38 (4.01)**	-14.41 (5.12)**	0.76 (0.67)	-0.05 (1.19)	-12.25 (7.24)***
FIN	8.08 (9.52)	4.93 (9.42)	7.84 (11.87)	0.06 (4.33)	-1.87 (7.41)	11.25 (16.47)	-0.16 (1.07)	-1.73 (1.73)	-15.04 (12.80)
STATE	-9.48 (8.59)	-16.91 (12.47)	-14.80 (15.15)	-1.60 (12.74)	-10.34 (12.25)	-22.89 (12.77)	-0.24 (1.32)	-0.17 (1.96)	
<i>CON1*ID largest:</i>									
CON1*INS	-0.40 (0.19)*	-0.05 (0.19)	0.53 (0.25)*	0.17 (0.13)	0.23 (0.13)***	0.55 (0.16)**	-0.01 (0.02)	0.01 (0.03)	0.66 (0.34)*
CON1*FIN	-0.33 (0.25)	-0.27 (0.30)	-0.27 (0.45)	-0.08 (0.08)	0.00 (0.18)	-0.97 (0.88)	0.00 (0.03)	0.03 (0.05)	0.50 (0.38)
CON1*STATE	0.17 (0.15)	0.36 (0.23)	0.41 (0.30)	0.00 (0.31)	0.27 (0.20)	0.31 (0.19)	-0.01 (0.03)	0.00 (0.04)	0.43 (0.98)
<i>Controls:</i>									
ORDER	0.56 (0.06)**	0.51 (0.06)**	0.37 (0.08)**	0.03 (0.05)	0.10 (0.05)*	0.04 (0.06)	0.02 (0.01)**	0.03 (0.01)**	0.01 (0.04)
SIZE	0.53 (1.98)	3.11 (2.35)	29.93 (7.51)**	-0.69 (1.52)	-1.06 (1.80)	-6.96 (5.51)	0.11 (0.18)	0.23 (0.34)	2.12 (3.29)

AGE	-0.14 (0.05)*	-0.12 (0.07)*		-0.01 (0.02)	0.01 (0.04)		0.00 (0.01)	0.00 (0.01)	
2001	3.64 (3.97)	2.56 (2.93)	2.04 (2.86)	22.11 (3.34)**			0.15 (0.41)	0.26 (0.54)	0.81 (1.01)
2003	6.04 (4.58)	3.79 (3.63)	3.75 (3.75)	18.99 (3.28)**	-1.64 (1.90)	16.32 (2.86)**	-0.45 (0.46)	-0.64 (0.65)	-0.50 (1.33)
Industries	y	y		y	y		y	y	
Constant	284.76 (108.72)**	245.90 (134.47)*	-119.80 (42.04)**	8.79 (50.32)	-8.34 (86.73)	36.06 (31.50)	-2.39 (12.10)	-5.80 (18.79)	-21.62 (7.79)*
No. of obs	169	169	169	73	73	73	163	163	65
Hausman test ¹⁾		37.92**			14.71			4.40	
R-squared (Pseudo	0.50	0.49	0.17	0.49	0.47	0.15	0.14	0.18	0.41
R-squared for logit ²⁾									

Reported are robust standard errors (in parentheses). Explanatory variables are defined as in Section 3.2. The Hausman test is used to test for orthogonality of the random effects and the regressors. Given a model and data in which fixed effects estimation would be appropriate, a Hausman test tests whether random effects estimation would be almost as good. In a fixed-effects kind of case, the Hausman test is a test of H_0 : that random effects would be consistent and efficient, versus H_1 : that random effects would be inconsistent. Under the null hypothesis, the test has a limited χ^2 distribution with $K - 1$ degrees of freedom, where K is the number of regressors excluding constant terms (AGE, industries, and constant). Large values of the test statistic argue in favour of a fixed-effects model over a random effects model. For the Logit model, we report McFadden likelihood index: $\text{pseudo-}R^2 = 1 - (\ln L / \ln L_0)$, an analogue to the R^2 in a conventional regression.

