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1. Introduction

Changes in the ownership structure of productive assets have been one of the most pivotal and controversial issues in the framework of the transition processes of former socialist to market economies. Since privatization has been launched in the countries of Central and Eastern Europe, the former Soviet Union and China, interest of economists in the effects of privatization and transformations in ownership structure has only been growing. An overwhelming amount of the empirical studies has found positive effects of privatization on indicators of firm performance. However, the results of privatization processes in the transition economies are not uniform across countries, different methods of privatization and types of ownership of privatized companies.

In the beginning of 1990s privatization was broadly considered to be one of the main keystones of the transition process. This was mostly based on the successful experience of developed economies, as well as relatively big theoretical foundation. Findings from research studies of developed countries, covered by Megginson and Netter (2001), indicate that privatization was likely to improve enterprise efficiency and profitability. Importance of privatization in the transition process was also strongly supported by Washington Consensus. (Estrin et al., 2009) It argued for faster transfer of ownership rights through privatization and promoted the belief that additionally to improved market forces private ownership would positively affect firm performance and the whole efficiency of the economy. (Blanchard et al., 1991) Overall, efficiency improvements were the key argument for privatization as transfer of ownership rights had to allocate resources in the most effective way and, therefore, lead to the raise of financial and operating indicators of the companies and economic growth.

However, results of privatization turned out to be not uniform across different countries, types of new owners and methods of privatization. Surveys that focused on privatization effects represent a wide range of empirical results from absence of systematic significant effect on performance (Bevan et al., 1999) and mixed results (Megginson and Netter, 2001) to strong significant privatization impact. (Djankov and Murrell, 2002)

Current paper is motivated by the ongoing debates among economists on whether privatization has any positive effects on firm performance or not.

Research paper aims to investigate the long-term performance effects of privatization and changes in ownership structure after it on the sample of Russian companies founded under the Soviet planning system and privatized in the mass privatization program. In our analysis, we focus on the questions whether changes in the

ownership structure after privatization, different privatization options and other initial conditions had positive impact on firms' revenue, profitability, labor productivity and employment.

Our proposed research project has several novel features. Firstly, none of the previous studies considering firm performance after privatization in Russia used detailed ownership data (by types of ultimate owners, measure of ownership concentration) and financial statement data to construct performance indicators. Secondly, we are going to provide a long-term analysis over 20-years period of time while most of the studies consider only up to five-year period after privatization. Additionally, we try to deal with endogeneity problem since it is likely that the companies were not privatized randomly. Unlike other studies, we use fixed effects technique together with instrumental variables in order to adequately treat selection problem.

The data used for the study is taken from a panel containing 530 privatized and non-privatized firms that have been surveyed in 1999–2000 with retrospective information going back to the year 1990. Data on ultimate ownership is taken from Interfax-Spark and financial data is taken from Ruslana database.

Contrary to the results of many previous studies we find that the effects of different types of owners and ownership concentration on firm performance are limited. Results vary across different ownership types but in general show that private owners do not improve financial and operational performance of the company. However, when we analyze ownership in more details, we determine significant effects of specific types of owners. While domestic private ownership in general has no significant impact on firm performance, we find strong positive effect of managers on revenue, profitability and employment growth rates. At the same time, domestic individuals have mixed and mostly not significant effect on firm performance. Concerning state ownership, we find statistically significant negative effect of federal state holding controlling stake in the company. This result is stable for all analyzed profitability indicators and labor productivity. The effect remains even for a case when the federal state is not controlling shareholder, but still has more shares than the others. We also find positive significant impact of foreign ownership and negative significant impact of nomenees on profitability indicators.

Analysis of different privatization options show no significant effect for options 1, 2 and 3 but negative significant impact of option 4 – lease-buyouts, which was common in 1989 before mass privatization and mostly resulted in 100% ownership by employees.

Paper is built as follows. Firstly, in Section 2 we examine theoretical and empirical literature on the privatization effects. In Section 3 we provide information on the privatization process in Russia and in Section 4 we describe data and basic statistics for our research. In Section 5 estimation methodology is presented. Finally, in section 6 we provide our results and make conclusions in Section 7.

2. Literature review

In many countries it is widely accepted that private ownership improves corporate performance. However, the numerical empirical studies are not entirely conclusive about the performance effects.

Two surveys of Megginson (2005) and Estrin et al. (2009) summarizing results of postcommunist literature come to the conclusion that effects of privatization have been generally positive. However, there is divergence of findings between Central and Eastern Europe (CEE), the Commonwealth of Independent States (CIS) and China (due to differences in policies and institutional development) and between different types of new owners. Privatization to foreign owners is found to have strong positive effect virtually in all transition economies while the performance effect of privatization to domestic owners is on average less impressive and varies across regions. The effect has been smaller, often delayed, but positive in CEE and insignificant or even negative in CIS countries.

For instance, Djankov and Murrell (2002) find positive impact of privatization on company performance in CEE, but statistically insignificant in the CIS. They explain this by the more widespread occurrence of insider ownership after privatization and a weaker institutional environment leading to less effective governance by outside owners in the CIS countries. The results of Djankov and Murrell are supported by Megginson (2005), who studied privatization impact in transition economies. He found that "mass" (or voucher) privatization, implying wide distribution of ownership rights and at nominal prices, often led to worse performance. The author explains it by the fact that such privatization scheme was frequently associated with insider ownership. Companies with higher level of insiders control did poorly compared to the firms with a larger ownership share of financial institutions, foreign corporations or local entrepreneurs. Similar results were obtained by Guriev and Megginson (2006) who related mixed privatization effects in transition economies to the slow progress in microeconomic and legal reform, especially in CIS countries.

Hanousek et al. (2007) came to the same conclusion while analyzing the effects of different types of owners using a large sample of companies in the Czech Republic after mass privatization. They found sustained positive impact only for foreign ownership. Frydman et al. study (1999) using a sample of 506 midsize manufacturing privatized and state firms in the Czech Republic, Hungary and Poland, also argues that privatization effects differ, depending on the types of owners who get control. Analogously to the previous studies they suggest that privatization to outsider owners is positively significant while

privatization to insiders has no effect on the performance.

On the other hand, Aussenegg and Jelic (2007) did not find any significant changes in companies' performance in a large sample of post-privatization firms from three Central European countries. This was also supported by the results of Russian companies. According to a large research program by the World Bank in Russia, ownership changes are generally weakly associated with most indicators of performance, including sales, wages and employment in the short term period. (Commander et al., 1996) Moreover, common results for Russia indicate that while privatization tended to have fairly immediate effect in such countries as Hungary, Romania, and Ukraine, in Russia lag of the initial effect was much longer, and a modest positive impact appeared only after about seven years. (Brown et al., 2006)

However, privatization effect is also very different depending on the examined performance measure. Since we are going to investigate privatization effects on 4 performance measures: revenues, profitability, labor productivity and employment, - we will cover previous literature on these indicators in more details.

