# Impact of the institutional structure of an enterprise on the efficiency of its operation: an empirical study[1]

*Marina Turuntseva*[2]

This section presents the results of an empirical study of the impact of the parameters characterizing the ownership structure and the Board of Directors of a joint stock company, as well as other indicators of the institutional structure on the efficiency indicators relating to the operations of Russia's enterprises in a three year panel consisting of 100 enterprises. The study is designed basing on the methods proposed in the paper by Radygin, Entov (2001), however, it was significantly modified. Firstly, we have changed the method pertaining to calculation of the corporate conflict intensity index, which is used as an explanatory variable in the course of regression analysis. Secondly, we used new (not previously used) data, what allowed us to form a data panel and apply methods of evaluation of panel regressions.

## Database: a description

The present study has been carried out basing on the results of two surveys conducted by IET in 1999 and 2001. In the course of the first stage of the survey conducted at the end of 1999, there were surveyed 872 enterprises, 201 of which were used to form a sample. An additional survey carried out at the end of 2001 embraced only the enterprises included in the sample (201 joint stock companies) and concerned such issues as the number of employees at an enterprise, amounts of sales proceeds in 1999 and 2000, profits in 1999 and 2000, and fixed assets value in 1999 and 2000, as well as issues relating to changes in the indicators of outstanding creditor and debtor indebtedness in 2000. Therefore, by combining the results of these two surveys the authors were able to form a three-year panel of data on 100 enterprises.

A specific feature of the sample under observation is that the absence of answers to certain questions frequently means a negative answer or zero. In order to obtain more adequate results, at the preliminary stage of data processing there was carried out a certain adjustment of the results of the survey.

Such an adjustment concerned the issues pertaining to the structure of capital stock and the Board of Directors. The respective reports contained omissions, many of which might be interpreted as a negative answer to a question (i.e. as an answer "representatives of this group of owners do not own shares in our enterprise" or as "representatives of this interest group are not included in the membership of the Board of Directors") depending on the sum of answers concerning the share (%) of stocks owned by other groups of shareholders, or about the share of representatives of this interest group in the Board of Directors. In the case the sum of answers relating to the questions about the structure of stock capital or the share of representatives of all interest groups in the Board of Directors made more than 100 per cent (or more), the authors assumed that the respondents indicated the representation of only those groups of

[2] Institute for the Economy in Transition (Moscow, Russian Federation).

owners or Board of Directors members, who owned stocks or were members of the Board of Directors, and replaced omissions in answers with zeros. In other words, the authors assumed that representatives of a certain group did not own shares in an enterprise, or were not members of the Board of Directors.

Besides, in the case the sum of answers concerning the structure of stock capital exceeded 100 per cent, the answers were proportionally adjusted in a way making their sum equal to 100 per cent. Of course, such an adjustment of data may be not absolutely correct, since only the answers to one question might have been significantly biased, while such an adjustment results in a bias of all data towards a decrease in the share of a concrete owner of capital stock. However, on the whole such an adjustment shall not significantly bias the results of the survey, since the share of such enterprises is rather small.

At the same time, in the case the sum of the answers to questions concerning the structure of stock capital or the Board of Directors were below 100 per cent, the authors did not conduct any adjustment, since it was assumed that replace omissions with zeros in this situation would have been incorrect.

Below, there are presented sample statistical characteristics of base indicators used in this study. Table 1 presents sample statistics of the shares of stock capital.

*Table 1*

**Mean share of an owner in stock capital as based on the whole sample**

| Mean % of shares owned by: | Number of enterprises having answered the question (out of 100) | mean % (among those having responded) | Median (among those having responded) (%) |
|---|---|---|---|
| Rank and file employees and the management (insiders) | 93 | 44 | 41 |
| Share of rank and file employees in insiders * | 90 | 74 | 81 |
| Share of management in insiders * | 90 | 29 | 19 |
| Russia's enterprises and holdings | 72 | 30 | 23 |
| Commercial banks, investment funds, pension funds, insurance companies | 47 | 13 | 7 |
| Outside shareholders – individuals | 69 | 23 | 19 |
| Foreign shareholders | 32 | 4 | 0 |
| State and local authorities | 36 | 0,05 | 0 |

* in these lines there are presented the mean values and medians of indicators of shares in stock capital owned by rank and file employees of enterprises and management in the structure of insiders.