*Statistically significant at the 5% level.

**Statistically significant at the 1% level.

***Statistically significant at the 10% level.

Table 8. Ownership concentration effects on the firm's performance and investment, 2003 (cross-section analysis).

	UR			INV			EXT		
<i>Ownership variables:</i>									
CON1	-0.22 (1.80)***	-0.27 (2.19)*	-0.27 (0.12)*	-0.29 (1.45)	-0.36 (1.84)***	-0.39 (0.23)***	-0.22 (0.84)	-0.45 (1.70)***	-0.52 (0.30)***
CON2		0.52 (1.65)***	0.53 (0.31)***		1.11 (1.39)	1.09 (0.67)***		1.08 (1.76)***	1.06 (0.63)***
<i>ID of the 1 largest:</i>									
INS			1.67 (6.72)			-7.15 (13.58)			4.92 (12.55)
FIN			11.60 (10.58)			6.16 (20.98)			5.89 (19.07)
STATE			-20.14 (17.41)			-63.01 (34.10)***			80.03 (40.90)***
<i>Controls:</i>									
ORDER	0.48 (4.55)**	0.45 (4.26)**	0.45 (0.11)**	3.29 (0.34)	4.48 (0.48)	3.18 (5.21)	0.22 (0.92)	0.19 (0.80)	0.18 (0.21)
SIZE	-0.28 (0.10)	-0.16 (0.06)	-0.45 (2.75)	6.60 (1.33)	6.63 (1.46)	5.26 (5.41)	7.24 (1.74)***	9.08 (2.15)*	10.08 (5.30)***
AGE	-0.23 (1.68)***	-0.27 (1.99)***	-0.26 (0.14)***	0.21 (1.08)	0.15 (0.67)	0.12 (0.27)	-0.10 (0.36)	-0.18 (0.63)	-0.26 (0.29)
Industry	Y	y	y	y	y	y	y	y	y
Constant	483.53 (1.82)***	563.58 (2.11)*	548.42 (268.37)*	-408.89 (0.99)	-303.87 (0.66)	-221.29 (528.97)	206.41 (0.37)	338.35 (0.60)	453.89 (566.31)
No. of obs.	66	66	66	65	65	65	46	46	46
R2 (Pseudo R2 for Logit)	0.37	0.40	0.41	0.17	0.22	0.27	0.30	0.35	0.37

<i>Ownership variables:</i>									
CON1	-0.08 (1.40)	-0.11 (1.86)***	-0.13 (0.05)*	0.00 (0.03)	-0.01 (0.16)	-0.01 (0.03)	-0.025 (1.94)***	-0.026 (1.85)***	-0.02 (0.01)*
CON2		0.33 (2.10)*	0.37 (0.15)*		0.10 (0.81)	0.09 (0.14)		0.008 (0.28)	0.01 (0.03)
<i>ID of the 1 largest:</i>									
INS			5.04 (2.98)***			-0.08 (2.67)			-1.79 (0.78)*
FIN			12.21 (4.49)**			-2.34 (4.95)			-0.06 (1.06)
STATE			6.69 (7.31)			0.58 (7.12)			0.03 (0.06)
<i>Controls:</i>									
ORDER	0.11 (2.32)*	0.09 (2.06)*	0.12 (0.05)*	-0.01 (0.31)	-0.02 (0.52)	-0.02 (0.05)	0.02 (1.87)***	0.01 (1.62)	0.05 (0.03)***
SIZE	-0.10 (0.07)	-0.05 (0.04)	-0.75 (1.15)	1.19 (1.51)	1.24 (1.55)	1.19 (1.22)	0.324 (1.24)	0.35 (1.36)	0.23 (0.32)
AGE	-0.08 (1.26)	-0.10 (1.67)***	-0.12 (0.06)*	0.03 (0.69)	0.03 (0.62)	0.03 (0.06)	0.01 (0.60)	0.01 (0.58)	0.01 (0.01)
Industry	y	y	y	y	y	y	Y	y	y
Constant	250.68 (1.92)***	294.65 (2.33)*	330.93 (114.2)**	-69.36 (0.71)	-60.11 (0.65)	-55.34 (121.5)	-16.97 (0.63)	-16.08 (0.58)	-19.09 (26.43)
No. of obs.	63	63	63	58	58	58	75	66	66
R2 (Pseudo R2 for Logit)	0.18	0.25	0.29	0.03	0.08	0.09	0.18	0.19	0.23

