THE RESTRUCTURING OF LARGE UKRAINIAN ENTERPRISES: IMPACT OF COMPETITION, PRIVATIZATION AND HARD BUDGET CONSTRAINTS

by

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Abstract

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This thesis investigates the impact of competition, privatization and hard budget constraints on enterprise restructuring and performance, using the dataset of 177 Ukrainian industrial enterprises with more than 250 employees. The paper also concentrates on the interactive effects between competition, privatization and hard budget constraints in order to reveal the presence of complementarity or substitutability between them. We find positive association between competition and restructuring, and positive effect of privatization, hard budget constraints and foreign competition on performance of the enterprises. Moreover, since the privatization, competition and hard budgets are complements in their effect on restructuring, the positive effect of one policy will be strengthened in the presence of other two. As a policy implication, the study suggests that speeding up privatization process, tightening financial discipline for firms and encouraging competition would foster restructuring process on Ukrainian enterprises and improve their performance.

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GLOSSARY

Hard Budget Constraints exist when an enterprise faces tight financial discipline from the side of government and banks, i.e. it does not get subsidies or credits on preferential terms.

Newly-created enterprises are the private enterprises that have been created after January 1991.

Privatized enterprises are former state enterprises, where state has transferred more than 50% of shares to the private owners in the process of privatization.

Regressive restructuring includes labor shedding, cutting of real wage, reduction in social and unused production assets, and closure of unprofitable product lines.

Restructuring involves substantial changes in enterprise's activity, relationships and organization, which lead to the creation of agents responsive to changes in market environment.

Soft Budget Constraints exist on an enterprise that could expect financial support from the state or other economic agents in the situation of bankruptcy or other financial problems.

State-owned enterprise is the type of enterprise with more than 50% of the shares owned by the state.

Strategic restructuring is a radical change in strategic outlook of the firm and is accompanied by investment in new equipment, development of new products and new markets, increased product quality, structural changes in labor force, and improvements in organizational structure.

Chapter 1

INTRODUCTION

A change from a planned to market economy in former communist countries has resulted in unexpectedly slow period of transition. This has stimulated an investigation of the usefulness and effectiveness of a great variety of policies that could influence the speed and successfulness of transition.

In this thesis, we will concentrate on three policy variables: competition, privatization, and hard budget constraints, which are believed to be main determinants in improving performance of enterprises in transition countries. Previous works discovered positive effect of privatization on performance and restructuring indicators for enterprises from different transition countries (Djankov and Pohl, 1997, Carlin and Lendesmann, 1997, Grosfeld and Nivet, 1997, Earle and Estrin, 1997, Brown and Earle, 2000, Grigorian, 2000). The positive influence on performance was also found for increased competitive pressure (Konings, 1998, Anderson *et al*, 1999, Brown and Earle, 2000, Carlin *et al*, 2001, Grosfeld and Tressel, 2001) and harder budgets (Grigorian, 2000, Earle and Estrin, 1998, Konings, 1998). An interesting observation has been made by Konings (1998) that tight financial and competitive pressure has positive and significant impact on total factor productivity only at early stages of transition, whereas in the 'advanced' transition countries, where restructuring has occurred, these factors "have no longer any effect because they have reached their optimum" (Konings, 1998, p.13).

In the face of institutional changes in post-communist countries, the question about substitutability and complementarity of different policy alternatives arises. The focus of interest concerns the question about whether

one policy can be enhanced by another policy and, thus, this would lead to higher results, or whether the policies could work without one another and still be effective. The answer to this question could help policy-makers to formulate strategies of enterprise restructuring in transition period. The discussion of this problem and empirical research is found in the works of Earle and Estrin (1997), Commander et al (1999), Brown and Earle (2001a), Grosfeld and Tressel (2001).

In this research, we will try to find the best policy alternative for Ukraine by estimating the effect of privatization, competitive pressure, financial discipline and their interactions on the performance of 177 large industrial enterprises. Ukrainian government has undertaken reforms in all three policy fields we are interested in. Although the reforms are not completed, there are first results. According to EBRD Transition Report 2001, private sector's share of GDP in mid-2001 constituted 60%. More than 20-25% of large-scale enterprise assets are in private hands, but, unfortunately, main questions regarding corporate governance remain unresolved. Although hardening of budgets is observed, bankruptcy enforcement remains to be weak. Competition policy and corresponding institutions are designed, while law enforcement is to be strengthened. Substantial progress has been achieved in price liberalization. According to the survey of 2100 enterprises the competition turned out to be the main incentive to undertake restructuring (EBRD Transition report 2001, p. 207).

As we can see, there is a great room for improvement in reforms in Ukraine. In this light, it is important to know which policy could give the best outcome. Estimating effects of the policies separately could show which one is more important when implemented alone. The estimation of the interaction effects between policy variables will show whether two policies implemented simultaneously are more efficient in their outcomes or not. If, for instance, there were positive effect of interaction between competition and privatization (i.e. if they are complements), this would mean that the

effectiveness of privatization in affecting restructuring of enterprises depends on implementation of competition policy. If, on the other hand, no interaction effect is discovered, this would point on the fact that the effect of one policy is not strengthened in the presence of another one, and we could design quite different strategies: for example, we may postpone or slow the pace of privatization until the good competitive environment and sound system of property rights are established. The same reasoning applies to the competition and hard budget constraints. Since there had been no quantitative studies investigating the interaction effects between the above-mentioned policies in Ukraine, this paper will first attempt to explore this area.

The thesis is organized as follows. In the next chapter we will take a close look on the existing literature on the topic. Then follows the description of Ukrainian case, and in particularly, of agents and institutions. The empirical model and regression results are presented in the chapter 4. Finally, the paper ends up with conclusions and policy recommendations.

Chapter 2

LITERATURE REVIEW

A great variety of literature investigating the effects of competition, privatization and hard budget constraints on efficiency of enterprises has appeared in recent times. In this section we will first briefly define what restructuring of an enterprise means. Then we will consider the works that concentrate on effect of different policies on enterprise efficiency and restructuring.

Restructuring[1] is a set of changes on the enterprise aimed to increase efficiency, to improve the general situation of an enterprise and to ensure its profitability over long period of time. We can define two types of restructuring: regressive and strategic. Regressive (or passive) restructuring means the implementation of measures that will ensure good functioning of an enterprise, at least in the short-run, without significant costs. These measures usually include maximization of productive efficiency of existing equipment (without significant costs), decreasing employment, selling of some property, cutting the expenses etc.

Strategic restructuring requires implementation of measures that will ensure efficient operation of an enterprise and make it competitive in the long term. Such measures should include not only replacement of obsolete equipment, but changes in technological process, the development of new products, and the search for new markets. It could also include changes in the organizational structure of an enterprise in order to improve management. One can subdivide strategic restructuring into two categories: hard, which results in investment in new equipment and technologies, and soft, which is characterized by improvements in marketing activities, increased promotion of products etc.

One should note that restructuring and performance (in terms of efficiency) of an enterprise are closely linked: successful restructuring will most likely result in better performance of an enterprise. Therefore, to investigate the impact of different policies on restructuring of an enterprise it is worthwhile to look not only at restructuring measures, but also at performance indicators.

Let us now concentrate on the existing literature that investigates impact of different policies on restructuring and efficiency of enterprises in transition.

According to standard economic theory, competition forces firms to produce at the point where prices are equated to marginal cost and, therefore, where firms earn zero profits in long run and where production (as well as consumption) is efficient. The positive influence of competition can be expanded into productive efficiency: tight competitive pressure tends to discipline firms by exerting a pressure on managers to cut costs and to reduce slack. Allowing for comparison relative to other firms competition stimulates managers to work hard to get higher rewards, which in turn improves performance of the firm. Besides, in the period of uncertainty competition reveals more investment opportunities and gives more information on quality of managers. In the long run only most efficient firms survive in competitive environment.

