

## Ownership Concentration and Performance in Ukraine's Privatized Enterprises

ALEXANDER PIVOVARSKY\*

*This article investigates empirically the relationship between ownership concentration and performance in 376 partially and fully privatized Ukrainian enterprises. It finds that ownership concentration is positively associated with enterprise performance in Ukraine. The article 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. The article documents that, in contrast to predictions by many observers of early transition, privatization methods determined the long-term ownership structure of privatized firms. [JEL G32, G37, L33, P31]*

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

---

\*Alexander Pivovarsky is an Economist in the Expenditure Policy Division of the IMF's Fiscal Affairs Department. At the time this article was prepared, he was in the IMF's European II Department. This article is based on Chapter 1 of the author's doctoral dissertation at Harvard University. He is grateful to Rachel Glennerster, Oleh Havrylyshyn, Jess Hobart, Simon Johnson, Dwight Perkins, Katharina Pistor, Edgardo Ruggiero, Jeffrey Sachs, and Janusz Szyrmer, as well as an anonymous referee, the participants in the Harvard Institute for International Development seminar in Kyiv, and the staff of the IMF's European II Department for valuable suggestions and comments.

(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 leads 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, thus providing an opportunity for testing a number of hypotheses on the role of ownership structure in enterprise restructuring and performance. In this article, I investigate the effects of ownership concentration on the post-privatization performance of medium and large enterprises in Ukraine. Its main hypothesis is that in Ukraine's inadequate legal and regulatory environment, enterprises with greater nonstate concentration of ownership perform better than those with a dispersed ownership structure.

This article is motivated by the debate on the effects of privatization. For the industrialized and emerging market economies, there is strong evidence of the positive effects of privatization on enterprise restructuring and performance. See, for example, Vining and Boardman (1992); Megginson, Nash, and von Randenborgh (1994); Boubakri and Cosset (1998); La Porta and Lopez-de-Silanes (1999); Dewenter and Malatesta (2001). The empirical evidence in the literature on privatization in transition economies is, however, less conclusive. Consider some examples of firm-level studies. For the Czech Republic, Hungary, and Poland, Frydman and others (1999) find that while privatization has no effect on profit margins in the short run, it does lead to improved 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 and others (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-owned and privately owned enterprises. For small retail stores in Russia, Barberis and others (1996) find significant improvement in restructuring after privatization. For six Commonwealth of Independent States (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.

In the survey studies of empirical literature on privatization, Djankov and Murrell (2000) and Megginson and Netter (2001) find that while privatization is strongly associated with enterprise restructuring in Central Europe, the results are mixed for the CIS countries. 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 has been argued that insiders are motivated by objectives other than enterprise efficiency and, therefore, enterprise equity should be transferred to outside owners to achieve better restructuring and performance (see, for example, Aghion and Blanchard, 1996). A second strand of the literature has

investigated the hypothesis that the degree of competition is more important than the ownership structure in explaining enterprise performance in transition (Tandon, 1995; Anderson, Lee, and Murrell, 2000). Market reforms in transition economies involved price liberalization 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 in the socialist system (see Kornai, 1992 and 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 transition, more questions should have been asked—and answered—about how best to privatize (see, for discussion, Havrylyshyn and McGettigan, 2000). In this article, 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 of the variation in enterprise performance.

Ukraine was selected for this study for several reasons. First, like most transition economies, in the early 1990s 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 study finds that ownership concentration is positively associated with enterprise performance in Ukraine. An instrumental variable approach confirms the article’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 that is principally domestic. Ownership by the Ukrainian investment funds and holding companies does not have a positive effect on performance. This study 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 article is organized as follows. Section I provides background and a review of related literature. Section II presents the data. Section III presents results of ordinary-least-squares regression estimates of the ownership concentration's effects on enterprise performance. Section IV presents the argument for using proportions of equity privatized by different privatization methods as instruments for current ownership concentration. Section V presents results of two-stage-least-squares regressions, and Section VI concludes.

## I. 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.<sup>1</sup> 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 that 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 reemerged 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 structures (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, and promoting enterprise restructuring and equitable distribution of wealth—the political constraints often interfered with these objectives. It was considered almost commonly accepted wisdom that privatization should proceed quickly, regardless of the method used, in order to reduce the possibility of corrupt officials benefiting from the control vacuum that emerged after the collapse of the planned economic systems and to rule out the 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 how enterprises would be governed after privatization. It was expected, at that time, that either the ownership structure would quickly evolve to attain an efficient equilibrium, given the institutional and other constraints facing the firms, or the

---

<sup>1</sup>I follow the definition of corporate governance provided in Shleifer and Vishny (1997), which deals with the ways in which suppliers of finance to firms assure that they will get a return on their investments.

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 determining firms' access to investment finance. It was argued that a combination of legal rules and ownership concentration could be used to mitigate governance problems (Shleifer and Vishny, 1997). It has been shown, however, that even in mature market economies, the diversion of corporate resources from minority shareholders to controlling shareholders and managers can be substantial (see, for example, Johnson and others, 2000) and that corporations are widely held only in countries with very good shareholder protection (La Porta, Lopez-de-Silanes, and Shleifer, 1999). In such countries, shareholders with effective control over firms are not afraid that their firms will be expropriated and, thus, they 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 firms' managers by outside shareholders, is not sufficient to address the enterprise problems of transition and of some other emerging economies. In transition economies, small investors are not likely to play an important role in providing new financing to firms in the near future, owing to the institutional constraints (Pistor, Raiser, and Gelfer, 2000). At the same time, practitioners who 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 and others, 1997). This debate on the interaction of institutions of investor protection and the 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. From this perspective, Ukraine is an excellent subject for a case study.

