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How Does Privatization Work?
Ownership Concentration and Enterprise Performance in Ukraine

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Abstract

This paper investigates the relationship between ownership concentration and enterprise performance in Ukraine. Using data on 376 medium and large enterprises, it finds that ownership concentration is positively associated with enterprise performance in Ukraine. The paper also finds that concentration of ownership by foreign companies and banks is associated with better performance than ownership concentrated by the domestic owners. Ownership by Ukrainian investment funds and holding companies does not have a positive effect on performance. In contrast to predictions by many observers of early transition, privatization methods had a lasting effect on ownership structure in Ukraine.

Contents   Page

Tables

I. INTRODUCTION

In the last two decades of the twentieth century, major transfers of state-owned enterprises into private ownership have taken place around the world. The scope of such transfers has been especially significant in the countries undergoing post-socialist transition (Nellis 1998). These privatizations present a unique opportunity for the study of the effects of corporate ownership structure on enterprise performance. The ownership structures that were established in the process of privatization in these economies are an outcome of political bargaining (Kaufmann and Siegelbaum 1996; World Bank 1996). This process is fundamentally different from the evolution of ownership structure in mature market economies, which is an outcome of the interaction of market forces and evolves to an optimal long-run equilibrium (Demsetz and Lehn 1985). Given poor capital markets and the high transaction cost of changes of ownership in most transition economies, the initial post-privatization ownership structures tend to persist over time, thus providing an opportunity for testing a number of hypotheses on the role of ownership structure in enterprise restructuring and performance. In this paper, I investigate the effects of ownership concentration on the performance of medium and large enterprises in Ukraine. Its main hypothesis is that in Ukraine's inadequate legal and regulatory environment, enterprises with greater non-state concentration of ownership perform better than those with a dispersed ownership structure.

This paper is motivated by the debate on the effects of privatization. For the market economies, there is strong evidence of the positive effects of privatization on enterprise restructuring and performance (see for example La Porta and Lopez-de-Silanes 1999; Megginson, Nash, and van Randenborgh 1994; Vining and Boardman 1992). However, the empirical evidence in the literature on privatization in transition economies is less conclusive.[1] In a meta-study of all available empirical literature on privatization in transition, Djankov and Murrell (2000) find that while privatization is strongly associated with enterprise restructuring in Central Europe, the results are statistically insignificant for the Commonwealth of Independent States (CIS). Several explanations have been offered as to why privatization results have not been uniform across transition economies. One strand of the literature has focused on the effects of ownership and control granted to enterprise insiders on the firms' performance and restructuring after privatization. It was argued that insiders are motivated by objectives other than enterprise efficiency and, therefore, enterprise equity should be transferred to outside owners with a view to achieving better restructuring and better performance (see for example Aghion and Blanchard 1996). A second strand of the literature has investigated the hypothesis that the level of competition is more important than the ownership structure in explaining enterprise performance in transition (Anderson, Lee and Murrell 2000; Tandon 1995). Market reforms in transition economies involved price liberalization

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[1] Consider some examples of firm-level studies. For the Czech Republic, Hungary and Poland, Frydman, Hessel, Gray and Rapaczynski (1999) find that while privatization has no effect on profit margin in the short run, it does lead to improvement of revenue performance. For the Slovak Republic, Djankov and Pohl (1998) find that privatization is associated with greater productivity and profitability as well as a number of other indicators of restructuring. For a group of Central European countries, Pohl, Anderson, Claessens and Djankov (1997) find that privatization had a positive and significant impact on enterprise productivity. For Russia, Earle and Estrin (1997) find no significant differences between performance of state- and privately-owned enterprises. For small retail stores in Russia, Barberis, Boyko, Shleifer and Tsukanova (1996) find significant improvement in restructuring after privatization. For six CIS countries, Djankov (1999) finds that state ownership is associated with less restructuring, but the result is not statistically significant. For Mongolia, Anderson, Lee and Murrell (2000) find that state owned enterprises perform better than privatized firms do.

and subjecting domestic enterprises to international competition, and it is possible that firm-level and country specific differences in competition explain the variation in post-privatization performance. A third strand of the literature has focused on the role of "soft budget constraints," a major enterprise governance problem inherent to the socialist system (see Kornai 1992; 1995). The empirical evidence supporting all of these hypotheses has been limited so far. For instance, Estrin and Rosevear (1999) find that insider dominated firms in Ukraine actually perform better than outsider dominated firms. Earle and Estrin (1996) obtain ambiguous results in their study of the role of competition in enterprise performance in Russia. While some studies do find that enterprises expect "soft" government support after privatization (Anderson, Korsun, and Murrell 2000), there is little evidence that soft budgets have an effect on post-privatization enterprise performance. For example, Earle and Estrin (1998) do not find a negative relationship between government subsidies and labor productivity in Russia.

Recent literature on transition economies has focused on the interaction of institutions and ownership structure for explanations of why privatization has not been a success across the board. Today, after we have had a chance to assess the early results of transition, a consensus is emerging that at the beginning of the transition, more questions should have been asked—and answered—about how best to privatize (see for discussion Havrylyshyn and McGettigan 2000). In this paper, I find evidence that supports some of the arguments made in this new literature and focus on the degree of ownership concentration as an explanation for the variation in enterprise performance.

Ukraine was selected for this study for several reasons. First, like most transition economies, in the early 1990's it adopted an ambitious privatization program. Second, Ukraine has made data on the identity and size of concentrated ownership stakes in a large number of privatized enterprises available for research (the first country in the CIS to do so). Third, the peculiarities of Ukraine's privatization program led to a variation in opportunities for initial ownership concentration. This variation in proportions of equity privatized by different privatization methods can be exploited to estimate the effects of ownership concentration on enterprise performance.

Using data on 376 medium and large enterprises, this paper finds that ownership concentration is positively associated with enterprise performance in Ukraine. An instrumental variable approach confirms the paper's basic findings. For the cross-section of enterprises, the concentration of ownership by foreign companies and banks is associated with better performance than ownership concentration by the domestic owners. Ownership by the Ukrainian investment funds and holding companies does not have a positive effect on performance. This paper also finds that in contrast to predictions by many observers of early transition, privatization methods have had a lasting effect on ownership concentration in Ukraine.

The remainder of this paper is organized as follows. Section II provides background and a review of related literature. Section III presents the data. Section IV presents results of ordinary least square regression estimates of enterprises performance variables on measures of ownership concentration. Section V presents the argument for using proportions of equity privatized by different privatization methods as instruments for current ownership concentration. Section VI presents results of two-stage least square regressions, and section VII concludes.

II. BACKGROUND

For a long time, economic literature investigating the modern firm was dominated by the image of a broadly held American corporation (see for example Berle and Means 1932). Its main focus has been on the corporate governance problem with the agency perspective as the central theme.[2] A manager controlling the firm may not act in the interests of the owner and such an agency problem may have a negative impact on enterprise performance. This problem may be especially severe when ownership is dispersed among a large number of shareholders. Researchers have found empirical evidence of the positive association between ownership concentration and enterprise performance in the United States (Shleifer and Vishny 1986). Some authors have challenged that traditional view of the effects of dispersed ownership structures on enterprise performance. They have argued that ownership structure in a mature market economy is the outcome of bargaining among economic agents, and any association between ownership structure and performance is spurious at best (Coase 1937; Demsetz and Lehn 1985).

The problem of ownership concentration and its effects on enterprise performance re-emerged in the context of post-socialist transition. The privatization programs in transition economies have been an outcome of the political process that did not necessarily lead to creation of "optimal" post-privatization ownership structure (Kaufmann and Siegelbaum 1996; World Bank 1996). While governments contemplating privatizations had a mixture of objectives, including maximization of government revenues, attracting international and domestic capital, promoting enterprise restructuring and equitable distribution of wealth, the political constraints often interfered with these objectives. It was considered almost a common wisdom that privatization should proceed quickly regardless of the method used in order to reduce the possibility for corrupt officials to benefit from the control vacuum that emerged after the collapse of the planned economic systems and also to rule out a possibility of a communist comeback. Driven by the political need for speed, many countries privatized thousands of firms by widely dispersing share ownership with little consideration given to post-privatization enterprise governance. It was expected at that time that either the ownership structure would quickly evolve to an efficient equilibrium, given the institutional and other constraints facing the firms, or the institutional arrangements would evolve to support the post-privatization ownership structure (see for example Boycko, Shleifer, and Vishny 1995).

More recent literature on comparative corporate governance has focused on the interaction of the institutions of investor protection and ownership structures in giving access to investment finance to firms. It was argued that a combination of legal rules and ownership concentration could be used to mitigate governance problems (Shleifer and Vishny 1997). It was found that, even in mature market economies, corporations are widely held only in countries with very good shareholder protection (La Porta, Lopez-de-Silanes, and Shleifer 1999b). In those countries, shareholders with effective control over firms are not afraid that their firms will be expropriated and, thus, can afford to sell shares to raise new capital or to diversify risk. At the same time, small investors can afford to take minority ownership interests in firms when they know that managers or controlling shareholders will not expropriate their ownership stakes. This new literature suggests that the traditional corporate governance paradigm with its focus on the problem of monitoring and control of the managers by outsider shareholders is not sufficient to address the enterprise problems of transition and some other emerging economies. The small investors

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[2] I follow Shleifer and Vishny (1997) definition of corporate governance, which deals with the ways in which suppliers of finance to firms assure that they will get a return on their investments.

are not likely to play an important role in providing new financing to firms in the near future due to the institutional constraints in transition economies (Pistor, Raiser, and Gelfer 2000). At the same time, the practitioners that were involved in designing mass privatization programs in the region argue that outside governance mechanisms tend to be ineffective in transition economies and suggest that privatization should involve mechanisms leading to direct enterprise monitoring by owners to achieve better results (Frydman, Gray, Hassel, and Rapaczynski 1997). This debate on the interaction of institutions of investor protection and ownership structure is relevant for the transition economies: there is a mismatch between the institutions of investor protection and the ownership structure that emerged after privatization in many transition economies. From this perspective, Ukraine represents an excellent case study.

In December 1991, the Ukrainian parliament declared two key principles to guide the privatization of state owned assets: speed and social acceptability (*The Concept for De-statization and Privatization of State Enterprises, Land and Housing*). To fulfill these principles, the government opted for privatization methods aimed primarily at establishing dispersed ownership of state-owned enterprises. The parliamentarians envisioned that all citizens would participate in privatization. Allocation of enterprises to investors who were capable of attracting new capital into firms or improving the quality of governance was not on the privatization agenda at that early stage.