In an open economy international competition is a significant factor in determining market power. Consider the case of a domestic monopoly. Once the economy is open, this monopoly faces competition from foreign firms either in the form of imports or actual entry into the market of the firms themselves. In either case, the outcome is more competition on domestic market. Import competition may be especially effective in Ukraine due to the

[1] Definitions of different types of restructuring are based on the works of Commander et al., 1999, Akimova and Schwödiauer, 1999, and Blanchard, 1997.

substantial quality deficit of most goods in Soviet times. Brown and Earle, 2000, provide strong evidence that import competition has positive significant effect on total factor productivity of Russian firms.

According to Commander et al. (1999) there exist several ways in which competitive pressure affects restructuring. Firstly, through price and profit signaling firms ensure to undertake appropriate restructuring measures. Secondly, closure of bad governed firms and emergence of innovation induce managerial incentives to restructure.

Therefore, one might assume that in transition period competition will lead to increased productivity and more restructuring activity. However, empirical evidence is rather mixed on this point. Studies of enterprise restructuring in Bulgaria (Konings, 1998), Mongolia (Anderson et al., 1999), Russia (Earle and Estrin, 1998, Brown and Earle, 2000), Poland (Grosfeld and Tressel, 2001) reveal significant positive effect of competitive pressure on firms' efficiency and performance indicators. Moreover, Anderson et al. (1999) find out that competition is the most efficient disciplinary device. On the other hand, Grigorian, 2000, finds "no clear evidence of market competition … on performance indicators in the sort-run". Similar results were found for Estonian firms (Konings, 1998).

In studies on Ukraine, results on impact of competition are not homogeneous: Warzynski, 2000, find no straightforward link between competition and performance, while Akimova and Schwödiauer, 1999, discovered positive impact of competition on performance and of foreign competition on restructuring.

Let us now turn to the question of relative efficiency of state-owned and private enterprises. Private enterprises are generally believed to perform better that their state-owned counterparts since the main goal of the former is economic performance, while the latter should follow social targets of the

government. Moreover, it is harder to evaluate managerial performance and more difficult to enforce corporate governance on state-owned firms.

Early studies concluded that privatization results in little restructuring. For instance Carlin et al. (1994) found that for a sample of enterprises in Poland, Hungary, Czech Republic, Slovakia and Russia "there is little evidence that privatized enterprises were more likely to restructure than state-owned enterprises". Estrin, 1997, notes that though "initial studies have found little evidence that privatized firms behave differently to their state-owned counterparts, it is still too early to make some conclusions". Indeed, since the effects of privatization have appeared only several years after its start, we see quite different findings in more recent literature. Different studies on enterprise restructuring in transition countries prove the hypothesis that privatized enterprises tend to perform better than the state-owned ones: Djankov and Pohl (1997) for Slovak firms; Carlin and Lendesmann (1997); Grosfeld and Nivet (1997) for Polish firms; Earle and Estrin (1997) and Brown and Earl (2000) for Russian firms; Grigorian (2000) for Lithuanian enterprises. Djankov (1999) found non-linear significant relationship between different types of owners and enterprise restructuring for enterprises in Georgia, Kazakhstan, the Kyrgyz Republic, Moldova, Russia and Ukraine. Nevertheless, Anderson et al. (1999) in their study of Mongolian enterprises reached the conclusion that enterprises with state ownership perform better than firms with other owners. This striking difference in the results could be explained by the advances in country's transition: Mongolia lags far behind other transition countries, and thus the effect of privatization has not been revealed yet. Another possible explanation is a difference in privatization programs.

For Ukrainian enterprises, Akimova and Schwödiauer, 1999, find significant impact of private ownership variable on performance, whereas Warzynski, 2000, states that enterprise performance is positively associated

only with certain ownership types (foreign owners and banks). Finally, Estrin and Rosevear, 1999, find no relation between ownership and performance.

Soft budget constraints turned out to be another important factor in influencing restructuring and performance. They lead to "the lack of productivity improvements and continuation of unprofitable production activities" (Djankov and Murrel, 2000a). Soft budgets allow managers to think that government would subsidize their enterprises whatever the performance they show. Therefore, tightening of constraints should encourage firms to cut costs allowing efficiency to increase.

Earle and Estrin, 1997, pointed out on the significance of eliminating soft financial discipline, since it slackens the pace of restructuring even at private enterprises. Further studies verify the general tendency that subsidies and other forms of government support of enterprises contribute negatively to performance indicators (Konings, 1998; Grigorian, 2000). Konings, 1998, finds that hard budgets do not play any role in affecting firm performance in Estonia, more advanced transition country, and concludes that this factor matters on early stages of transition, when financial discipline is only in the process of implementation or has been implemented recently. Reviewing most empirical studies on this topic Djankov and Murrel, 2000a, estimated that tightening of budget constraints has more significant effect on total factor productivity and labor productivity growth in non-CIS countries, which are more advanced in transition process, rather than in CIS countries, where transition is very slow.

However, tightening of financial discipline could entail negative outcomes as well. Coricelli and Djankov, 2001, concluded that hard budgets induced passive restructuring in Romanian enterprises, but not an active one, which they measured as new investments. They argued that "tightening of bank credit may raise enterprise efficiency in the short run, but at the cost of curtailing investments". In addition, firms with financial constraints may not

be able to pay in time or may be forced to pay lower prices for suppliers. This could lead to delays in delivery or even loss of suppliers, which, in turn, results in lost efficiency (Blanchard and Kremer, 1997).

For Ukrainian enterprises, Akimova and Schwödiauer, 1999, discovered hard budgets to be one of the driving forces in enhancing restructuring.

Let us now turn to the question of complementarity and substitutability between competitive pressure, privatization and budget constraints. These factors are most likely to be more important in the transition context (Earle and Estrin, 1998). In developed Western countries, where most firms are privatized, operate in competitive environments and are independent from the government, the general environment is such that it exerts a disciplinary pressure even on firms not characterized by any of these features. However, in transition one can compare performance of, say, subsidized, state-owned enterprises with the performance of privatized, competitive firms and make inferences about relative efficiency and necessary measures to mitigate the lag, if any. One could find that competition disciplines only privatized firms, or that monopolized enterprises behave differently depending on the ownership type. And it is possible that neither privatization nor competition will have any effect on performance and restructuring if budget constraints remain to be soft.

Some authors, e.g. Grosfeld and Tressel, 2001, believe that competition and ownership structure should have not only separate effects on performance of enterprises in transition, but influence the latter in interrelationship with each other. A substitution effect between them means that in the absence of good corporate governance competition may play disciplinary role and, as a result, influence increases in productivity and cutting costs; or in the situation of good corporate governance, competitive pressure play minor role. A complementary effect, however, means that "effectiveness

of corporate governance would be enhanced by market competition and vice-versa" (Grosfeld and Tressel, 2001).

Yet, there is little empirical evidence in this field and existing results do not point to any definite tendency. One of the early works examining interaction effects is Earle and Estrin, 1998. They find a complementarity relationship between privatization and competition, as well as between competition and budget constraints, while privatization and hard budgets turned out to be substitutes.

Later, Commander et al., 1999, support the previous finding. They find that changes in ownership structure without adequate changes in product market competition can result in long-term negative effects (i.e. complementarity relationship). However, they also find that competitive environment substitutes tight financial discipline, which they explain by two reasons: first, more competition enhances cost-reduction incentives of the firms and, second, competitive pressure improves corporate control by driving managers to profit maximization.

Grosfeld and Tressel, 2001, found that for the sample of Polish enterprises listed on Warsaw stock exchange competition and privatization tend to complement each other rather than substitute; that is competitive pressure acts more effectively on enterprises with 'good' corporate governance. This means that competition or privatization policy alone may not be successful in improving the efficiency of enterprises.

