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AFTER VOUCHER PRIVATIZATION: THE STRUCTURE OF CORPORATE OWNERSHIP IN RUSSIAN MANUFACTURING INDUSTRY

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ABSTRACT

After Voucher Privatization: The Structure of Corporate Ownership in Russian Manufacturing Industry*

This paper analyses the ownership structure emerging from the Russian privatization process, using information from a sample survey of 439 state and privately-owned manufacturing companies conducted in July 1994, just after the voucher programme was completed. The Russian ownership structure calls for a new approach to the analysis of corporate control because of the presence of multiple types of owners pursuing conflicting objectives and facing different constraints, and because of the weakness of other corporate governance mechanisms in the Russian economy.

We distinguish four important categories of owners: the state, workers, managers, and outside investors (of which we consider several types). Our empirical results include new findings on the distribution of ownership across these categories, on the implications of alternative privatization methods for ownership structure, on the incidence of non-voting and voting shares, and on the extent of concentration of ownership within groups (with a particular focus on outside blockholders). As potential determinants of the ownership structure, we investigate measures of the size, complexity, capital intensity, and industrial relations of firms, the impact of regulation and other state actions, and the heterogeneity of the firm's productive activities and of its work-force. Finally, we examine the effects of ownership structure on enterprise performance, measured by labour productivity, several types of restructuring, and an overall index of restructuring activity.

We find evidence of positive effects of private ownership on enterprise performance. The effects vary across types of private owners, however, with managerial and institutional investor ownership having the strongest and most robust impacts, the latter accounted for mostly by investment fund ownership, which has an impact estimated to be quite large in a number of specifications. Remarkably, the impact on performance of outsider blockholders appears to be strengthened in the instrumental variables (IV) estimates compared to the ordinary least squares (OLS) estimates, suggesting that the privatization

investment funds. Significantly, strong evidence is found that institutional investors in Russia are trying to hold blocks of shares in particular companies, giving them more influence on behaviour in the key firms that they have selected than would be implied by the aggregate numbers noted above. The paper finds that around 39% of privatized firms had an outside blockholder with at least 10% of voting shares, in large part because each firm appears to have only one outside owner; only 16% of firms that have a 10% blockholder have more than one such blockholder. The evidence thus suggests that institutional investors tend either to acquire large stakes or not to invest at all. These findings are strengthened when the issue of non-voting shares is taken into account properly.

The final part of the paper is concerned with whether private ownership affects performance, measured by labour productivity, restructuring actions and an index of restructuring. One of the main methodological advances in the paper is to take into account the issue of reverse causality – the possibility that a privatization process which was so driven by insider choice might have selected the better firms for private ownership, and the best firms for insider domination. The paper finds considerable evidence for this view. The main finding is that private ownership does improve enterprise performance, with ownership by managers and by institutional investors having the strongest effects.

Thus Russian privatization did not lead to an ideal ownership outcome. Because institutional investors have taken a blockholder view of voting shares in selected companies, however, they can exercise some influence in key sectors. This is already acting to improve enterprise performance. As the secondary market becomes more established and the capital market becomes more liquid, it seems likely that this process will accelerate.

NON-TECHNICAL SUMMARY

Russia has recently undergone what is probably the largest and most rapid privatization in history. In a period of around two years, some 122,000 companies have changed from state to private hands. These dramatic changes represent one of the most significant elements in the Russian government's reform policies. But the issue remains open as to who owns Russian firms now and whether the new private owners can bring to bear effective governance to transform corporate decision-making, in a situation where capital market institutions are at best fledgling. This paper draws on the largest enterprise sample taken in Russia: a random sample of 439 state and privately-owned firms conducted just after the voucher privatization programme was completed in July 1994.

We investigate three questions: Who owns and controls Russian firms post-privatization? What characteristics influenced ownership structure? What are the effects of different ownership arrangements on corporate governance? The sample suggests that the privatization process has successfully transformed the balance of state to private ownership in Russia: from virtually a 100% share in the Soviet era, the state's average holding has fallen to 38% across all Russian firms (including the 27% of previously state-owned firms which had not been privatized by the summer of 1994), and down to only 15% in privatized enterprises. But the new private owners are not the external private actors or institutions typical of Western capital markets. Disproportionately, private ownership has gone into the hands of 'insiders' – managers, workers or both. Thus, in all privatized firms, insiders on average hold 66.1% of shares, divided between workers with 46.2% and managers with 19.6%. Outsiders hold only 18.9% of all shares. Analysing firms according to dominant ownership (a majority stake) shows that 50% of privatized firms are 'worker owned', 15% are 'management owned' and only 9% of enterprises are 'outsider owned'. Enterprises fall fairly clearly into these categories. Thus Russian privatization has led primarily to worker or management ownership.