As Table 1 demonstrates, in the mean across the whole sample the largest number of stocks (44 per cent) is owned by insiders (rank and file employees and management), while at a half of enterprises the share of insiders makes less than 40 per cent of stocks. At the same time, in the mean rank and file employees own almost three fourths of all stocks owned by insiders. Groups of Russian enterprises and holdings and outside shareholders – individuals in the ownership structure is rather significant: in the mean across the whole sample these groups of shareholders own 30 per cent and 23 per cent of stocks respectively. Various financial institutions (commercial banks, investment funds, pension funds, insurance companies) own 13 per cent of stocks in the mean. Groups of foreign shareholders and the state in the structure of stock capital are less significant – they own 4 per cent and 0.05 per cent of stocks respectively.

Table 2 presents mean values of shares the representatives of insiders, large private shareholders, and the state have in the composition of the Board of Directors.

*Table 2*

**Mean values of shares (%) the representatives of various interest groups have in the composition of the Board of Directors (across the whole sample)**

| "Average" Board of Directors consists of representatives of interest groups (%) | Number of those having responded | Mean value (among those having responded) | Median (among those having responded) |
|---|---|---|---|
| Insiders | 99 | 62 | 60 |
| Large private shareholders | 91 | 19 | 13 |
| State | 94 | 7 | 0 |

Therefore, in the average Board of Directors (across the whole sample) representatives of insiders (management and rank and file employees) make 60 per cent, representatives of large private shareholders – 19 per cent, and representatives of the state – 7 per cent. At the same time, at about half of the enterprises included in the sample (out of the number of those having responded to this question) there are no representatives of the state in the Board of Directors.

Table 3 demonstrates that the structure of employment (distribution of enterprises across size groups) has not changed significantly over the three years under observation. The majority of enterprises included in the sample had from 101 to 500 employees, although there was detected a certain decline in the share of such enterprises in 2000 in comparison with the figures registered in the preceding years.

*Table 3*

**Distribution of enterprises by the indicator of the total number of employees across size groups**

| | 1998 | | | 1999 | | | 2000 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number of answers | % | % among those having responded | Number of answers | % | % among those having responded | Number of answers | % | % among those having responded |
| No response | 6 | 6 | | 6 | 6 | | 6 | 6 | |
| Below 100 | 4 | 4 | 4,26 | 4 | 4 | 4,26 | 7 | 7 | 7,45 |
| 101-500 | 37 | 37 | 39,36 | 40 | 40 | 42,55 | 33 | 33 | 35,11 |
| 501-1000 | 28 | 28 | 29,79 | 23 | 23 | 24,47 | 30 | 30 | 31,91 |
| 1001-1500 | 17 | 17 | 18,09 | 18 | 18 | 19,15 | 13 | 13 | 13,83 |
| 1501-2000 | 3 | 3 | 3,19 | 3 | 3 | 3,19 | 6 | 6 | 6,38 |
| over 2000 | 5 | 5 | 5,32 | 6 | 6 | 6,38 | 5 | 5 | 5,32 |

Similarly, the share of enterprises having from 1001 to 1500 employees declined from 18 per cent (in 1998) to 14 per cent (in 2000). On the contrary, the number of enterprises having from 501 to 1000 employees increased to 32 per cent in 2000 as compared with 24.5 per cent registered in 1999.

The distribution of the enterprises included in the sample as broken down by size groups in accordance with the indicator of employed in industrial production is practically similar to the distribution in accordance with the indicator of the total number of employees at an enterprise.

Tables 4 and 5 present the results of the survey concerning changes (increase or decrease) in the size of outstanding creditor indebtedness to suppliers and outstanding creditor indebtedness to banks. Table 4 demonstrates that the nature of behavior of the outstanding creditor indebtedness to suppliers in 1999 is different from the behavior of this indicator in 1998 and 2000: while in 1998 and 2000 about one third of respondents having answered the respective question declared that their outstanding creditor indebtedness to suppliers increased

and about two thirds of respondents pointed out that it declined, in 1999 the nature of behavior of this indicator was opposite – only about one third of the respondents having answered the respective question declared that this indebtedness declined, while two thirds of respondents indicated that the respective indicator increased.

*Table 4*

**Changes in outstanding creditor indebtedness to suppliers in 1998 through 2000**

|  | 1998 | | | 1999 | | | 2000 | | |
|---|---|---|---|---|---|---|---|---|---|
|  | Number of answers | % | % among those having responded | Number of answers | % | % among those having responded | Number of answers | % | % among those having responded |
| No response | 18 | 18 |  | 15 | 15 |  | 16 | 16 |  |
| Increased | 31 | 31 | 37,8 | 53 | 53 | 62,35 | 30 | 30 | 35,71 |
| Decreased | 51 | 51 | 62,2 | 32 | 32 | 37,65 | 54 | 54 | 64,29 |

The results presented in Table 5 demonstrate that the nature of behavior of outstanding creditor indebtedness to banks also differs across years. It shall be mentioned that in contradistinction to the preceding indicator the share of respondents having answered this question makes approximately 20 to 30 per cent of the total number of respondents, therefore, no unambiguous conclusions can be made as concerns the behavior of this indicator.