The initial privatization rules divided enterprises into seven groups based on the value of their assets, number of workers, and the type of activity (*1992 Law on Privatization of Property of State Enterprises*). The privatization law envisioned eight privatization methods that differed in terms of the opportunities for ownership concentration offered to potential interested parties. (The privatization methods and stylized facts about the ability of different groups of investor to acquire significant ownership stakes are described in detail in part 5 of this paper). Most small enterprises went through a single method of privatization. For medium and large enterprises (defined by the Ukrainian government as enterprises that maintained independent balance sheets before privatization), partial stakes were to be distributed via a combination of some or all privatization methods. Preparation for privatization of medium and large enterprises involved their transformation from units of ministries and government agencies into open joint stock companies.

In terms of numbers of enterprises and workers involved, the privatization efforts have been enormous. Between 1991 and 1998, the Ukrainian government transferred formal ownership titles for over 60 thousand state-owned enterprises to non-state agents and the privatization program involved all sectors of the national economy (see Table 1). In 1992, medium and large enterprises owned by the central government employed almost 13 million people or approximately 61 percent of the total number employed by all Ukrainian medium and large enterprises. By the end of 1998, the number of people employed by medium and large state-owned enterprises declined to just over five million employees or 34 percent of the total (see Table 2, panel A). In terms of the share of capital assets employed by medium and large enterprises, the magnitude of privatization was also significant (see Table 2, panel B).

For political and historical reasons, the Ukrainian privatization in 1992–98 primarily involved mechanisms that led to dispersed ownership structures. Enterprise insiders were able to acquire a significant proportion of shares in many firms. In most cases, the equity offered to outsiders was either transferred into dispersed individual holdings or into the holdings of broadly held financial intermediaries. Central budget revenues from privatization as a share of GDP and total government revenues were insignificant due to the nature of mass privatization, involving free privatization certificates (see Table 3).

Only a small share of equity was offered to owners interested in accumulating significant ownership stakes, through such privatization methods as stock exchange or over-the-counter sales and commercial and non-commercial tenders.

The Ukrainian privatization took place in an economic environment that did not lend institutional support to minority shareholders or investors in general. After the collapse of the Soviet coordination and control system, Ukraine faced the challenge of setting up a system of institutions that would support decentralized investment and production. Corporate law had not existed for over seven decades. Even before the revolution of 1917, when most of the country was a part of the Russian empire, society in Ukraine did not have an institutional framework for implementing a traditional corporate governance paradigm of dispersed equity ownership (Owen 1991). Unlike in neighboring Poland, Hungary and the Czech Republic, there were no commercial codes that could be restored and no deeply ingrained social rules or civic society supporting private ownership. As a result, today Ukraine has weaker investor protection than the developed market economies and more advanced economies in transition.

La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998) use six criteria to evaluate the quality of shareholder protections, based on a country's commercial law. They assign a cumulative score of anti-director rights (between zero and six) by adding points if a country's commercial code or commercial law meets the criteria of minority shareholder protection. Ukrainian corporate law scores relatively well on the anti-director rights index if compared with other transition countries (Pistor, Raiser and Gelfer 2000) and countries whose laws are based on the English legal system—these countries have the greatest degree of protection provided to minority shareholders (La Porta, Lopez-de-Silanes, Shleifer and Vishny 1998). Table 4 shows the anti-director rights index for Ukraine, the United States and Poland. Poland is considered to be one of the most advanced among the transition countries in terms of institutional reforms (EBRD 1999). On the positive side, Ukrainian law requires that ordinary shares carry one vote per share. The law does not allow firms to require from shareholders to deposit their shares prior to general shareholder meetings. This requirement would prevent them from selling their shares if their rights are violated. The existing shareholders are granted the first opportunity to buy new issues of stock, which should make it harder for majority shareholders to dilute the holdings of the minority shareholders. Finally, Ukrainian law has a relatively low proportion of shares (10 percent) required to call for an extraordinary shareholders' meeting. On the negative side, Ukraine's company law does not allow proxy voting by mail—a practice that makes it easier for shareholders to exercise their voting rights. Also, Ukrainian law does not allow cumulative voting, thus making it virtually impossible for minority shareholders to elect their representatives to a board of directors.[3] Furthermore, the law does not specify a mechanism that would give minority shareholders the right to sue or get relief from a decision that favors the majority of shareholders.

While Ukraine possesses a functioning legal and court system and its company law compares reasonably well with those of other countries, it is poorly equipped for administration of commercial law and contract enforcement. In 1997, *The Wall Street Journal* created an index of rule of law for countries in transitions based on interviews with investment professionals acquainted with those countries. Ukraine scored 3.9 on a scale of one to 10 while its neighbor Poland scored 9 (*Central European Economic Review*, 1998). The legal transition index of the European Bank for Reconstruction and Development

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[3] Cumulative voting makes it easier for minority shareholders to gain representation on the board of directors by allowing shareholders to give all of their votes to one director instead of voting separately for each of the positions.

(EBRD), based on a survey of lawyers in the region, ranks countries on the basis of the extensiveness and effectiveness of pledge, bankruptcy, and company laws in the its countries of operation (EBRD 1997). Ukraine scored 2 (on a scale from 1 to 4+) on both of their measures.[4] The 1997 Index of Economic Freedom, assembled by the Heritage Foundation, assigns Ukraine a score of 3+ on a scale from 1 to 4, which signifies a moderate level of protection of private property.[5] On the enterprise level, Johnson, McMillan and Woodruff (1999) conducted a survey that asked managers in five countries (Ukraine, Poland, Slovakia, Romania and Russia) whether courts could be used to enforce contracts with customers and suppliers. The percentage of managers who gave a positive answer was lowest in Ukraine (55 percent).

Some scholars have recently argued that corporate law is not the most important instrument of shareholder protection. For instance, Coffee (1998) has argued that legislation governing securities and exchanges provides broader and more effective rules for shareholder protection. Pistor (2001) has argued that investor protection rules, such as rules of disclosure, mandatory takeover bids, and insider trading rules, benefit investors in general and may be important in the development of sound equity markets. Glaeser, Johnson, and Shleifer (2001) argued that government regulation of trading rules and financial intermediaries could substitute for commercial law in countries where property rights are poorly defined and enforced. In terms of regulation of intermediaries, Ukraine is well behind advanced market economies and more advanced transitioning neighbors. The Ukrainian Securities and Exchange Commission, established as an independent government body in 1995, sets and enforces regulations for intermediaries and trading rules. The existing regulations take a *laissez faire* approach to individual brokers, brokerage companies, and investment funds licensed by the commission. The existing rules do not require "fair" practice or that intermediaries act in the interests of their clients. Securities can be traded outside the control of the stock exchange. There is no provision that would ensure a uniform price for the same securities at the same time or wide distribution of information about security prices. There is no regulation that would ban the fixing of securities prices.

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[4] The EBRD index of extensiveness equals 1 if legal rules are very limited in scope, 2, if legal rules are limited in scope and may be the subject of conflicting interpretations, 3, if amended legislation has recently been enacted in at least two of the three areas (pledge, bankruptcy and company law), 4, if comprehensive legislation exists in at least two of three areas (pledge, bankruptcy and company law), 4+, if comprehensive legislation exists in all three areas and legal rules approach those of more developed countries. The index of effectiveness of legal rules equals 1 if commercial rules are usually very unclear and contradictory and law enforcement is rudimentary, 2, if commercial rules are generally unclear and sometimes contradictory and there are few meaningful procedures in place in order to make commercial laws operational and enforceable, 3 indicates that while commercial rules are reasonably clear, they are not fully enforced by the court system, 4 indicates that "commercial law is reasonably clear, and administration and judicial support of the law is reasonably adequate," 4+, if commercial laws are clear and readily ascertainable.

[5] The score is accompanied with the explanation: "Although its new constitution legally protects private property, Ukraine has not yet fully established a legal system that sufficiently enforces the laws that protect it. But recent government reforms in the judicial system are improving some courts. Some inefficiencies remain, however. Despite an ambitious government program to privatize large sectors of the economy, property remains subject to government expropriation." (Johnson, Holmes, and Kirkpatrick 1998, p. 447).

According to a *Global Competitiveness Report* survey (published by the World Economic Forum), business executives ranked Ukraine close to the bottom of the list of nations when they were asked the question: "Are government regulations precise and fully enforced?" A similar rating was achieved on the question of whether regulation and supervision of financial institutions is among the most stringent in the world. Table 5 shows some results for the three years when Ukraine was included in the survey. In the EBRD transition indicators for the quality of securities markets and non-bank financial institutions, Ukraine ranks consistently close to the bottom (see EBRD 1997; EBRD 1998).

In sum, the quality of institutions of shareholder and investor protection in Ukraine is low by most available definitions. In the capital markets that do not provide an easy exit option to small shareholders and possibilities for ownership concentration, the combination of the poor institutions of investor protection and dispersed ownership structure should lead to a control vacuum and related corporate governance problems. From here follows my main hypothesis: in Ukraine's inadequate legal and regulatory environment, enterprises with greater concentration of ownership should report better performance than those with a dispersed ownership structure.

There is some empirical evidence supporting my hypothesis for more advanced transition economies. Weiss and Nikitin (1998) find that ownership concentration in the Czech Republic is associated with improvements in the performance of companies, but only if ownership is concentrated in hands other than those of investment funds. Claessens and Djankov (1999) find that for a cross section of Czech firms the more concentrated the ownership, the higher the firm's profitability and labor productivity. Unlike for the more advanced transition economies, this problem has not been addressed at all in the empirical research devoted to former Soviet republics. At the same time, for this group of countries the argument in favor of ownership concentration may be especially relevant. The CIS countries were more likely to adopt privatization strategies that led to dispersed post-privatization ownership structure than the more advanced transition economies (EBRD 1997). Their equity markets are nontransparent and illiquid (IFC 1999). At the same time, the legal mechanisms for effective corporate governance in those countries are more poorly developed than in the more advanced reformers of Central and Eastern Europe (Pistor, Raiser and Gelfer 2000). Thus, a study of the interaction of ownership concentration and enterprise performance in Ukraine may explain, at least in part, the evidence that privatization was not as successful in the CIS countries as it was in the advanced transition economies.