The second theme of the paper is to explore the factors determining ownership structures in more detail. We establish that the choice of different options was significant in determining ownership structure, with option 1 (one of three methods that could be chosen by Russian enterprises in the State Privatization Programme) reducing the probability of insider dominance, and leased buy-out increasing it. The paper also investigates the nature of outsider ownership, showing that the major outside investors are individuals, domestic firms and

process may have contained a negative selection bias with respect to ownership by outside investors.

JEL Classification: C30, G32, L10, L32, L33, P20, P31
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1. Introduction

The recent mass privatization and the new ownership structure in Russian industry are not only fascinating topics with important implications for Russia's transition to a market economy, but they also call for a reconsideration of standard analyses of ownership, control, and firm behavior. By any standard, the Russian privatization program was extraordinarily rapid, involving the "changing of ownership type" of about 122,000 enterprises since 1992, according to official statistics (Goskomstat (1996)), and there has been considerable speculation about the resulting characteristics and consequences of the corporate ownership and control structure.[1] The principal discussions have concerned the extent to which the privatized companies are dominated by "inside" owners - managers and other employees - and the potential for private outside investors - particularly institutional investors such as banks, investment funds, and foreign investors - to enter and exercise control. Clearly the issue deserves attention, for economic theories predict different performance of firms, depending not only on whether they are privately or state-owned and whether privately owned firms are insider- or outsider-controlled, but also according to whether the controlling group of insiders consists of managers or workers and whether the outside investors are concentrated or dispersed.[2]

In the current situation in Russia, the ownership structure and the ability of new private owners to exercise effective control are particularly important in view of both the substantial restructuring likely to be necessary for many industrial enterprises - including *inter alia* the need for new technologies, quality improvements, and, in many cases, large-scale layoffs and shutdowns - and the manifest weakness of alternative governance mechanisms. As in other transitional economies,

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[1]See, e.g., Aoki and Kim (1995), Blasi and Shleifer (1996), Boycko, Shleifer, and Vishny (1995), Earle and Estrin (1995), Frydman and Rapaczynski (1994), and McFaul (1996). Other studies are cited below.

[2]Reviews of Western literature include Boardman and Vining (1989) on state ownership; Bonin, Jones and Putterman (1993) on employee ownership; and Blair (1995) and Shleifer and Vishny (1995) on standard corporate governance issues, including ownership concentration. In the transition context, see, e.g., Aghion, Blanchard, and Burgess (1994), Earle and Estrin (1995), and Tirole (1991).

credit markets and bank monitoring are undeveloped, competitive forces are only beginning to operate in both factor and product markets, there is a general lack of reliable information to evaluate company and managerial performance, and secondary markets for shares are largely absent.[3] Moreover, the weakness of the legal framework for corporate governance, especially the poor enforcement of managerial obligations and minority shareholder rights, permits corporate decisions to be determined by the private interests of the controlling group. Yet there has been surprisingly little empirical analysis of the actual ownership structures which have resulted from the various privatization methods, nor of the degree to which important new owners have been able to translate their nominal ownership stakes into roles in corporate governance and genuine influence over the behavior of "their" firms.[4]

This paper analyzes the new ownership structure emerging from the Russian privatization process using the results from a survey of 439 industrial enterprises conducted in July 1994, just after the conclusion of the voucher privatization program. We argue that the peculiarities of ownership structures and financial market institutions in Russia require a reconsideration of conceptual approaches to the analysis of corporate ownership, control and behavior. In the corporate finance literature, the standard approach treats the case of a large company characterized by high dispersion of ownership, homogeneity of objectives among all or nearly all owners, and ease of exit through well-functioning stock markets; in many cases, competitive product and factor markets are also assumed. While these assumptions may often be violated in market economies as well, and indeed we argue that they are becoming ever less appropriate with the recent increases in employee and institutional ownership in the U.S. and the partial privatization of large companies in Western Europe, they are patently false in Russia. Ownership even of very large Russian companies tends to be much

[3]For further discussion, see Frydman *et al* (1993), Earle and Sapatoru (1994), or Berglof (1995).