*Table 5*

**Changes in outstanding creditor indebtedness to banks in 1999 through 2000**

|  | 1998 | | | 1999 | | | 2000 | | |
|---|---|---|---|---|---|---|---|---|---|
|  | Number of answers | % | % among those having responded | Number of answers | % | % among those having responded | Number of answers | % | % among those having responded |
| No response | 73 | 73 |  | 72 | 72 |  | 69 | 69 |  |
| Increased | 20 | 20 | 74,07 | 23 | 23 | 82,14 | 10 | 10 | 32,26 |
| Decreased | 7 | 7 | 25,93 | 5 | 5 | 17,86 | 21 | 21 | 67,74 |

Therefore, in 1998 and 1999, the share of enterprises where the increase in the amount of outstanding creditor indebtedness made about 75 to 80 per cent of the number of those having responded to the question, while less than one fourth of the respondents declared that this indicator decreased. In 2000, the behavior of this indicator changed: only about one third of enterprises indicated that their outstanding creditor indebtedness to banks increased, while two thirds declared a decline in this indicator.

The authors used the following five indicators[3] as characteristics of the efficiency of enterprises' operations (hereinafter referred to as indicators of the efficiency of enterprises' (economic) operations):

- Ratio between proceeds and the total number of employees at an enterprise in prices of 1998;
- Ratio between proceeds and the number of employed in industrial production in prices of 1998;
- Ratio between profits and fixed assets;

---

[3] This study uses the same indicators of the efficiency of enterprises' operations as in the paper by Radygin, Entov (2001), where the authors have thoroughly justified the choice of exactly these characteristics of economic operations of enterprises as explained variables.

- Ratio between profits and proceeds;
- Ratio between proceeds and fixed assets.

It shall be mentioned that in the course of regression analysis all aforementioned indicators were adjusted in the following way: 5 per cent of maximum and minimum values were replaced with respective maximum and minimum values from the sub-sample consisting of 95 per cent of the remaining values.

Table 6 presents descriptive statistics of the indicators of proceeds, profits, and fixed assets in prices of 1998: the maximum and minimum values, mean and 25 per cent value, 50 per cent value (median), and 75 per cent value. As it is demonstrated by the table, no less than 50 per cent of the enterprises included in the sample (among those having answered the question) show real financial indicators below respective sample mean values notwithstanding the year. Only for 25 per cent of the most successful enterprises (in terms of the characteristics under observation) certain real financial indicators are commensurable with the respective mean sample values. The only exception is the amounts of profits of enterprises among 25 per cent of the most profitable ones: notwithstanding the year, all values are below the mean sample value.

*Table 6*

**Real amounts of profits, proceeds, and fixed assets (in prices of 1998, Rub. thous.)**

| Indicator | # of answers | Minimum value | Maximum value | Mean value | Quartiles | | |
|---|---|---|---|---|---|---|---|
| | | | | | 25 % | 50 % | 75 % |
| Profit, 1998 | 65 | -38140 | 104000 | 2055 | -5,32 | 23,78 | 4152 |
| Profit, 1999 | 84 | -64459 | 188688 | 5333 | 90,54 | 1802 | 4646 |
| profit, 2000 | 83 | -16562 | 457237 | 9729 | 207,60 | 1609 | 5775 |
| Sales proceeds, 1998 | 86 | 1,68 | 527000 | 44066 | 1045 | 14114 | 48750 |
| Sales proceeds, 1999 | 99 | 3,55 | 718133 | 65805 | 11287 | 25441 | 72582 |
| Sales proceeds, 2000 | 99 | 2,87 | 1333608 | 76533 | 12073 | 30124 | 77701 |
| Cost of fixed assets, 1998 | 79 | 12,14 | 5747000 | 151270 | 3834 | 31854 | 79132 |
| Cost of fixed assets, 1999 | 91 | 16,67 | 555795 | 64922 | 12510 | 32600 | 68008 |
| Cost of fixed assets, 2000 | 89 | 13,74 | 320824 | 46355 | 8945 | 23778 | 53902 |

Similar behavior is demonstrated by the indicator of the cost of fixed assets in 1998 – the values of this variable are almost two times below the mean sample value for 75 per cent of enterprises.