III. THE DATA

This study is based on financial and privatization data covering a cross-section of 376 medium and large enterprises. The 1998 balance sheet, financial statement, and ownership data is from a database maintained by the Ukrainian Commission on Securities and Financial Markets (UCSFM). Starting in 1998, the commission required open joint stock companies to report all shareholders with five percent of equity or more. For the first time since the beginning of the privatization in Ukraine, both enterprise financial and ownership data for a significant group of medium and large enterprises were made available. The data on the privatization history of enterprises, including privatization flows over time and the privatization methods used, is from the database maintained by the State Property Fund of Ukraine. The combined data set is limited to medium and large enterprises for two reasons. First, a significant majority of medium and large enterprises were transformed into open joint stock companies before privatization. Many of the small and medium firms, in particular those which insiders believed would be most attractive

to outsider takeovers, were transformed into closed joint stock companies. The data on closed joint stock companies is not publicly available. Second, most medium and large enterprises, regardless of their performance, possess the organizational capacity necessary to process their financial statements before supplying them in an electronic format to UCSFM. Many small firms do not possess the same capacity. Thus, the sample would be biased if small open joint stock companies were included in the analysis since the UCSFM database covers only open joint stock companies that submitted their annual reports in the electronic format. The sample selection is determined by the variation in the dates when enterprises submitted their reports to UCSFM and it includes the data for enterprises, whose reports were processed by the commission before the end of May 2000. This type of selection should not be related to the variables of interest for this study.

This study focuses on three measures of enterprise performance: total factor productivity, material cost (per unit of revenue), and labor productivity. For market economies, price of shares, Tobin's Q, and profits are appropriate measures of enterprise performance and have been used in the literature (see for example Demsetz and Lehn 1985; Shleifer and Vishny 1986). These measures are not available or are simply not appropriate for the study of enterprises in the transition environment. While a large number of enterprises in Ukraine were transformed into corporations, most of them do not list their shares in the public markets. Even when the shares are listed, their liquidity is low and so the share price and Tobin's Q are not useful measures of performance. For a number of reasons, profitability is not a reliable measure either. Reported profits are subject to manipulation due to changes in accounting conventions and tax considerations. The enterprises' non-state owners may hide profits in order to avoid taxation by the state. Recent studies found that transition economies, including Ukraine, possess shadow economies among the largest in the world (see for example Kaufmann and Kaliberda 1996). While the historic cost of the capital assets may be sufficient to assess variation in the degree of capital intensity across enterprises, it is not a reliable measure of today's value of the capital stock. The significant share of assets was accumulated before the beginning of transition when the capital assets' value was calculated based on the physical input costs and not on the market prices.

Frydman, Gray, Hessel and Rapaczynski (1997; 1999) advocate the use of strategic (revenue performance) and defensive (cost performance) variables to measure enterprise restructuring in transition economies. They argue that revenues are not only less subject to manipulation than profitability and other conventional measures of performance, but they are also more transparent to an outside observer, more future-oriented and unpredictable on the basis of past history (1997, p. 10). These authors used changes in enterprise revenue over time to assess effects of privatization on enterprise performance. Since there is no reliable time series financial data matched with the ownership data for a sufficiently large sample of Ukrainian enterprises, in this paper, I have identified an alternative approach to study cross-enterprise variation in revenue performance. Following Weiss and Nikitin (1998), I will use an approximation of total factor productivity, or Solow residual, as a measure of enterprise revenue performance. To generate this variable, I assume that all enterprises employ a Cobb-Douglass production function and estimate the following equation:

$$\text{Ln (sales revenue in 1998)}_i = \text{Constant} + a \ln K_i + b \ln L_i + t_i,$$

where $\ln K_i$ is a logarithm of the value of enterprise balance assets, $\ln L_i$ is a logarithm of the enterprise number of employees and t_i is an approximation of "total factor productivity." From this equation, I estimate t_i for each firm by subtracting predicted value of Ln (sales revenue in 1998)$_i$ from the logarithm

of the actual value of the 1998 sales revenues. Given the highly simplifying assumptions made to derive this variable and also the concerns with the quality of the capital assets data, statistical results involving this measure should be interpreted with caution.

To study the cross-firm variation in performance on the cost side, I focus on the ratio of the cost of material inputs to sales revenues—a variable that reflects well the managers' efforts to reduce variable input costs. Socialist enterprises frequently hoarded material inputs, regardless of such a policy's impact on the enterprises' balance sheets. One of the objectives of privatization was to reduce the managers' incentives to hoard material inputs and to rationalize their utilization. The cost of material inputs may also, in part, reflect the managers' ability to use transfer-pricing schemes to siphon off some of the revenues into affiliated firms. I would expect that the owners who are more capable of controlling such manager behavior achieve better material cost performance.

Finally, I use sales revenues per employee (or labor productivity), a variable that reflects on the revenue performance and labor cost performance at the same time. The advantage of this variable is that its derivation does not involve the value of enterprise capital or other variables that may be subject to manipulation or historic valuation problems. In addition, this variable reflects the enterprise manager's ability to trim the labor force to the minimum level necessary for the efficient functioning of the enterprise.

I focus on two measures of non-state ownership concentration: first, the sum of ownership stakes held by the top 10 reported non-state owners (T10NS) and, second, a Herfindahl index of ownership concentration derived as a sum of squared values of ownership stakes held by each of the top 10 significant owners and divided by 100 (HT10NS). Descriptive statistics for the performance and ownership concentration variables are presented in Table 6.

Before turning to empirical analysis, let us take a look at the sample enterprises as a group. The vast majority of enterprises included in the sample did not begin privatization before the end of 1994 (see Table 7A). By the end of 1998, the year of interest for this study, 138 of the 376 enterprises were 100 percent privatized, while the rest were at different stages of the privatization process. Another 145 enterprises were more than 50 percent privatized, a status at which non-state owners could exercise effective control over the enterprises. As of the end of 1998, the sample enterprises with larger number of employees were less privatized than the smaller firms (see Table 7B). This is representative of the situation in the economy as a whole. The mean number of employees for the enterprises fully owned by the state is 5,468 while the mean number of employees for the fully privatized enterprises is 1,362.

The sample includes a broad range of firms by industry (summarized in Table 8). This wide distribution reflects the structure of the Ukrainian economy before privatization. For instance, capital goods, construction, and basic industries—the industries favored by the socialist planners—together constitute almost 50 percent of all firms in the sample. The services, leisure, and finance/real estate industries—the industries underdeveloped in the planned economies—represent a small fraction of the sample.

The enterprises included in the sample represent a diverse group in terms of their reported end-of-1998 ownership structure (summarized in Table 9). For the whole sample of 376 enterprises, 184 have the state as the largest significant owner of shares. The next largest group includes enterprises with other

Ukrainian companies as the largest significant owners. In most cases, those are limited-liability companies established in the process of privatization with the primary objective of hiding the identity of significant owners. The third largest group, of 46 enterprises, includes enterprises with no reported significant owners. "Physical persons" are the largest significant owners of 30 enterprises in the sample. Foreign companies and banks are the largest owners in 26 enterprises. The rest of the enterprises have Ukrainian investment funds and non-state holding companies, Ukrainian enterprises-producers and Ukrainian banks as the largest significant owners.

Table 9 also summarizes the numbers of firms in the sample that have each type of the owners among the top 10 significant owners and also the mean percentage of equity owned by each group of owners when such an owner is present. The mean value is the highest when the largest owner is the state. On average, if the state is among an enterprise's top 10 owners, it controls 48.18 percent of all equity. For the non-state significant owners, the sum of ownership stakes ranges between 12.57 percent for Ukrainian banks and 22.46 percent for Ukrainian enterprises. For the top 10 percent of firms measured by the size of the T10NS variable, the largest ownership stakes are most likely to be held first, by other Ukrainian companies and second, by foreign companies and banks. For fully privatized firms, other Ukrainian companies are the largest significant shareholders (31.16 percent of the fully privatized firms in the sample). For this sub-sample, the physical person and foreign company/bank rank second and third (17.39 percent and 10.87 percent respectively).

IV. OWNERSHIP CONCENTRATION AND ENTERPRISE PERFORMANCE: THE OLS ESTIMATES

The basic evidence on the relationship between ownership concentration and enterprise performance comes from the cross-section regressions of the following form:

$$y_i = \mu + \alpha R_i + \gamma X_i + \varepsilon_i \qquad (1),$$

where y_i is a measure of enterprise performance for enterprise i, R_i is a measure of ownership concentration, X_i is a vector of industry dummies and other covariates, and ε_i is a random error term.

The key coefficient of interest for this analysis is α, or the effect of non-state ownership concentration on enterprise performance. The coefficient is expected to have a positive sign in the regressions on the total factor productivity estimate and labor productivity and a negative sign in the regressions on material cost (per unit of revenue).

In previous literature, it has been hypothesized that the effect of ownership concentration on firm performance may depend on the size of individual ownership stakes. Previous authors have used either a linear combination of ownership stakes held by a group of large shareholders (top five, top 10 or top 20) or a transformation of such combination that would give greater weight to large individual ownership stakes (Claessens and Djankov 1999; Demsetz and Lehn 1985; Weiss and Nikitin 1998). This paper's objective is to investigate whether ownership concentration has an effect on performance and not to test the alternative theories on the functional form of this relationship. Given this, all empirical models will be estimated for both types of ownership concentration indices—linear (T10NS) and Herfindahl (HT10NS). I will expect similar empirical results from these two measures of concentration, given their high degree of correlation (correlation coefficient is 0.78).

Columns 1, 4, and 7 in Table 10 presents the basic regression results for the T10NS measure of ownership concentration and columns 1, 4, and 7 in Table 11—for HT10NS. All regressions include a set of industry dummies, and regressions of cost performance and labor productivity also include a logarithm of the capital-labor ratio to control for variation in capital intensity across firms. The empirical evidence reveals that the higher the ownership concentration, the higher the total factor productivity and labor productivity and the lower the material cost (per unit of revenue). The coefficients on the ownership concentration variables have the predicted signs and are statistically significant at the 90 percent level and higher for all specifications.