- **Revenues**

Studies, considering the impact of privatization on firm's revenue, represent a good measure of the effect of privatization on the scale of operation of the company. In most of the studies covering Central and Eastern European countries, researchers find strong and positive effect of private ownership on revenues. (Megginson, 2005; Frydman et al., 1998) Claessens and Djankov (2002) investigated changes in the performance of over 6000 privatized and state-owned manufacturing firms in seven Eastern European countries over the initial transition period and found out that privatization was associated with significant increases in revenues.

However, positive effect is mostly typical for studies that cover a longer period after privatization. At the same time those studies that only cover short-term period of time find less significant impact or even no impact of private ownership. Moreover, positive impact is determined for both foreign and domestic private ownership, with foreign ownership having greater positive effects. Studies carried out for Commonwealth of Independent States also have controversial results: they find strong positive effect in the early periods but small positive or even negative effect in the longer run. (Guriev and Megginson, 2006)

These results were mostly echoed by Chinese studies. Jia et al. (2005) on the basis of 53 privatized Chinese companies made conclusions on the negative relation between state

ownership and revenues. Another sample of Chinese privatized firms investigated by Sun and Tong (2003) also showed negative impact of state ownership and positive impact of legal-person ownership on firms' performance, which suggested that legal persons behaved differently from the state government.

Considering studies of Russian companies (Perevalov et al., 2000; Commander et al., 1996), any strong relationship was found between privatization and firm's ability to generate higher revenues.

- **Profitability**

Results of privatization impact on profitability are more controversial than effects on revenue. Most of the studies are carried out for CEE region and show small positive or insignificant impact of private (domestic and foreign) ownership on profitability in short term transformation period. Differences in effects are found on more detailed levels of ownership structure: positive effects are more typical for industrial (nonfinancial) firms in case of privatization to foreign owners and financial firms in case of privatization to domestic organizations. (Hanousek et al., 2007)

Positive relationship between privatization and profitability was supported by Megginson et al. (1994). Using data of traded companies in the Czech Republic during 1993-1995, Hanousek and Kocenda (2003) also made conclusion on a positive impact of foreign majority ownership on such profitability measure as returns on assets (ROA). In support to this, Miller (2006) found positive effect of concentrated private ownership on return on assets to be positive in Bulgaria. Claessens et al. (1999) on the sample of 706 Czech firms over the period 1992-1997 found that profitability was positively related with private ownership concentration, and 10% increase in concentration lead to 3% increase in short-term profitability.

However, Dewenter and Malatesta (1998) did not find much evidence that privatization had persistent positive effects on profitability. They showed that net income-based profitability measures improved after privatization, but EBIT-based profitability measures did not. Frydman et al. (1997) and Earle and Estrin (1997) considered profits to be extremely volatile measure in the short run due to higher level of costs just after the privatization.

Studies of privatization effects on profitability in China mostly show positive results. Thus, Jefferson and Su (2006) estimation of private ownership effect on profit/sales ratio

was positive and significant at 10% level. This result was partly supported by Xu and Wang (1999) who found positive correlation for Chinese companies between ownership concentration and firm performance in case when the company had been privatized by legal person shareholders (institutional investors).

Study for Russian companies carried out by Perevalov et al. (2000) on the sample of 189 industrial enterprises in 1992-1996 showed that on average privatization produced little improvement in profitability. This can be explained by a relatively short period of investigation and the fact that most of the privatized companied had to increase their costs during the first years of transition process in order to stay in the market.

- **Labor Productivity**

In general, findings of the privatization impact on labor productivity show that it is primarily positive or insignificant. Foreign ownership mostly has positive or insignificant effect, while the effects of insider ownership (employee and management) are determined to be statistically insignificant. At the same time government retention of a golden share is concluded to have an insignificant effect.

Claessens and Djankov (1999) in their study, carried out on the sample of 706 Czech firms over the period 1992-1997, found out that 10% increase in private ownership concentration leads to a 2% increase in short-term labor productivity. These findings were also supported by Grigorian (1999) who found positive impact of privatization for Lithuanian firms. Furthermore, econometric results for Romanian industrial enterprises also showed positive and significant effects of private ownership on labor productivity. (Earle and Telegdy, 2002)

For Russian companies a positive impact of private ownership on labor productivity was found by Earle (1998). OLS regression estimates showed a positive privatization effect relative to state, with most of this result due to managerial ownership and non-managerial worker ownership. Among outsiders a positive statistically significant impact was found only for individual share ownership. However, this was argued by Perevalov et al. (2000), who found no significant relationships between the indicators.

- **Employment**

The effect of privatization on employment is considered to be a good indicator of the extent of restructuring brought about through privatization. (Estrin et al., 2009)

Most of the studies indicate that there is a tendency for privatized firms, especially owned by foreign investors, to increase or not to reduce employment level in comparison with state-owned firms, ceteris paribus. (Estrin et al., 2009)

Comparison of privatized and non-privatized companies in the early 1990s, when employment rates were decreasing in most of the transition economies, showed that privately owned companies, especially foreign owned, were likely to decrease employees in a smaller proportion than state-owned firms. (Estrin et al., 2009) This was also echoed by Konings and Walsh (1999) and Konings and Xavier (2003) who found positive impact of privatization on labor growth relatively for Ukraine and Slovenia. However, these results were different from findings of La Porta and Lopez-de-Silanes (1999) who determined negative employment effect in the Mexican privatized firms. Interesting result is a time pattern related to privatization and employment in Polish firms identified by Mickiewicz et al. (2005) who found no significant effect on employment in the first three years after privatization, a significant positive effect about 3-6 years after privatization, and no significant effect afterwards. (Estrin et al., 2007)

Results for Russia are also mixed. Brown and Earle (2002) found positive relationships between private ownership and growth of employment for a large sample of firms. At the same time Commander et al. (1996) showed that privatization effect on employment behavior of Russian companies was relatively weak. This was also supported by Earle and Estrin (1997).

Overall, results of different studies vary across different indicators of firm performance, different owners and different countries. Surveys of privatization effects on firm performance range from those that have strong positive impact to those that are cautious on concluding that private ownership improves performance and those that indicate no significance at all. This variation in results can be explained by several reasons.

Firstly, most of the studies rely on short-term investigations observing privatization effects immediately or in 2-3 years after privatization. Thus, they cannot capture medium-term and long-term effects of transition process. Secondly, a big part of studies covered earlier used limited databases or combined data from different accounting systems and, thus, had small and often unrepresentative samples of firms. Moreover, taking into consideration time of the studies it was likely difficult to identify accurate ownership since privatization processes were still ongoing.

Lastly, many of the studies did not control for endogeneity problem. However, for

all privatization methods it is likely that firms were assigned for privatization not randomly. This means that those studies that consider allocation of firms for privatization to be random can have biased estimates and overstate effect of private ownership on firm performance.