**Methodology of the study**

Taking into account the specifics of the data (a sample of 100 enterprises over three years from 1998 to 2000), in the course of evaluation of regression models the authors used the methods of panel data analysis. Since there were available only the data for three years and the enterprises included in the sample differed by their industrial, size, etc. structures, regressions were evaluated using the iterated feasible (estimated) generalized least squares (IFGLS) method as adjusted for heteroskedasticity of random errors. All models were evaluated using the econometric package STATA 8,0.

At the first stage, the authors estimated bivariate panel regressions, firstly, because it was considered necessary to check if there exist pair correlations between institutional characteristics of enterprises and efficiency of their operations, and, secondly, because it was assumed that the estimation of multiple regressions pertaining to the dependence of certain indi-

cators of enterprises' efficiency on their institutional characteristics would be too difficult due to the specifics of the database.

At the second stage of the study, the authors estimated models of multiple panel regressions allowing to detect more significant institutional characteristics of enterprises affecting the efficiency of their operations.

It shall be noted that the data on the ownership structure, composition of the Board of Directors, etc. were available only for the first year of the sample. Due to this fact, the authors could test the hypotheses about the impact of the institutional characteristics of enterprises on the efficiency of their operations only assuming that the variables characterizing the institutional specifics of an enterprise remain unchanged over the period under observation. No doubt that this assumption sets certain limitations on the interpretation of obtained results, however, generally speaking, it is rather realistic taking into account that a rather short time interval is under observation. Besides, even the assumption that large owners of stocks will change due to the continuing process of redistribution of ownership rights after privatization may rather make amendments concerning titles of ownership rights than the structure of ownership, what apparently does not contradict the initial assumption. This is in particular related to the persistent system of indirect corporate control on the part of the largest (concentrated) owners.

## Corporate conflict intensity index (CCII): the methods of construction

Before starting to present main hypotheses tested in the course of the study, the method of construction of the corporate conflict intensity index, which is used in this paper as an institutional characteristic of an enterprise, shall be described in more detail. In this study, the methods of construction of the CCII were modified as compared with those offered in papers by Radygin and Entov (2001), Radygin and Arkhipov (2000, 2001). In order to compute the CCII the authors used the methods borrowed from papers concerning the study of poverty levels in different countries[4].

In order to construct the corporate conflict intensity index there were used the results of the survey across the following six questions somehow signaling that a corporate conflict exists at an enterprise:

*Question No. 19*. Did the joint stock company pay the preferred dividend in 1997 and 1998?

*Question No. 21*. Did the joint stock company redeem its shares?

*Question No. 22*. Did the joint stock company sell (transfer) shares to employees in 1996 through 1999?

*Question No. 23*. Did the joint stock company carry out new issues not related to revaluation of fixed assets in 1996 through 1999?

*Question No. 27*. Is there a shareholder owning more than 50 per cent of stocks?

*Question No. 31*. How many general meetings of shareholders were held over the last two years?

In general form, the formula for computation of the corporate conflict intensity index looks as following:

---

[4] See, for instance, Cheli, Lemmi (1995), or Korchagina, Ovcharova, Turuntsev (1998).

$$CCI_i = \frac{\sum_{k=1}^{6} d_k w_k}{\sum_{k=1}^{6} w_k} \, ,$$

where $CCI_i$ is the corporate conflict intensity index at the $i$-th enterprise, $d_k$ is the dummy characterizing the presence or absence of the $k$-th indicator of corporate conflict at the $i$-th enterprise, $w_k$ is the weight given to the $k$-th indicator of corporate conflict at which it is included in the constructed index. The weight of each parameter indicating a corporate conflict at an enterprise in the aggregate index depends on the degree of its prevalence, i.e.: the more frequently this indicator of corporate conflict is detected among the enterprises included in the sample, the less is its impact on the corporate conflict intensity index[5]. Such an opposite impact is taken into account by the use of the following weight coefficients:

$$w_k = \log \frac{1}{m_k} \, ,$$

where $m_k$ characterizes the degree of prevalence[6] of the $k$-th indicator of corporate conflict. Since in this case all parameters characterizing the existence or absence of a corporate conflict are binary, this indicator coincides with the mean value of the $k$-th indicator of corporate conflict. For the information on values assigned to the parameters characterizing the existence of corporate conflict at an enterprise, see Table 7. It shall be noted that the indicator was assigned the value equal to one in the case the respondent gave an answer indicated in column "1", otherwise the value was equal to zero.

It shall be noted that the mean value of the corporate conflict intensity index is equal to 0.22, the minimum value equals zero, and the maximum value equals 0.81.