Brown and Earle, 2001a, also point out on the importance of "substitutability or complementarity of market competition and private ownership" when choosing policy strategy. They construct a model where privatization enhances competition in the product market, which in turn stimulates firms to improve their efficiency. Econometric analysis, which was based on a dataset of Russian medium- and large-sized industrial enterprises,

reveals that there exist strong complementarity relationship between market competition and private ownership.

Summing up this review, we should point out that competitive pressure, privatization and hard budget constraints are found to be the main determinants of enhancing enterprise efficiency and restructuring. Still, there are deviations from this result, which are mainly explained by peculiarities of the country in question. Moreover, there exists strong evidence of complementarity between private ownership and competition. The purpose of the research is to find whether the above-mentioned tendencies are true for Ukraine or whether there are some other, unforeseen relations.

Chapter 3

AGENTS AND INSTITUTIONS

This chapter is devoted to the description of major agents and institutions that are relevant in the light of this paper.

Agents

Main agents in this thesis are large Ukrainian enterprises from all over the Ukraine, mainly from Kiev, Lviv, Sumy and Kharkiv. The criteria for choosing the firm in the sample were as follows: it should be and industrial enterprise with the labor force more than 250 employees. The sample presents the enterprises of different forms of ownership: joint stock companies, state enterprises, collective enterprises, holding companies and other. Great part of the firms is privatized (see appendix 3).

Ukrainian enterprisers are not the only actors in the thesis. Another actor is the Ukrainian government, which sets the policies determining further development of industries. Other actors are firms (not necessarily from Ukraine) that act as competitors of the given enterprises. They are present in the paper implicitly: these firms are not necessarily in the sample, but they are taken into account when calculating different indices of competitive pressure.

Institutions

Competition. Competition policy in Ukraine started its development in 1991 and since that time there has been created a proper legislative framework. Its main principles are stated in the Constitution of Ukraine, the Law # 2210-3 "*On the protection of economic competition*", the Law # 236/96 "*On the protection from unfair competition*", and the Law # 1682-3 "*On natural monopolies*". It is worth to note that Ukrainian government stuck

to the international standards of competition law when developing the above-mentioned laws.

In addition to the laws there are now in action around 25 competition-related normative documents like "*State program of de-monopolization of the economy and competition development*", "*Major targets of competition policy in 1999-2000 and measures of its implementation*" etc. However, the existence of such great number of regulatory procedures does not necessarily mean their proper implementation.

The state body, which controls execution of antimonopoly legislation, is Antimonopoly Committee of Ukraine (AMC). Among major functions of AMC, which are defined in the Law #3629-12 "*On the Antimonopoly Committee of Ukraine*" are prevention, detection and elimination of violations of antimonopoly legislation, control over market concentration, and encouragement of the development of fair competition. The major problem of the antitrust regulatory body is its under-financing. This limitation could not ensure proper functioning of such widely distributed agency as AMC (it has 27 territorial divisions). Moreover, in accordance to the Law "*On natural monopolies*", there could be created national commissions on regulation of natural monopolies. Presence of multiple regulatory authorities at local and regional levels makes monitoring and control over execution of antitrust legislation inefficient.

To sum up, at present time there exist good legislative background for the development of competition policy in Ukraine. The laws are designed to protect competition on domestic markets, to control merger activities, and to prevent practices of unfair competition. However, regulatory authorities are not functioning properly. Enforcement of competition laws could not be called "satisfactory". Enterprises could still get unfair competitive advantage.

Usually state enterprises, and especially monopolized ones, have more opportunities to receive aid from government, either explicit or implicit – in form of subsidies or state order. Clearly, this creates more favorable conditions for them comparing to other enterprises.

Privatization. In 1991 Ukrainian Parliament (Verchovna Rada) approved the "*Concept for De-statization and Privatization of State Enterprises, Land and Housing*", where major principles of the privatization process were declared. In 1992 main privatization laws were adopted: "*On privatization of Property of Large Enterprises*", "*On Privatization of Small State Enterprises*" and "*On Privatization Certificates*". June 1992, when the first privatization program has been adopted, can be considered as the starting point in the Ukrainian privatization.

In 2000 President of Ukraine issued a decree on "*Measures for accelerating Privatization of Property in Ukraine*", which plans privatization of Ukrainian companies for the years 2000-2002. This decree specified new priorities and goals of privatization policy in Ukraine. In particular, the goal of finding new owners for state enterprises has expanded into one of finding "more effective" owners, who will be able and willing to invest in an enterprise and to improve its current business operation. Another new aspect of privatization policy, which had been announced in this decree, was a strategy to accelerate privatization by selling state shares in large packets via tenders to "strategic" investors, i.e. large industrial corporations with good knowledge of the industry where a given company operate. Other principles of the degree include reducing state control over enterprises and improving corporate management.

Tight financial discipline. Hardness of budget constraints faced by enterprises is most often associated with the subsidization, tax arrears and bankruptcy procedures. In June 1999 Ukrainian Parliament adopted new

bankruptcy law[2]. Compared to previous bankruptcy procedure, which was enacted in 1992, present law has been improved significantly. It specifies the steps of bankruptcy process, identifies the categories of agents that might initiate bankruptcy procedure, sets the minimum debt that may serve as a minimum for bankruptcy, and identifies the rights of parties to an arbitration hearing. The efficiency of the present law can be characterized by its flexibility: there exist several different paths for an enterprise to follow during the restructuring of its debts.

Description of Restructuring Process in Ukraine

Ukrainian privatization process can be divided into the three stages: "the initial period of legitimate privatization (1992-95), the mass privatization (1995-98), and the money-driven, predominantly industrial, privatization period (1999-now)" (Voronkova, 2000).

Unfortunately, Ukraine was not able to ensure fast and efficient reforms. First privatization program was not adopted as a law, and small-scale privatization was blocked. As a result, only 1% of enterprises[3] subject to privatization were privatized in 1992. In the whole period from 1992 to 1994, 1240 medium and large enterprises has been privatized[4]. At that time, domestic and foreign investors were not involved in privatization.

At the mass privatization stage, rates of privatization have increased on average 4.2 times compared to the previous period. (Voronkova, 2000). There have been privatized 9,504 medium and large enterprises[5].

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[2] "The Law on Restoring the Solvency of the Debtor or Declaring It Debtor".

[3] Voronkova, 2000

[4] IMF Staff Country Report, 1999. Ukraine: Recent economic development. #99/42

[5] IMF Staff Country Report, 1999. Ukraine: Recent economic development. #99/42

The third state of privatization program started in 1999. This is a stage of money-driven privatization, which should facilitate transparency of privatization and reduce below market selling prices (Voronkova, 2000).

In general, the share of private enterprises in GDP has increased significantly during the period 1991 – 2000: private sector's output comprised only 10% of GDP in 1991, while in 1997-2000 this share has increased up to 60% level[6].

With regard to what has been done in competition policy, one should note that the progress was made in establishing independent antitrust regulatory authorities, breaking up some monopolies, separating out the natural monopolies from other activities in order to improve competition (IMF, 1999). However, there still exist unfair competition on domestic markets. According to the survey of 2200 Ukrainian firms, which was conducted by International Financial Corporation in 2000, the major cause of unfair competition for the producers is the existence of shadow economy. Other obstacles are the system of tax concessions, privileges to some firms to entry certain markets or to access credit resources.

The development of enterprises in present times is limited due to the number of factors, most important of which are difficulties to attract capital for investment, failure of bankruptcy laws enforcement and weak financial discipline. According to EBRD transition report (2001), governance and restructuring of Ukrainian enterprises has the mark '2' on 1-4 scale, which corresponds to the moderately tight financial discipline, weak enforcement of bankruptcy laws and little actions with respect to strengthening of competition and corporate governance.