This paper tries to eliminate all these problems by investigating long-term effects of privatization, using proper information bases and controlling for nonrandom selection.

3. Privatization process in Russia

Historically state-owned enterprises (SOEs) were established in both the socialist and capitalist countries with the ultimate goal to guarantee economic development in the absence of well functioning markets, ensure political control of production, make better provision of public goods, be more efficient in dealing with externalities, and support employment rates and distribute income equally. (Estrin et al., 2007) However, many state-owned firms turned out not to achieve the targets and showed low economic performance. Thus, since 1980s economists started to consider privatization as a means of establishing clear property rights, providing economic incentives and stimulating superior economic performance of firms and economies at large. (Vickers and Yarrow, 1988)

There were a lot of various reasons why governments attempted to privatize state-owned enterprises: building capitalism, rewarding political loyalists, reducing administrative burden on the state bureaucracy, making private sector responsible for needed enterprise investment, increasing government revenues etc. (Nellis, 1991). However, the primary reason was still to improve efficiency of state-owned firms and lower the budgetary burden on the state.

Inefficiency of state-owned enterprises is often explained by different objectives and different ways of corporate governance of SOEs and privately owned firms. For instance, commonly state-owned enterprises may be required to deviate from profit maximization or cost minimization in order to satisfy political objectives, by creating or maintaining employment in economically depressed regions or by holding prices below average costs for redistributive reasons. (see e.g., Estrin and Perotin, 1991) Moreover, even in case of profit maximization objectives governments can remain inefficient due to difficulties in placing effective constraints on managers' discretionary behavior. (Estrin et al., 2007) Thus, it was widely considered that private ownership will overcome these problems and, therefore, improve firms' performance.

In Russia improvement of firm performance was initially the second significantly important privatization target determined by the State Program of Privatization of State and Municipal Enterprises in the Russian Federation in 1992. (Perevalov et al., 2000) After July, 1 in 1994 in the framework of the Fundamentals of the State Privatization Program it became priority number one.

A vast majority of productive assets in Russia was privatized in the mass privatization program between 1992 and 1994. Privatization was conducted at unprecedented speed. While private sector share in GDP in 1991 was only 5%, in 1994 it

became 50%, and in 1999 it was already more than 70%. (Sprenger, 2011) Although the speed of privatization conduct is always one of the principal questions for policy makers and there are supportive arguments for both fast and gradual transition process, in Russia it was practically impossible to choose the second option. Fast privatization was explained by the facts that otherwise price liberalization and other reforms would not provide sufficient incentives for state-owned enterprises to restructure and become competitive; state would not be able to resist intervening in SOEs (Frydman and Rapaczynski, 1991; Boycko et al., 1995) and managers would decapitalize firms in the absence of rapid clarification of property rights (Blanchard et al., 1991).

After all, the process of privatization became the main determinant of the current ownership structure in Russia. Due to political reasons Russian privatization program favored firms' insiders. Mass privatization program was targeted to decrease political influence on firms decision making in a very tight time. (Boycko et al., 1995) In order to do this government needed support of enterprise managers.

The process began in 1989-1991 during the perestroika, when control of the branch ministries over the enterprises ceased and gave rise to incidents of spontaneous privatization. (Sprenger, 2013) In 1989 employees got an opportunity to lease the assets of state-owned firms with the right of a further buyout. Such privatization usually resulted in 100% ownership share of insiders (employees). However, with the start of mass privatization such method of privatization stopped existing.

Mass privatization program from 1992 until June 1994 implied transferring ownership rights from state to private owners for virtually all small enterprises and approximately 15 000 out of 24 000 medium and large companies. (Sprenger, 2013) Peculiarities of privatization process in Russia mostly depend on the political situation in the country, which was highly unstable, with changing governments, a tremendous fall in real output and high inflation. Price and foreign trade liberalization in January 1992 did not bring macroeconomic stability and efficiency of state-owned enterprises was hardly improved. In such an environment design of the privatization program for medium and large firms, which formed the major part of the industrial sector, was mainly influenced by a strong preference for rapid privatization by the reform government and by the interests of enterprise insiders and the industrial lobby. (Sprenger, 2013)

Privatization process can be considered in three stages: the decision to privatize, the choice of a privatization option, and tenders, auctions and first secondary sales. (Sprenger, 2011)

On the initial stage it was determined whether a particular firm was mandated or prohibited to be privatized by law or whether the decision about privatization could be made by privatization agency or employees. For companies in particular sectors, especially in natural resources, military complex and public utilities, decision about privatization was mainly postponed or needed special approval of the government. Privatization plan of a certain company had to include proportion of shares that could be offered to various groups of potential investors. This plan had to be approved by the State Property Committee (Goskomimushchestvo) or its regional offices. After that companies were transformed into open joint-stock firms, yet under the control of the state. Charter capital of the firm was based on the book value of assets other than land, net of outstanding debt. This fact meant that the share prices for employees were very low in real terms because of high inflation in 1992-1995.

Second stage implied selling shares with one of the three options. Decision on what option to choose was based on employee votes with two-thirds majority on one of the variants. If no decision was made during voting, Option 1 was accepted as default.

- Under Option 1 25% of firm shares was transferred to insiders (workers and managers) as non-voting shares for free. Employees were then allowed to buy additional 10% as voting shares with 30% discount to the nominal price. 5% of shares could be additionally purchased by senior management.
- Under Option 2 up to 51% of shares could be purchased by insiders (workers and managers) at a price 1.7 times the nominal value.
- Under Option 3 20% of shares was offered to managers of the company at the nominal price in case if they complete a proposed one-year restructuring plan. Further 20% of shares could be bought by all employees with 30% discount to the nominal price.

Third stage of the privatization process implied voucher component. It was settled that no less than 29% of shares had to be transferred through voucher auction. Vouchers or privatization checks were distributed among all population of the country at a low price. However, because of low investment literacy level of population and limited information on investment opportunities, vouchers were poorly used by Russian citizens. A big proportion of vouchers was used by employees in order to increase their share in the firm. 32% of all vouchers was accumulated by check investment funds.

Further privatization steps implied loans-for-shares scheme in 1995 and case-by-case privatization, regulated by a new privatization law since 1997. (Sprenger, 2011) However, the majority of the companies was privatized by 1994.

Special features of privatization process in Russia were the main reason of ownership distribution. Results of privatization in the framework of ownership structure will be covered in the next section.

4. Data and summary statistics

4.1. Sample description

The study is based on the sample of 530 Russian companies, which comes from the Russian Longitudinal Monitoring Survey, a nationwide household survey across 32 regions of the Russian Federation. The survey was conducted from spring 1999 till the fall of 2000. It involved both, representatives of the top management and the chief accountants. The major part of the quantitative information collected and used in the framework of the research, including output, profits, capital, employment data, wages, costs and investment, is based on standardized accounting principles of the State Statistical Committee of Russia (Goskomstat). This data was completed with retrospective information concerning the firm ownership structure changes, reorganizations, privatization information, labor relations, distribution of sales and financial indicators. The retrospective data used for the research goes back to the year 1990.

