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PRIVATIZATION AND SURVIVAL – EVIDENCE FROM A RUSSIAN FIRM SURVEY**

ABSTRACT: *This study is dedicated to an important aspect of the long-run performance of firms, namely their survival under rapidly changing conditions in a transition economy. The analysis is focused on the question of whether privatization and ownership structure have affected the likelihood of liquidation and bankruptcy of firms in Russia. We use a sample of 497 privatized and non-privatized firms that were surveyed in 1999-2000, and for which information was collected about their survival status and reasons for exit, such as bankruptcy, mergers and court decisions. More than 38% of the sample*

firms were liquidated over the period 1999 to 2013. We find that privatization and the choice of privatization option have no effect on the long-term survival of firms in Russia, but that managerial ownership lowers the likelihood of both liquidation and bankruptcy. Other transition-specific predictors of bankruptcy, such as the extent of price controls and the amount of wage arrears, affect firm exit in a significant way.

KEY WORDS: *survival analysis, privatization, ownership structure, liquidation, bankruptcy, Russia*

JEL CLASSIFICATION: G32, G33, G34, L33, P34

1. INTRODUCTION

There is a continuing interest in the effects of privatization, changes in ownership structure, and corporate governance of companies on their productivity and financial performance. This is particularly true of the transition countries of Central and Eastern Europe and China, where privatization has encompassed almost all sectors of the economy and where ownership structures and corporate governance arrangements have changed radically in a relatively small period of time.

Almost twenty years have passed since the major privatization programs in the countries of Central and Eastern Europe. In Russia the vast majority of productive assets was privatized in the mass privatization program between 1992 and 1994. This study is dedicated to an important aspect of their long-run performance, namely their survival under rapidly changing conditions. In our analysis we focus on the question of whether privatization and ownership structure have affected businesses' likelihood of liquidation and bankruptcy.

We use a sample of 497 privatized and non-privatized firms that were founded in Russia under the Soviet planning system. These firms were surveyed in 1999-2000. In addition, we observe whether these firms have been liquidated or bankruptcy proceedings initiated. The vast majority of liquidations are due to bankruptcy. We treat the relatively small number of mergers as active firms. Many of them have become subsidiaries of holding companies as a result of the restructuring of the electricity sector in 2008. We concentrate on liquidation and bankruptcy as outcomes for two reasons: first, they are important measures of firm performance, and we would like to estimate how they are affected by privatization; second, we would like to see whether privatization has played a role in accelerating the natural process of creative destruction in the transition from a planned to a market economy, in particular the removal of inefficient companies from the markets.

There might be objections to the view that bankruptcy and liquidation can be seen as a performance measure and that they have served to drive inefficient firms out of the market in Russia. First, from 1998 to 2002 the Russian bankruptcy law established a very low bankruptcy threshold and left debtors in a position where they could not effectively defend themselves from false accusations of non-payment. There is anecdotal evidence that dishonest creditors used this legal situation to redistribute ownership rights, effectively through hostile takeovers (Simachev, 2003). However, in our sample 60% of bankruptcies were initiated in 2003 and later, after a new bankruptcy law was adopted that corrected this

loophole. Second, we came across various cases in our sample where a firm's assets were auctioned off during a bankruptcy procedure, only to be transferred to a new firm with the same name and location (often under a different legal form) that continued the same type of production. Still, we believe that bankruptcy and liquidation of an existing legal entity are fundamental disruptions of its business. Third, Lambert-Mogiliansky et al. (2007) argue that regional governors often captured the bankruptcy process with the help of loyal judges. They find that in regions with politically strong governors, bankruptcy procedures were introduced more frequently but led to liquidation in fewer cases. In our sample we observe only bankruptcies that eventually lead to liquidation, with the exception of 13 companies in which bankruptcy proceedings were underway at the point of data collection (beginning of 2013). Therefore, political biases should be mitigated in our sample, and we do not explicitly control for political variables in our regressions.