For the basic regression specification, the coefficient α should be interpreted as a marginal effect on enterprise performance of ownership concentration vis-à-vis dispersed non-state ownership and state ownership of equity. From a theoretical point of view, it might be appropriate to group together the state and dispersed non-state ownership. The agency problems of the dispersed private ownership are also inherent to the state ownership if one thinks of the modern state as a corporation with a dispersed ownership structure. An important empirical problem that does not get addressed by this approach is how enterprises were selected for privatization. It is possible that the timing of privatization was in fact endogenous to enterprise performance, and that the state retained ownership either in the worst or in the best enterprises. In order to control for this, I introduce dummies for two levels of significant state ownership (the controlling share and the blocking share) into the basic specification (reported in columns 2, 5, and 8 of Tables 10 and 11) and also undertake regressions for the sample limited to firms with controlling stakes privatized (reported in columns 3, 6, and 9 of Tables 10 and 11). With both types of controls, the coefficients on ownership concentration do not change dramatically and remain statistically significant at the 90 percent level or better in five of the six cases. The only exception is the coefficient on HT10NS for the material input cost per employee when the sample is limited to enterprises with controlling stakes privatized as of 1998 (Table 11, column 8). Even in this case, the coefficient has the predicted sign and a p-value of 14 percent. The relationship between ownership concentration and performance is significant in economic terms. The OLS regression estimate implies that a 10 percent increase in ownership concentration variable T10NS leads to 5.6 percent change in the total factor productivity estimate. These regressions show that a similar increase in ownership concentration would lead to 2.2 percent decline in the material input cost (per unit of revenue). An increase in ownership concentration from the median value of the linear ownership concentration index (15.2 percent) to the 75th percentile value (42.79 percent) would be associated with an increase in revenue per employee of 8,277 Ukrainian hryvnias (or more than 30 percent of the mean value of sales per employee for the whole sample).

In the regressions described so far, all non-state concentrated owners were treated as a group and no distinction was made between the types of owners. The theoretical literature and empirical evidence for other countries suggest that not all concentrated investors are alike in their ability to establish effective enterprise governance. This is particularly the case when the authors compare the ownership effects of domestic and foreign strategic investors. Thus, Claessens and Djankov (1999) find that ownership concentration by foreign investors has a positive effect on enterprise profitability in the Czech Republic. Frydman, Hessel, Gray and Rapaczynski (1999) also find that foreign investors perform better as owners after privatization in the Czech Republic, Hungary and Poland. Another reason not to lump all owners together is that some types of domestic owners themselves have dispersed ownership structures and suffer from similar governance problems to the enterprises they own. For instance, investment funds, which

themselves possess a dispersed ownership structure, succeeded in gaining significant ownership stakes in many Ukrainian enterprises during privatization. Previous authors have found that investment funds perform poorly as owners (Claessens and Djankov 1999; Weiss and Nikitin 1998). To explore the effects of different types of concentrated owners, I differentiate between three types of non-state significant owners: (a) Ukrainian investment funds and non-state holding companies, (b) other Ukrainian non-state owners, and (c) foreign companies and banks. For each of the three ownership types, the ownership concentration variables (T10NSINF, T10NSDOM and T10NSFOR) are simple sums of each of the specified owners among the top 10 non-state significant owners. The coefficients on each of these variables should be interpreted as marginal effects of ownership concentration by each of the three types of owners on enterprise performance vis-à-vis the state and dispersed owners.

The results of empirical tests by ownership type are reported in Table 12. For all regression specifications, the coefficients on ownership concentration by Ukrainian investment funds and non-state holding companies are statistically insignificant and for the labor productivity variable have a negative sign. This is consistent with the findings in the empirical literature for other countries and also with the theory on the role of ownership concentration in countries with poor institutions of investor protection. Since the investment funds have dispersed ownership structure, they suffer from agency problems similar to the enterprises they own. The concentrated ownership by foreign companies and banks has a strong positive effect on enterprise performance for all measures of performance and in all regression specifications. The coefficients are larger in absolute terms than the coefficients from regressions using the T10NS concentration variable (which did not differentiate between the owner types). The concentration effects of other domestic significant non-state owners carry the predicted signs, but the coefficients' statistical significance varies depending on the sample specification or the inclusion of additional control variables into the regression equations. It is possible that foreign owners targeted better quality enterprise during and after privatization. If the concentration effects were exclusively due to this type of selection, this would undermine my argument about the role of ownership concentration on enterprise performance. Since I cannot test directly for this possibility, I tried limiting the sample to firms that do not have foreign owners among the top 10 non-state significant owners. For this sample, the coefficients have the predicted signs and are statistically significant for the total factor productivity estimate and for labor productivity. The coefficient has a predicted sign, but is not statistically significant at an acceptable level in regressions for material cost (per unit of revenue). Thus, while I cannot rule out the possibility of selection of enterprises by foreign owners completely, these tests reveal that the ownership concentration effects are not exclusively due to ownership concentration by foreign owners.

Overall, the cross-section regressions reveal that ownership concentration has a positive association with performance of medium and large enterprises in Ukraine. It also reveals that among the three groups of significant owners, concentrated ownership by foreign companies and banks is associated consistently with better performance for all measures of performance. Ownership concentration by domestic owners other than the investment and holding companies has a positive, but less robust, effect on performance. This is possibly due to the greater measurement error for the ownership concentration variable for domestic concentrated owners than it is for the foreign owners. Finally, concentrated ownership by Ukrainian investment funds and non-state holding companies does not have a statistically significant effect on performance.

One has to be cautious when interpreting the results of such cross-section regressions. It is possible that quality of enterprises determined their ownership structure and, thus, the causality goes in

the direction opposite from that hypothesized in this paper. In order to address this problem, the next section will explore an instrumental variable approach that uses equity shares privatized by different privatization methods as instruments for ownership concentration during the period of interest for this study.

V. PRIVATIZATION METHODS AS DETERMINANTS OF OWNERSHIP CONCENTRATION

The cross-section regressions presented in the previous section may suffer from a reverse causality problem. It is possible that ownership in better enterprises was concentrated at the time of privatization or that they were more likely targets for a post-privatization concentration. Previous authors used panel data analysis (Frydman, Gray, Hessel and Rapaczynski 1999) or a difference-in-difference technique (La Porta and Lopez-de-Silanes 1999) to address the problems of selection in the process of privatization. Given that no time series enterprise level performance data matched with the ownership concentration data is available in Ukraine, I propose to use shares of equity privatized by different privatization methods as instruments for current ownership concentration.

The privatization process in Ukraine has been an outcome of an interaction of political forces and was, to a significant extent, controlled by enterprise insiders. Workers' collectives and management were granted a major role in the design and implementation of their enterprise privatization plans. Already before Ukraine' independence in 1991, insiders as a group were allowed to lease their enterprises and, later on, they were allowed to transform leases into buy-out arrangements. There is evidence that workers' collectives of enterprises that were perceived to have good chances of profitable operation opted for lease arrangements early on and privatized better quality enterprises (Kyryliuk and Leshchenko 2000).

From the point of view of insiders seeking to preserve control over their enterprises, the privatization mechanisms had the following pecking order: insider privatization was most preferable, dispersed outsider privatization was next most appealing, and privatization by concentrated outsiders, the least preferred option. Given the equity considerations traditional in the socialist society, outright concentration of ownership by the insiders was not politically acceptable. Enterprise managers often had to disguise themselves as outsiders by establishing proxy legal entities that would participate in the privatization auctions. Thus, the methods most preferred by the insiders and also feasible from the equity point of view led to dispersion of the initial post-privatization ownership. The next best privatization methods from the insiders' point of view were mass privatization methods involving privatization vouchers. For a given enterprise, only after the insiders' rights for equity privatization were satisfied and privatization voucher allocations have been made were relatively concentrated equity stakes offered for privatization. This has changed in 1999 when the government, interested in generating additional budgetary revenues, shifted privatization efforts to privatization methods involving concentrated equity stakes. This new stage of privatization is outside the scope of this study.

It was anticipated by the early observers of transition that once the property rights were properly defined, the ownership of equity in privatized enterprises would be reallocated to the most effective users. This conclusion was based on a simplifying assumption about the nature of capital markets in the transition economies and did not take into account the realities of transitional economies. Given the high transaction costs and informational asymmetries of the Ukrainian capital markets, the initial ownership structure has been sustained over time and, thus, the privatization methods used have determined, in large

part, the enterprise ownership structure even several years after privatization. If this is indeed the case, we can use proportions of equity privatized by different privatization methods as instruments for ownership concentration in the regressions on enterprise performance. Schematically, my story can be summarized as follows:

choice of privatization methods $\Rightarrow$ initial post-privatization ownership concentration $\Rightarrow$ present ownership concentration $\Rightarrow$ current performance.

Let us review in some detail the eight proposed instrumental variables that are proportions of equity privatized by all of the privatization methods defined by Ukrainian law. The stylized facts of the degree of expected dispersion of initial ownership stakes and the types of agents allowed by the law to accumulate concentrated stakes are summarized in Table 13. The data on privatization methods used is from the State Property Fund database. The sample summary statistics for the proportions of equity privatized by each of the methods as of the end of 1998 are provided in Table 14.

The first method—distribution of the tenant association property or shares accumulated by the tenant associations engaged in lease-with-buy-out procedures—was used to privatize a significant number of enterprises, and affected the post-privatization ownership structure to a large degree. By 1991 thousands of firms operated under the lease agreements. In April 1992, the Ukrainian parliament passed a law allowing enterprise insiders with lease arrangements to acquire equity in leased firms in exchange for profits generated by the enterprise (*The Law on Leasing of Property of State Enterprises and Organizations*). As a result, insiders in a large number of primarily small and medium enterprises succeeded in formally privatizing all of their enterprises' assets as early as 1992. Since valuation of enterprise assets did not keep up with the pace of inflation (and, thus, the valuation of profits), insiders could acquire enterprises quickly and without significant cash outlays. The ownership stakes in these enterprises were distributed among employees based on their position in the enterprise and seniority. Only in very small enterprises could individuals receive significant ownership stakes. This privatization option was phased out in 1995 when the government shifted its privatization efforts to methods that involved privatization securities. For the whole sample, the mean proportion of equity privatized via this procedure is just over 14 percent.