Firms for the survey were randomly chosen from the whole population of manufacturing firms with a probability proportional to firm employment. The final sample of the database includes companies from 32 subjects of the Russian Federation, and matches the overall distribution of Russian firms by industry, region and size rather well. We should note that the sample is biased towards larger firms since employees are more likely to work for a large firm. It is considered to be a particular characteristic of Russian economy.

Thus, our initial sample contains 530 manufacturing firms. It contains both privatized and state-owned firms, as well as a few newly established firms. In order to analyze privatization effects more precisely we have excluded 33 companies that were founded after 1986. Thus, this left 497 firms that were established under the Soviet planning economy and could potentially have gone through the process of privatization.

Information in the database was complemented with ownership structure information for the period of ten years from 2002 to 2012 in order to investigate long-run effects of privatization. Process of collecting ownership data was rather comprehensive since information on each company was obtained and analyzed separately from Interfax-Spark quarterly reports or Rosstat/EGRYUL filings. Information was obtained for all levels of ownership in order to find the share of ultimate beneficiaries. All in all, data on 484 companies was collected.

As for the performance measures, they include the following indicators: revenue, profitability indicators (ROS, ROA, ROE), labor productivity and employment. A big

number of indicators was reasoned by the fact that none of the indicators taken alone is a perfect measure of company performance. All financial indicators were taken or calculated on the basis of Financial reports available through Bureau van Dijk Ruslana and the Interfax Spark database.

4.2. Summary statistics

4.2.1. Performance data

In the framework of our study we examine effect of privatization on firm performance. Djankov and Murrell (2002) emphasize the importance of presenting results of studies on privatization effects so that they can be accurately compared with the rest of the literature. Therefore, in order to be comparable with previous empirical results, following Megginson et al. (1994), D'Souza et al. (2005) or Boubakri et al. (2005), Bai et al. (2009) we examine the similar groups of variables, measuring: (1) revenue as the scope of operating activities, (2) profitability indicators, (3) labor productivity, (4) employment. The indicators used to compare financial and operating performance are the following:

1. For analyzing revenue as the measure of the scope of operating activity we use inflation adjusted sales for the period 2003-2012. We carry out estimation in first differences and, therefore, we define the indicator as the annual rate of change of revenue between periods *t-1* and *t*.
2. Profitability is broadly considered to be the best ultimate measure of corporate performance. Therefore, in the framework of our study we use several measures for it:
    - *Return on sales (ROS)* = Net income divided by sales
    - *Return on assets (ROA)* = Net income divided by total assets
    - *Return on equity (ROE)* = Net income divided by equity

We also use first difference approach for these indicators and define indicators as the annual rate of change of ROS between periods *t-1* and *t* and the annual change in ROA and ROE, measured as the ratio of the change in net income between periods *t-1* and *t* to total assets of the firm in period *t-1* and the ratio of the change in net income between periods *t-1* and *t* to equity of the firm in period *t-1* relatively. ROS ratio has an advantage since it is based on two flow measures of net income and sales which are considered to be less sensitive to accounting conventions and inflation compared to many other indicators. Since ROA and ROA do not have such an advantage, we correct them by using assets and equity of period *t-1*.

3. Labor productivity is measured by the ratio of operating income to the number of employees. For our study we use the rate of annual change in this ratio between periods *t-1* and *t.*
4. Employment is measured as the rate of change in the total number of employees between periods *t-1* and *t.*

Our working dataset contains 1 697 – 2 008 observations on an unbalanced panel of 241 – 355 industrial companies during the period 2003 – 2012. Since we are using the rates of annual changes for performance variables we consider 2004-2012 period. As can be seen in Table 1, exact number of observations varies across different performance indicators.

Table 1. Summary statistics of the rate of change of performance indicators 2004-2012

Indicator (annual rate of change)	Mean	Standard deviation	Minimum	Maximum	Number of obs.
Revenue	0,08	0,61	-1	9,9	2 008
ROS	-0,19	2,61	-9,9	27,1	1 878
ROA	-0,23	2,29	-8,9	13,0	1 895
ROE	-0,28	1,71	-7,8	6,1	1 827
Labor productivity	-0,13	1,22	-4,9	4,0	1 697
Employment	0,01	0,33	-1	6,0	1 912

One of the issues that should be concerned while working with firm-level financial data in transition and emerging market economies is the fact that it may contain missing values and outlier observations. This may bias the estimated coefficients. (Filer and Hanousek, 2002) In our study we use financial and operating data of the companies after 2003 when the equal standards of reporting began to be widely used by the majority of the companies. Additionally, we have deleted from our sample those observations that contained inconsistent values of variables, such as negative values of revenues, and observations with extreme values.

However, as we can see in Table 1, even after excluding extreme values there are huge differences in the annual performance rate changes. There is a big set of firms that have either very low minimum values or very high maximum while the means for all indicators are fair enough. Moreover, we can see that means for profitability measures and labor productivity are negative. This is connected with the fact that most of the firms had very unstable profits during 2004-2012 years and were more likely to have negative rates of annual changes in profits.

4.2.2. Ownership data

The explanatory variables of the main interest in the study are indicator variables of the changes in the ownership structure. The primary hypothesis we study in the research paper is whether ownership structure after privatization has an impact on performance of the firm.

Dataset used for the study allows to analyze ultimate owners of the firm and identify controlling owner type (if there is any) for each case. Ownership data was mostly collected from quarterly reports for the end of each year during the period 2002-2012 available in Interfax-Spark system.

Information from the quarterly reports was mainly taken from section 6 for ownership information and section 5.2 about management of the company and their stakes in the firm. We identified both, CEOs of the company who had share in the firm and top management team who were also the owners of the company. By looking at section 1.1 it was checked whether the firm had just a CEO or also a top management team. Section 8.1.1 provided information about the share of preferred (non-voting) shares in the capital of the firm.

If there were no quarterly reports for certain years ownership information was taken from Rosstat/EGRYUL filing also available in Interfax-Spark system.

The process of collecting data on each company was done in several steps. Firstly, direct owners of the sample company were determined. These could include owners from the following groups:

- Federal government
- Regional government
- Municipal government
- Domestic non-financial company
- Domestic financial institution (e.g., bank, insurance company, mutual funds)
- CEO (general director) of the sample firm
- Other top manager of the sample firm
- Domestic individual owners
- Nominee
- Offshore firm
- Foreign firm (except offshore firms) or foreign individuals

Ownership shares were recorded both for the overall equity capital and voting (common) capital of each firm and for each year. If on the first level of ownership there were any domestic companies the process was repeated until the ultimate owners were found. Thus, ultimate owners of the company could represent state (on federal, regional and municipal levels), private domestic ownership (individual owners, managers of the firm, funds), foreign ownership, offshore companies and nomenees. For each ultimate owner the final total share of the company was computed.