## 4.3. Basic hypotheses tested in the course of the study

In certain papers focusing on the problems of empirical study of the impact of the parameters of the ownership structure, corporate governance, and characteristics of external environment on the indicators of privatized enterprises' economic operations (see, for instance, Radygin, Entov (2001), Radygin, Entov, Turuntseva, Gontmakher (2002)), it is indicated that the results of an empirical analysis frequently either contradict the traditional theoretical principles, or do not detect significant relationships between the parameters of efficiency of enterprises' operations and any institutional characteristics of firms[7]. In the framework of this study, there is tested a number of traditional hypotheses about the impact of the parameters of the institutional structure of enterprises on the efficiency of their operations, at the same time,

---

[5] The problem of weight assignment in the course of construction of composite indicators is rather non-trivial. The method of selection of weights used in this paper is only one from many relevant ones. The major factor behind this choice is that it was assumed that there are present certain "traditional" or "rather frequently encountered," and, respectively, "less frequently encountered" and "more refined" methods of struggle for control over enterprises. I.e., the more frequently there is encountered this or that indicator of a corporate conflict, the more traditional and, therefore, less significant it is. In this case it seems more logical to give a less weight to such an indicator. On the contrary, in the case a "rare" indicator of corporate conflict is detected at an enterprise, it may be interpreted as an indication that all traditional methods of struggle have been exhausted and the parties of the conflict try to use less frequently encountered and more costly methods of struggle for the enterprise. In this connection, in the course of construction of the corporate conflict intensity index it seems more logical to give a greater weight to such an indicator.

[6] For binary variables, the degree of prevalence of an indicator coincides with the percentage of ones among the answers to the respective question.

[7] As concerns the factors behind the possible deviations, for more details see: Radygin, Entov (2001).

it is assumed that obtained empirical results can be at variance with the introduced hypotheses. Below there are presented the basic hypotheses selected for testing in the framework of this study.

*Table 7*

**Numerical values assigned to the parameters used for the computation of CCII**

| Question # | Question | «1» | «0» |
|---|---|---|---|
| 19 | Did the joint stock company pay the preferred dividend in 1997 and 1998? | Yes | No |
| 21 | Did the joint stock company redeem its shares? | Yes | No |
| 22 | Did the joint stock company sell (transfer) shares to employees in 1996 through 1999? | Yes | No |
| 23 | Did the joint stock company carry out new issues not related to revaluation of fixed assets in 1996 through 1999? | Yes | No |
| 27 | Is there a shareholder owning more than 50 per cent of stocks? | Yes | No |
| 31 | How many general meetings of shareholders were held over the last two years? | More than two | Two or less |

The following five characteristics were chosen as indicators of the efficiency of enterprises' operations:

- Ratio between proceeds and the total number of employees at an enterprise in prices of 1998;
- Ratio between proceeds and the number of employed in industrial production in prices of 1998;
- Ratio between profits and fixed assets;
- Ratio between profits and proceeds;
- Ratio between proceeds and fixed assets.

It shall be noted that there were reviewed the following explanatory variables: shares (or per cent)[8] of different groups of owners in the structure of stock capital, shares (or per cent) of different interest groups in the Board of Directors, the indicators characterizing the effect of early privatization (dummies with values equal to 1 in the case the enterprise was privatized in 1993 (1992) or earlier, otherwise the respective values equal to zero), the characteristics of the concentration of property (shares or per cent), indicators showing changes (increase or decrease) in outstanding creditor indebtedness to suppliers or banks, the corporate conflict intensity index (shares or per cent).

*Hypotheses on the impact of different parameters of enterprises' ownership structure on the efficiency of their operations..*

- Enterprises where the share of managers in the stock capital is high, while the share of employees is respectively lower, demonstrate higher indicators of efficiency of eco-

---

[8] Depending on the measurement units of the endogenous variable, there were used certain explanatory variables either in shares (an indicator changing within the interval from 0 to 1), or in per cent (changing from 0 to 100 per cent). In the case the indicators of ratios between real proceeds and the total number of employees at the enterprise, or the ratio between real proceeds and the number of employed in industrial production were used as the dependable variables, there were used respective explanatory variables measured in per cent, in other cases there were used variables measured in shares.

nomic operations as compared with enterprises where the share of employees in stock capital is high and the share of managers is low;

- The higher is the share of the state in the structure of stock capital, the less efficient such firms are;
- A higher share of outsiders (without the state) in the composition of stockholders causes better efficiency of an enterprise's operations. This hypothesis will be tested both for the group of outsiders on the whole, and its different subgroups. For instance, it is assumed that enterprises, where a lower share of stocks is owned by Russian enterprises and a higher share of stocks is owned by foreign firms, are more efficient.