In December 1991, the Ukrainian parliament declared two key principles to guide the privatization of state-owned assets: speed and social acceptability. 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 1992 privatization law envisioned eight privatization methods that differed in terms of the opportunities for ownership concentration that were offered to potentially interested parties (described in detail in Section IV of this article). Most small enterprises experienced 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 of the specified 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 more than 60,000 state-owned enterprises to nonstate agents and the privatization program involved all sectors of the national economy. The number of people employed by medium and large enterprises owned by the central government declined from 13 million in 1992 to just over 5 million in 1998. In terms of the share of capital assets employed by medium and large enterprises, the magnitude of privatization was also significant.

For political and historical reasons, the Ukrainian privatization during 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. State revenues from privatization as a share of GDP and total government revenues were insignificant owing to the nature of mass privatization, which involved issuance of free privatization certificates. 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 noncommercial 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 more than seven decades. 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 civil society supporting private ownership. As a result, today Ukraine has weaker investor protection than the developed market economies and the more advanced economies in transition.

Although by the mid-1990s Ukraine possessed a functioning legal and court system, and its company law compared reasonably well with those of other countries,<sup>2</sup> it was poorly equipped for administration of commercial law and contract enforcement. The legal transition index of the European Bank for Reconstruction and Development (EBRD), based on a survey of lawyers in the region, ranks countries on the basis of the extensiveness and effectiveness of their pledge, bankruptcy, and company laws (EBRD, 1997). Ukraine scored 2 (on a scale from

---

<sup>2</sup>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 compared with those of other transition countries (Pistor, Raiser, and Gelfer, 2000). Countries whose laws are based on the English legal system have the greatest degree of protection provided to minority shareholders (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1998).

1 to 4+) on both of their measures.<sup>3</sup> The 1997 Index of Economic Freedom, assembled by the (U.S.) Heritage Foundation, assigned Ukraine a score of 3+ on a scale from 1 to 4, which signifies a moderate level of protection of private property.<sup>4</sup> 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) have 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 its 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 securities prices. Nor is there a regulation that would ban the fixing of securities prices.

According to a *Global Competitiveness Report* survey (World Economic Forum, 1997 and 1999), 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

---

<sup>3</sup>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 the three areas, and 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 if commercial rules are reasonably clear but are not fully enforced by the court system, 4 if commercial law is reasonably clear and administration and judicial support of the law is reasonably adequate, and 4+ if commercial laws are clear and readily ascertainable.

<sup>4</sup>The score is accompanied by the following 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).

of whether regulation and supervision of financial institutions was among the most stringent in the world (see World Economic Forum, 1997 and 1999). In the EBRD transition indicators for the quality of securities markets and nonbank financial institutions, Ukraine ranked consistently close to the bottom (see EBRD, 1997 and 1998).

In sum, the quality of institutions of shareholder and investor protection in Ukraine is low by most available definitions. In 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. My main hypothesis, therefore, is that in Ukraine's inadequate legal and regulatory environment, enterprises with greater concentration of ownership should report better performance than those with dispersed ownership structures.

There is some empirical evidence supporting my hypothesis for more advanced transition economies. For example, 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. In contrast to the empirical research done on the more advanced transition economies, this problem has not been addressed in the empirical research done on former Soviet republics. Nonetheless, the argument in favor of ownership concentration may be especially relevant to the CIS countries. They were more likely than the more advanced transition economies to adopt privatization strategies that led to dispersed post-privatization ownership structures (EBRD, 1997). Their equity markets are nontransparent and illiquid (IFC, 1999). At the same time, the legal mechanisms for effective corporate governance in these countries are not as well developed as in the more advanced reformers of Central and Eastern Europe (Pistor and others, 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.

## II. 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 are 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 5 percent of equity or more. For the first time since the beginning of the privatization in Ukraine, both financial data 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, are from the database maintained by the State Property Fund of Ukraine. The combined dataset 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 that insiders believed would be most attractive to outsider takeovers, were transformed into closed joint stock companies, data on which are 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 to the UCSFM in an electronic format. 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 the 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 have been transformed into corporations, most of them do not list their shares in the public markets. Even when these firms' shares are listed, their liquidity is low, 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 owing to changes in accounting conventions and to tax considerations. The enterprises' nonstate owners may hide profits in order to avoid taxation by the state. Recent studies found that transition economies, including Ukraine, possess shadow economies that are among the largest in the world (see, for example, Kaufmann and Kaliberda, 1996). While the historic cost of capital assets may be sufficient to assess variation in the degree of capital intensity across enterprises, it is not a reliable measure of the value of today's capital stock. It needs to be borne in mind that a significant share of firms' assets was accumulated before the beginning of transition, when their value was based on the physical input costs of producing them rather than market prices.

Frydman and others (1997 and 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 also more transparent to an outside observer, more future-oriented, and more unpredictable on the basis of past history (Frydman and others, 1997, p. 10). These authors used changes in enterprise revenues over time to assess effects of privatization on enterprise performance. Since there are no reliable time-series

financial data matched with the ownership data for a sufficiently large sample of Ukrainian enterprises, in this article I have identified an alternative approach to studying cross-enterprise variation in revenue performance. Following Weiss and Nikitin (1998), I 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-Douglas production function and estimate the following equation:

$$\ln(\text{sales revenue in 1998})_i = \text{Constant} + a \ln K_i + b \ln L_i + t_i \quad (1)$$

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  $\ln(\text{sales revenue in 1998})_i$  from the logarithm of the actual value of the 1998 sales revenues.<sup>5</sup> Given the highly simplifying assumptions made to derive this variable, and owing to the concerns with the quality of the capital asset data, statistical results involving total factor productivity 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 their balance sheets. One of the objectives of privatization was to reduce 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 their firms' revenues into affiliated firms. I would expect that the owners who are more capable of controlling such managerial behavior achieve better material cost performance.