Reported are robust standard errors (in parentheses). Explanatory variables are defined as in Section 3.2. For the Logit model, we report McFadden likelihood index: $\text{pseudo-}R^2 = 1 - (\ln L / \ln L_0)$, an analogue to the R^2 in a conventional regression.

*Statistically significant at the 5% level.

**Statistically significant at the 1% level.

***Statistically significant at the 10% level.

by the second largest shareholders appear to encourage investments, create better opportunities for external financing, stimulate expansion of existing capacities, raise capacity utilization, and provide positive effects on profitability (in the regressions with PROFIT as dependant variable, coefficients for the second largest block of shares are positive but insignificant).⁴

Table 8 also provides data on the relationship between the identity of the largest owner and the firm's performance (the limited number of observations did not allow us to include in the analysis either the second largest owner or the interaction of ownership concentration with shareholders' identity). These data indicate that (1) state ownership is positively correlated with external investment, but state-owned enterprises invest less than privately owned ones; (2) firms owned by insiders and financial outsiders (FIN) invest more than firms owned by non-financial outsiders; (3) firms that have an insider as the largest shareholder are more likely to make a loss than a profit.

Having established an association between multiple ownership and performance, we are nonetheless unable to maintain with certainty that the former is the cause of the latter on the basis of the source data available. It may easily be hypothesized that successful firms are more attractive to investors and therefore they are more likely to be controlled by a group of large shareholders. Yet we are inclined to think that, in Russia at least, it is multiple ownership that drives performance for the simple reason that equity emission is used only very rarely as a means to raise new capital. Consequently, the premise that efficient firms are more likely to become owned by a group of significant owners lacks credibility.

5. Discussion and conclusions

This paper analyses the effects of ownership concentration on the performance of firms in Russia. Our analysis provides support for the two hypotheses formulated in Section 4. However, our findings also lead to two broad conclusions which are relevant not only for Russian privatized firms, but also for corporations with concentrated shareholdings operating in economies with poor-functioning institutions in general. First, our findings denote that there may be a negative impact of ownership concentration on firm performance. In doing so, our results conform with the theoretical model offered by Castaneda (2006) which suggests that, when minority-shareholders are not well protected, the markets are not very liquid, share prices do not convey the needed information to improve efficiency in allocation, and legal and political institutions that protect the rights of all stakeholders are weak, ownership concentration will result in controlling owners choosing low-risk, low-productive projects if they feel that their position is threatened. A similar view is expressed by Desai and Goldberg (2000) who argue that the problem of corporate governance in countries such as Russia is not limited to protecting minority shareholders or other financiers. Rather it is the problem of insufficient incentives that owner-managers have to restructure firms and maximize their value over the long run. Desai and Goldberg (2000) relate this to two aspects of Russian reality. To begin with, firm performance reflects the insecurity of dominant shareholders as they feel threatened by the general instability and uncertainty regarding property and inheritance rights, contract law, judicial protection, personal safety, etc.⁵ Next, the underdeveloped state of Russian capital markets makes it difficult for owners to realize value accumulated in shares. In fact, Pappe (2002) maintains that the only legal way of doing this is by trading the shares of Russian firms on international stock markets. This, of course, is out of reach for the majority of Russian companies. As a consequence, controlling owners are more likely to be engaged in 'tunnelling' and asset stripping rather than increasing the long-term value of the firm.