*Hypotheses on the impact of the composition of the Board of Directors on efficiency of enterprises' operations*

- An enterprise where the share of the state in the Board of Directors is high is less efficient;
- A large share of insiders in the composition of the Board of Directors presupposes that the economic operations of such a firm are less efficient;
- Enterprises where the share of large private stockholders in the composition of the Board of Directors is high demonstrate higher indicators of efficiency of their operations.

*Hypotheses on the impact of the privatization effect and the level of property concentration on the efficiency of firms' operations*

- There exists a positive relationship between the early privatization effect and the efficiency of enterprises' operations;
- The higher is the level of property concentration, the more efficiently operates the enterprise.

*Relationship between the existence of intense corporate conflicts and characteristics of efficiency of enterprises' operations and parameters of ownership structure and corporate governance*

This hypothesis can be formulated in the most abstract terms, since in the situation of still forming ownership structure and other corporate characteristics of an enterprise it is rather difficult to discuss any concrete relationships among these indicators. Therefore, in the course of the study of the impact the intensity of corporate conflict has on the efficiency of an enterprise's operations the authors attempted to find out the existence or absence of such an impact and its nature (positive or negative) over the time period under observation.

## Empirical testing of the hypotheses: the results

Before starting to describe the concrete results obtained in the course of the econometric study of the relationships between the five financial indicators listed above and different characteristics of distribution of stock capital, the composition of the Board of Directors, privatization effect, etc., it shall be noted that no significant multiple relationships between the indicators of the ratios between profits and fixed assets and proceeds and fixed assets and characteristics of the institutional structure of enterprises could be detected. As concerns these indicators, there could be detected only significant pair relationships, which are discussed below.

As it was noted above, the results of an empirical analysis often do not coincide with the traditional theoretical principles, and this study was not an exception from many of such papers: many of hypotheses formulated in paragraph 2 could not be substantiated in the course of this study or obtained results contradicted to theoretical principles selected for testing.

Table 8 presents the results of the regression analysis of relations between real proceeds per an employee and different characteristics of the ownership structure and corporate governance. As it was expected, there was detected a positive relationship between the indicator of the share (per cent) of stocks owned by the management in the block of stocks owned by insiders at large, and the ratio between the enterprise's proceeds and the total number of employees at this enterprise[9]. On the contrary, despite the generally accepted hypotheses, there was detected a negative impact of the early privatization effect (variable *Priv_92*) on the indicator of the efficiency of enterprises' economic operations.

*Table 8*

**Relation between the indicator of real proceeds per an employee and the institutional characteristics of an enterprise**

| | | |
|---|---|---|
| Number of obs   = | 233 | |
| Number of groups   = | 86 | |
| Obs per group: min = | 1 | |
| avg = | 2.709302 | |
| max = | 3 | |
| | Wald chi2(4)= | 789.84 |
| Log likelihood= -1090.027 | Prob > chi2= | 0 |
| | **Coef.** | **P-value (z-stat)** |
| cci_50 | .0405353 | 0.042 |
| own_5 | -.3597308 | 0.000 |
| priv_92 | -6.779514 | 0.000 |
| m_ins | .2952439 | 0.000 |
| Constant | 60.72544 | 0.000 |

*Note*: cci_50 is the index (%) of corporate conflict intensity, own_5 is the percentage of stocks owned by 5 largest shareholders, priv_92 is the dummy with value 1 in the case the enterprise was privatized in 1992 or earlier, otherwise it is equal to zero, m_ins is the share (%) of stocks owned by the management of the enterprise in the block of stocks owned by insiders at large.

Besides, this relationship indicates a positive influence of an intense corporate conflict at the enterprise on the efficiency of its operations. At the same time, a high concentration of property (variable own_5) negatively affects the indicator of proceeds per an employee.

*Impact of different parameters of the ownership structure and corporate gov-
ernance on real proceeds per an employed in industrial production*

The following financial characteristic selected for the empirical testing of the formulated hypotheses was the indicator of real proceeds per an employed in industrial production. As it is seen from Table 9, there was detected a negative impact of variables, characterizing the fact of early privatization (variable Priv_93), property concentration (variable Own_5),

---

[9] There was also detected a negative dependence of the indicator of the efficiency of enterprises' operations on the indicator of the share (%) of the rank and file employees in the structure of the insider stock capital. At the same time, other variables included in the regression practically do not change their numerical values.

and the share (per cent) of stocks owned by rank and file employees in the structure of insiders' block of stocks. Besides, it is following from the regression relationship that the existence of corporate conflict positively affects the indicator of real proceeds per an employed in industrial production.