This division allows us to analyze the effect of ownership on firm performance using two sets of ownership measures. Firstly, we evaluate the performance effect with different types of the controlling owners: federal, regional and municipal state, domestic individuals, managers of the firm, offshore companies, foreign firms and nomenees. We also test if the type of the largest owner in the ownership structure affects firm performance. Secondly, we assign all owners into 5 groups, aggregating state and domestic owners into two big groups. We examine whether controlling share of these owners or the type of the largest owner has any effect on company performance.

As can be concluded from Table 2, domestic individual owners (Russian citizens) represent the biggest group of ultimate owners with 1 552 observation, followed by managerial ownership (450 observations) and state federal ownership (401 observations). At the same time individual owners have the highest mean size of the stake held – 70,4%. Statistics show that in cases of state ownership government is more likely to stay controlling owner. More than a half of federal state owners remaining their share in the firm prefer to hold control stake. The same situation is with regional state. Most of the companies prefer to held stake of more than 51% shares. For our sample we got that municipal state owners for more than half of the cases held 100% stake. The major part of managers holding shares, nomenees, offshore companies and foreign investors do not usually held control stake, even if they represent the largest shareholders in the ownership structure. We can also mention that golden share is held by the state in a small number of cases. However, it is met more frequently for companies with major managerial ownership.

Table 2. Summary statistics across types of ultimate owners

Type of ultimate owner	Number of observations	Share in total sample (%)	Mean size of the stake held (%)	Controlling ownership	Largest stake held
State					
Federal	401	12,2	50,67	231	352
Regional	160	4,9	51	83	86
Municipal	95	2,9	100	60	68
Managerial	450	13,7	34,96	88	277
Individual	1 552	47,4	70,4	847	1356
Nomenee	244	7,4	35,08	79	124
Offshore	233	7,1	44,57	104	157
Foreign	142	4,3	24,3	49	79

Notes: "Controlling ownership" represents the number of observations of a particular owner type when his share is more than 50%; "Largest stake held" represents the number of observations of a particular owner type when he holds the biggest stake (but not necessarily controlling) in the whole structure

In terms of dynamics of ownership structure over the analyzed period, there were little changes in the types of owners. Mostly they were observed in the transfer of the ownership rights from one organization to the other, thus, mainly changing individuals in the ultimate ownership structure.

4.2.3. Privatization option data

In the framework of our survey we also test whether different types of privatization options have an impact on firm performance.

Privatization scheme is measured by 4 different options mentioned earlier. Option 1 implies free transferring of 25% of shares to workers and managers as non-voting shares; selling 10% of shares as voting to employees with 30% discount to nominal price. Additional 5% could be purchased by senior managers. Option 2 implied selling up to 51% of shares at a price 1.7 times the nominal price. Under option 3 managing group was able to buy 20% of shares at nominal price in case of proposal a one-year restructuring plan and its completion. Additional 20% could be purchased by employees with 30% discount of the nominal price. We consider option 4 as lease-buyouts that were available before mass privatization program.

Table 3. Privatization data distribution across different options

	Total number of firms	Option 1	Option 2	Option 3	Option 4	No data on option
Non-privatized companies	121					
Privatized companies	409	108	185	64	41	11
Privatized by 1994	375	94	180	61	37	3
Privatized between 1995 and 1999	16	6	3	3	3	1
Privatized between 2000 and 2012	18	8	2	0	1	7
Total number of firms	487					

Table 3 presents the number of companies from the sample that were privatized at different time and their distribution among 4 different options. The table shows that 77% of the firms from the sample size in the framework of our study were privatized during the mass privatization program and through lease-buyouts before 1994. 7% of the firms were privatized after 1995. 24,8% of the firms remained state-owned by the end of 2012 or by the date of liquidation.

5. Estimation methodology

5.1. Model specification

The main objective of the research is to analyze long-term effects of different types of owners after mass privatization on firm financial performance, labor productivity and employment. Following Frydman et al. (1999), Hanousek et al. (2007) and Bai et al. (2009), we use fixed effect model together with instrumental variables.

This methodology is based on two assumptions. Firstly, there can be unobservable ownership effects that include those coming from selection of firms for privatization. They are likely to be correlated with explanatory variables and error term in the model and not to change over time. For eliminating bias from unobservable heterogeneity we use fixed effects model. It includes individual specific constant that allows to capture time-invariant characteristics. Secondly, unobservable ownership effects can vary over time. In order to deal with it we use instrumental variables that allow to consider selection problem inherent in privatization. Success of using instrumental variables mostly depends on finding appropriate indicators that satisfy exogeneity condition.

In our study instrumental variables include indicators that measure initial conditions of the firm from the original survey. According to Sprenger (2011), ownership structure of Russian companies after privatization was not random but could be explained by firms' characteristics in the beginning of transition process. Thus, we will use characteristics identified by Sprenger (2011) as instrumental variables in our survey.

Following Frydman et al. (1999) and Bai et al. (2009) we will evaluate the impact of privatization on the firm performance using standard panel data treatment evaluation procedure and employing firm fixed effect model. We construct the following specification:

$$y_{ijt} = \alpha_j + P_{ijt}\beta_j + X_{ijt-1}\gamma_j + \varepsilon_{ijt}, \text{ where}$$

y_{ijt} – the outcome variable, indicating the rate of growth of a financial performance measure for firm i between (t-1) and t;

α_j – fixed group effects;

P_{ijt} – key independent variable: either treatment variable equal to 1 if firm i operates as ownership type j firm in period t and 0 otherwise (for other models) or treatment variable equal to 1 if firm I was privatized with option j and 0 otherwise (for model 1)

X_{ijt-1} – vector of performance indicators (growth rates) at period t-1, which is used in order to control for the differences in the initial levels of performance indicators;

β_j , γ_j– coefficients;

i – index of a firm;

j – ownership type;

t – time index.

As a result of solving the model we get the estimations of β_j-s that measure the performance contrasts between different types of owners and different types of privatization options. We make estimations for several models. Firstly, we will see how different kinds of ownership affect firm performance. For models 1 and 2 we introduce dummy variables for controlling stake of ownership. Thus, if the stake of a particular owner is more than 50% it is considered to be controlling. For models 3 and 4 we test whether performance is affected by the single largest owners. In this case we just determine which type of owner has the biggest stake in the ownership structure. In model 4 we consider whether different privatization options had different effect on firm performance or not.

Concerning the fact that fixed effect model does not address all types of endogeneity, we will also employ instrumental variables strategy in order to deal with time-varying effects.

5.2. Instrumental and control variables

In literature of new generation concerning privatization effect on performance endogeneity is one of the most burning problems. (Hanousek et al., 2007; Gorodnichenko and Grygorenko, 2008) It is now widely accepted that companies were not privatized randomly. Owners could make their decision to privatize a concrete company based on their expectations about its further performance. Thus, ownership cannot be considered as an exogenous factor explaining performance. In our study we use a number of instrumental variables covered in the paper of Sprenger (2011) on the issues of the choice of ownership structure during mass privatization. Following Sprenger (2011) we consider indicators of firm quality, attractiveness to state versus private owners and attractiveness to outsiders versus insiders as possible reasons of nonrandom selection.