[6] EBRD Transition report, 2001. p 208.

Chapter 4

EMPIRICS

This chapter is devoted to the empirical part of the work. First we will present description of the data used. Then models' specification will be described. Obtained empirical results conclude the section.

Data

The dataset used in this research is provided by the Institute for Economic Research and Policy Consulting at German Advisory Group in Ukraine. It consists of 2 parts. The first part contains qualitative indicators for each enterprise. These indicators were constructed on the basis of the survey[7] of 210 large industrial enterprises from all over the Ukraine, mainly from Kiev, Kharkiv, Sumy, and Lviv (the survey was conducted in the summer-fall 2001 under the supervision of the above-mentioned Institute). In the process of the survey, in-depth interviews with the representative of top management, such as president, vice-president on economics or finance, chief accountant, or chief economist were conducted in each enterprise. However, in the process of estimation the sample was reduced to 177 enterprises, since some firms have not reported answers on many important questions and these observations were dropped.

The second part of the dataset contains information from the balance sheets of the sample enterprises for the years 1998 - 2000. Using this information we were able to construct quantitative indicators for each enterprise. In particular, we needed information on sales, number of employees, and wear and tear of capital.

[7] Survey questions used for construction of the variables are listed in the appendix 4.

The characteristics of the sample are presented in the appendix 1.

Even though the quantitative indicators are available for the period of three years, qualitative indicators, which are taken from the survey, cover only a period of two years – 1998 and 2000. Moreover, many indicators, such as ones of budget constraints and market shares, were available only for the year 2000. Therefore, in the regression analysis we will use cross-section data for the year 2000 that covers 177 enterprises. Indicators for the year 1998 would not be wasted, since most of them would be used as instruments for endogenous variables or as control variables in the regressions.

Definition of the Variables

As we learned from the literature review, competitive forces should positively influence restructuring and performance indicators of enterprises. So should privatization and hardened budget constraints. Let us now concentrate more closely on the variables that will appear in the model.

Two types of depended variables will be employed in the analysis. First is performance indicator. Depending on the country in question and available data, different authors use different indices. In developed market setting one may use accounting profits, stock market prices and Tobin's Q as measures of firm performance. However, in the transition context these indices are either unavailable (as in the case of stock market prices and Tobin's Q) or unreliable (accounting profits). Therefore, we should appeal to other indicators that would adequately reflect transition reality. Most commonly used indices corresponding to transition economies are level of sales (Akimova and Schwödiauer, 1999) and export (Grigorian, 2000), labor productivity (Earle and Estrin, 1997, Akimova and Schwödiauer, 1999, Pivovarsky, 2001), and total factor productivity (TFP) (Nickel, 1996, Brown and Earle, 2001a). In the context of this work, it would be better to use performance indicator that reflect efficiency of an enterprise rather than profitability, since in competitive environment profits tend to decrease. For

data-driven reasons, we use labor productivity (measured as the sales per employee) as a performance indicator, which reflects how efficiently enterprises are operating.

Another type of dependent variable we will use is a measure of restructuring activity. In this regard there are available different restructuring indices depending on the depth of the problem analyzed. In our work we will construct 4 restructuring dummies in order to follow the impact of different types of restructuring separately. (Detailed explanation of how these dummies were constructed is presented in the appendix 3). Therefore, other four dependent variables, which we will employ in our analysis, are dummy for overall restructuring activity, dummy for regressive restructuring and dummies for hard and soft strategic restructuring.

Main independent variables that will appear in the model are competition indices, ownership dummy and budget constraint indices. We will use also interaction terms for competition, privatization and hard budget constraints.

Usually competitive pressure is measured by concentration ratios or Herfindahl-Hirschman index (e.g. in Brown and Earle, 2000). Unfortunately, due to the data limitations these indices could not be constructed and, therefore, we will rely on indicators, based on the managers' responses on the survey questions about market share of the main products of an enterprise and degree of competition from the side of Ukrainian and foreign producers. Thus, competitive pressure will be measured by the following indices:

- $MSHARE_i$ represents the market share of the main product of *i*-th enterprise. It varies from 1 to 5, where 1 stands for the market share >40%, 2 – 31-40%, 3 – 21-30%, 4 – 11-20%, 5 – <10%.

- Indices CP_UKR00_i and $CP\_FOREIGN00_i$ show the tightness of competitive pressure on the markets *i*-th firm operate from

the side of domestic and foreign producers[8] respectively in 2000. They are measured on 0-5 scale (0 - do not operate on this market, 1 - no competitive pressure, 5 - very tight).

One may argue that these indicators might be biased because they reflect managers' subjective beliefs. That is why we use different measures of competition parallel. In the first index, subjective bias should be very small, because usually managers of an enterprise are very much aware of the approximate share of their enterprise in the market. Other two indices, which measure degree of competition from Ukrainian and foreign producers, could be biased because managers may subjectively value tightness of competitive pressure from the side of some rival firms or countries. However, we could not exclude these indices from the set of the variables used in the regression analysis, since we are interested in the relative importance of foreign competition as a disciplinary device.

The effect of ownership structure of each enterprise is captured in the dummy $PRIV00_i$, which is equal to 1 if more than 50% of i-th enterprise's equity capital is concentrated in private hands, and equal to 0 if 100% of i-th enterprise's equity capital is held by state or it is partly privatized with at least 50% of shares in state ownership.

Budget constraints are measured by an index of hard budget constraints, $HBINDEX_i$. It is constructed using the following set of dummies, which were derived from the managers' answers on the survey questions:

- $StSubs_i$ = 1 if a manager reported that the enterprise had received subsidies during the last three years; =0 if not.

[8] Under foreign producers we mean the producers from "far abroad", i.e. excluding CIS countries.

- $TaxExempt_i$ = 1 if a manager reported that the enterprise had been exempted from tax arrears or permitted to postpone tax payments in the last three years; = 0 if not, or if there were no tax arrears on the enterprise.

- $CrExepmt_i$ = 1 if a manager reported that the enterprise had obtained a permission for a delay in credit payments in the last three years; = 0 if not.

The three dummies above, which measure softness of budget constraints (since for all four dummies 1 means soft budget constraints), do not have bias that could arise from the subjectivity of managers' answers. The questions were well-defined and clear-cut, as well as the answers: managers usually know whether the enterprise has received any kind of subsidy from state or not, and answered the questions respectively, i.e. "yes" or "no".

To get an overall index of hard budget constraints we calculate the average of the above three dummies and subtract it from 1:

$$\text{HBINDEX}_i = 1 - (StSubs_i + TaxExempt_i + CrExepmt_i)/3$$

This index ranges from 0 to 1, where 0 shows that i-th enterprise has received some support from state or banks during the last three years, which corresponds to soft budget constraints on enterprise, and 1 means that *i*-th enterprise faces tight financial discipline.

In order to account for differences in performance that are not caused by ownership structure, competition or budget constraints we will also introduce control variables into our model:

- Industry and region dummies, which correspond to an industry, in which an enterprise is operating, and to a region,

where an enterprise is located, respectively. They are used in order to capture the effects of regional peculiarities and growth opportunities of particular industries.

- FINPOS98$_i$ is an index, which was also constructed on the basis of the survey question and which captures the differences in the financial position of enterprises in 1998. This is an interval variable with the range from 1 to 5 (1 – much worse compared to other enterprises in the industry, 3 – average, 5 – much better). Even though this variable could be biased we could not through it away because of its importance and because of our inability to measure it in any other way.

- LABOR00$_i$ stands for the number of employees on i-th enterprise in 2000 and it captures differences between enterprises due to their sizes.