*Table 9*

**Relation between the indicator of real proceeds per an employed in industrial production and the institutional characteristics of an enterprise**

| | | |
|---|---|---|
| Number of obs = | 220 | |
| Number of groups = | 81 | |
| Obs per group: min = | 1 | |
| avg = | 2.716049 | |
| max = | 3 | |
| | Wald chi2(6)= | 1485.24 |
| Log likelihood = -1043.295 | Prob > chi2= | 0 |
| | **Coef.** | **P-value (z-stat)** |
| cci_50 | .4124786 | 0.000 |
| priv_93 | -15.79784 | 0.000 |
| own_5 | -.241677 | 0.000 |
| w_ins | -.2202076 | 0.000 |
| sd_fis | .176716 | 0.000 |
| sd_state | -.4549612 | 0.000 |
| Constant | 75.67326 | 0.000 |

*Note*: cci_50 is the index (%) of corporate conflict intensity, own_5 is the percentage of stocks owned by 5 largest shareholders, priv_93 is the dummy with value 1 in the case the enterprise was privatized in 1993 or earlier, otherwise it is equal to zero, w_ins is the share (%) of stocks owned by the rank and file employees of the enterprise in the block of stocks owned by insiders at large, sd_state is the per cent of state representatives in the Board of Directors of the enterprise, sd_fis is the share (per cent) of representatives of large private stockholders in the Board of Directors of the enterprise.

Alongside with the relationships mentioned above, there was detected a positive relation between the indicator of the share (per cent) of large private stockholders in the composition of the Board of Directors and the indicator of real proceeds per an employed in industrial production, as well as there was noted a negative influence of the variable characterizing the share (per cent) of the state representatives in the Board of Directors on the indicator of the efficiency of enterprises' operations under observation.

*Impact of different parameters of the ownership structure and corporate governance on the ratio between profits and proceeds*

Table 10 presents the results of the empirical estimate of the impact the characteristics of the institutional structure of enterprises have on the ratio between profits and proceeds. Similarly to the preceding cases, it may be indicated that an intense corporate conflict at an enterprise has a positive impact on the efficiency of its operations.

There was detected a negative impact of the indicator characterizing the early privatization effect on the ratio between profits and proceeds. In contradistinction to the preceding cases, the indicator of property concentration (variable own_10) positively influences the effectiveness of enterprises' operations.

Basing on the obtained results, it may be indicated that the impact of the structure of the Board of Directors on the indicator of efficiency of enterprises' operations is as follows: high shares of insiders and large private stockholders positively influence the ratio between profits

and proceeds, while the existence of high share of the state, on the contrary, negatively affects this ratio.

**Relation between the "profits – proceeds" indicator and the institutional characteristics of an enterprise**

| | | |
|---|---|---|
| Number of obs    = | 208 | |
| Number of groups  = | 84 | |
| Obs per group: min = | 1 | |
|                avg = | 2.47619 | |
|                max = | 3 | |
| | Wald chi2(6)= | 1344.62 |
| Log likelihood  =  287.1473 | Prob > chi2= | 0 |
| | **Coef.** | **P-value (z-stat)** |
| cci_50 | .0581388 | 0.000 |
| priv_93 | -.037617 | 0.000 |
| own_10 | .0657871 | 0.000 |
| sd_ins | .0883432 | 0.000 |
| sd_fis | .0191249 | 0.097 |
| sd_state | -.065475 | 0.000 |
| constant | -.0062129 | 0.141 |

*Note*: cci_50 is the index (%) of corporate conflict intensity, own_5 is the percentage of stocks owned by 5 largest shareholders, priv_93 is the dummy with value 1 in the case the enterprise was privatized in 1993 or earlier, otherwise it is equal to zero, sd_state is the per cent of state representatives in the Board of Directors of the enterprise, sd_fis is the share (per cent) of representatives of large private stockholders in the Board of Directors of the enterprise, sd_ins is the share of representatives of insiders in the Board of Directors.

*Impact of different parameters of the ownership structure and corporate governance on the ratio between proceeds and fixed assets and between profits and fixed assets*

**Relation between ratios "proceeds – fixed assets" and "profits – fixed assets" and the institutional characteristics of an enterprise**

| | Ratio between proceeds and fixed assets | Ratio between profits and fixed assets |
|---|---|---|
| cr_p | - | - |
| w_ins | - | |
| m_ins | + | |
| nonfin | + | |
| fis | + | |
| for_outs | - | |

*Note*: cr_p is the indicator of changes in outstanding creditor indebtedness to suppliers, w_ins and m_ins are shares in stocks owned by the rank and file employees of the enterprise and the management respectively in the block of stocks owned by insiders at large, nonfin is the share of Russian enterprises and holdings in the stock capital of the enterprise, fin is the share of financial institutions in the stock capital of the enterprise, fis is the share of outsiders – individuals in the stock capital of the enterprise, for is the share of foreign stockholders in the stock capital of the enterprise.