Our empirical approach is to test whether privatization, as well as ownership structure and other firm characteristics, have predictive power for the survival of firms. Our dependent variables will be indicators of liquidation or bankruptcy and the time that elapsed from the time of the survey until one of these events. Our explanatory variables of main interest are: whether a firm has been privatized, the chosen privatization option, the ownership stakes of various types of owners, and the concentration of ownership in the hands of outsiders (i.e., non-government shareholders that are not employed by the firm). We control for a number of standard bankruptcy predictors such as firm size, profitability, and leverage, and transition-specific variables such as the extent of price regulation and wage arrears, as well as location and industry affiliation.

On the one hand, if privatization improves the productivity and financial performance of firms, as has been found in several studies (see section 2), we can expect it to also lower the likelihood of liquidation and bankruptcy. On the other hand, the government might protect firms under its control from bankruptcy, so the resulting effect is difficult to predict on theoretical grounds. Insider ownership (especially by managers) and the presence of large outside shareholders who monitor the management can mitigate agency problems and thus lead to better performance. However, there might also be entrenchment effects at work, which makes the question of the effect of insider and managerial ownership ambiguous *a priori*.

We find that privatization and the choice of privatization option have no effect on the long-term survival of firms in Russia. This is in line with earlier results

by Brown et al. (2011), that any positive productivity effects of privatization in Russia take a long time to realize. But nor is it the case that privatization has considerably accelerated the process of creative destruction, which often takes the form of liquidation of existing firms.

Company insiders have typically received large ownership shares in the Russian privatization process, and at the date of the survey (1999/2000) they were still relatively high. We find that more than the size of the aggregate insider ownership stake it is the distribution of that stake among company insiders, i.e., managers and workers, that significantly affects the likelihood of being liquidated or going bankrupt. In particular, managers having a higher ownership stake reduces this likelihood, which could be explained by the presumably more concentrated ownership of managers and reduced agency costs, since their interests become more aligned with those of the firm (i.e., its shareholders).

The remainder of the paper is structured as follows. After a short literature review in section 2, we present our data, descriptive statistics on liquidation, bankruptcy, and privatization, as well as the variables used in the analysis in section 3. Section 4 briefly discusses the econometric methods used in the paper. Section 5 presents the empirical results, and section 6 concludes.

2. LITERATURE REVIEW

Our study relates to at least three strands of the literature, namely the literature that studies the performance effects of privatization in the context of transition economies, the literature on the prediction of bankruptcy and corporate default, and the literature on the effect of ownership and corporate governance on default risk and firm exit more generally.

Two excellent surveys, Megginson (2005) and Estrin et al. (2009), summarize the literature on privatization and suggest that by and large the performance effects of privatization have been positive. However, the literature is not entirely conclusive about the performance effects. For example, Aussenegg and Jelic (2007) did not find significant changes in profitability, efficiency, output, and investments in a large sample of post-privatization firms from three Central European countries.

Hanousek et al. (2007), extending the methodology of Frydman et al. (1999), analyze the effects of different types and the concentration of ownership on performance using a large sample of firms in the Czech Republic after mass

privatization. They find only limited effects of certain types of ownership, except for a positive effect of foreign ownership and ownership concentration for some performance indicators. Bai et al. (2009) study performance effects of the privatization of Chinese state-owned enterprises using a comprehensive panel data set. They find positive effects on labour productivity and profitability, which are sustained in the long run and more pronounced if the government reduces its stake to a minority position as opposed to keeping a majority stake.

Brown et al. (2011), in a follow-up study of Brown et al. (2006), find that the overall effect of privatization to domestic owners on firms' productivity has been negative compared to other firms in the same industry in Russia. The estimation of time-varying effects, however, shows that positive effects of privatization appear around the year 2003, i.e., about ten years after the mass privatization program.