- AMORT00$_i$ shows the level of wear and tear of the capital on *i*-th enterprise. Though this variable may have no effect on restructuring, it could be very important in determining enterprise efficiency – obviously, labor productivity will be higher, ceteris paribus, on an enterprise with better (modern) equipment rather than with out-of-dated one.

Specification of the Models

We will test two hypotheses in our research. Under the first, increased competitive pressure, change of ownership structure from state to private and hardening of budget constraints positively influence performance indicators and restructuring activity of large industrial enterprises in Ukraine. Secondly, we will investigate whether these policy variables are complements or substitutes in their effect on performance and restructuring.

To see whether competition, ownership change and hardening of budget constraints separately influence restructuring and performance of an enterprise we will first estimate the following models:

$$P=P(own, comp, hbc, controls), \quad (1)$$

$$R=R(own, comp, hbc, controls), \quad (2)$$

where P stands for performance indicator (labor productivity in our case) and R – for restructuring indicator (index of overall restructuring activity, index of regressive restructuring, and indices of hard and soft strategic restructuring); *own* represents an ownership dummy; *comp* – a competition index; *hbc* – an index of hard budget constraints; and *controls* stands for other variables that influence performance and restructuring.

Since we have two kinds of competition variables, we will use them parallel in the analysis. This would help us to distinguish between two effects: an effect of an overall competitive pressure on a firm and an effect of competitive pressure from the side of two types of producers - domestic and foreign. The question about the impact of foreign competition on domestic producers is controversial. On the one hand, foreign competition may act as an independent disciplinary device in improving firm's efficiency, but on the other hand it may have no separate effect and influence efficiency of domestic firms jointly with domestic competition.

We will employ different kinds of control variables in different specifications. Some factors, like regional and industrial discrepancies, have an influence on both efficiency and restructuring. However, other factors do not necessarily have to be equally important. In the specification with the labor productivity as a dependent variable we will use the following controls: regional and industrial dummies, size of an enterprise (LABOR00), lagged value of labor productivity (logLPROD98), and the level of wear and tear of firm's equipment (AMORT00). Test for omitted variables empirically proved

a relevance of the above-mentioned controls. However, it seems that other factors should determine incentive of an enterprise to restructure. What seems to be more relevant and significant is financial position of an enterprise before 2000, which we captured in the variable FINPOS98. Of course, one could think of wider range of factors that could influence efficiency or restructuring activity, however, our data sample limits us to use the above-mentioned indicators.

To test the second hypothesis of complementarity and substitutability of the three policies we need to introduce interaction terms. Therefore, we will estimate following models:

$$P=P(own, comp, hbc, Comp_i * Own_i , Comp_i * HBC_i , Own_i * HBC_i , controls), \quad (3)$$

$$R=R(own, comp, hbc, Comp_i * Own_i , Comp_i * HBC_i , Own_i * HBC_i , controls), \quad (4)$$

where P, R, *own, comp, hbc,* and *controls* denote the same variables as in the models (1) and (2). $Comp_i * Own_i$, $Comp_i * HBC_i$, and $Own_i * HBC_i$ stand for interaction terms between competition and ownership, competition and budget constraints, and ownership and hard budget constraints. They are measured by the following variables: $Comp_i * Own_i$ is measured by MSHARE*PRIV00, CP_UKR00*PRIV00 and CP_FOREIGN00*PRIV00; $Comp_i * HBC_i$ – by MSHARE*HBINDEX, CP_UKR00*HBINDEX and CP_FOREIGN00*HBINDEX; $Own_i * HBC_i$ – by PRIV00*HBINDEX.

Before we define the method of estimation of our models let us concentrate on some econometric problems that could arise in the process of estimation. First, there is a possibility of endogeneity of independent variables with respect to the firm performance. Endogeneity of market structure was first suggested by Demzetz in his "efficient market structure hypothesis",

1973, which stated that market concentration rises as a result of growth of more efficient firms. Ownership structure may also be endogenous, since better performing enterprises are more likely to be privatized. To avoid this problem one should use instruments, which are highly correlated with the endogenous variable in question and not correlated with an error term. Lagged values of market concentration can serve as an instrument, though some authors suggest that more appropriate instrument may be competition index in the period prior to transition, when market structure was determined by central planners and was purely exogenous to profitability (Brown and Brown, 2001; Brown and Earle, 2000, 2001a, 2001b). Unfortunately we are not able to construct competition index for the distant past and thus we will use the measures of tightness of competitive pressure for the year 1998 (CP_UKR98 and CP_FOREIGN98), which are available from the survey. To handle problem of endogeneity of ownership structure, we choose ownership measure with the lag 2 years (PRIV98) as an instrument.

Another econometric problem that can arise is multicollinearity of regressors. However, examination of matrix of correlation coefficients between independent variables shows that neither variable is correlated with another, except that variables with lagged values are highly correlated with their current values (which just proves correct choice of instruments).

Finally, heteroskedasticity of the error term is possible since enterprises are heterogeneous, so there could be some specific factors that affect performance and restructuring activity of each enterprise non-uniformly. This means that variance of the error terms may have the functional form as follows: $var(\varepsilon_i) = \sigma\, g(X_i)$, where X_i is a vector of enterprise characteristics. Formal econometric tests proved the existence of heteroskedasticity of residuals, which may cause inconsistency of the estimated coefficients. Therefore, to get consistent estimates we will use the Huber/White/Sandwich estimator of variance, which is computed automatically by Stata7.0 software.

Taking into account econometric problems specified above we suggest following methods for estimation of our models.

Since we have two types of dependent variables and since one is a continuous variable (logLPROD00) and the other are discrete variables (restructuring dummies), estimation techniques for these two kinds of regression will be different. For the models (1) and (3) Hausman test reported that there indeed exists endogeneity of regressors. Hence, we will apply a two-stage least squares (instrumental variables) technique with robust standard errors. In the models (2) and (4) dependent variable is a dummy; therefore, we will applying probit model with robust standard errors. Tests of the probit regressions showed that error terms are distributed normally.

Results[9]

Let's first explore the empirical results for the first hypothesis that privatization, increased competition and hardening of budget constraints positively influence restructuring and performance of large Ukrainian enterprises[10].

As we can see, increased competitive pressure in general has negative and insignificant effect on labor productivity, while the competition from the side of foreign producers is positive and significant. The significance of this coefficient points out on the importance of imports as a disciplinary device for domestic enterprises.

In the case of restructuring, we cannot unambiguously evaluate the impact of competition: overall competitive pressure, measured as

[9] Note: the regression outputs are reported in the appendices 5 – 8. Each type of equation was estimated with alternative competition measures. Specifications are numbered according to the hypothesis tested, a dependent variable and a measure of competitive pressure used. For instance, specification 2.3.1 means that we are testing 2nd hypothesis, dependent variable is RESTRSOFT00, and competitive pressure is measured by CP_UKR00 and CP_FOREIGN00.

[10] Regression outputs are presented in the appendices 5 and 6.

MSHARE, is insignificant and has different signs in different specifications. However, domestic competition positively influences all types of restructuring activities. Moreover, in regressions with overall and regressive restructuring as dependent variables, this coefficient becomes significant. Foreign competition seems to have positive and significant effect only on inducing overall restructuring activity.

Privatization has a positive influence on performance, and in one specification this coefficient is significant. However, privatization's effect on restructuring activity is negative and insignificant. This could mean that state-owned enterprises tend to undertake more restructuring than privatized ones. It is most likely that insignificance of this variable is caused by the small sample size, and increasing the latter could bring up the significance and, perhaps, change the size of the coefficients.

The hard budget constraint variable has a positive, though insignificant, impact on performance. A similar result is observed for strategic restructuring (both soft and hard). However, in case of regressive restructuring hard budgets seem to have negative effect. This negative impact overweighs the positive one on strategic restructuring, resulting in a negative (though insignificant) influence on overall restructuring activity.