The second broad conclusion is that in a certain institutional environment, a coalition of several significant owners might have a favourable impact on the performance of the firm. We have

obtained positive empirical evidence that coalitions can provide a governance mechanism that would minimize combined costs associated with both managerial and majority shareholder opportunism. Our result finds support in literature. Bennedsen and Wolfenzon (2000) argue that the coalition of owners internalizes the costs of its actions, resulting in fewer costly private benefits it extracts. Similarly, Brunello, Graziano, and Parigi (2003) obtain results that multiple non-CEO controlling shareholders are a governance mechanism that provides a substitute for outside members on boards of directors in terms of lowering agency costs. Our own interpretation of our empirical findings is similar. In Russia, it is very difficult for shareholders excluded from the narrow circle of owners who actually run the firm to exert any influence. However, the members of such a circle are likely to be in a position to organize effective monitoring and control both over the firm's managers and over each other. A more balanced configuration of property rights might better contribute to maximization of corporate wealth. Unfortunately, our current knowledge of coalitions between significant shareholders in Russian firms (their formation, stability, and roles allocation within the coalition) is still very limited. Further research is needed to provide informed advice to both Russian policy-makers and to foreign investors seeking to invest in the Russian corporate sector.

In this paper, we have identified two tendencies in the Russian corporate sector. Both are related to the same cause: the poor state of the institutional framework which puts a pressure on large shareholders to keep increasing their stake. As a result, their control over the firm increases. However, the same institutional inadequacies make this category of shareholders feel insecure about the future of their investment. This undermines their commitment to the firm they own/control and encourages them to tunnel wealth out of companies.

This study has been instrumental in establishing some key characteristics of corporate governance in Russia, but its scope has necessarily been restricted by the parameters of the available database. They did not allow us to look at a number of issues that would constitute a fertile ground for further research. One is the implications of 'state capture', *i.e.*, the ability of powerful blockholders (oligarchs as they are known in Russia) to manipulate politicians and shape institutions in pursuit of own interests. Given the importance of networks in institutionally weak economies, another one is the performance of firms controlled by owners belonging to political or social networks. Further investigation of the political economy of corporate governance in countries such as Russia is important for enhancing our understanding of the relationship between institutions and corporate performance.

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Notes

1. For example, the estimates of the share of family-controlled firms among the largest American industrial corporations vary from 35% (Anderson and Reeb 2003) to as high as 60% (Zeitlin 1974).
2. This is not to say that pursuing non-pecuniary private benefits cannot result in value destruction. The receivers of such benefits may place higher premium on retaining them than on securing the expansion and growth of the firm to the detriment of smaller shareholders (Thomsen, Pedersen, and Kvist 2006).
3. The Center's analytical bulletin *REB: Market Situation Tests, Estimates, Forecasts* is published four times a year and is available in English.
4. We omit the discussion of effects of control variables which are similar to results obtained for panel estimates.
5. The Russian legal system offers inadequate protection of legitimate owners, even if they hold majority of stakes. In the West, hostile takeovers are feasible when shares of the target company are widely available and easily purchased.

In Russia, hostile takeovers rely on the abuse of the rights of shareholders and the exploitation of legalistic hitches and corruption in the judicial system. One of the common tricks is to obtain a judicial decision that bans the current owners of the firm to use their right to vote in the shareholders general meeting or take a position on the board of directors. Another ploy is to make the court requisite the registry of shareholders, the only legal proof of ownership, and then replace it with an alternative registry with a different composition of shareholders (Sizov 2004). One notorious incident involved Krasnoyarsk Aluminium, which deleted from its share register a 20% stake held by the British Trans World Group, effectively wiping out its holding (Mileusnic 1996).

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