The choice of concrete instrumental variables for each kind of model is based on the significance levels of the indicators in the models tested by Sprenger (2011).

Firstly, we consider the case of ownership effects on firm performance. Based on previous results (Sprenger, 2011) we use level of wage arrears in 1992 as an instrument for firm quality, share of firm sales to public institutions in 1990 as the measure of

attractiveness to state versus private owners, and unionization level in 1992, labor concentration in 1992, average wages of industrial employees in 1992 and number of social benefits in 1994 as indicators of attractiveness to outsiders versus insiders.

Taking into consideration results of the paper by Sprenger (2011), while studying the effect of privatization options we include *log profitability 1992*, being computed as the logarithm of accounting profits before taxes in 1992 minus logarithm of the number of employees in 1991, and the level of wage arrears in 1992 as the measures of quality. Similarly to the first case we use share of firm sales to public institutions in 1990 for controlling attractiveness for state vs private owners, and logarithm of capital labor ratio in 1992 for attractiveness to outsiders versus insiders.

Besides instrumental variables, measuring firm quality, its attractiveness to state vs private owners and attractiveness to insiders vs outsiders we also control for a number of additional firm characteristics that indicate its size, industry affiliation and location.

Our sample is biased towards larger companies which coincides well peculiarities of Russian economy on the whole. On average size of firms in Russia was larger than size of companies in developed countries. However, larger firms suffered more severely from transition. (Frydman et al., 1997) Larger firms usually had higher political support before and needed less business justification. Thus, it was harder for such firms to respond to fast-changing market environment. (Perevalov et al., 2000) For this reason we introduced size as control variable into our model. We evaluate firm's size on the basis of employment in 1991 but use only dummy variable of whether the company was big or medium size.

We also control for industry affiliation. There were serious structural changes in Russian industry during the transition process. For instance, shares of monopoly and export-oriented industries such as energy sector or ferrous and non-ferrous metallurgy rose dramatically. At the same time there was a sharp decline in production in such sectors as machine-building and food industry. Therefore, industry affiliation is likely to be important in transition process in Russia. We consider industry affiliation as exogenous as none of the firms examined changed its sector affiliation during the period analyzed and introduce 9 industry dummies according to a sector:

- energy sector;
- ferrous and non-ferrous metallurgy;
- chemical industry;
- wood and forestry;
- construction material industry;

- light industry;
- food industry;
- machine building;
- other industries.

Additionally, we introduce three dummy variables for firm's region location: Moscow/St. Petersburg, Asian part of Russia and European part of Russia (except for Moscow and St. Petersburg).

6. Empirical results

Our research shows that privatization does not produce performance improvements "on average". We find that the effects of different types of owners, ownership concentration and privatization options on firm performance are limited. Results vary across different models and ownership types but in general show that most of the types of private owners do not improve financial and operational performance of the company. However, we determine significant effects of specific types of owners.

Table presents estimated coefficients for 8 groups of ultimate owners who control more than 50% stake in the company and, therefore, are the major decision makers in the company.

Results of the Model 1 (Table 4) show statistically significant negative effect of federal state holding controlling stake in the company. This result is stable for all analyzed profitability indicators, labor productivity and employment. Regional state ownership for most of the cases shows negative, but statistically insignificant effect on profitability, labor productivity and employment growth rates. Municipal owners, on the contrary, have positive insignificant impact on all indicators for the exception of revenue growth rate.

Positive and statistically significant effect is found for managerial ownership effect on profitability indicators in case when managers hold more than 50% of shares. This is connected with the fact that managers having a controlling interest are more interested in efficiency improvements and raising profitability. However, their effect on revenue growth and labor productivity is insignificant.

Domestic individuals have significant negative influence on the indicators of revenue and employment growth rates. However, for the other cases they are not likely to affect firm performance.

Following previous studies, we also find positive effect of foreign ownership on profitability and employment growth rates. Although the share of foreign owners is relatively small and they are not likely to invest in Russian companies due to poor political and business environment, they cause a more effective allocation of recourses and higher profitability rates. This can be connected with the fact that foreigners can use best practices from international companies while doing business in Russia.

Offshore companies have mixed effect on performance indicators, showing significant positive impact only in case of ROE growth rate.

Results also show stable significant negative effect for all three profitability indicators. For most of the cases, beneficial owners prefer to appoint a nominee in order not

to register shares on their names. Thus, it is practically impossible to say who is standing behind these shares. Such not transparent structure creates more risks for corporate governance and, thus, has negative impact on the profitability.

Practically for all ownership types we find negative sign for the effect on employment indicator. Following Commander et al. (1996) and Earle and Estrin (1997) we can make conclusion on the weak effect of ownership structure after privatization on firms' changes in employment. During the privatization process and after it there was a general negative tendency as reductions in employment were very typical for Russian companies. This was caused by output decreases during transition and over-employment rates before privatization.

Table 4. Model 1. Effect of the controlling owners (detailed)

	Revenue	ROS	ROA	ROE	Labor prod.	Employment
Ownership						
State federal	-0,0345 (-0,12)	-2,211 (-1,6) *	-1,778 (-1,56) *	-0,1341 (-0,13) *	-2,1597 (-2,4) **	-0,2665 (-1,74) *
State regional	0,1670 (0,13)	-7,7168 (-1,3)	-5,925 (-1,17)	-2,2778 (-0,52)	-5,8226 (-1,3)	-0,1537 (-0,2)
State municipal	-0,2223 (-0,73)	1,8968 (1,26)	0,8912 (0,67)	0,6928 (0,61)	0,2792 (0,26)	0,1173 (0,91)
Individuals	-0,418 (-2,14)**	0,6159 (0,63)	1,1463 (1,36)	1,3447 (1,54)	0,0885 (0,14)	-0,2718 (-3,1) ***
Managers	-0,5038 (-0,68)	0,9085 (0,36) *	0,7136 (0,61) *	0,4667 (0,39) **	0,3622 (0,18)	-0,447 (-1,44)
Foreign owners	-1,3054 (-1,44)	3,2897 (0,71) *	0,8954 (0,22) *	3,4274 (1,0)	3,31 (1,7) *	-0,442 (-1,27)
Offshores	-0,4822 (-1,15)	2,0537 (1,09)	1,4109 (0,89)	2,1851 (1,62) *	0,7681 (0,8)	-0,2399 (-1,38)
Nomenees	0,065 (0,26)	-1,4011 (-1,17) *	-1,9232 (-1,86) *	-2,873 (-3,18) ***	-1,5129 (-1,75)	-0,0721 (-0,62)
Previous performance	0,0005 (0,01)	-0,0004 (-0,01)	-0,001 (-0,02)	-0,0062 (-0,11)	0,0935 (1,75) *	-0,019 (-0,48)
N of observations	1025	981	980	1058	996	967
R^2	0,2638	0,2773	0,2128	0,2304	0,019	0,3338