Summing up the results on the first hypothesis, one notes that privatization and hard budget constraints positively influence labor productivity, which is consistent with the findings in the previous researches. The effect of competition on performance is insignificant. However, subdividing competitive pressure on the one from the side of Ukrainian and foreign producers, we see that the latter have a

positive and significant effect on labor productivity of domestic enterprises.

Let us now consider the evidence on the second hypothesis about complementarity and substitutability between competition, privatization and hard budgets[11]. A positive sign of the coefficient at interaction term indicates a complementary relationship between two variables, while a negative sign indicates a substitutability relationship.

The results from the regression with the labor productivity as dependent variable point on no clear interrelationship between privatization and competition, and between competition and hard budget constrains. However, coefficient at interaction term PRIV00*HBINDEX is statistically significant and negative, indicating on the possible existence of substitutability relationship between privatization and hard budget constraints. This means that private ownership can substitute tight financial discipline in its effect on labor productivity, i.e. private enterprise, even if it has soft budget constraints, have enough incentives to stimulate labor productivity growth and improve their performance. Similarly, if placing state enterprises into tight budget constraints should induce them to improve their performance.

Let us now turn to the regressions with restructuring dummies as dependent variables. We observe a clear tendency for privatization and competition to complement each other in their effect on all types of restructuring: the respective coefficients in all specifications are positive, and in regressions with overall restructuring and regressive restructuring these coefficients are significant. This complementarity effect means that competitive pressure acts more effectively on privatized enterprises rather than on state-owned ones, and thus is

[11] Regression outputs are presented in appendices 7 and 8.

more successful in inducing restructuring. On the other hand, privatizing enterprises that operate in monopolized markets, or exerting high competitive pressure on state enterprises would have smaller (or even negative) effect on restructuring.

One also observes an existence of another strong complementarity relationship – the one between competition and hard budget constraints. In the regressions with overall restructuring activity and hard strategic restructuring the coefficients at MSHARE*HBINDEX are not only positive but also significant. This means that competition has stronger effect on an enterprise restructuring if the enterprise faces hard budget constraints.

The last interaction term we should consider is PRIV00*HBINDEX, which points on interaction between privatization and hard budgets. As one can see, it is insignificant in three regressions. However, in specifications with regressive restructuring, the coefficients at this interactive term are positive and highly significant, which means that privatization and hard budget constraints are complements in their effect on regressive restructuring of an enterprise. The intuitive explanation behind this result is as follows: in order to induce regressive restructuring, enterprises have not only to be privatized but also have to face tight financial discipline. Otherwise, say, if enterprise is private but has soft budget constraints, managers will not have enough incentives to start regressive restructuring. As we know, regressive restructuring is the most painful type of the restructuring since it requires firing redundant labor. Thus, managers should have sound reasons, such as change of ownership together with elimination of state support, to start regressive restructuring.

To sum up the empirical results on the second hypothesis, we should note that there exists strong evidence in support of the complementarity between privatization, competition and hard budget constraints in their effect on different types of restructuring. In the labor productivity regressions we found only one significant interrelationship between policy variables: privatization and hard budget constraints turned out to be substitutes in improving efficiency of an enterprise.

Limitations of the Research and Suggestions for Further Work

Unfortunately there exist some limitations of the present research that we should mention. And here we will also discuss the possible ways to improve this work.

First, and most important limitation is the small sample size. Therefore, in the future works it should be increased.

Secondly, it would be worthwhile to include in the model other, more formal measures of the competition, such as concentration ratios or Herfindahl-Hirschman index. Since the survey indicators we are using here are rather objective, we expect regressions with new variables on competition to give approximately the same results. However, if the results differ, this will indicate on possible drawbacks in the survey data.

Next, we would like to consider several types of private ownership: concentrated and non-concentrated, outsider and insider owned. According the existing literature, different types of owners have different incentives, and therefore, their impact on performance and restructuring activity will be uneven. For example, Akimova and Schwödiauer, 2000, found that performance of privatised enterprises is

significantly improved by concentrated outsider ownership. Aghion and Blanchard, 1998, discovered that concentrated outsider ownership stimulates more restructuring, especially strategic one, than the insider ownership.

It would be also worthwhile to investigate dynamic impact of ownership, competition and hard budget constraints on performance and restructuring by using time series data.

Chapter 5

CONCLUTIONS AND POLICY IMPLICATIONS

In conclusion we should say that private ownership, foreign competition and hardening of budget constraints appear to have positive influence on efficiency of large Ukrainian enterprises. It seems also that both domestic and foreign competition has positive impact on restructuring, and hard budgets has positive effect on strategic restructuring.

In regard to interactive effects, we discovered that in case of enterprise restructuring there exist strong complementarity relationship between competition and privatization, and competition and hard budget constraints. Privatization and hard budget constraints turned out to be complements in their effect on regressive restructuring, while they are substitutes in affecting performance.

We would like to note that our results are based on the measures of competition, which are not perfect. However, the fact that we obtained similar results in different specifications in almost all regressions suggests that they are robust.

Our findings reveal a crucial point that the effect of one policy variable *depends* on another two. That is, in order to pursue active restructuring activity on enterprises it is not enough to make them privately owned. Privatization would have stronger effect on restructuring if these enterprises are placed into more competitive environment and have tight financial discipline.

Therefore, the policy advice that emerges from this research is as follows: Ukrainian government should continue to foster privatization

process so that to complete privatization of state-owned enterprises and partially privatized ones. At the same time, competition policy should be strengthened by improving enforcement of the current law, and soft budget constraints should be eliminated. First of all this concerns state-owned enterprises, especially monopolized ones, which have more opportunities to receive state support. All these measures should be done simultaneously in order to stimulate more restructuring on Ukrainian enterprises.

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APPENDIX 1: **Composition of the Sample**.

	Number of enterprises	% of the total number of enterprises
Industry Categories:		
1. Energy	3	1.70
2. Chemical industry	8	4.52
3. Engineering industry	84	47.46
4. Woodworking industry	7	3.95
5. Construction industry	10	5.65
6. Light industry	26	14.69
7. Food industry	25	14.12
8. Other industrial productions (includes printing industry, stomatology, jeweler's art)	14	7.91
Region Categories:		
1. Kiev	37	20.90
2. Lviv	40	22.60
3. Kharkiv	63	35.60
4. Sumy	12	6.78
5. Other cities	25	14.12
Ownership Categories:		
• Privatized	130	73.45
• State-owed	47	26.55
Overall	177	100%

Note:

- The enterprises from the sample were divided into 8 industries according to the 5-digit industry classification adopted in Ukraine (OKONKh).

APPENDIX 2: **Summary Statistics for the Variables Used in the Analysis.**

Variable Name	Description	Mean	Std. Deviation
Dependent Varibles:			
LPROD00	Real sales/employment, 2000 (98 Hrn/worker)	27.979	41.043
RESTR00	Dummy for restructuring activity in 2000	.613	.489
RESTRREGR00	Dummy for regressive restructuring in 2000	.446	.499
RESTRSOFT00	Dummy for soft strategic restructuring in 2000	.565	.497
RESTRHARD00	Dummy for hard strategic restructuring in 2000	.700	.460
Ownership:			
PRIV00	Proportion of private enterprises	.726	.447
Competition:			
MSHARE	Manager's estimate of the firm's market share (index: 1..5, equal to 1 if share >40%, 5 if <10%)	2.197	1.389
CP_UKR00	Manager's estimate of tightness of competitive pressure from the side of domestic producers (index: 1..5: 1 – no competitive pressure, …, 5 – very tight)	3.471	1.313
CP_FOREIGN00	Manager's estimate of tightness of competitive pressure from the side of foreign producers (index: 1..5: 1 – no competitive pressure, …, 5 – very tight)	2.248	1.989
Budget Constraint:			
HBINDEX	Index of hard budget constraints, 0..1	.352	.283
StSubs	Proportion of enterprises which have received state subsidies during last three years	.140	.348
TaxExempt	Proportion of enterprises which were exempted from tax arrears during last three years	.586	.494
CrExempt	Proportion of enterprises which had obtained a permission for a delay in credit payments during last three years	.159	.367
Controls:			
AMORT00	Rate of wear and tear of equipment	53.756	16.029
LPROD98	Sales/employment, 1998 (98 Hrn/workers)	18.13	27.935
LABOR00	Enterprise's labor force in 2000	1068.48	1989.57