The second method—equity transfer on preferential terms—involved share transfer to enterprise employees and limited categories of outsiders. Using privatization certificates and cash, each current and former employee, as well as limited other categories of citizens (such as distinguished veterans of World War II), could acquire shares with a nominal value equivalent to 150 percent of the value of a privatization certificate.[6] Similar rights to purchase shares of food processing enterprises were given to farm employees. Members of management teams could as a group acquire additional shares at their nominal value for up to five percent of the total equity. A 1994 Presidential Decree introduced an option that allowed management teams who completed *corporatization* and submitted privatization plans to the privatization agency to purchase an additional five percent of equity in their firms. Since this method allowed voluntary participation by individuals it was used to a greater degree for enterprises with greater

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[6] The March 1992 *Law on Privatization Securities* gave each citizen of Ukraine the right to open an individual non-negotiable privatization account (later transformed into privatization certificates). The certificates could be used for acquiring shares in an enterprise (or enterprises) of choice and the face value of the certificate was equivalent to 1/52,000,000[th] of the total book value of assets privatized.

perceived quality. Individuals could receive significant ownership stakes through this procedure only in enterprises with a very small fixed capital. For the full sample, just over 21 percent of total equity was privatized via this method.

The third method involved free distribution of shares. This method was rarely used as it was designed primarily for distribution of shares among agricultural input producers in a small number of food processing enterprises. Individual recipients of shares distributed through this method did not receive significant ownership stakes. For the full sample, the mean value of the equity privatized via this method is just over two percent of the total. The rest of the privatization methods granted a greater role to outsiders. In some cases, in particular when an enterprise had little registered capital, the privatization agencies had to adjust the nominal value of shares that could be acquired by insiders to make sure that each eligible individual could participate in the process. This led to even greater initial dispersion of ownership stakes in such enterprises.

The fourth method—privatization at the privatization certificate auctions—was employed to privatize large ownership stakes in a significant majority of medium and large enterprises. The law envisioned the creation of two types of intermediaries—investment trusts and investment companies, which could handle transactions with privatization certificates. Investment trusts were designed to assist individual holders of privatization certificates in the acquisition of shares in individual enterprises. Investment companies issued their own shares in exchange for privatization certificates. Accumulated certificates were used to purchase shares in enterprises offered for privatization. Since privatization certificates were non-transferable and each citizen was issued certificates equivalent in value to a small fraction of the total equity being privatized, only licensed financial intermediaries were allowed to bid for significant share packages. The law regulating financial intermediaries limited the share of the total capital under the intermediary's management that could be allocated for shares in a single enterprise, thus limiting further the opportunities for concentration. For the full sample, the mean proportion of total equity privatized via this method was about 18 percent.

The fifth privatization method—privatization auctions for compensation certificates—was introduced in 1994. These certificates were securities issued to individuals whose deposits in the State Savings Bank and state insurance system were devalued after the 1992 price liberalization. In contrast to the privatization certificates, compensation certificates were tradable, and so enterprise insiders and outsiders were allowed to purchase significant stakes using this privatization method. Since no liquid market for compensation certificates emerged, broadly held intermediaries remained the only realistic actors in the market for significant ownership stakes at the compensation certificate auctions. Just over seven percent of all equity was privatized via this method for the enterprises in the sample.

The sixth method involved cash sales via the organized stock exchanges or over-the-counter market and could lead to the creation of relatively concentrated stakes by financial intermediaries, managers and outsiders. A legal provision stipulating that individuals purchasing significant ownership stakes must declare the sources of their income complicated participation of physical entities in bidding for shares. As a result, as anecdotal evidence shows, individuals chose to hide behind newly created legal entities (primarily limited partnerships) when purchasing the shares. On average, only just over two percent of equity was privatized via this method for the sample enterprises.

The seventh method—cash privatization via certificate privatization centers—was similar to the previous method, the only difference being the auctions' location. These methods were used relatively rarely during the privatization and for my enterprise sample the mean proportion of equity privatized via this method was less than one percent.

The eighth method involved transfer of shares via commercial or non-commercial tenders. Participants in the non-commercial auctions had to present business plans and did not involve any cash payments, and the winners received share packages sufficient to pass their business plans past the boards of directors. The business plans were expected to lay out strategies that would increase enterprise employment or, at least, keep employment at a constant level. Most of the time, labor collectives won these non-commercial tenders and, thus, increased the proportion of shares that could be allocated among insiders. The commercial tenders were similar to non-commercial tenders, but for the highest bidders a chance to buy shares with a combination of cash and privatization and compensation certificates. The government rarely followed up on whether the business plans were fulfilled. Thus, this method tended to allow insiders and, in some cases, outsiders to gain control of additional shares in excess of those shares that could be acquired via the other methods. This method was more popular than cash sales and, for this data sample, the mean proportion of all equity privatized using this method was just under seven percent.

As the previous discussion reveals, the privatization methods differed in terms of the opportunities they provided for the initial ownership concentration. I assume that they were exogenous to current enterprise performance and related to current performance exclusively through their effect on current ownership concentration.

Table 15 presents the ordinary least squares regression results for the two measures of ownership concentration versus the proportion of equity allocated by each privatization method. The share of equity privatized at privatization certificate auctions is omitted to prevent co-linearity (the equity privatized by different methods would add up to the total percentage of equity privatized). The coefficients on the proportions of equity privatized by different methods have the signs that would be predicted by the nature of each of the methods. The coefficients should be interpreted as the marginal effects of privatizing an additional percentage of enterprise equity via a specific method on the measures of ownership concentration if compared with the effect of privatizing that equity at the privatization certificate auctions. These variables alone explain 31 percent of the variation in the linear ownership concentration index (T10NS) and 21 percent of variation in the Herfindahl index (HT10NS). This indicates that the proportions of equity privatized by different privatization methods are good instruments for ownership concentration at the end of 1998.

A word of caution is warranted on the exogeneity of these instruments. It is possible that perceived quality of enterprises at the time of the design of their privatization plans influenced the choice of a combination of privatization methods. For example, for a sample of small and medium Ukrainian enterprises, Kyryliuk and Leshchenko (2000) find that the insiders privatized significant proportions of equity in enterprises with better pre-privatization performance through the dispersed ownership schemes. It is possible that pre-privatization enterprise performance also had an effect on ownership concentration for the sample used in this study. Given the data constraints, this question cannot be investigated empirically. In any case, if the dispersed insiders indeed privatized enterprises of higher quality and their initial performance does have an effect on enterprise performance in 1998, we should observe reduced effect of ownership concentration on enterprise performance in the two stage least squares framework.

Having identified a set of instruments for the current ownership concentration, I turn again to the investigation of the relationship between ownership concentration and enterprise performance.

VI. OWNERSHIP CONCENTRATION AND ENTERPRISE PERFORMANCE: INSTRUMENTAL VARIABLE RESULTS

The original equation (1), re-written here:

$$y_i = \mu + \alpha R_i + \gamma X_i + \varepsilon_i \qquad (1),$$

describes the relationship between ownership concentration and enterprise performance in 1998. Further relationships can be written as:

$$R_i = \lambda_R + \beta_R C_i + \gamma_R X_i + \upsilon_{Ri} \qquad (2),$$
$$C_i = \lambda_C + \beta_C P_i + \gamma_C X_i + \upsilon_{Ci} \qquad (3),$$

where R_i is a measure of ownership concentration in 1998, C_i is a measure of initial post-privatization ownership concentration and P_i is a vector of proportions of equity privatized by each method, and X_i is a vector of industry dummies and other covariates.

Given that there is no reliable data on the initial ownership concentration variable for the enterprise sample, my identification strategy will be to use the vector of proportions of equity privatized by each method, as a set of instruments for current ownership concentration and model R_i as

$$R_i = \xi + \beta P_i + \delta X_i + \upsilon_i \qquad (4).$$

I estimate equations (1) and (4) jointly using two stage least squares methodology.

The basic results for the second stage equation (1) are presented in Tables 16 and 17. Columns 1, 5, and 9 in Table 16 present the second stage coefficients from the two-stage regression for the T10NS measure of ownership concentration and columns 1, 5, and 9 in Table 1—for HT10NS. All of these regressions include a set of industry dummies and the regressions of material cost performance and labor productivity also include the log transformation of the capital-labor ratio to control for variation in capital intensity across firms. For the linear index of ownership concentration, the coefficients α on ownership concentration have the predicted signs in all cases and are statistically significant at the 99 percent level for the total factor productivity estimate and material cost performance, but not statistically significant for labor productivity measure (p-value of 0.28). For the Herfindahl index of ownership concentration, the coefficients α always have the predicted signs and are statistically significant at the 90 percent level or better.

The relationship between ownership concentration and performance is significant in economic terms too. The coefficients on the ownership concentration variable increase if compared with the simple cross-section regressions of the total factor productivity estimate and material cost performance using linear index of ownership concentration and for all three measures of performance in the regressions using

the Herfindahl index of ownership concentration. Thus, a 10 percent increase in the ownership concentration variable T10NS leads to a 9.8 percent improvement in the total factor productivity estimate. A similar increase in ownership concentration would lead to a 3.9 percent decline in the material input cost (per unit of revenue). From regressions on Herfindahl index of ownership concentration, the increase in ownership concentration from the median value of 1.49 to the 75th percentile value of 7.2 would be associated with an increase in revenue per employee of 2,512 Ukrainian hryvnias (or approximately 10 percent of the mean value of sales per employee for the whole sample).

An empirical problem that does not get addressed by the instrumental variable approach is the enterprise selection for privatization by the state. In order to control for the possibility that the state retained equity in the best or worst performing enterprises, I introduce dummies for two levels of significant state ownership (the controlling share and the blocking share) into the basic specification (reported in columns 2, 6, and 10 of Tables 16 and 17) and also undertake regressions for the sample limited to firms with controlling stakes privatized (reported in columns 3, 7, and 11 of Tables 16 and 17). With both types of controls, the coefficients on ownership concentration remain statistically significant at the 90 percent level or better in all cases with the exception of regressions of labor productivity on the linear index of concentration.

The ordinary least squares approach generated evidence that enterprises with concentrated foreign owners perform better than enterprises with concentrated domestic owners. My instrumental variable story presented in this paper does not address potential concerns related to selection of enterprises for concentration by ownership type (foreign versus domestic). It is also possible that the foreign investors concentrated better enterprises after privatization. Since I cannot address this question directly, I limit the sample to enterprises with no significant foreign owners as a robustness check on the broad conclusions about the effects of ownership concentration on performance. The results for the limited sample are included in columns 4, 8, and 12 in Tables 16 and 17. In all cases, the coefficients retain the predicted signs and do not change significantly from those for the full sample. The statistical significance declines in the regression of material input cost (per unit of revenue) for both measures of ownership concentration. Given this, I cannot rule out a possibility that foreign investors improve cost performance of enterprises for reasons different from the concentrated owners' ability to resolve an agency problem when compared with the dispersed owners.