Notes: Estimated coefficients; *t* statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Size, industry and regional controls are included but not reported. Instrument used for quality performance is *wage arrears 92*, for attractiveness for state vs private owners – *public sales 90*, for attractiveness for insiders/outsiders – *union 92, labor concentration 92, log average wage 92, number of social benefits 94*

In table 5 results for Model 2 are presented. This model tests ownership structure effects on firm performance on a more aggregated level, not dividing state and domestic

owners into groups. Results show that in general state ownership has a significant negative effect on profitability indicators while its impact on other variables is mixed and insignificant. In this model domestic private ownership is insignificant for all the cases. Effect of other ownership types is mixed and not stable across difference performance indicators. We find that foreign owners have positive significant impact on growth rate of ROS and labor productivity. Offshore firms positively influence ROE rate of growth. Unlike Model 1, nomenees show negative significant effect only on an indicator of ROE growth.

Table 5. Model 2. Effect of the controlling owners (aggregated)

	Revenue	ROS	ROA	ROE	Labor prod.	Employment
Ownership						
State	-0,0527 (-0,21)	-0,0211 (-0,02) *	-0,3248 (-0,32) *	-0,2323 (-0,27) *	-0,7621 (-1,01)	0,1134 (1,0)
Domestic private	0,1174 (0,77)	0,6316 (0,58)	0,3587 (0,52)	-0,522 (-0,98)	0,5825 (1,44)	0,1656 (2,36)
Foreign owners	-0,2688 (-0,41)	1,649 (0,48)*	0,8612 (0,27)	-1,6225 (-0,64)	1,7927 (1,32)*	-0,1731 (-0,68)
Offshores	-0,1927 (-0,58)	0,7321 (0,49)	1,3046 (1,05)	1,8681 (1,82) *	0,3857 (0,53)	-0,1433 (-0,99)
Nomenees	0,3295 (1,55)	-1,0428 (-1,1)	-1,0917 (-1,24)	-2,2887 (-3,04) ***	-1,8045 (-2,91)	0,1674 (1,61)
Previous performance	0,0027 (0,07)	0,017 (0,44)	0,0249 (0,61)	0,032 (0,78)	0,0717 (1,82) *	0,0014 (0,04)
N of observations	1025	1005	944	1004	976	967
R^2	0,3884	0,2565	0,2432	0,2224	0,0485	0,239

Notes: Estimated coefficients; *t* statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Size, industry and regional controls are included but not reported. Instrument used for quality performance is *wage arrears 92*, for attractiveness for state vs private owners – *public sales 90*, for attractiveness for insiders/outsiders – *union 92, labor concentration 92, log average wage 92*

Tables 6 show results for a more general case when the owner is not necessarily have the controlling stake but still remains to have the biggest stake relatively to the other shareholders. Model shows no significant impact of state federal and state regional owners while municipal state turns to be positively and significantly effective in case of ROS and ROA growth rates and employment indicator. For most of the cases in the sample municipal state remains to be an owner of the firm only if it has 100% share of the company. Thus, it performs like controlling stakeholder having the possibility to make all strategic and operational decisions. At the same time, there are a lot of cases when state federal and state regional ownership concentration is less than 50%. Although they remain to be the biggest

owners they do not have an opportunity to have controlling votes in decision making (less than 50%) or even to block other decisions (less than 25%). This fact can explain the differences in the results of different kinds of state ownership.

Concerning private domestic ownership, according to Model 3 there is no significant effect of individuals on any of the indicators. However, following results of Model 1, managerial ownership shows positive significant effect on revenue and profitability growth rates as well as on employment indicator.

There are mixed results for ownership impact on performance of foreigners and offshore companies. However, the effects are insignificant for the exception of positive impact of offshores on ROE. In Model 3 nomenees still have negative sign for profitability and labor productivity indicators but the results are significant only for the impact on ROE and labor productivity.

Table 6. Model 3. Effect of the largest owners (detailed)

	Revenue	**ROS**	**ROA**	**ROE**	**Labor prod.**	**Employment**
Ownership						
State federal	0,2094 (0,71)	-0,1219 (-0,1)	-0,8746 (-0,75)	-0,76624 (-0,68)	-0,6772 (-0,72)	0,0426 (0,26)
State regional	0,6472 (0,55)	-3,2055 (-0,56)	4,0376 (0,72)	0,912 (0,19)	-2,6738 (-1,02)	0,7716 (1,24)
State municipal	-0,0512 (-0,17)	2,5643 (1,91) *	2,4679 (1,77) *	1,452 (1,27)	0,7058 (0,78)	0,3485 (2,29) **
Individuals	-0,1714 (-0,94)	0,4443 (0,56)	0,274 (0,33)	0,1473 (0,21)	0,3914 (0,77)	0,003 (0,03)
Managers	0,8418 (2,25) **	0,0175 (0,01) *	3,0266 (1,88) *	1,7048 (1,16) *	0,7599 (0,79)	0,7003 (3,99) ***
Foreign owners	-0,7909 (-1,17)	1,0097 (0,33)	2,9706 (0,95)	2,4898 (0,96)	1,9355 (1,32)	-0,2393 (-0,76)
Offshores	-0,0743 (-0,22)	1,7608 (1,32)	1,6837 (1,29)	1,7205 (1,66) *	1,1856 (1,59)	-0,0617 (-0,35)
Nomenees	0,3066 (0,98)	-1,8751 (-1,5)	-1,4084 (-1,09)	-2,1043 (-2,15) **	-1,581 (-2,04) **	0,0695 (0,42)
Previous performance	-0,0713 (-1,54)	0,0214 (0,49)	0,0486 (0,97)	0,0284 (0,56)	0,0747 (1,46)	-0,0742 (-1,37)
N of observations	1045	997	966	1027	1046	994
R^2	0,21	0,1818	0,2405	0,3487	0,0237	0,2698

Notes: Estimated coefficients; *t* statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Size, industry and regional controls are included but not reported. Instrument used for quality performance is *wage arrears 92*, for attractiveness for state vs private owners – *public sales 90*, for attractiveness for insiders/outsiders – *union 92, labor concentration 92, log average wage 92, number of social benefits 94*

Model 4 (table 7) again aggregates all state and domestic private owners into two big groups. However, results for these ownership categories are insignificant for all cases for the exception of positive and significant effect of domestic private owners on revenue growth rate. A big part of the companies in the sample is owned by several individuals (including managers of the company) who are likely to be affiliated with each other. In the absence of one controlling shareholder these individuals need to come to consensus in decision making. One of the most commonly accepted strategic decision in this case is an increase of operation activity, i.e sales of the firm. Thus, we can see a positive significant impact on revenue growth rate.