APPENDIX 3: **Construction of Dummies for Restructuring Activity.**

The dummy for overall restructuring activity, dummy for regressive restructuring and dummies for hard and soft strategic restructuring are constructed on the basis of managers' response on what types of restructuring activity out of 17 specified in the question (see table below) has been undertaken on their enterprise in the years 1998-2000. Each positive answer was converted into a dummy rd_j , which is equal to 1 if j-th measure has been adopted on an enterprise. The maximum number of these dummies corresponding to regressive restructuring is 6, hard strategic restructuring – 4, and soft strategic restructuring – 7. The restructuring dummies were obtained in the following way:

- Dummy for overall restructuring activity, RESTR00, is equal to 1 if $\sum_{i=1}^{17} rd_{ij} \geq 9$ and 0 otherwise.

- Dummy for regressive restructuring, RESTRREGR00, is equal to 1 if a sum of dummies rd_j corresponding to this type of restructuring is greater of equal than 4.

- Dummy for soft strategic restructuring, RESTRSOFT00, is equal to 1 if a sum of dummies rd_j corresponding to this type of restructuring is greater of equal than 5.

- Dummy for hard strategic restructuring, RESTRHARD00, is equal to 1 if a sum of dummies rd_j corresponding to this type of restructuring is greater of equal than 3.

Number	Restructuring measures	Type of restructuring
1	Selling/leasing out some basic production assets	Regressive
2	Closure of plant's subdivisions and shops	Regressive
3	Closure of outdated production lines	Regressive
4	Selling/transferring in state ownership social assets	Regressive
5	Reduction of labor force	Regressive
6	Keeping real wage at low level	Regressive
7	Increasing the share of qualified labor in the total number of employees	Hard strategic
8	Buying new equipment and technologies	Hard strategic
9	International certification of products' quality	Hard strategic
10	Significant product innovations	Hard strategic
11	Innovations in the existing range of products	Soft strategic
12	Entering new markets	Soft strategic
13	Significant changes in packaging and design of existing products	Soft strategic
14	Developing of sales channels	Soft strategic
15	Increasing of expenditures on advertising	Soft strategic
16	Changes in organizational structure	Soft strategic
17	Studying consumer demand and conducting other marketing research	Soft strategic

APPENDIX 4: **Survey Questions Used for the Construction of Variables.**

1. How much is the market share of your enterprise's main product:

<10% ____ 11-20%_____ 21-30%_____ 31-40%_____ >40%_____

2. Estimate the level of competitive pressure from the side of the following groups of producers on the main markets where your enterprise operates. *Please, use the following scale: 0 – the enterprise does not operate on this market, 1 – the enterprise is the only producer on the market, 2 – very weak competitive pressure, 3 – weak competitive pressure, 4 – tight competitive pressure, 5 – very tight competitive pressure*

	In 1998	In 2000
Ukrainian producers	0 1 2 3 4 5	0 1 2 3 4 5
Producers from Russia and other New Independent States countries	0 1 2 3 4 5	0 1 2 3 4 5
Producers from Eastern Europe	0 1 2 3 4 5	0 1 2 3 4 5
Producers from developed countries in Western Europe	0 1 2 3 4 5	0 1 2 3 4 5
Producers from other countries	0 1 2 3 4 5	0 1 2 3 4 5

3. Compare your enterprise's financial position with the average for other enterprises on your industry:

Much worse____ Worse____ Average____ Better____ Much better____

4. Has your enterprise received any state subsidy during the last 3 years?

Yes_____ No_____

5. Has your enterprise had any tax arrears during the last 3 years?

Yes_____ No_____

6. If yes, has it been canceled during the last 3 years?

Yes_____ No_____

7. Has your enterprise received a delay of tax payments during the last 3 years?

Yes_____ No_____

8. Has your enterprise received a delay of bank credit payments during the last 3 years?

Yes_____ No_____

APPENDIX 5: **Regression Results on Hypothesis 1; Labor Productivity as Dependent Variable.**

Dependent Variable: Log of LPROD00 (measured as real sales per employee in 2000, 98 Hrn/worker)
Method of estimation: IV (2SLS) regression with robust standard errors

Independent variables	Specification			
	1.1.1		1.1.2	
	Coef.	St. Error	Coef.	St. Error
Ownership:				
PRIV00	.441	.298	**.483****	.281
Competition:				
MSHARE	--	--	-.019	.123
CP_UKR00	-.026	.058	--	--
CP_FOREIGN00	**.124****	.061	--	--
Budget Constraint:				
HBINDEX	.192	.391	.077	.379
Controls:				
LABOR00	.0006**	.00003	.0008***	.00003
LOGLPROD98	.638***	.106	.625***	.108
AMORT00	.001	.006	-.003	.006
INDUSTRIES	+/-	2 out of 8 coef's are significant	+/-	4 out of 8 coef's are significant
REGIONS	+/-	2 out of 4 coef's are significant	+/-	2 out of 4 coef's are significant
Constant	-.195	.746	.613	.647
R-SQUARED	.6342		.6105	
F-statistics (p-value)	17.51 (0.0000)		16.40 (0.0000)	
Omitted Variables Test (p-value)	.1728		.3262	
Hausman Test (p-value)	.0178		.0026	
OIR Test (p-value)	.99989		.9997	

Note: "Industries" and "Regions" represent eight industries and four regions respectively.
Standard errors are calculated using heteroskedasticity-consistent variance-covariance matrix
* means that the coefficient is significant at 10% level, ** - significant at 5%, *** - significant at 1%.

APPENDIX 6: **Regression Results on Hypothesis 1; Restructuring Dummies as Dependent Variables.**

Method of estimation: Probit model

The table below reports marginal effects, which show the change in probability for an infinitely small change in each independent continuous variable and the discrete change in the probability for dummy variable.

Dependent variable	RESTR00				RESTRREGR00				RESTRSOFT00				RESTRHARD00			
Independent variables	Specification				Specification				Specification				Specification			
	1.2.1		1.2.2		1.3.1		1.3.2		1.4.1		1.4.2		1.5.1		1.5.2	
	Coef.	St. Error	Coef.	St. Error	Coef.	St. Error	Coef.	St. Error	Coef.	St. Error	Coef.	St. Error	Coef.	St. Error	Coef.	St. Error
Ownership:																
PRIV00	-.067	.134	.021	.138	-.251	.169	-.064	.160	-.094	.110	-.076	.118	-.185	.119	-.182	.119
Competition:																
MSHARE	--	--	-.022	.036	--	--	.021	.045	--	--	-.030	.034	--	--	.019	.032
CP_UKR00	**.071***	.041	--	--	**.149*****	.049	--	--	.038	.037	--	--	.008	.033	--	--
CP_FOREIGN00	**.047***	.027	--	--	.036	.035	--	--	.032	.028	--	--	-.016	.029	--	--
Budget Constraint:																
HBINDEX	-.128	.238	-.049	.228	**-.477***	.261	-.305	.235	.271	.219	.300	.221	.213	.204	.195	.180
Controls:																
FINPOS98	-.078	.056	-.073	.058	-.266***	.080	-.237***	.072	-.054	.061	-.057	.058	.019	.049	.061	.151
INDUSTRIES	+/- (3 out of 8 coef's are significant)		+/- (2 out of 8 coef's are significant)		+/- (5 out of 8 coef's are significant)		+/- (2 out of 8 coef's are significant)		+/- (3 out of 8 coef's are significant)		+/- (4 out of 8 coef's are significant)		+/- (2 out of 8 coef's are significant)		+/- (3 out of 8 coef's are significant)	
REGIONS	+/- (2 out of 4 coef's are significant)		+/- (1 out of 4 coef's are significant)		+/- (2 out of 4 coef's are significant)		+/- (2 out of 4 coef's are significant)		+/- (2 out of 4 coef's are significant)		+/- (2 out of 4 coef's are significant)		+/- (2 out of 4 coef's are significant)		+/- (2 out of 4 coef's are significant)	
Wald Statistics (p-Value)	25.64 (0.0287)		20.25 (0.0892)		52.37 (0.0000)		54.22 (0.0000)		25.71 (0.0282)		23.90 (0.0321)		25.50 (0.0198)		27.10 (0.0121)	
Pseudo R-Squared	.1751		.1424		.4031		.3541		.1523		.1461		.2356		.2343	