Overall, this paper finds that non-state ownership concentration has a positive effect on enterprise performance in Ukraine. The effect is especially strong when performance is measured as an estimate of total factor productivity and labor productivity (sales revenues per employee). The paper also finds that, in contrast to predictions by many observers of early transition, privatization methods had a lasting effect on ownership structure in Ukraine. While the paper also finds that for a cross-section of firms, concentration of ownership by foreign companies and banks is associated with better performance than ownership concentrated by the domestic concentrated owners, further study is needed to determine the channels through which foreign ownership affects performance and to address a possibility that foreign owners concentrated better quality enterprises after privatization.

VII. CONCLUDING REMARKS

The paper's findings have several important policy implications. First, the paper questions the effectiveness of mass privatization method that led to a dispersed post-privatization ownership structure and suggests that privatization that grants significant ownership stakes to single parties may have greater efficiency gains than privatization that disperses ownership. Second, it finds that several years after privatization, ownership structure of individual enterprises depends to a significant extent on the privatization methods used. Thus, if due to political and equity considerations the governments in transition economies have to use privatization mechanisms leading to dispersed ownership, they should consider creating appropriate conditions for ownership reallocation to make privatization work. Third, the cross-section regression results reveal that ownership concentration by foreign companies and banks is positively associated with enterprise performance. If foreign companies and banks indeed perform better as owners, perhaps the governments should consider attracting foreign investors for participation in the future privatizations and making institutional environment conducive to foreign direct investment.

My argument in favor of privatization that grants concentrated ownership stakes is based on the observation that the institutional environment in Ukraine is not conducive to the protection of investors (both foreign and domestic) and exacerbates the agency problems associated with dispersed ownership. From this perspective, my results should be interpreted as promoting a second best solution. If a country possesses an appropriate institutional environment for investor protection, it is possible that the agency costs of dispersed ownership would be outweighed by the benefits of the risk diversification and access to capital afforded by the arms-length capital markets. This second best approach does not address the legitimate equity concerns of privatization. These concerns can be addressed in a number of ways, including improving the quality of institutions of investor protection, increasing transparency and liquidity of the capital markets and transferring most of the privatization revenues to the public.

It is important to stress that a number of important questions remain. First, the paper's empirical evidence did not identify all the channels through which ownership concentration affects performance. I argue in this paper that ownership concentration affects performance by addressing the agency problems. However, one can think of several other channels through which ownership concentration affects performance. First, it is possible that concentrated owners reinvest more profits than dispersed owners and, thus, increase productivity. Second, it is possible that concentrated investors (especially foreign investors) have better access to new technology. Third, it is possible that concentrated investors are better at replacing old incompetent managers with competent ones. In any case, the findings show that ownership concentration affects performance. Further research is needed to determine the precise channels of this relationship. From a policy perspective though, the lessons are more straightforward: it is a good idea to privatize concentrated stakes, at least until the government is able to improve capital markets infrastructure and institutions for investor protection.

This paper's findings are also important for other reasons. First, a significant share of Ukraine's capital assets is still owned by the state and, thus, my findings have implications for design of the future privatization efforts in Ukraine. Starting in late 1999, medium and large enterprises have been privatized by selling large packages of shares. The government invites foreign investors to participate in privatization tenders. Some critics of the government argue that this new approach is a result of the urgent need to increase government revenues and not a careful search for an effective privatization model. The good news is that this time the political process may have a positive side effect on the Ukrainian

economy. Second, the results for Ukraine may be generalized for other countries in the region. Ukraine's privatization program was similar to those adopted by other CIS countries, and those countries possess similar institutional environments for arms-length corporate governance (EBRD 1998; World Bank 1996). Finally, the paper's findings may be useful for designing of privatization programs in countries yet to embark on privatization efforts (such as Belarus, China, Cuba or Vietnam).

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Table 1. Number of Enterprises Privatized in Ukraine by Sector 1/

Sector	1992-1998	1998 2/
Mining and industry	6,760	407
Agriculture	2,956	187
Transportation and communications	1,325	75
Construction	3,181	139
Trade and catering	27,776	2,324
Logistics and supplies	1,110	50
Procurement	476	315
Communal services	2,532	392
Utilities	11,256	472
Science, research, and development	345	29
Health care, physical education, and social security	342	73
Education	187	34
Culture and art	630	150
Other sectors	2,715	804
Total	61,591	5,451

Source: State Statistics Committee of Ukraine, Statistical Yearbook of Ukraine for 1998

1/ Enterprise is considered privatized if the state equity holding is less than 30 percent. According to a more stringent definition (when 100 percent of equity is privatized), in 1991-98 the Ukrainian government privatized 58,000 enterprises.

2/ This column includes number of enterprises that reached the official definition of privatization (i.e., 70 percent of equity privatized) in 1998.

Table 2. Employment and Capital Assets by Ownership Type 1/

Panel A: Employment

Ownership Type	1992		1995		1996		1997		1998	
	(Employees in thousands)	(In percent of total)	(Employees in thousands)	(In percent of total)	(Employees in thousands)	(In percent of total)	(Employees in thousands)	(In percent of total)	(Employees in thousands)	(In percent of total)
Private	n.a.	n.a.	21	0.12	30	0.17	28	0.18	70	0.47
Collective ownership	6,308	29.55	7,586	41.56	8,176	47.69	7,881	49.71	7,624	50.41
including by economic associations 2/	224	1.05	2,822	15.46	3,626	21.15	3,845	24.26	4,162	27.52
including by collective agricultural enterprises	3,226	15.11	2,926	16.03	2,922	17.05	2,755	17.38	2,634	17.42
State	15,027	70.39	10,632	58.25	8,925	52.06	7,934	50.04	7,420	49.05
including by central government	12,940	60.62	8,015	43.91	6,711	39.15	5,655	35.67	5,092	33.66
Property of international organizations and legal entities of other states	12	0.06	13	0.07	12	0.07	11	0.07	11	0.07
Total	21,348	100.00	18,252	100.00	17,142	100.00	15,853	100.00	15,126	100.00

Panel B: Capital Assets

Ownership Type	1994	1995	1997	1997
	(In percent of total)			(In mln. HUA)
Private	7.70	2.00	1.90	16,246
Collective ownership	32.90	35.90	42.30	358,124
State	59.10	62.00	55.70	472,486
Property of international organizations and legal entities of other states	0.30	0.10	0.10	757
Total	100.00	100.00	100.00	847,613

Sources: State Statistics Committee of Ukraine; Statistical Yearbook of Ukraine for 1997 and 1998.
Note: n.a. indicates information not available
1/ The data excludes small enterprises.
2/ This ownership category includes joint stock companies.

Table 3. Budget Revenues from Privatization

| Year | Privatization revenues | | |
	(in millions of hryvnia)	(in % of GDP)	(in % of budget)
1992	0.02	0.04%	0.12%
1993	2.30	0.16%	0.40%
1994	21.80	0.18%	0.41%
1995	62.70	0.12%	0.16%
1996	111.50	0.14%	0.37%
1997	87.10	0.09%	0.24%
1998	360.80	0.28%	0.96%

Source: State Property Fund of Ukraine website (www.spfu.gov.ua).

Table 4. Comparison of Investor Protection Rules in Ukraine, the United States, and Poland

Anti-director rights criteria 1/	Ukraine		US		Poland	
	Rule	Score	Rule	Score	Rule	Score
One Share - One Vote 2/	Yes	1	No	0	No	0
Proxy by mail allowed 3/	No	0	Yes	1	No	0
Not allowed to block shares before shareholder meeting 4/	Yes	1	Yes	1	No	0
Cumulative voting/proportional representation 5/	No	0	Yes	1	Yes	1
Oppressed minority mechanism 6/	No	0	Yes	1	Yes	1
Preemptive right to new issues 7/	Yes	1	No	0	No	0
Percentage of capital to call an extraordinary shareholder meeting 8/	10%	1	10%	1	10%	1
Total score on "Anti-Director Rights" index		4		5		3

Sources: For Ukraine - Law on Economic Associations (1991) with amendments; for US - La Porta et al. (1998); for Poland - Johnson, Glaeser and Shleifer (2000).

1/ Criteria according to La Porta et al. (1998)

2/ Equals one if the company law or commercial code of the country requires that ordinary shares carry one vote per share, and zero otherwise. Equivalently, this variable equals one when the law prohibits the existence of both multiple-voting and non-voting ordinary shares and does not allow to set a maximum number of votes per shareholder irrespective of the number of shares owned, and zero otherwise.

3/ Equals one if the company law or commercial code allows shareholders to mail their proxy vote to the firm, and zero otherwise.

4/ Equals one if the company law or commercial code does not allow firms to require that shareholders deposit their shares prior to a general shareholder meeting, thus preventing them from selling those shares for a number of days, and zero otherwise.

5/ Equals one if the company law or commercial code allows shareholders to cast all their votes for one candidate standing for elections to the board of directors (cumulative voting) or if the company law or commercial code allows a mechanism of proportional representation in the board by which minority interests may name a proportional number of directors to the board, and zero otherwise.

6/ Equals one if the company law or commercial code grants minority shareholders either a judicial venue to challenge the decisions of management or of the assembly or the right to step out of the company by requiring the company to purchase their shares when they object to certain fundamental changes, such as mergers, asset depositions, and changes in the articles of incorporation. The variable equals zero otherwise. Minority shareholders are defined as those shareholders who own 10 percent of share capital or less.

7/ Equals one when the company law or commercial code grants shareholders the first opportunity to buy the new issues of stock, and this right can be waived only by a shareholder's vote; equals zero otherwise.

8/ Equals one if the minimum percentage of ownership of shares that entitles a shareholder to call an extraordinary shareholders' meeting less than or equal to 10 percent. The variable equals zero otherwise.