We draw our methodological framework from a series of studies of corporate bankruptcy and default. Altman (1968) and Zmijewski (1984) estimate static models of the probability of bankruptcy with mainly accounting ratios as explanatory variables. Altman's z-score has become a particularly popular measure of financial distress. Shumway (2001) proposes a dynamic logit or hazard model with time-varying covariates and adds more equity market variables. Both the new variables and the improved estimation methodology increase the accuracy of the bankruptcy forecasts. Chava and Jarrow (2004) follow Shumway's methodology and show that the inclusion of industry effects is important. In addition, they use data at monthly frequency, as opposed to yearly data as in the previous studies. Campbell et al. (2008) use the empirical measure of financial distress obtained from the dynamic logit model in order to infer the risk and return characteristics of stocks of financially distressed firms in the US. They show that the optimal model specification changes with the forecast horizon. Their explanatory variables based on accounting data are the ratio of net income to total assets, leverage (total liability as a ratio of total assets), cash holdings per total assets, market-to-book ratio, the firm's price per share, and a measure of distance to default. Variables based on equity market data include the excess stock return over the S&P 500, volatility of stock returns, and market capitalization. Complementary to the finance literature, Manjón-Antolín and Arauzo-Carod (2008) summarize empirical methods and evidence on firm survival from an industrial organization perspective.

Few studies have been dedicated to the effect of ownership distribution on default or firm exit directly. Zeitun and Tian (2007) find for a sample of Jordanian firms that firms with high ownership concentration and more state ownership are less

likely to default. Several papers study the relation between corporate governance and various measures of default risk, such as credit ratings (Ashbaugh-Skaife et al., 2006), corporate bond yields spreads (Cremers et al., 2007), and credit default swap spreads (Switzer and Wang, 2013). Goktan et al. (2009) find that firms where managers have higher ownership stakes are more likely to go private, less likely to be acquired by another company, and less likely to go bankrupt.

Two papers have investigated firm survival in Russia. Rinaldi (2008) analyzes entry and exit in the footwear industry during the years 1992-2000 and finds that new entrants are not better in terms of their survival chances than incumbent firms. Iwasaki (2013) studies two rounds of a large survey of Russian industrial firms (not the same that we use). The author concentrates on the effects of corporate governance mechanisms on the survival of firms and finds that the quality of corporate governance institutions has a positive effect on the chances of survival.

3. DATA, DESCRIPTIVE STATISTICS ON SURVIVAL AND PRIVATIZATION, AND VARIABLES

The sample of firms in this study comes from a survey of Russian manufacturing firms conducted in the years 1999 and 2000, with retrospective information going back to the founding of the firm and privatization at the beginning of the 1990s. Part of the initial sampling strategy was to rely on the careful procedures, including sophisticated regional stratification, of the Russian Longitudinal Monitoring Survey (RLMS). Firms were identified from the answers of respondents to a question about their employer. From all the manufacturing firms, employers were randomly chosen with a probability proportional to firm employment. As a result the sample is biased towards larger firms, just like the Russian economy, since an employee (and thus a respondent of the RLMS) is more likely to work for a large firm. The final sample of firms covers 32 subjects of the Russian Federation, and matches the overall distribution of Russian firms across sectors rather well. There is some overweight in the electricity and fuel sectors, which reflects the rather large size of the firms in these sectors.

The overall sample contains 530 manufacturing firms. Since most of our analysis is dedicated to the effects of privatization we exclude a small fraction of the sample, 33 firms that were founded after 1986. This leaves us with 497 firms that have their roots in the Soviet planned economy and could potentially have gone through the process of privatization.

We complement the survey data with information about the current survival status of the firm (active or inactive, and, in the latter case, liquidation date) as of the end of the first quarter of 2013, the reasons for liquidation, and ownership structure (state-owned vs. private) at the end of year 2012 or previous to the liquidation date. The status information was obtained from the Bureau van Dijk Ruslana database for Russian enterprises. The survey provided a unique firm identifier (OKPO, Russian classifier of firms and organizations) that allowed us to identify 488 out of 497 firms. The status of firms that were classified as non-active and had not provided financial accounts in recent years was then verified in the Interfax-Spark database and the unified enterprise registry (Russian acronym EGRYuL). The latter also contained the date of the initiation of bankruptcy procedures - specifically, the date of the appointment of a bankruptcy manager.[1] Ownership information, which allowed inferring the date of privatization of companies that remained state-owned at the date of the survey, comes from the Interfax-Spark database and quarterly filings of firms to the Federal Agency for Financial Markets.