[4]The most extensive empirical work on Russian ownership structure are Blasi (1994, 1995, and 1996) and Blasi and Shleifer (1996). We discuss this work and the limited official data available in subsection 2c below. Discussions of the roles of some particular types of owners in Russia can be found in the following: Akamatsu (1995) and Frydman, Pistor, and Rapaczynski (1996) on voucher investment funds; Belyanova and Rozinsky (1995), Dittus and Prowse (1996), and Litwack (1995) on banks; Pistor and Turkewitz (1996) on the state; Earle and Estrin (1996) on workers; and Shleifer and Vasiliev (1996) on managers.

less dispersed, and the strong presence of inside and/or state ownership in many firms implies that objectives may be quite heterogeneous across different groups of owners. Exit of owners from Russian firms is usually far from easy; thus, the ownership structure tends to shift only slowly, share prices (where available) provide little information on firm performance, and, like large blockholders in the West, outside investors may tend to be locked into their holdings, raising their incentives to actively monitor managers.[5] The potential importance of governance by outside investors is underlined by the strong presence of insider and state ownership and by the weakness of legal regulations, competitive markets, and bankruptcy procedures as devices to discipline firm behavior in the transition environment. . .

In section 2a, we briefly review relevant literature on corporate finance and governance, emphasizing recent work that recognizes the possibility for some types of divergence of interests among owners. The situation in many Russian corporations, however, demands closer attention to conflicting objectives among owners, and in section 2b we propose a cooperative bargaining model, akin to Aoki's (1984) stakeholder model of firm behavior, which allows for such possibilities. Groups of owners are distinguished according to the different objectives each is likely to pursue and the different kinds of constraints each is likely to face (including the ability of the owner to restructure, to raise new capital, to adopt superior technology, etc.). To motivate our subsequent empirical analysis, we posit illustrative objective functions for the four groups of owners that we believe to be important in the Russian case: the state, workers, managers, and outsiders (of which we distinguish individual from various kinds of institutional investors). We develop two approaches to characterizing the determinants of the distribution of bargaining power, in terms of influence on enterprise behavior, among these groups. With respect to the first approach, the bargaining power of a group is a function of its ownership stake, the stakes of the other groups, the concentration of ownership within the membership of the group, the concentration within the membership of the other groups, and some other variables. With respect to the second approach, we seek to classify firms according to their potential control by a dominant group presumed to hold all bargaining power, and we also distinguish firms lacking such a dominant group (in cases where no single group has a large

[5]Coffee (1991) develops this argument with respect to institutional investors in the U.S.

shareholding). It is important to emphasize that we view these approaches not as theories susceptible to econometric testing - for that, much more structure would be needed - but rather as guides useful in organizing the data. Nonetheless, our conceptual framework is somewhat novel in that it recognizes the potential for fundamental conflicts of interest among multiple types of owners of a given firm. Standard analyses have largely neglected this issue, despite the fact that ownership structures in market economies share some of these features and are even evolving to some degree in the direction of greater concentration and heterogeneity of owner-types. Section 2c describes the existing sources of information and previous analyses of the post-privatization ownership structure in Russia, and it presents our enterprise data, which was collected by the World Bank and the All-Russia Center for Public Opinion (VTsIOM) in July 1994.

We apply the approaches to an analysis of the new ownership structure of Russian manufacturing industry in section 3. Distinguishing the firms which have undergone various types of privatization processes from the remaining state enterprises and from the newly established private (*de novo*) firms, section 3a describes the distribution of shares across different types of owners and the composition of our sample of firms according to their type of dominant owner. Section 3b discusses the incidence and characteristics of continued state ownership, including both state enterprises and the state shareholding in partially privatized firms, while section 3c presents the ownership structure for the entire sample of old Russian manufacturing firms by industry, region, and size. Our statistical tests provide evidence of systematic selection effects of these characteristics on whether firms are privatized, on the size of the private shareholding, and on the shareholdings of different types of private owners.