Finally, I use sales revenues per employee (or labor productivity), a variable that reflects both revenue performance and labor cost performance. 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 nonstate ownership concentration: first, the sum of ownership stakes held by the top 10 reported nonstate owners (*TIONS*) and, second,

---

<sup>5</sup>My derivation of the approximation of the total-factor-productivity variable is based on several simplifying assumptions. First, I assume that all enterprises employ the same production function. Second, I assume that all enterprises pay the same wages to labor and rents on capital. Finally, I assume that the output price per unit is the same across all enterprises in the sample. Only output volume varies across enterprises along with the variation in the volumes of inputs and enterprise-specific total factor productivity. Given these assumptions, the constant in the equation (1) includes a log transformation of the unit output price. The predicted value of  $\ln(\text{sales revenue in 1998})_{i,\text{predicted}}$  is derived by adding the constant and the enterprise-specific values of  $a \ln K_i$  and  $b \ln L_i$ , and, thus, leaving the total-factor-productivity approximation  $t_i$  out. From here,  $t_i$  is derived by subtracting  $\ln(\text{sales revenue in 1998})_{i,\text{predicted}}$  from  $\ln(\text{sales revenue in 1998})_{i,\text{actual}}$ .

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 (*HTIONS*).

Before I turn to empirical analysis, let me add a few more words about the sample enterprises. The vast majority of enterprises included in the sample did not begin privatization before the end of 1994. 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 nonstate owners could exercise effective control over them. The enterprises in the sample with larger numbers of employees were less privatized than the smaller ones. This is representative of the situation in the economy as a whole. The sample includes a broad range of firms by industry, reflecting the structure of the Ukrainian economy before privatization. For instance, capital goods, construction, and basic industries—the industries favored by the socialist-era 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 socialist era—represent a small fraction of the sample.

The enterprises included in the sample represent a diverse group in terms of their reported ownership structures at the end of 1998 (summarized in Table 1). Of 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, these 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 of 26 enterprises. The rest of the enterprises have Ukrainian investment funds and nonstate holding companies, Ukrainian enterprises-producers (that is, Ukrainian manufacturing enterprises), and Ukrainian banks as the largest significant owners.

Table 1 also summarizes the numbers of firms in the sample that have each type of owner, among the top 10 significant owners, and also the mean percentage of equity owned by each type of owner when such an owner is present. The mean value is 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 nonstate 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 *TIONS* 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 subsample, the physical person and foreign company/bank rank second and third (17.39 percent and 10.87 percent, respectively).

Table 1. Ownership Structure<sup>1</sup>

Type of Owner	Largest Significant Owner (Entire sample)		Top 10 Significant Owners (Entire sample)			Largest Significant Owner (Top 10 percent by nonstate concentration)		Largest Significant Owner (Fully privatized firms)	
	Number of firms	Percent of total	Number of firms <sup>2</sup>	Mean percentage of all firms' equity <sup>3</sup>	Mean percentage 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	...	...	...	...
Dispersed ownership <sup>4</sup>	46	12.23	...	...	...	...	...	38	27.54
Total	376	100.00	...	...	...	37	100.00	138	100.00

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

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

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

<sup>3</sup>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.

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

### III. OLS Estimates of Ownership Concentration and Enterprise Performance

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

$$y_i = \mu + \alpha R_i + \gamma X_i + \varepsilon_i, \quad (2)$$

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  $\varepsilon_i$  is a random error term.

The key coefficient of interest for this analysis is  $\alpha$ , or the effect of nonstate 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 5, top 10, or top 20) or a transformation of such combination that would give greater weight to large individual ownership stakes (Demsetz and Lehn, 1985; Weiss and Nikitin, 1998; and Claessens and Djankov, 1999). This article'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 (*TIONS*) and Herfindahl (*HTIONS*). I will expect similar empirical results from these two measures of concentration, given their high degree of correlation. (The correlation coefficient is 0.78.)

Columns 1, 4, and 7 in Table 2 present the basic regression results for the *TIONS* measure of ownership concentration and columns 1, 4, and 7 in Table 3, for *HTIONS*. 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  $\alpha$  should be interpreted as a marginal effect on enterprise performance of ownership concentration vis-à-vis dispersed nonstate ownership and state ownership of equity. From a theoretical point of view, it might be appropriate to group together state ownership and dispersed nonstate ownership. The agency problems of dispersed private ownership are also inherent in state ownership if one accepts the premise that the modern

Table 2. OLS Regression of Enterprise Performance on 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 percent (3)	Full sample (4)	Full sample (5)	Sample PR98> 50 percent (6)	Full sample (7)	Full sample (8)	Sample PR98> 50 percent (9)
Ownership concentration ( <i>TIONS</i> )	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 percent		-0.099 (0.13)			-0.0025 (0.056)			-4.92 (3.24)	
Dummy for state share 50.1–100 percent		-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; State Property Fund of Ukraine.

Notes: OLS denotes ordinary least squares. 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 percent indicates that only enterprises with more than 50 percent of equity privatized as of the end of 1998 were included in the regressions.