Table 1 presents information on the status of the sample firms. 57.6% of the sample firms have remained active and another 2.5% had remained active but were undergoing the process of bankruptcy at the point of data collection (beginning of 2013). All the other firms were liquidated as legal entities between 2000 and 2012. The most frequent reason for liquidation (27.1% of the sampled firms) was bankruptcy. In 7% of cases the reason for liquidation was accession to a holding company or a merger. Most of the cases of accession occurred as a result of the restructuring of the electricity sector in 2005-2008. Thus, we observe only a very low number of firms that exited through genuine corporate restructuring.

Table 1. Survival status and reasons for market exit

Status	Frequency	Percentage
Active	281	57.58
Liquidated as a result of bankruptcy	132	27.05
Legal entity dissolved due to accession or merger	34	6.97
Liquidated due to other reasons	29	5.94
In the process of bankruptcy	12	2.48
Total	488	100.00

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1   The enterprise registry was set up in 2002, and in several cases the appointment of the bankruptcy manager coincided with the first entry in the registry. In these cases, and if we could not detect the reason for liquidation from the registry, we consulted the Integrum database, which contains archives of Russian newspapers, in particular Rossiskaya Gazeta and the Bulletin of the Federal Agency for Insolvency and Financial Recovery, for news about courts' arbitration decisions in bankruptcy cases.

Table 2 displays the number of liquidations and bankruptcy initiations for each year from 1995 to 2012. Liquidation and bankruptcy rates were computed as the fraction of firms that were liquidated or entered bankruptcy in a given year among all active firms at the beginning of that year. We observe that liquidation rates peaked in the year 2006. In that year more than 8% of still-existing sample firms were liquidated. Bankruptcy rates were highest during the years 2001-2005 (between 3% and 5%). Surprisingly, we do not observe any strong effect of the recent financial crisis on bankruptcies or liquidation.

Table 2. Number of liquidations and bankruptcies, and their rates by year

Year	Liquidations	Liquidation rate (%)	Initiations of bankruptcy	Bankruptcy rate (%)
1995	0	0.00	1	0.20
1996	0	0.00	2	0.41
1997	0	0.00	4	0.82
1998	0	0.00	4	0.83
1999	0	0.00	8	1.68
2000	1	0.20	13	2.77
2001	3	0.62	21	4.61
2002	8	1.65	13	2.99
2003	18	3.78	20	4.74
2004	18	3.93	13	3.23
2005	19	4.32	17	4.37
2006	34	8.08	2	0.54
2007	23	5.94	8	2.16
2008	19	5.22	1	0.28
2009	12	3.48	1	0.28
2010	8	2.40	5	1.39
2011	14	4.31	5	1.41
2012	5	1.61	2	0.57
2013	2	0.65	1	0.20
TOTAL	184		140	

Note: The total number of cases is slightly lower than in Table 1 due to missing values for the liquidation and bankruptcy year. The liquidation and bankruptcy rates are computed as ratios of the surviving (non-bankrupt) firms starting from 488 in the first year, the number of total observations in Table 1.

Next, Table 3 presents the fraction of firms that have been privatized at various points in time. A firm is considered to be privatized when private owners control

more than 50% of the firm's shares. The vast majority of firms were privatized in the mass privatization program and through lease-buyouts prior to 1994. Only 7.3% of the sample firms were privatized after that year, and 17.4% of the firms were still state-owned at the end of year 2012 or at the date of liquidation.