Section 4 focuses on the privatized sector, analyzing the results from both the State Privatization Program and the earlier-initiated lease-buyouts, the latter representing a process and a group of enterprises which has been ignored in most studies. In section 4a, we analyze the differences in shareholding structure and in the pattern of dominant owners emerging from the three options under the State Program and the lease-buyouts. Section 4b describes the distribution of control rights across different types of owners, including a discussion of the different classes of ordinary and preferred shares in privatized companies in Russia. Although the widespread presence of preferred shares without voting rights is an important feature of Russian privatization and corporate

governance, with implications for corporate control and takeovers, they have received little attention in previous analyses. Finally, section 4c reports the results of statistical tests for the effect of privatization method on share structure. We find that the choice of privatization method was far from irrelevant, as has sometimes been claimed, and indeed that it had large and statistically significant effects on the resulting ownership structure.

In addition to the potentially deleterious effects of insider ownership on corporate governance and restructuring, a second and more conventional risk of Russia's mass privatization program was the possibility that it would give rise to a high level of dispersion among outside owners, many of whom would have acquired their shares by participating in voucher auctions.[6] Indeed the two risks are likely to be complementary inasmuch as insider control is enhanced when outsiders are dispersed, while more concentrated outside ownership may be more influential when inside shareholdings are themselves dispersed among rank-and-file workers. Section 5 uses information from our enterprise data set to analyze the extent of concentration among owners of particular types. Section 5a provides measures of dispersion for all owner-types, while section 5b focuses on the prevalence and size of different types of outside blockholders. Section 5c reports statistical tests of the impact of the method of privatization on the size of outside blocks and on the likelihood of a firm having one or more blockholders of a given size in its ownership structure.

In the sixth section, we analyze potential determinants of ownership structures in Russia, drawing on the approach of Demsetz and Lehn (1985), who identified value-maximizing size, control potential, regulation, and amenity potential as principal sets of causes of the degree of concentration among outside owners of public corporations in the U.S. As we emphasize throughout the paper, the issue in Russia is not only the concentration, but also the identity of owners; therefore, we extend the analysis to consider factors likely to be important to the state and/or to employee-owners, and more generally to other factors that could have differential effects on the value of the firm to different types of owners or on their ability to acquire it through the privatization process. Among the factors are capital intensity and cost, industrial relations, interference and support from the state, affiliation

[6]Ownership concentration, usually in the form of large blockholders, is of course a central focus of research on Western corporate governance. See, e.g., the summary in Shleifer and Vishny (1995).

with the military-industrial complex, firm "quality," assets of the firm of particular importance to workers (including "social assets"), and the degree of homogeneity of production and the labor force. Finally, we consider the impact of these determinants in the context of an analysis of the structure of bargaining over ownership rights that was embodied in the design of the Russian privatization process.

Section 7 reports the results of our investigation concerning whether interfirm differences in ownership structure, measured along the dimensions we have presented in the paper, have yet been translated into differences in enterprise performance. As proxies for performance in the Russian situation, we consider labor productivity, an index of overall restructuring, the layoff rate, a dissimilarity index for the structure of sales in 1994 compared to 1990, and the magnitude of employment change associated with unbundling, and examine their statistical association with the shareholdings of different types of owners, with classification by dominant-owner type, and with the size and presence of outside blockholders, defined in various ways.

Section 8 concludes with a brief summary of the several themes brought out by this research, and their implications for both the Russian transition to a market economy and for the study of corporate governance more generally.

In any discussion of Russian privatization, the questions of timing and data quality almost inevitably appear, and we close this introduction by describing our position on these issues. Some might argue that it is still too early and that the data is of insufficient quality to justify research on systematic patterns of ownership structures and their relationships with measures of enterprise performance. The privatization program only finished its first, "mass" phase in mid-1994 (the time of the survey from which we draw most of our information in this paper), and sales of the remaining shares and companies have been ongoing since then (albeit at a much slower pace).[7] Secondary

[7]Mention should be made of the so-called "loans for shares program" through which a very small number of very valuable companies (typically in mining and other natural resource sectors) were sold, mostly to banks through auctions organized frequently by the banks themselves, in 1995. Obviously, our data contains no information on these companies, nor on those new banks and financial-industrial groups often said to dominate Russian financial markets. Our information and analysis is concerned rather with the bulk of industry, at least where "bulk" is measured by employment rather than by "value" and controversy.

trading has also been occuring, although again most evidence indicates that it has so far been limited. But other types of policies (including stabilization) have been continually evolving, and the environment has been extremely volatile. In a situation of great chaos and uncertainty, random experimentation may seem to be the order of the day, making it hard to make any predictions about the direction to be taken by "restructuring" enterprises. Moreover, together with all the other changes, the ways of measuring those changes (accounting systems and statistical reporting) are themselves changing, making it difficult to monitor and calibrate, a problem still further exacerbated by the years of near-hyperinflation. Perhaps it would indeed be better to "let the dust settle" a bit before trying to determine the new lay of the land.