Table 3. 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 percent (3)	Full sample (4)	Full sample (5)	Sample PR98> 50 percent (6)	Full sample (7)	Full sample (8)	Sample PR98> 50 percent (9)
Ownership concentration ( <i>HTIONS</i> )	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 percent		-0.10 (0.13)			0.00052 (0.056)			-4.97 (3.24)	
Dummy for state share 50.1–100 percent		-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
<i>R</i> -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; State Property Fund of Ukraine.

Notes: OLS denotes ordinary least squares. 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 percent indicates that only enterprises with more than 50 percent of equity privatized as of the end of 1998 were included in the regressions.

state closely resembles a corporation with a dispersed ownership structure. An important empirical problem that is not 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 in either the worst or the best enterprises. In order to control for this, I introduce dummies for two levels of significant state ownership (the controlling stake and the blocking stake) into the basic specification (reported in columns 2, 5, and 8 of Tables 2 and 3) and also undertake regressions for the sample limited to firms with controlling stakes privatized (reported in columns 3, 6, and 9 of Tables 2 and 3). With both types of control, the coefficients on ownership concentration do not change dramatically and remain statistically significant at the 90 percent level or higher in five of the six cases. The only exception is the coefficient on *HTIONS* for the material input cost per employee when the sample is limited to enterprises with controlling stakes privatized as of 1998 (Table 3, column 6). 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 ordinary-least-squares (OLS) regression estimate implies that a 10 percent increase in ownership concentration variable *TIONS* leads to a 5.6 percent change in the total factor productivity estimate. These regressions show that a similar increase in ownership concentration would lead to a 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 seventy-fifth 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 nonstate 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 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 and others (1999) also find that foreign investors perform better than domestic investors 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 governance problems similar to those of 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 (Weiss and Nikitin, 1998; Claessens and Djankov, 1999). To explore the effects of different types of concentrated owners, I differentiate among three types of nonstate significant owners: (a) Ukrainian investment funds and nonstate holding companies, (b) other Ukrainian nonstate owners, and (c) foreign companies and banks. For each of the three ownership types, the ownership concentration variables

(*TIONSINF*, *TIONSDOM*, and *TIONSFOR*) are simple sums of each of the specified owners among the top 10 nonstate 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 owner on enterprise performance vis-à-vis the state and dispersed owners.

The results of empirical tests by ownership type are reported in Table 4. For all regression specifications, the coefficients on ownership concentration by Ukrainian investment funds and nonstate holding companies are statistically insignificant and have a negative sign for the labor productivity variable. 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 structures, they suffer from agency problems similar to those of 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 *TIONS* concentration variable (which did not differentiate between the owner types). The concentration effects of other domestic significant nonstate owners carry the predicted signs, but the coefficients' statistical significance varies, depending on the sample specification or the inclusion of additional control variables in the regression equations. It is possible that foreign owners targeted better-quality enterprises 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 could not test directly for this possibility, I tried limiting the sample to firms that did not have foreign owners among the top 10 significant nonstate 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 the predicted sign but is not statistically significant at an acceptable level in regressions for material cost (per unit of revenue). Thus, while I cannot completely rule out the possibility of selection of enterprises by foreign owners, 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 for foreign owners. Finally, concentrated ownership by Ukrainian investment funds and nonstate 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

Table 4. 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 percent (3)	Enterprises with no significant foreign owners (4)	Full sample (5)	Full sample (6)	Sample PR98>50 percent (7)	Enterprises with no significant foreign owners (8)	Full sample (9)	Full sample (10)	Sample PR98>50 percent (11)	Enterprises with no significant foreign owners (12)
<i>TIONSINF</i>	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)
<i>TIONSFOR</i>	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)	
<i>TIONSDOM</i>	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 percent		-0.11 (0.13)				0.017 (0.055)				-0.81 (3.18)		
Dummy for state share 50.1–100 percent		-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; State Property Fund of Ukraine.

Notes: OLS denotes ordinary least squares. 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 percent indicates that only enterprises with more than 50 percent of equity privatized as of the end of 1998 were included in the regressions.

structures and, thus, the causality goes in the direction opposite from that hypothesized in this study. 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.

#### IV. 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 and others, 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 corresponding to the ownership concentration data are available in Ukraine, I have used shares of enterprise equity privatized by different privatization methods as instruments for current ownership concentration.

The privatization process in Ukraine has been an outcome of the 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 privatization plans for their enterprises. Even before Ukraine's independence in 1991, insiders as a group were allowed to lease their enterprises, and, later on, they were allowed to transform leases into buyout 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 subsequently privatized better-quality enterprises (Kyrlyuk and Leshchenko, 2000).

From the point of view of insiders seeking to preserve control over their enterprises, the privatization mechanisms had the following hierarchy: insider privatization was most preferable, dispersed outsider privatization was next most preferable, and privatization by concentrated outsiders least preferable. Given the equity considerations traditional in Ukraine's 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 that were 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 the issuance of privatization vouchers. For a given enterprise, only after the insiders' rights for equity privatization had been satisfied and privatization voucher allocations had been made were relatively concentrated equity stakes offered for privatization. This changed in 1999, when the government, interested in generating additional budgetary revenues, shifted privatization efforts to meth-

ods involving the sale of concentrated equity stakes. This new stage of privatization is outside the scope of the present study.

The early observers of transition anticipated that once 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, and did not take into account the realities of, transitional economies. Given the high transaction costs and informational asymmetries of 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 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 5.