Table 3. When Firms Were Privatized

	Number of firms	Sample size	Percentage
Privatized by 1994	349	446	78.3
Privatized by 1999	382	491	77.8
Privatized by 2012 (or before liquidation)	400	484	82.6
Privatized between 1995 and 1999	16	446	3.6
Privatized between 2000 and 2012	18	484	3.7

We get a first approximate answer to our question of how privatization affected firm survival by looking at a simple two-dimensional tabulation of two indicator variables, one for privatization up to the year 1999 and the other for liquidation or bankruptcy, presented in Table 4.

Table 4. Privatization, liquidation, and bankruptcy

Privatization by 1999/2000	Liquidation			Bankruptcy		
	No of firms	Sample size	Percent	No of firms	Sample size	Percent
No	32	106	30.2	29	106	27.4
Yes	129	380	33.9	116	380	30.5
Total	161	486	33.1	145	486	29.8

We can observe that liquidations and bankruptcy were present to approximately the same extent among privatized and non-privatized firms. However, this might be the result of other effects such as industry affiliation, profitability, or leverage, such that only a multivariate analysis can answer the question about the effect of privatization on survival.

Along with the indicator of privatization by the time of the survey, we consider the ownership structure to be the most interesting explanatory variable. In particular, we include the stakes of various types of shareholders and a measure of ownership concentration. At the beginning of 1999, on average 76.2% of the firm shares were in the hands of private owners, 43.7% were owned by company

insiders (managers and workers), and 12.4% were owned by managers alone. As a proxy for ownership concentration among outside shareholders we consider the holdings of blockholders (shareholders with an at least 5% ownership stake). The stake of all such blockholders is 22.6% and the stake of the three largest blockholders is 21.4% on average.

Our control variables include standard predictors of bankruptcy. These are the return on assets as a measure of profitability, leverage (measured as bank loans as a fraction of total assets), and firm size (the logarithm of the number of employees), all for the year 1998. We also have data on the amount of payables, expressed as a fraction of total assets. We add two variables that are specific to the context of Russia as a transition country. The first is the amount of wage arrears. In the 1990s it was a widespread for firms not to pay their workers for several months and to accumulate wage arrears. On average, our sample firms were 2.5 monthly payrolls in arrears at the end of 1998. Another feature that might affect the survival of firms is direct state intervention, in the form of regulated prices. On average, 24% of the sample firms' sales were subject to price controls at the end of 1998.

Finally, we include two dummy variables for the location of the firm, the first if the firm is located in either Moscow or St Petersburg (which takes value 1 in that case), and the second if the firm is located in the Asian part of Russia (the European part excluding the two capitals is the base group). We also control for industry by including eight industry dummies. A complete list of explanatory variables and their definitions is given in Table A1.

4. METHODS

We have two working definitions of a firm exit. The first is the formal liquidation of the firm, which includes liquidation as a consequence of bankruptcy, by court decision, or for other reasons. As mentioned above, we treat accessions and mergers as active firms. The second definition of an exit is the initiation of bankruptcy procedure.

In our econometric analysis we use two types of model to estimate the quantitative effects of various determinants of firm survival. First, we use logit models with an indicator variable for exit. Second, we use the Cox proportional hazard model as the most popular model for survival analysis. It assumes proportional

hazard ratios, i.e., the ratio of the risk of liquidation of two groups (for example, privatized and non-privatized) is constant over time.

Firm exit may occur due to various reasons. In studies of listed firms, bankruptcy, corporate mergers, and going private (delisting) are considered and a competing risk model is used to estimate the factors driving each of these decisions jointly (He et al., 2010, Goktan et al., 2009). Most of our sample firms are not traded, but it would still be desirable to study bankruptcy and mergers jointly as alternative forms of firm exit. However, we have only a small number of mergers in our sample, so we concentrate on the drivers of a company's liquidation in general, and of bankruptcy in particular.

5. ECONOMETRIC RESULTS

We first present the results of logit models with an indicator for liquidation or bankruptcy as the dependent variable. The estimation results are displayed in Tables A2 and A3 of the appendix, for liquidation and bankruptcy respectively. Each table contains three model specifications. The first model includes the dummy variable of whether the firm was privatized, the second the stakes of three types of owners, and the third our measure of concentration of outside ownership, each time along with standard predictors of bankruptcy. The regional and industry indicators are not reported.