Note: "Industries" and "Regions" represent eight industries and four regions respectively.

Standard errors are calculated using heteroskedasticity-consistent variance-covariance matrix.

* means that the coefficient is significant at 10% level, ** - significant at 5%, *** - significant at 1%.

APPENDIX 7: **Regression Results on Hypothesis 2; Labor Productivity as Dependent Variable.**

Dependent Variable: Log of LPROD00 (measured as real sales per employee in 2000, 98 Hrn/worker)
Method of estimation: IV (2SLS) regression with robust standard errors

Independent variables	Specification			
	2.1.1		2.1.2	
	Coef.	St. Error	Coef.	St. Error
Ownership:				
PRIV00	3.596	2.262	.847	.983
Competition:				
MSHARE	--	--	-.388	.458
CP_UKR00	.337	.332	--	--
CP_FOREIGN00	.178	.185	--	--
Budget Constraint:				
HBINDEX	-1.609	.932	-.918	.784
Interaction terms:				
MSHARE*PRIV00	--	--	.231	.401
CP_UKR00*PRIV00	-.523	.413	--	--
CP_FOREIGN00*PRIV00	-.003	.139	--	--
MSHARE*HBINDEX	--	--	.531	.672
CP_UKR00*HBINDEX	.202	.207	--	--
CP_FOREIGN00*HBINDEX	-.094	.225	--	--
PRIV00*HBINDEX	**-3.680****	1.614	**-3.390****	1.247
Controls:				
LABOR00	.00003	.00003	.00005*	.00003
LOGLPROD98	.658***	.090	.668***	.090
INDUSTRIES	+/-	2 out of 8 coef's are significant	+/-	2 out of 8 coef's are significant
REGIONS	+/-	2 out of 4 coef's are significant	+/-	2 out of 4 coef's are significant
Constant	-.838	2.505	.843	1.797
R-squared	.6429		.5696	
F-statistics (p-value)	15.79 (0.0000)		15.52 (0.0000)	
Omitted Variables Test (p-value)	.8588		.5295	
Hausman Test (p-value)	.0903		.0045	
OIR Test (p-value)	.9997		.9998	

Note: "Industries" and "Regions" represent eight industries and four regions respectively.
Standard errors are calculated using heteroskedasticity-consistent variance-covariance matrix
* means that the coefficient is significant at 10% level, ** - significant at 5%, *** - significant at 1%.

APPENDIX 8: **Regression Results on Hypothesis 2; Restructuring Dummies as Dependent Variables.**

Method of estimation: Probit model

The table below reports marginal effects, which show the change in probability for an infinitely small change in each independent continuous variable and the discrete change in the probability for dummy variable.

Dependent variable	RESTR00				RESTRREGR00				RESTRSOFT00				RESTRHARD00			
Independent variables	Specification				Specification				Specification				Specification			
	2.2.1		2.2.2		2.3.1		2.3.2		2.4.1		2.4.2		2.5.1		2.5.2	
	Coef.	St. Error	Coef.	St. Error	Coef.	St. Error	Coef.	St. Error	Coef.	St. Error	Coef.	St. Error	Coef.	St. Error	Coef.	St. Error
Ownership:																
PRIV00	**.539****	.321	-.240	.270	**-.620***	.343	**-.617*****	.080	-.119	.370	**-.414****	.189	.331	.221	**-.511****	.233
Competition:																
MSHARE	--	--	**-.256*****	.096	--	--	-.137	.119	--	--	**-.154****	.080	--	--	**-.113***	.069
CP_UKR00	.086	.101	--	--	**.191****	.103	--	--	.132	.093	--	--	-.032	.076	--	--
CP_FOREIGN00	**.136***	.080	--	--	.023	.090	--	--	.003	.061	--	--	.095	.050	--	--
Budget Constraint:																
HBINDEX	-.154	.351	.197	.308	.426	.451	.514	.364	.331	.360	**.596****	.309	.363	.284	**.561****	.232
Interaction terms:																
MSHARE*PRIV00	--	--	**.180****	.091	--	--	**.182****	.091	--	--	.122	.077	--	--	.088	.066
CP_UKR00*PRIV00	-.125	.096	--	--	.051	.092	--	--	-.085	.087	--	--	-.115	.082	--	--
CP_FOREIGN00*PRIV00	-.069	.062	--	--	-.121	.091	--	--	.043	.058	--	--	-.064	.051	--	--
MSHARE*HBINDEX	--	--	**.263****	.129	--	--	.226	.174	--	--	.138	.096	--	--	**.207*****	.086
CP_UKR00*HBINDEX	.168	.151	--	--	-.117	.174	--	--	-.070	.109	--	--	**.282*****	.099	--	--
CP_FOREIGN00*HBINDEX	-.109	.103	--	--	.181	.137	--	--	-.018	.096	--	--	**-.204****	.090	--	--
PRIV00*HBINDEX	-.817	.539	-.466	.335	**1.431****	.759	**1.30*****	.484	.441	.403	.171	.325	-.313	.344	.042	.325
Controls:																
FINPOS98	-.053	.061	-.059	.059	-.318***	.077	-.273***	.085	-.044	.060	-.030	.060	.081	.056	.059	.050
INDUSTRIES	+/- (3 out of 8 coef's are signif.)		+/- (2 out of 8 coef's are signif.)		+/- (4 out of 8 coef's are signif.)		+/- (2 out of 8 coef's are signif.)		+/- (4 out of 8 coef's are signif.)		+/- (3 out of 8 coef's are signif.)		+/- (4 out of 8 coef's are signif.)		+/- (2 out of 8 coef's are signif.)	
REGIONS	+/- (2 out of 4 coef's are signif.)		+/- (2 out of 4 coef's are signif.)		+/- (2 out of 4 coef's are signif.)		+/- (2 out of 4 coef's are signif.)		+/- (1 out of 4 coef's are signif.)		+/- (2 out of 4 coef's are signif.)		+/- (2 out of 4 coef's are signif.)		+/- (2 out of 4 coef's are signif.)	
Wald Statistics (p-Value)	25.22 (0.1132)		24.48 (0.0796)		52.61 (0.0001)		61.76 (0.0000)		30.30 (0.0481)		24.92 (0.0713)		47.83 (0.0005)		27.30 (0.0383)	
Pseudo R-Squared	.1983		.1937		.5314		.4852		.1710		.1791		.3569		.3156	

Note: "Industries" and "Regions" represent eight industries and four regions respectively.

Standard errors are calculated using heteroskedasticity-consistent variance-covariance matrix

* means that the coefficient is significant at 10% level, ** - significant at 5%, *** - significant at 1%.