The first method—distribution of the tenant association property or shares accumulated by the tenant associations engaged in lease-with-buyout 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 such lease agreements. In April 1992, the Ukrainian parliament passed a law allowing enterprise insiders with lease agreements to acquire equity in leased firms in exchange for profits generated by the enterprise and paid to the state (*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 by the end of 1992. Since valuation of enterprise assets did not keep pace with inflation (and, thus, with 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 positions and seniority in the enterprises. Only in very small enterprises could individuals receive significant ownership stakes. This method was phased out in 1995, when the government shifted its privatization efforts to methods that involved the issuance and transfer of securities. For the whole sample, just over 14 percent of total equity was privatized using the first method.

The second method—equity transfer on preferential terms—involved share transfers to enterprise employees and limited categories of outsiders. Using privatization certificates and cash, each current and former employee, as well as limited additional categories of citizens (such as distinguished veterans of World War II), could acquire from the state shares with a nominal value equivalent to 150 percent

**Table 5. Privatization of Enterprises in the Sample by Method<sup>1</sup>**  
(In percent)

Method	Full Sample		Sample PR98>50%		Sample PR98=100%	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
	Property of association of tenants	14.34	26.6	17.84	29.07	21.37
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; State Property Fund of Ukraine.

<sup>1</sup>All data are as of December 31, 1998. Only firms with 500 or more workers are included. The full sample includes 363 enterprises; the sample of enterprises more than 50 percent privatized at the end of 1998 includes 281 enterprises; and the sample of fully privatized enterprises includes 137 enterprises.

of the value of a privatization certificate.<sup>6</sup> 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 5 percent of the enterprise's 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 5 percent of the equity in their firms. Since this method allowed voluntary participation by individuals, it was used to a greater degree for enterprises with higher perceived quality. Individuals could receive significant ownership stakes through this procedure only in enterprises with very small fixed capital. For the full sample, just over 21 percent of total equity was privatized using this method.

The third method involved free distribution of shares. This method was rarely used, since 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, just over 2 percent of total equity was privatized using this method. The other 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.

<sup>6</sup>The March 1992 *Law on Privatization Securities* gave the citizens of Ukraine the right to open individual nonnegotiable privatization accounts (which were 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 each certificate was equivalent to 1/52,000,000 of the total book value of the assets privatized.

The fourth method—privatization at the privatization certificate auctions—was employed to privatize large ownership stakes in a significant majority of medium-sized and large enterprises in exchange for privatization certificates. The law envisioned the creation of two types of intermediaries—investment trusts and investment companies—that 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 nontransferable, 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, about 18 percent of total equity was privatized using this method.

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. Like privatization certificates, these securities could be used in the privatization auctions to bid at their face value for equity in enterprises being privatized. 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. For the full sample, just over 7 percent of total equity was privatized using this method.

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 shares. For the full sample, just over 2 percent of total equity was privatized using this method.

The seventh method—cash privatization via certificate privatization centers—was similar to the previous method, with the only difference being the auctions' location. These methods were used relatively rarely during the privatization—for the full sample, less than 1 percent of total equity was privatized using this method.

The eighth method involved transfer of shares via commercial or noncommercial tenders. Participants in the noncommercial tenders had to present business plans but did not need to make any cash or privatization securities payments to the

state, and the winners received share packages sufficient to ensure their business plans would be approved by the enterprises' boards of directors. The business plans were expected to lay out strategies that would increase enterprise employment or, at least, keep employment constant. Most of the time, labor collectives won these noncommercial tenders, thus increasing the proportion of shares that could be allocated among insiders, and the government rarely followed up on whether the business plans were fulfilled. The commercial tenders were auctions in which the highest bidders were given a chance to buy shares from the state with a combination of cash and privatization and compensation certificates. Thus, they tended to allow insiders and, in some cases, outsiders to gain control of shares in addition to those that could be acquired using the other methods. This method was more popular than cash sales, and, for the full sample, just under 7 percent of total equity was privatized using this method.

As the previous discussion reveals, the privatization methods differed in terms of the opportunities they provided for the initial ownership concentration. I assume that the choice of the privatization methods was exogenous to current enterprise performance and was related to current performance exclusively through the methods' effect on current ownership concentration. As in most recent privatization programs around the world, the cash received for the share offerings in Ukraine always went directly to the government. As a result, any post-privatization improvements in enterprise performance had to result from ownership structure changes rather than from new cash resources made available to the privatized firms through the share offerings.

Table 6 presents the ordinary-least-squares (OLS) 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 collinearity. (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 using a specific method on the measures of ownership concentration, compared with the effect of privatizing that equity at privatization certificate auctions. These variables alone explain 31 percent of the variation in the linear ownership concentration index (*TIONS*) and 21 percent of the variation in the Herfindahl index (*HTIONS*). 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-sized Ukrainian enterprises, Kyryliuk and Leshchenko (2000) find that in enterprises with better-than-average pre-privatization performance, insiders privatized significant proportions of equity through the dispersed-ownership schemes. It is possible that pre-privatization enterprise performance also had an effect on ownership concentration for the

**Table 6. Ordinary-Least-Squares (OLS) Estimates of the Extent of Ownership Concentration in 1998<sup>1</sup>**

Independent Variables	Dependent Variable	
	<i>TIONS</i>	<i>HTIONS</i>
	Full sample (1)	Full sample (2)
Shares privatized using:		
Lease with buyout	0.065 (0.048)	0.052* (0.020)
Preferential transfer	-0.045 (0.055)	0.014 (0.023)
Free transfer	-0.20** (0.11)	-0.033 (0.045)
Compensation certificates	0.31* (0.10)	0.051** (0.043)
Stock exchange	0.78* (0.19)	0.18** (0.079)
Cash auctions	0.12 (0.43)	-0.082 (0.18)
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; State Property Fund of Ukraine.

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.

<sup>1</sup>Share privatized for privatization certificates at privatization certificate auctions is used as a numeraire.