We find no significant effect of privatization per se on the likelihood of being liquidated or going bankrupt. In previous research with the same sample (Sprenger, 2011) we found that firms with higher productivity and higher wages were more likely to be privatized. One would, therefore, expect privatized firms to survive longer, but this might be compensated for by some state-owned firms being protected from bankruptcy, so that we do not find any difference. Unfortunately, we do not have direct measures of protection such as subsidies, state guarantees, or preference in public procurement. We do observe, however, that firms with a higher fraction of sales subject to price controls as a form of regulation decrease the likelihood of liquidation and bankruptcy. Such firms, while not necessarily owned by the government, seem to enjoy certain protection, or simply have a less volatile stream of revenues.

The result that privatization has no effect on survival is in line with the finding of Brown et al. (2011), that the positive effects of privatization on productivity took a very long time to materialize in Russia. We also test the effect of various

privatization methods on the likelihood of liquidation and bankruptcy. Since we do not find any significant effects they are not reported.

Next, we study various features of the ownership structure and their relation to the exit of companies. We distinguish the state from private shareholders. Among private owners we consider the stakes of insiders (managers and workers) vs. outsiders (domestic financial institutions, non-financial firms, and foreign owners). Finally, we focus on the stake of managers among company insiders. We find that managerial ownership is associated with a lower risk of liquidation and bankruptcy. This result seems logical from an agency perspective. The interests of managers with higher ownership stakes are more aligned with those of the firm (i.e., its shareholders) and they therefore exert more effort and engage less in value-destructing activities such as the diversion of firm assets. Such an effect is not present for the stake of insiders as a whole, which means that the ownership stake of workers has the opposite effect. The share of workers in the equity of privatized firms was initially high due to the design of the Russian mass privatization program and subsequently has fallen considerably (Sprenger, 2011). Ownership by workers has usually been dispersed among many, which explains why it does not have an incentive alignment effect, but rather leads to lower performance.

In addition we consider outside owners, either measured as the joint ownership stake of the largest three blockholders (reported here) or as the joint ownership stake of all blockholders (not reported). A blockholder is defined as a shareholder with an ownership stake of at least 5%. In both cases we do not observe a significant effect on the likelihood of liquidation or bankruptcy.

Several of the control variables from standard models of bankruptcy prediction have explanatory power. Larger firms are less likely to be liquidated, but size does not affect the likelihood of going into bankruptcy. Wage arrears are, as one might expect, a positive predictor of both liquidation and bankruptcy. Wage arrears might indicate that firms were already distressed at privatization, but only the adoption of a functioning bankruptcy law in 1998 led to a larger number of liquidations. Overdue payables are also a positive predictor of bankruptcy in 2 out of 3 specifications. In contrast, standard bankruptcy predictors such as profitability and leverage are insignificant in our regressions. The reason might be that these variables are measured with error or that they are quite volatile, in particular around the Russian crisis of 1998, when they were measured in our study.

We now turn to the results from the Cox proportional hazard models given in Tables A4 and A5 of the appendix. In these models we estimate the effects of explanatory variables on the time until liquidation or bankruptcy. Model specifications 1 to 3 are analogous to the ones in Tables A2 and A3 for logit models. What is informative is whether the coefficients are greater or smaller than one. A one-unit increase in an explanatory variable leads to an increase in the hazard ratio by the reported coefficient minus one.

Privatization and concentration of outside ownership do not affect the time until liquidation or bankruptcy, consistent with the previous results from logit models. However, there is no negative effect of managerial ownership in these specifications. As before, size affects liquidity negatively, and the negative effect of price controls and the positive effect of wage arrears are confirmed.