As it has been noted above, in the case of relations between proceeds, fixed assets, and profits, no significant multiple relations could be detected as concerns these indicators of effectiveness of enterprises' economic operations and their institutional structure. Table 11 presents the signs of coefficients of detected significant relations obtained in the result of estimation of simple panel regressions for the given characteristics of efficiency of enterprises' operations and their institutional characteristics.

Thus, with certain reservations, it may be indicated that an increase in the outstanding creditor indebtedness to suppliers negatively affects the characteristics of efficiency of enterprises' operations under observation. The obtained results indicate that enterprises where the share of rank and file employees in the stock capital is low and the share of management is high demonstrate higher values of the indicator "proceeds – fixed assets." This relation is also positively affected by the indicators of shares of Russian enterprises and holdings in the stock capital of an enterprise and outsiders - individuals in the stock capital of an enterprise.


## Principal conclusions

The obtained results of the study are not always unambiguous. For instance, a number of proposed hypotheses failed in the course of the conducted empirical study. For instance, there were detected no assumed positive relation between the indicator characterizing the early privatization effect and the parameters of effectiveness of enterprises' operations. On the contrary, the detected relation turned out to be negative. This fact primarily indicates that the theoretical assumptions about positive influence of early privatization on the efficiency of economic operations formed in the 1990s not always are true in the case of real interrelations. However, the authors are fully aware of possible distortions and inaccuracies of the study caused by the quality of the available sample.

At the same time, the results obtained in the course of the study present a rather wide picture of interrelations between dominating owners, representation in Boards of Directors, concentration levels, corporate conflicts and the efficiency of enterprises' economic operations, which originates from the analysis. For principal outcomes of the study, see below.

- It may be indicated that the early privatization effect has rather a negative impact on the efficiency of enterprises economic operations. However, this circumstance may be more likely related to the objectively earlier "entry" of an enterprise to the stage of post-privatization development bearing all respective costs (in this case there are compared not state and private enterprises, but only private enterprises, which started privatization at different points in time). More generally, it may be assumed that their "life cycles," the starting point of which is the moment of privatization (i.e. initial privatization, first fixation of property rights, consolidation or interception of corporate control, new fixation of property rights, etc.) did not coincide;

- Enterprises, where corporate conflicts are intense, demonstrate higher values of the indicators of efficiency of operations in comparison with enterprises, where corporate conflicts are less intense;

- The higher is the share of management in the stock capital of an enterprise and lower the share of rank and file employees, the more efficient is such an enterprise;

- Enterprises, where the share of large private stockholders in the structure of the Board of Directors is high, or the share of the state is low, are more efficient;

- The process of concentration of stock capital has a rather ambiguous impact on the enterprises' operations: high concentration of property negatively affects some of the efficiency parameters, at the same time positively affecting other parameters. This conclusion is important primarily because it assumes a more balanced evaluation of possible practical measures of public regulation.

## Literature

Korchagina I., L. Ovcharova, E. Turuntsev (1998). *Deprivation index system in Russia in transition*, EERC, working paper #98-04

Cheli B., and A. Lemmi. (1995). Totally Fuzzy and Relative Approach to the Multidimensional Analysis of Poverty, *Economic Notes*, 1, pp. 115-134.

Kennedy, P. (1999). *A Guide to Econometrics*. Oxford, UK: Blackwell Publishers Ltd.

Radygin A., Arkhipov S. (2000). Ownership strucrute, corporate conflicts and efficiency (some empirical evaluations), *Voprosy Economiki*, #11, pp. 114-133 (in Russian)

Radygin A., Arkhipov S. (2001). Ownership structure and financial position of firms in Russia, *Russian Economic Trends*, Vol. III

Radygin A., Entov R., (2001). *Corporate governance and protection of property rights: empirical analysis and actual tendencies of reforms,* Moscow, IET

Radygin A., Entov R., Turuntseva M., Gontmakher A., Kuznetsov B. (2002). *The Problems of Corporate Governance in Russia and its Regions*, Moscow, Canadian International Development Agency, Association of Universities and Colleges of Canada, IET, WCER, ANE, CEPRA