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 a 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.

## V. Ownership Concentration and Enterprise Performance: Instrumental Variable Results

The original equation (2), as rewritten here,

$$y_i = \mu + \alpha R_i + \gamma X_i + \varepsilon_i \quad (2)$$

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

$$R_i = \lambda_R + \beta_R C_i + \gamma_R X_i + \upsilon_{Ri} \quad \text{and} \quad (3)$$

$$C_i = \lambda_C + \beta_C P_i + \gamma_C X_i + \upsilon_{Ci}, \quad (4)$$

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

Given that there are 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 for each enterprise included in the sample as a set of instruments for current ownership concentration and model  $R_i$  as

$$R_i = \xi + \beta P_i + \delta X_i + \upsilon_i. \quad (5)$$

I estimate equations (2) and (5) jointly using two-stage-least-squares methodology.<sup>7</sup>

The basic results for the second-stage equation (2) are presented in Tables 7 and 8. Columns 1, 5, and 9 in Table 7 present the second-stage coefficients from the two-stage regression for the *TIONS* measure of ownership concentration and columns 1, 5, and 9 in Table 8—for *HTIONS*. 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  $\alpha$  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 the labor productivity measure ( $p$ -value of 0.28). For the Herfindahl index of ownership concentration, the coefficients  $\alpha$  always have the predicted signs and are statistically significant at the 90 percent level or higher.

The relationship between ownership concentration and performance is significant in economic terms, too. The coefficients on the ownership concentration

---

<sup>7</sup>In the first-stage regression, enterprise-specific proportions of equity privatized by different methods are used to generate an estimated, or predicted, value of current ownership concentration for each enterprise. In the second stage, the predicted values of current ownership concentration are regressed on the measures of enterprise performance. The ordinary-least-squares (OLS) estimates of ownership concentration presented in Table 6 serve as an approximation of the first-stage regression results for the sample of enterprises.

Table 7. Two-Stage-Least-Squares Regressions of Enterprise Performance on 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 percent (3)	Enterprises with no significant foreign owners (4)	Full sample (5)	Full sample (6)	Sample PR98>50 percent (7)	Enterprises with no significant foreign owners (8)	Full sample (9)	Full sample (10)	Sample PR98>50 percent (11)	Enterprises with no significant foreign owners (12)
Ownership concentration ( <i>TIONS</i> )	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 percent		-0.078 (0.13)				-0.0049 (0.056)				-0.63 (3.18)		
Dummy for state share 50.1–100 percent		-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; 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 percent indicates that only enterprises with more than 50 percent of equity privatized as of the end of 1998 were included in the regressions.

**Table 8. Two-Stage-Least-Squares Regressions 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 percent (3)	Enterprises with no significant foreign owners (4)	Full sample (5)	Full sample (6)	Sample PR98>50 percent (7)	Enterprises with no significant foreign owners (8)	Full sample (9)	Full sample (10)	Sample PR98>50 percent (11)	Enterprises with no significant foreign owners (12)
Ownership concentration ( <i>HTIONS</i> )	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 percent						-0.017 (0.059)				0.38 (3.26)		
Dummy for state share 50.1–100 percent						-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; 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 percent indicates that only enterprises with more than 50 percent of equity privatized as of the end of 1998 were included in the regressions.

variable increase if compared with the simple cross-section regressions of the total factor productivity estimate and material cost performance using the 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 *TIONS* 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 the Herfindahl index of ownership concentration, the increase in ownership concentration from the median value of 1.49 to the seventy-fifth 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 revenue 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 stake and the blocking stake) into the basic specification (reported in columns 2, 6, and 10 of Tables 7 and 8) and also undertake regressions for the sample limited to firms with controlling stakes privatized (reported in columns 3, 7, and 11 of Tables 7 and 8). With both types of controls, the coefficients on ownership concentration remain statistically significant at the 90 percent level or higher 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. The instrumental-variable story presented in this study 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 acquired concentrated ownership stakes in better-quality 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 7 and 8. 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 the possibility that foreign investors improve the cost performance of enterprises for reasons different from concentrated owners' greater ability to resolve an agency problem than dispersed owners.

Overall, this article finds that nonstate 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 article also finds that, in contrast to predictions made by many observers of early transition, privatization methods had a lasting effect on ownership structure in Ukraine. Although the article also finds that for a cross section of firms, concentration of ownership by foreign companies

and banks is associated with better performance than concentration of ownership domestically, further study is needed to determine the channels through which foreign ownership affects performance and to address the possibility that foreign owners acquired better-quality enterprises after privatization.

## VI. Concluding Remarks

The article's findings have several important policy implications. First, the article questions the effectiveness of mass privatization methods that led to a dispersed post-privatization ownership structure and suggests that privatization that grants significant ownership stakes to single parties may bring about greater efficiency gains than privatization that disperses ownership. Second, it finds that several years after privatization, the ownership structures of individual enterprises depend, to a significant extent, on the privatization methods used. Thus, if, owing 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 future privatizations and making the 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 (whether foreign or 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, the agency costs of dispersed ownership may be outweighed by the benefits of the risk diversification and access to capital afforded by the arm's-length capital markets. This second-best approach does not address the legitimate equity concerns regarding privatization. These concerns can be addressed in a number of ways, including by improving the quality of institutions of investor protection, increasing the transparency and liquidity of the capital markets, and transferring most privatization revenues to the public.