Table 5. Managers' Perception of the Quality of Financial and Stock Markets in Ukraine in Comparative Perspective

	Year	Countries in Sample	Ukraine's Rank	Leader's Score	Ukraine's Score
Government regulations are precise and fully enforced	1997	53	52	6.36	2.05
Venture capital is readily available for new business development	1997	53	53	6.24	1.95
Stock markets in your country are an important source of new capital for firms	1997	53	53	6.29	2.32
	1998	53	52	6.34	2.14
The level of sophistication of financial markets is higher than international norms	1998	53	53	6.68	1.59
	1999	59	57	6.77	2.12
Regulation and supervision of financial institutions is adequate for financial stability	1997	53	47	6.29	3.50
	1998	53	53	6.43	2.61
Regulation and supervision of financial institutions is among the world's most stringent	1999	59	56	6.25	2.96
Stock markets are open to new firms and medium-sized firms	1999	59	57	6.74	2.88
Insider trading is not common in the stock market	1997	53	46	5.88	3.18
	1998	53	33	5.92	3.90
	1999	59	21	6.72	4.56

Sources: World Competitiveness Report of the World Economic Forum (1997, 1998, 1999).
Note: The data give mean scores for answers of senior business executives surveyed on a scale from 1 to 7. A score of 1 indicates complete disagreement with the statement and a score of 7, complete agreement.

Table 6. Selected Summary Statistics for the Enterprise Sample 1/

Variable	No. of observations	Mean	St. Dev.	Minimum	Maximum
Number of employees	376.0	2,412.6	3,610.7	500.0	26,059.0
Sales revenue*	376.0	89,569.0	231,959.2	0.0	2,121,148.0
Balance assets*	376.0	176,928.2	385,873.6	0.0	3,182,966.0
Total factor productivity estimate 2/	374.0	0.0	1.040	-5.1	2.3
Material cost (per unit of revenue)	375.0	0.5	0.4	0.0	5.5
Labor productivity (sales revenue per employee)*	376.0	25.5	28.2	0.0	203.8
Log (Balance assets/ Number of employees)	374.0	3.6	0.9	0.1	5.9
T10NS 3/	376.0	23.6	25.6	0.0	92.6
HT10NS 4/	376.0	5.6	10.0	0.0	82.1
T10NSDOM 5/	376.0	12.9	18.9	0.0	88.3
T10NSFOR 6/	376.0	6.4	15.9	0.0	92.6
T10NSINF 7/	376.0	4.0	10.3	0.0	69.5

Source: Sample of enterprises based on data provided by the Ukrainian Commission on Securities and Financial Markets and by the State Property Fund of Ukraine. See Appendix Table A1 for detailed data description.

1/ All variables are for 1998.

2/ Total factor productivity estimate is generated by subtracting the value of ln revenues from the predicted value of ln revenues generated from regressing ln revenues on ln number of employees and ln balance assets.

3/ Percentage of shares controlled by ten significant non-state owners (i.e., owners with five percent of equity or more each).

4/ Herfindahl index of ownership concentration by all significant non-state owners (i.e., owners with five percent of equity or more each).

5/ Percentage of shares controlled by ten significant domestic non-state owners (i.e., owners with five percent of equity or more each), excluding domestic investment funds and holding companies.

6/ Percentage of shares controlled by ten significant foreign non-state owners (i.e., owners with five percent of equity or more each).

7/ A sum of all significant holdings (i.e., five percent of equity or more each) controlled by Ukrainian investment funds and nonstate holding companies.

Note: * indicates that values are in thousands of Ukrainian hryvnia

Table 7A. Degree of Privatization of Enterprises Included in the Sample
(At year-end)

Share of equity privatized	1993	1994	1995	1996	1997	1998
0	362	321	214	100	39	10
0.1-24.99	1	7	53	46	54	37
25-49.99	2	7	31	43	44	46
50-74.99	2	11	20	56	67	77
75-99.99	3	15	26	71	85	68
100	6	15	32	60	87	138
TOTAL	376	376	376	376	376	376

Table 7B. Sample Firm Size by Privatization Status
(As of December 31, 1998)

Percent share of equity privatized	No. of firms	Mean No. of employees	St. Dev.	Minimum No. of employees	Maximum No. of employees
0	10	5,468	7,083	651	20,549
0.1-24.99	37	4,241	4,712	506	18,928
25-49.99	46	3,907	5,637	593	26,059
50-74.99	77	3,041	4,041	511	25,585
75-99.99	68	1,378	1,515	506	9,400
100	138	1,362	1,318	500	7,406
TOTAL	376	2,413	3,611	500	26,059

Source: Sample of enterprises based on data provided by the Ukrainian Commission on Securities and Financial Markets and by the State Property Fund of Ukraine.

Table 8. Composition of the Enterprise Sample by Sector, 1998

Variable	No. of observations	Percent of total
Food/tobacco industry	76	20.21
Basic industry	59	15.69
Petroleum industry	7	1.86
Construction industry	53	14.1
Trade industry	10	2.66
Textiles industry	16	4.26
Capital goods industry	68	18.09
Transportation industry	24	6.38
Utilities industry	33	8.78
Consumer durables industry	14	3.72
Finance/real estate industry	3	0.8
Leisure industry	2	0.53
Services industry	11	2.93
TOTAL	376	100.0

Source: Sample of enterprises based on data provided by the Ukrainian
Commission on Securities and Financial Markets and by the State Property Fund of

Table 9. Ownership Structure 1/

Type of Owner	Largest Significant Owner (All Sample)		Top 10 Significant Owners (All Sample)			Largest Significant Owner (Top 10 pct. by nonstate concentration)		Largest Significant Owner (Fully privatized firms)	
	Number of firms	Percent of total	Number of firms 2/	Mean percent of all firm's equity 3/	Mean percent of firm's equity for full sample	Number of firms	Percent of total	Number of firms	Percent of total
Physical person	30	7.98	69	21.71	3.84	2	5.41	24	17.39
Foreign company or bank	26	6.91	81	29.87	6.36	12	32.43	15	10.87
Ukrainian enterprise	4	1.06	9	22.46	0.52			3	2.17
Ukrainian bank	2	0.53	11	12.57	0.37	1	2.70	2	1.45
Ukrainian investment fund or holding company	24	6.38	77	19.55	3.93	6	16.22	13	9.42
Other Ukrainian company	60	15.96	118	25.5	7.87	16	43.24	43	31.16
Ukrainian state	184	48.94	205	48.18	26.22	n.a.	n.a.	n.a.	n.a.
Dispersed ownership 4/	46	12.23	n.a.	n.a.	n.a.	n.a.	n.a.	38	27.54
TOTAL	376	100.00	n.a.	n.a.	n.a.	37	100.00	138	100.00

Source: Ukrainian Commission on Securities and Financial Markets; and the State Property Fund of Ukraine.

Note: n.a. indicates information not available

1/ All data is as of December 31, 1998. Only firms with 500 or more workers are included.

2/ The number of firms that have at least one owner of the type, among the owners with 5 percent of equity or more.

3/ The average share of equity owned by all owners of the type indicated, in firms that have at least one owner of the type among the owners with 5 percent of equity or more.

4/ Dispersed ownership indicates that no owner is reported to hold an ownership stake equal to or greater than 5 percent of all equity.

Table 10. OLS Regression of Enterprise Performance on the Linear Index of Ownership Concentration

Independent variables	Total factor productivity estimate			Material input cost per unit of revenue			Labor productivity		
	Full Sample (1)	Full Sample (2)	Sample PR98>50% (3)	Full Sample (4)	Full Sample (5)	Sample PR98>50% (6)	Full Sample (7)	Full Sample (8)	Sample PR98>50% (9)
Ownership concentration (T10NS)	0.0056 * (0.0018)	0.0047 ** (0.0019)	0.0034 *** (0.0019)	-0.0022 * (0.0008)	-0.0025 * (0.00085)	-0.0025 * (0.0009)	0.11 ** (0.047)	0.12 ** (0.049)	0.12 ** (0.48)
Dummy for state share 25.1-50 %		-0.099 (0.13)			-0.0025 (0.056)			-4.92 (3.24)	
Dummy for state share 50.1-100 %		-0.21 *** (0.12)			-0.056 (0.52)			0.33 (2.99)	
Log (Balance assets/ Number of employees)				0.0014 (0.030)	0.0063 (0.30)	-0.029 (0.35)	8.69 * (1.73)	8.63 * (1.75)	8.55 * (1.84)
Industry dummies included	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	374	374	280	374	374	280	374	374	280
R-squared	0.31	0.31	0.32	0.18	0.18	0.21	0.40	0.41	0.40

Sources: Ukrainian Commission on Securities and Financial Markets; and the State Property Fund of Ukraine.
Notes:
Standard errors are shown in parentheses.
* Indicates coefficient is significantly different from zero at the 1 percent level of confidence.
** Indicates coefficient is significantly different from zero at the 5 percent level of confidence.
*** Indicates coefficient is significantly different from zero at the 10 percent level of confidence.
Sample PR98>50% indicates that only enterprises with over 50 percent of equity privatized as of end of 1998 were included in the regressions.

Table 11. OLS Regression of Enterprise Performance on Herfindahl Index of Ownership Concentration

Independent variables	Total factor productivity estimate			Material input cost per unit of revenue			Labor productivity		
	Full Sample (1)	Full Sample (2)	Sample PR98>50% (3)	Full Sample (4)	Full Sample (5)	Sample PR98>50% (6)	Full Sample (7)	Full Sample (8)	Sample PR98>50% (9)
Ownership concentration (HT10NS)	0.012 * (0.0046)	0.0099 ** (0.0047)	0.0086 *** (0.0044)	-0.0037 *** (0.0021)	-0.0041 *** (0.0021)	-0.0032 (0.0021)	0.30 ** (0.12)	0.31 ** (0.12)	0.32 * (0.11)
Dummy for state share 25.1-50 %		-0.10 (0.13)			0.00052 (0.056)			-4.97 (3.24)	
Dummy for state share 50.1-100 %		-0.24 ** (0.12)			-0.03 (0.051)			-0.21 (2.92)	
Log (Balance assets/ Number of employees)				-0.0016 (0.03)		-0.041 (0.035)	8.55 * (1.73)	8.54 * (1.75)	8.45 * (1.82)
Industry dummies included	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	374	374	280	374	374	280	374	374	280
R-squared	0.30	0.31	0.32	0.17	0.17	0.20	0.40	0.41	0.40

Sources: Ukrainian Commission on Securities and Financial Markets; and the State Property Fund of Ukraine.
Notes:
Standard errors are shown in parentheses.
* Indicates coefficient is significantly different from zero at the 1 percent level of confidence.
** Indicates coefficient is significantly different from zero at the 5 percent level of confidence.
*** Indicates coefficient is significantly different from zero at the 10 percent level of confidence.
Sample PR98>50% indicates that only enterprises with over 50 percent of equity privatized as of end of 1998 were included in the regressions.