6. CONCLUSION

Our representative sample of the old sector of the Russian economy (i.e., firms founded under the planned economy) shows that more than 42% of the sample firms interviewed in 1999-2000 were liquidated as legal entities over the next 14 years. Most of the liquidations were due to bankruptcy. We have investigated drivers of firm exit with particular focus on privatization and ownership structure. We find that privatization and the choice of privatization option have no effect on the long-term survival of firms in Russia. This is in line with earlier results by Brown et al. (2011) that any positive productivity effects of privatization in Russia take a long time to realize. But nor has privatization considerably accelerated the process of creative destruction, which often takes the form of the liquidation of existing firms. A further investigation of other outcomes such as productivity and financial performance may clarify whether both effects (productivity increase and creative destruction) have been at work at the same time, so that the net effect on survival is close to zero.

It turns out, however, that one feature of ownership structure, namely managerial ownership, is associated with a lower likelihood of liquidation and bankruptcy, even though this effect is not robust to the estimation using a proportional hazard model where the timing of liquidation and bankruptcy is taken into account as well. Even though profitability is not related to subsequent firm exit we found a rather strong indicator of liquidation and bankruptcy: those firms who piled up wage arrears had significantly lower chances of survival. So there are indeed indications that less efficient firms are removed from the market.

Some of our results might be influenced by the fact that all explanatory variables are measured for the year 1998 when there was a severe financial crisis in Russia. We plan to investigate whether the effects are robust to the use of variables for the pre-crisis year 1997. More generally, further research should also take into account the dynamic changes in ownership structure and performance over time and their joint effect on firm exit.

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APPENDIX

Table A1. List of explanatory variables

Variable	Explanation
privatized	Equals 1 if the firm was privatized at the date of the survey (1999-2000), 0 otherwise
priv_opt1	Equals 1 if the firm chose privatization option 1, 0 otherwise
priv_opt2	Equals 1 if the firm chose privatization option 2, 0 otherwise
priv_opt3	Equals 1 if the firm chose lease-buyout as privatization option, 0 otherwise
priv_opt4	Equals 1 if the firm chose another privatization option, 0 otherwise
privsh99	Share of private (non-state) owners at the beginning of 1999
inssh99	Share of insider owners (managers and workers)
mansh99	Share of managers
threebl99	Share of the three largest outside non-state blockholders (A blockholder is a shareholder with a stake greater than 5%)
lnemp98	Natural logarithm of the number of employees 1998
roa_98	Return on assets 1998 (profit before taxes divided by total assets at the end of the year)
lev_98	Leverage 1998 (bank loans divided by total assets at the end of the year)
PRICECONT98	Share of sales subject to price controls 1998
wagearr_mon98	Wage arrears in monthly wage funds 1998
ovdu_p98	Overdue payables as a fraction of total assets 1998
reg_cap	Moscow/St. Petersburg
reg_asia	Asian part of Russia
ind_met	Ferrous and non-ferrous metallurgy
ind_chem	Chemical industry
ind_macb	Heavy and light machinery
ind_for	Forestry
ind_cons	Construction materials
ind_food	Food industry
ind_ligt	Light industry
ind_othr	Other industries

The omitted regional dummy is for the European part of Russia (excluding Moscow and St. Petersburg). The omitted industry dummy is for Coal, Gas, Fuel, Oil Extraction, and Electricity.

Table A2. Estimation results for logit models. Dependent variable: Liquidation

	(1)		(2)		(3)	
Privatized99	0.007	*(0.02)*				
privsh99			0.001	*(0.17)*		
inssh99			0.003	*(0.51)*		
mansh99			-0.022*	*(-1.89)*		
threebl99					0.000	*(0.05)*
lnemp98	-0.346***	*(-2.94)*	-0.323***	*(-2.60)*	-0.297***	*(-2.65)*
roa_98	-0.109	*(-0.50)*	-0.049	*(-0.23)*	-0.074	*(-0.35)*
lev_98	0.094	*(0.28)*	0.060	*(0.17)*	0.097	*(0.29)*
PRICECONT98	-0.014**	*(-2.48)*	-0.013**	*(-2.22)*	-0.013**	*(-2.43)*
wagearr_mon98	0.147***	*(3.35)*	0.138***	*(3.10)*	0.143***	*(3.31)*
ovdu_p98	0.788	*(1.25)*	0.615	*(0.94)*	0.789	*(1.28)*
_cons (%)	1.916*	*(1.72)*	1.792	*(1.54)*	1.527	*(1.45)*
N	230		219		230	
Pseudo R^2 (%)	16.19		17.79		14.81	