Foreign owners and offshores have mixed insignificant impact on performance growth rates while nominees, following the previous models, show negative significant effect on ROA, ROE and labor productivity indicators.

Table 7. Model 4. Effect of the largest owners (aggregated)

	Revenue	**ROS**	**ROA**	**ROE**	**Labor prod.**	**Employment**
Ownership						
State	0,3566 (1,39)	-0,8936 (-0,78)	-0,463 (-0,41)	-0,3414 (-0,42)	-0,0596 (-0,1)	-0,1108 (-1,1)
Domestic private	0,4535 (1,73)***	0,7081 (0,59)	0,2539 (0,22)	0,2957 (0,35)	0,0619 (0,09)	-0,2193 (-1,92)
Foreign owners	-0,1777 (-0,44)	1,4689 (0,7)	1,3406 (0,68)	0,613 (0,4)	-0,1841 (-0,19)	0,1815 (1,09)
Offshores	-0,0905 (-0,33)	-0,8936 (-0,78)	1,4357 (1,33)	1,6572 (1,94) *	0,5984 (1,0)	0,0339 (0,3)
Nomenees	0,4337 (2,17)	-1,1386 (-1,24)	-1,806 (-2,08)**	-1,7536 (-2,54)**	-1,019 (-1,76) *	0,0467 (0,51)
Previous performance	-0,0216 (-0,56)	0,0359 (0,87)	0,0436 (1,02)	0,0327 (0,79)	0,0883 (2,0) *	-0,0052 (-0,14)
N of observations	1045	1007	966	1027	1046	994
R^2	0,0458	0,2657	0,1239	0,216	0,1765	0,3169

Notes: Estimated coefficients; *t* statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Size, industry and regional controls are included but not reported. Instrument used for quality performance is *wage arrears 92*, for attractiveness for state vs private owners – *public sales 90*, for attractiveness for insiders/outsiders – *union 92, labor concentration 92, log average wage 92*

In Model 5 (table 8) we have tested effect of different privatization options on performance indicators. For most of the cases privatization options 1,2 and 3 show no significant effect. However, we can consider option 4 (lease-buyout) to be the worst.

Although it has a strong positive impact on revenue growth, it shows stable negative effect on profitability and employment indicators. Lease-buyouts which started in 1989 before mass privatization program usually resulted in 100% ownership of employees. Thus, in case when ownership is dispersed among many employees efficiency is likely to decrease.

Table 7. Model 5. Effect of the privatization options

	Revenue	ROS	ROA	ROE	Labor prod.	Employment
Privatization option						
Option 1	0,0346 (0,31)	0,202 (0,29)	-0,0021 (-0,01)	0,5616 (1,51)	-0,1699 (-0,57)	0,0244 (0,51)
Option 2	0,0076 (0,08)	0,0956 (0,2)	0,3202 (0,75)	0,1651 (0,48)	0,2317 (0,86)	-0,034 (-0,82)
Option 3	-0,0842 (-0,58)	0,4258 (0,62)	0,628 (1,01)	0,8252 (1,77)	-0,5579 (-1,25) *	0,0037 (0,06)
Option 4	0,6183 (2,01) **	-2,6436 (-1,86)**	-1,9724 (-1,45) *	-0,1324 -(0,12)*	-0,8754 (-1,2)	-0,2015 (-1,66) *
Previous performance	0,0126 (0,34)	-0,022 (0,57)	0,0284 (0,72)	0,0299 (0,79)	0,0809 (1,87) *	-0,0025 (-0,07)
N of observations	1025	945	944	1004	996	1077
R^2	0,016	0,3112	0,2982	0,2125	0,062	0,2664

Notes: Estimated coefficients; *t* statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Size, industry and regional controls are included but not reported. Instrument used for quality performance is *log profitability 92, wage arrears 92*, for attractiveness for state vs private owners – *price control 92*, for attractiveness for insiders/outsiders – *log capital labor ratio 92*

Overall, we can make a conclusion that the ownership structure in Russian companies is very complicated and is better to be analyzed on deeper levels. Thus, when we analyze state and domestic ownership in more details, we find more stable results. While domestic private ownership in general has no significant impact on firm performance, we find strong positive effect of managers on revenue, profitability and employment growth rates. In state ownership federal state has the most significant effect. It negatively influences practically all performance indicators. We also find positive significant impact of foreign ownership and negative significant impact of nomenees on profitability indicators.

7. Conclusion

The transformation of former communist economies from almost fully state-owned to private is one of the key events in recent history. The question whether changes in the ownership structure improved relatively poor performance of the centrally planned economies is one of the most controversial today.

Current paper was motivated by the ongoing debates on the privatization effects on firm performance. Unlike many previous studies, our research project focused on the long-term effects in the period 2004-2012, used detailed information on ultimate ownership and financial information and treated endogeneity problem.

Considering complicated ownership structure of Russian companies we made a conclusion that it is better to analyze performance effects on a more detailed level. Among other results we have found that in general state has significant negative impact on profitability growth rates in cases when it owns more than 50% stake. At the same time, federal state turns to have the worst effect. When federal state aggregates controlling stake in the company, it negatively influences practically all performance indicators. Regional and municipal state ownership have mixed and mostly insignificant results for all indicators for the exception of the case when municipal owners have the biggest (but not necessarily controlling) share among others. In this case municipal state shows positive impact on ROS, ROA and employment growth rates.

While domestic private ownership in general has no significant impact on firm performance, we find strong positive effect of managers on revenue, profitability and employment growth rates. This result is stable both, for the cases when managers have controlling stake and when they just represent the group with the biggest share. Furthermore, domestic individuals turn to be not very efficient owners. This group has mixed and mostly not significant effect on firm performance.

Following previous studies, we also find positive effect of foreign ownership on profitability and employment growth rates in cases when foreigners have controlling stake. Although the share of foreign owners is relatively small in the whole sample of the companies and they are not likely to invest in Russian firms due to poor political and business environment, they provide a more effective allocation of recourses and higher profitability growth rates.

For all models offshore companies have mixed effect on performance indicators, showing significant positive impact only in case of ROE growth rate. Considering nominee as a group of ultimate owners we determine significant negative effect for profitability

indicators and labor productivity. This effect is stable across different models. These cases are difficult to analyze because of nontransparent structure and impossibility to find beneficial owner.

Analysis of different privatization options show no significant effect for options 1, 2 and 3 but negative significant impact of option 4 – lease-buyouts, which were common in 1989 before mass privatization and mostly resulted in 100% ownership by employees. Thus, in these cases ownership is generally dispersed among many employees and, therefore, operations are likely to be inefficient.

Overall, limited and mixed effects of privatization one more time prove that process of transferring ownership rights was very complex in Russia and needs to be investigated in details case by case. Further survey can study ownership data more precisely for each firm. Much attention should be paid to transferring shares between different single individuals as well as to cross-ownership and holding shares on different levels of ownership structure.

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