It is important to stress that a number of important questions remain. First, the study's empirical evidence did not identify all the channels through which ownership concentration affects performance. I have argued here 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, concentrated owners may reinvest more profits than dispersed owners and, thus, increase their enterprises' productivity. Second, concentrated investors (especially foreign investors) may have better access to new technology. Third, concentrated investors may be better at replacing incompetent managers with competent new ones. In any case, the findings show that ownership concen-

tration affects performance. Further research is needed to determine the precise channels through which this effect is transmitted. 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 market infrastructure and institutions for investor protection.

This study'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, the findings have implications for the design of the future privatization efforts in Ukraine. Starting in late 1999, medium-sized and large enterprises have been privatized by selling large packages of shares. The government has invited foreign investors to participate in privatization tenders. Some critics of the government have argued that this new approach is a result of the urgent need to increase government revenues and not of a careful search for an effective privatization model. The good news is that in this instance the political process may have a positive side effect on the Ukrainian economy. Second, the results for Ukraine may be generalized to other countries in the region. Ukraine's privatization program was similar to those adopted by other CIS countries, which possess similar institutional environments for arm's-length corporate governance (World Bank, 1996; EBRD, 1998). Finally, the study's findings may be useful for designing privatization programs in countries yet to embark on such efforts (such as Belarus, China, Cuba, and Vietnam).

## REFERENCES

- Aghion, Philippe, and Olivier Blanchard, 1996, "On Insider Privatization," *European Economic Review*, Vol. 40, No. 5, pp. 759–66.
- Anderson, James H., Georges Korsun, and Peter Murrell, 2000, "Which Enterprises (Believe They) Have Soft Budgets?: Evidence on the Effects of Ownership and Decentralization in Mongolia," *Journal of Comparative Economics*, Vol. 28, No. 2, pp. 219–46.
- Anderson, James H., Young Lee, and Peter Murrell, 2000, "Competition and Privatization Amidst Weak Institutions: Evidence from Mongolia," *Economic Inquiry*, Vol. 38, No. 4, pp. 527–49.
- Barberis, Nicholas, and others, 1996, "How Does Privatization Work? Evidence from the Russian Shops," *Journal of Political Economy*, Vol. 104, No. 4, pp. 764–90.
- Berle, Adolf A., and Gardiner C. Means, 1932, *The Modern Corporation and Private Property* (New York: Macmillan).
- Boubakri, Narjess, and Jean-Claude Cosset, 1998, "The Financial and Operating Performance of Newly Privatized Firms: Evidence from Developing Countries," *Journal of Finance*, Vol. 53 (June), pp. 1081–110.
- Boycko, Maxim, Andrei Shleifer, and Robert Vishny, 1995, *Privatizing Russia* (Cambridge, Massachusetts: MIT Press).
- Claessens, Stijn, and Simeon Djankov, 1999, "Ownership Concentration and Corporate Performance in the Czech Republic," *Journal of Comparative Economics*, Vol. 27, No. 3, pp. 498–513.
- Coase, Ronald H., 1937, "The Nature of the Firm," *Economica*, Vol. 4 (November), pp. 386–405.

- Coffee, John C., Jr., 1998, "The Future as History: The Prospects for Global Convergence in Corporate Governance and Its Implications" (unpublished). Available on the web at <http://papers.ssrn.com/so13/delivery.cfm/991020101.pdf?abstractid=142833>.
- Demsetz, Harold, and Kenneth Lehn, 1985, "The Structure of Corporate Ownership: Causes and Consequences," *Journal of Political Economy*, Vol. 93, No. 6, pp. 1155–77.
- Dewenter, K. L., and P. H. Malatesta, 2001, "State-Owned and Privately Owned Firms: An Empirical Analysis of Profitability, Leverage, and Labor Intensity," *American Economic Review*, Vol. 91, No. 1, pp. 320–34.
- Djankov, Simeon, 1999, "Ownership Structure and Enterprise Restructuring in Six Newly Independent States," World Bank Policy Research Paper No. 2047 (Washington: World Bank).
- , and Peter Murrell, 2000, "Enterprise Restructuring in Transition: A Quantitative Survey" (unpublished). Available on the web at [http://papers.ssrn.com/so13/delivery.cfm/SSRN\\_ID238716\\_code001031600.pdf?abstractid=238716](http://papers.ssrn.com/so13/delivery.cfm/SSRN_ID238716_code001031600.pdf?abstractid=238716).
- Djankov, Simeon, and Gerhard Pohl, 1998, "The Restructuring of Large Firms in the Slovak Republic," *Economics of Transition*, Vol. 6, No. 1, pp. 67–85.
- Earle, John S., and Saul Estrin, 1996, "Privatization versus Competition: Changing Enterprise Behavior in Russia," IIASA Working Paper No. 96-049 (Laxenburg, Austria: International Institute for Applied Systems Analysis).
- , 1997, "After Voucher Privatization: The Structure of Corporate Ownership in Russian Manufacturing Industry," SITE Working Paper No. 120 (Stockholm: Stockholm Institute of Transition Economies and East European Economies).
- , 1998, "Privatization, Competition, and Budget Constraints: Disciplining Enterprises in Russia," SITE Working Paper No. 128 (Stockholm: Stockholm Institute of Transition Economies and East European Economies).
- Estrin, Saul, and Adam Rosevear, 1999, "Enterprise Performance and Corporate Governance in Ukraine," *Journal of Comparative Economics*, Vol. 27, No. 3, pp. 442–58.
- European Bank for Reconstruction and Development (EBRD), 1997, *Transition Report, 1997: Enterprise Performance and Growth* (London).
- , 1998, *Transition Report, 1998: Financial Sector in Transition* (London).
- Frydman, Roman, and others, 1997, "Private Ownership and Corporate Performance: Some Lessons from Transition Economies," NYU C.V. Starr Center for Applied Economics Working Paper No. 97-28 (New York: New York University).
- , 1999, "When Does Privatization Work? The Impact of Private Ownership on Corporate Performance in the Transition Economies," *Quarterly Journal of Economics*, Vol. 114, No. 4, pp. 1153–91.
- Glaeser, Edward, Simon Johnson, and Andrei Shleifer, 2001, "Coase versus the Coasians," *Quarterly Journal of Economics*, Vol. 116, No. 3, pp. 853–99.
- Havrylyshyn, Oleh, and Donal McGettigan, 2000, "Privatization in Transition Countries," *Post-Soviet Affairs*, Vol. 16, No. 3, pp. 257–86.
- International Finance Corporation (IFC), 1999, *Emerging Stock Markets Factbook* (Washington: International Finance Corporation).
- Johnson, Bryan T., Kim R. Holmes, and M. Kirkpatrick, 1998, *Index of Economic Freedom, 1997* (Washington: Heritage Foundation and *Wall Street Journal*).
- Johnson, Simon, and others, 2000, "Tunnelling," *American Economic Review, Papers and Proceedings*, Vol. 90 (May), pp. 22–27.