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A3. Estimation results for logit models. Dependent variable: Bankruptcy

	(1)		(2)		(3)	
Privatized99	-0.164	*(-0.40)*				
privsh99			-0.003	(-0.49)		
inssh99			0.011	*(1.63)*		
mansh99			-0.031**	*(-2.35)*		
threebl99					0.000	*(0.01)*
lnemp98	-0.072	*(-0.63)*	-0.049	*(-0.40)*	-0.040	*(-0.37)*
roa_98	-0.833	*(-1.45)*	-0.784	*(-1.52)*	-0.662	*(-1.43)*
lev_98	-0.364	*(-0.80)*	-0.282	*(-0.70)*	-0.283	*(-0.70)*
PRICECONT98	-0.014**	*(-2.50)*	-0.013**	*(-2.14)*	-0.013**	*(-2.38)*
wagearr_mon98	0.074*	*(1.84)*	0.086**	*(1.99)*	0.074*	*(1.85)*
ovdu_p98	1.033*	*(1.67)*	0.878	*(1.34)*	1.096*	*(1.80)*
_cons	0.310	*(0.29)*	0.247	*(0.22)*	-0.109	*(-0.11)*
N	230		219		230	
Pseudo R^2 (%)	14.45		17.91		13.21	

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A4. Estimation results for Cox proportional hazard models: Time until liquidation

	(1)		(2)		(3)	
Privatized	0.910	*(-0.30)*				
privsh99			0.998	*(-0.57)*		
inssh99			1.003	*(0.71)*		
mansh99			0.991	*(-1.08)*		
threebl99					0.998	*(-0.46)*
lnemp98	0.816**	*(-2.45)*	0.851**	*(-2.05)*	0.851**	*(-2.20)*
roa_98	0.893	*(-0.61)*	0.941	*(-0.37)*	0.930	*(-0.43)*
lev_98	1.025	*(0.10)*	1.020	*(0.08)*	1.049	*(0.19)*
PRICECONT98	0.992**	*(-2.03)*	0.993*	*(-1.72)*	0.992*	*(-1.91)*
wagearr_mon98	1.073***	*(3.15)*	1.073***	*(3.03)*	1.074***	*(3.10)*
ovdu_p98	1.330	*(0.68)*	1.188	*(0.39)*	1.404	*(0.81)*
N	226		216		226	

Exponentiated coefficients (hazard ratios); z statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A5. Estimation results for Cox proportional hazard models: Time until bankruptcy

	(1)		(2)		(3)	
privatized	0.849	*(-0.49)*				
privsh99			0.995	*(-0.99)*		
inssh99			1.006	*(1.17)*		
mansh99			0.989	*(-1.18)*		
threebl99					0.997	*(-0.60)*
lnemp98	0.926	*(-0.84)*	0.967	*(-0.38)*	0.956	*(-0.54)*
roa_98	0.543	*(-1.36)*	0.608	*(-1.34)*	0.624	*(-1.31)*
lev_98	0.828	*(-0.52)*	0.908	*(-0.31)*	0.919	*(-0.27)*
PRICECONT98	0.991**	*(-2.15)*	0.991*	*(-1.95)*	0.991**	*(-2.04)*
wagearr_mon98	1.056**	*(2.25)*	1.058**	*(2.26)*	1.057**	*(2.26)*
ovdu_p98	1.446	*(0.84)*	1.269	*(0.51)*	1.496	*(0.91)*
N	228		217		228	

Exponentiated coefficients (hazard ratios); z statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$