Table 12. OLS Regressions of Ownership Concentration by Owner Type

Independent variables	Total factor productivity estimate				Material input cost per unit of revenue				Labor productivity			
	Full sample (1)	Full sample (2)	Sample PR98>50 (3)	Enterprises with no significant foreign owners (4)	Full sample (5)	Full sample (6)	Sample PR98>50 (7)	Enterprises with no significant foreign owners (8)	Full sample (9)	Full sample (10)	Sample PR98>50 (11)	Enterprises with no significant foreign owners (12)
T10NSINF	0.0036 (0.0045)	0.0020 (0.0046)	0.0026 (0.0043)	0.0032 (0.0051)	-0.0008 (0.0020)	-0.0012 (0.002)	-0.0014 (0.0020)	-0.00099 (0.0024)	-0.056 (0.11)	-0.032 (0.12)	-0.0054 (0.10)	-0.098 (0.11)
T10NSFOR	0.0079 * (0.0030)	0.0064 ** (0.0031)	0.0068 ** (0.0030)		-0.0037 * (0.0013)	-0.0041 * (0.0014)	-0.0041 * (0.0014)		0.24 * (0.077)	0.27 * (0.081)	0.29 * (0.073)	
T10NSDOM	0.0048 *** (0.0025)	0.0025 (0.0027)	0.0017 (0.0025)	0.0063 ** (0.0029)	-0.0016 (0.0011)	-0.0020 *** (0.0014)	-0.0018 (0.0012)	-0.0016 (0.0014)	0.080 (0.063)	0.10 (0.069)	0.064 (0.60)	0.15 * (0.060)
Dummy for state share 25.1-50 %		-0.11 (0.13)				0.017 (0.055)				-0.81 (3.18)		
Dummy for state share 50.1-100 %		-0.30 ** (0.14)				-0.043 (0.060)				2.82 (3.48)		
Log (Balance assets/ Number of employees)					0.0053 (0.030)	0.011 (0.031)	-0.025 (0.035)	0.0061 (0.037)	8.29 * (1.73)	7.93 * (1.77)	8.03 * (1.82)	4.49 (1.66)
Industry dummies included	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	374	374	280	294	374	374	280	294	374	374	280	294
R-squared	0.31	0.32	0.32	0.27	0.18	0.18	0.22	0.15	0.41	0.41	0.42	0.31

Sources: Ukrainian Commission on Securities and Financial Markets; and the State Property Fund of Ukraine.
Notes:
Standard errors are shown in parentheses.
* Indicates coefficient is significantly different from zero at the 1 percent level of confidence.
** Indicates coefficient is significantly different from zero at the 5 percent level of confidence.
*** Indicates coefficient is significantly different from zero at the 10 percent level of confidence.
Sample PR98>50% indicates that only enterprises with over 50 percent of equity privatized as of end of 1998 were included in the regressions.

Table 13. Stylized Facts about Ability of Different Groups of Investors to Acquire
Significant Ownership Stakes by the Method of Privatization

	Physical persons	Broadly held intermediaries	Concentrated outsiders 1/
1 Property of association of tenants	No	No	No
2 Sales on preferential terms	No	No	No
3 Free transfer of shares	No	No	No
4 Privatization certificate auctions	No	Yes	No
5 Compensation certificate auctions	No	Yes	Yes
6 Stock exchange and over-the-counter sales	Yes	Yes	Yes
7 Cash sales via certificate privatization centers	Yes	Yes	Yes
8 Commercial and noncommercial tenders	No	No	Yes

Sources: State Property Fund of Ukraine; Legal Aspects of Privatization in Ukraine (in Ukrainian), Kyiv: Ruska Pravda Publishers, 1996.

1/ Concentrated outsiders are defined as legal entities not owned or associated with the enterprises being privatized. These concentrated legal entities may be owned by the enterprise managers or their proxies.

Table 14. Privatization of Enterprises in the Sample by Method 1/

(In percent)

	Full Sample		Sample PR98>50		Sample PR98=100	
	Mean	St.dev.	Mean	St.dev.	Mean	St.dev.
Property of association of tenants	14.34	26.6	17.84	29.07	21.37	30.69
Sales on preferential terms	21.41	22.21	24.13	24.01	27.79	26.69
Free transfer of shares	2.27	11.14	2.74	12.41	1.72	10.5
Privatization certificate auctions	17.93	18.4	20.62	19.48	22	21.22
Compensation certificate auctions	7.6	12.06	8.77	12.77	8.52	13.01
Stock exchange and over-the-counter sales	2.34	6.17	2.69	6.79	3.12	7.7
Cash sales via certificate privatization centers	0.74	2.72	0.53	3.02	0.66	3.69
Commercial and noncommercial tenders	6.83	14.56	8.48	16.01	8.53	16.39

Sources: Ukrainian Commission on Securities and Financial Markets; and the State Property Fund of Ukraine
1/ All data is as of December 31, 1998. Only firms with 500 or more workers are included. Full sample includes 363 enterprises, sample of enterprises over 50 percent privatized at the end of 1998 includes 281 enterprises, and the sample of fully privatized enterprises includes 137 enterprises.

Table 15. OLS Estimates of the Extent of Ownership Concentration in 1998 1/

Independent variables	Dependent variable	
	T10NS	HT10NS
	Full sample (1)	Full sample (3)
Share privatized via lease with buyout	0.065 (0.048)	0.052 * (0.020)
Share privatized via preferential transfer	-0.045 (0.055)	0.014 (0.023)
Share privatized via free transfer	-0.20 ** (0.11)	-0.033 (0.045)
Share privatized for compensation certificates	0.31 * (0.10)	0.051 ** (0.043)
Share privatized via stock exchange	0.78 * (0.19)	0.18 ** (0.079)
Share privatized via cash auctions	0.12 (0.43)	-0.082 (0.18)
Share privatized via privatization tenders	0.84 * (0.083)	0.31 * (0.035)
Observations	363	363
R-squared	0.31	0.21

Sources: Ukrainian Commission on Securities and Financial Markets; and the State Property Fund of Ukraine.

1\ Share privatized for privatization certificates at privatization certificate auctions is used as a numeraire.

Notes:

Standard errors are shown in parentheses.

Only enterprises with 500 and more workers are included.

* Indicates coefficient is significantly different from zero at the 1 percent level of confidence.

** Indicates coefficient is significantly different from zero at the 5 percent level of confidence.

*** Indicates coefficient is significantly different from zero at the 10 percent level of confidence.

Table 16. 2SLS Regression of Enterprise Performance on the Linear Index of Ownership Concentration

Independent variables	Total factor productivity estimate				Material input cost per unit of revenue				Labor productivity			
	Full sample (1)	Full sample (2)	Sample PR98>50 (3)	Enterprises with no significant foreign owners (4)	Full sample (5)	Full sample (6)	Sample PR98>50 (7)	Enterprises with no significant foreign owners (8)	Full sample (9)	Full sample (10)	Sample PR98>50 (11)	Enterprises with no significant foreign owners (12)
Ownership concentration (T10NS)	0.0098 * (0.0034)	0.0073 *** (0.0038)	0.0099 * (0.0037)	0.0094 ** (0.0045)	-0.0039 * (0.0015)	-0.0053 * (0.0019)	-0.0081 * (0.0020)	-0.0025 (0.0022)	0.095 (0.087)	0.097 (0.11)	0.16 (0.10)	0.13 (0.097)
Dummy for state share 25.1-50 %		-0.078 (0.13)				-0.0049 (0.056)				-0.63 (3.18)		
Dummy for state share 50.1-100 %		-0.17 (0.17)				-0.12 (0.080)				2.32 (4.53)		
Log (Balance assets/ Number of employees)					0.010 (0.034)	0.030 (0.036)			9.68 * (1.92)	9.50 (2.06)	8.34 (2.11)	4.91 (1.87)
Industry dummies included	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	361	361	279	281	361	361	279	281	361	361	279	281

Sources: Ukrainian Commission on Securities and Financial Markets; and the State Property Fund of Ukraine.
Notes:
Standard errors are shown in parentheses.
* Indicates coefficient is significantly different from zero at the 1 percent level of confidence.
** Indicates coefficient is significantly different from zero at the 5 percent level of confidence.
*** Indicates coefficient is significantly different from zero at the 10 percent level of confidence.
Sample PR98>50% indicates that only enterprises with over 50 percent of equity privatized as of end of 1998 were included in the regressions.

Table 17. 2SLS Regression of Enterprise Performance on Herfindahl Index of Ownership Concentration

Independent variables	Total factor productivity estimate				Material input cost per unit of revenue				Labor productivity			
	Full sample (1)	Full sample (2)	Sample PR98>50 (3)	Enterprises with no significant foreign owners (4)	Full sample (5)	Full sample (6)	Sample PR98>50 (7)	Enterprises with no significant foreign owners (8)	Full sample (9)	Full sample (10)	Sample PR98>50 (11)	Enterprises with no significant foreign owners (12)
Ownership concentration (HT10NS)	0.036 * (0.010)	0.031 * (0.012)	0.035 * (0.011)	0.047 * (0.015)	-0.011 ** (0.0046)	-0.014 ** (0.0057)	-0.018 * (0.0057)	-0.0091 (0.0072)	0.44 *** (0.26)	0.55 *** (0.32)	0.65 ** (0.28)	0.71 ** (0.32)
Dummy for state share 25.1-50 %						-0.017 (0.059)				0.38 (3.26)		
Dummy for state share 50.1-100 %						-0.083 (0.077)				4.14 (4.25)		
Log (Balance Assets/ Number of Employees)					0.015 (0.035)	0.30 (0.039)	0.019 (0.045)	0.0098 (0.043)	9.04 * (1.97)	8.44 * (2.16)	7.17 * (2.20)	4.30 ** (1.91)
Industry dummies included	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	361	361	279	281	361	361	279	281	361	361	279	281

Sources: Ukrainian Commission on Securities and Financial Markets; and the State Property Fund of Ukraine.
Notes:
Standard errors are shown in parentheses.
* Indicates coefficient is significantly different from zero at the 1 percent level of confidence.
** Indicates coefficient is significantly different from zero at the 5 percent level of confidence.
*** Indicates coefficient is significantly different from zero at the 10 percent level of confidence.
Sample PR98>50% indicates that only enterprises with over 50 percent of equity privatized as of end of 1998 were included in the regressions.