- Johnson, Simon, John McMillan, and Christopher Woodruff, 1999, "Contract Enforcement in Transition" (unpublished). Available on the web at <http://www.hss.se/site/publications/workingpapers/No151web.pdf>.
- Kaufmann, Daniel, and Alexander Kaliberda, 1996, "Integrating the Unofficial Economy into the Dynamics of Post-Socialist Economies: A Framework of Analysis and Evidence," in *Economic Transition in Russia and the New States of Eurasia*, ed. by Bartolomiej Kaminski (Armonk, New York and London: M. E. Sharpe), pp. 81–120.
- Kaufmann, Daniel, and Paul Siegelbaum, 1996, "Privatization and Corruption in Transition Economies," *Journal of International Affairs*, Vol. 50 (Winter), pp. 419–58.
- Kornai, János, 1992, *The Socialist System: The Political Economy of Communism* (Princeton, New Jersey: Princeton University Press).
- , 1995, *Highway and Byways: Studies on Reform and Post-Communist Transition* (Cambridge, Massachusetts: MIT Press).
- Kyryliuk, Volodymyr, and Larysa Leshchenko, 2000, "Performance of Ukrainian Privatized Enterprises: Some Statistical Evidence and Conclusions," *Economic Essays*, Kyiv, Institute of Reforms, Vol. 1, pp. 46–80.
- La Porta, Rafael, and Florencio Lopez-de-Silanes, 1999, "The Benefits of Privatization: Evidence from Mexico," *Quarterly Journal of Economics*, Vol. 114 (November), pp. 1193–242.
- , and Andrei Shleifer, 1999, "Corporate Ownership Around the World," *Journal of Finance*, Vol. 54, No. 2, pp. 471–517.
- , and Robert Vishny, 1998, "Law and Finance," *Journal of Political Economy*, Vol. 106, No. 6, pp. 1113–55.
- Meggison, William L., Robert C. Nash, and Matthias von Randenborgh, 1994, "The Financial and Operating Performance of Newly Privatized Firms: An International Empirical Analysis," *Journal of Finance*, Vol. 49 (June), pp. 403–52.
- Meggison, William L., and Jeffrey M. Netter, 2001, "From State to Market: A Survey of Empirical Studies on Privatization," *Journal of Economic Literature*, Vol. 39 (June), pp. 321–89.
- Nellis, John, 1998, "Privatization in Transition Economies: An Update," in *Case-by-Case Privatization in the Russian Federation: Lessons from International Experience*, ed. by Harry G. Broadman (Washington: World Bank), pp. 13–22.
- Pistor, Katharina, 2001, "Law as a Determinant for Equity Market Development: The Experience of Transition Economies," in *Assessing the Value of Law in Transition Economies*, ed. by Peter Murrell (Ann Arbor, Michigan: University of Michigan Press).
- , Martin Raiser, and Stanislaw Gelfer, 2000, "Law and Finance in Transition Economies," *Economics of Transition*, Vol. 8, No. 2, pp. 325–68.
- Pohl, Gerhard, and others, 1997, "Privatization and Restructuring in Central and Eastern Europe: Evidence and Policy Options," World Bank Technical Paper No. 368 (Washington: World Bank).
- Shleifer, Andrei, and Robert W. Vishny, 1986, "Large Shareholders and Corporate Control," *Journal of Political Economy*, Vol. 94 (June), pp. 461–88.
- , 1997, "A Survey of Corporate Governance," *Journal of Finance*, Vol. 52 (June), pp. 737–83.
- Tandon, Pankaj, 1995, "Welfare Effects of Privatization: Some Evidence from Mexico," *International Law Journal*, Vol. 13, No. 2, pp. 329–49.

- Vining, Aidan R., and Anthony E. Boardman, 1992, "Ownership Versus Competition: Efficiency in Public Enterprise," *Public Choice*, Vol. 73 (March), pp. 205–39.
- Weiss, Andrew, and Georgiy Nikitin, 1998, "Performance of Czech Companies by Ownership Structure," William Davidson Institute Working Paper No. 186 (Ann Arbor, Michigan: University of Michigan).
- World Bank, 1996, *World Development Report 1996: From Plan to Market* (Oxford and New York: Oxford University Press for the World Bank).
- World Economic Forum, 1997, *Global Competitiveness Report* (Geneva).
- , 1999, *Global Competitiveness Report* (Geneva).