Against this epistemological pessimism, we would argue that much can be learned in Russia, even in the short run, and that the situation is too exciting (and perhaps dangerous) to wait for historians to sort out in the next generation. Moreover, if one is ever in the future to be able to chart the path of transition, including thorough understanding of the starting point, then the time for gathering data and trying to make sense of events is already slipping away.

But most importantly, we believe that even the exploratory results offered in this paper are instructive. The Russian ownership structure is unlike any ever seen in world history and simply documenting the several dimensions of its uniqueness, of the privatization process that brought it about, and of the role of different actors and new owners in that process appears to us to be well worthwhile. Moreover, to the surprise of many, including to some extent ourselves, the data appear to indicate that, already in mid-1994, the ownership structure was indeed systematically related to enterprise behavior. This remains true even when we treat the ownership structure itself as endogenous, to try to eliminate any selection biases arising from the privatization process. The future may be hard to forecast, certainly no less so when the object is Russian corporate governance or indeed practically any aspect of the Russian economy, but we believe that the data and analyses offered in this paper do contribute to understanding the structure of corporate ownership and its implications in Russia just after the voucher program was completed.

2. Conceptual Approach and Data

Previous economic research on the ownership, control, and behavior of firms has generally

followed one of two paths. A first path, which includes most of the corporate finance literature, has focussed on the governance of large public corporations in developed market economies, while a second has compared a particular ownership type - most commonly, either the state enterprise or the producer cooperative - with the conventional capitalist firm. Although they are useful starting points, we argue that the approaches in these literatures are not fully appropriate to grapple with some of the central corporate control issues in Russia and many other transition economies. The transition feature which we believe to be particularly important is the co-existence of multiple types of owners who seem likely to have conflicting objectives, who frequently have sizable and rather concentrated stakes, and whose behavior is relatively unconstrained by other corporate governance mechanisms and market institutions. In this section, we first summarize relevant aspects of the previous literature very briefly, in subsection 2a, in order to evaluate its applicability to the Russian context. Then we present, in 2b, the approach to organizing the data that we employ in the rest of this paper. Subsection 2c reviews the existing sources of information on Russian ownership and corporate governance and describes our data set; in addition to presenting the sample of what we label as "old" enterprises (formerly and/or currently state-owned enterprises), we also analyze the composition of the "new" (private firms created *de novo*).

It bears emphasis that, although we believe analysis of the Russian ownership structure positively demands a new conceptual approach, many of the same considerations are also valid, if somewhat attenuated, in the Western context. Ownership by managers and nonmanagerial employees (see, e.g., Blasi and Kruse (1991)) and by institutional investors (e.g., Pound (1992)) appear to be very much on the rise in market economies, and these new types of owners co-exist in some companies and some countries with strong ownership presence by governments and banks, and with cross-ownership arrangements with "stakeholder" firms; each of these groups, which are also found in Russia, may plausibly pursue fundamentally different objectives from the others. Paradoxically, the Western ownership structure may be converging in some ways towards the current structure in Russia, an analysis of which may therefore have broad lessons for other economies as well.

2a. Standard Approaches to Corporate Ownership and Control

The relationship between ownership and control in large firms is complex and multi-

dimensional, and it is not surprising that research has drastically simplified its analysis. The standard approach in the corporate governance and finance literature assumes that all owners share the same objective - profit maximization - and looks primarily to concentration of ownership, usually via a large "blockholder," to internalize the benefits of collective action and overcome the agency problems in monitoring management (see, e.g., the summaries in Blair (1995) and Shleifer and Vishny (1995)). Discussions of the theoretical possibility of the separation of ownership from control have been around since at least Berle and Means (1932) and have mushroomed into a large literature on agency and ownership beginning with Jensen and Meckling (1976), although only rather recently have the private benefits to control by a dominant owner come under direct empirical scrutiny (e.g., Morck, Shleifer, and Vishny (1988) on entrenchment of managerial owners, and Barclay and Holderness (1989) on the premium paid for large blocks of shares).

Theoretical research on possible conflicts among owners has considered managerial versus outside ownership (Jensen and Meckling (1976)) and securities with different combinations of control rights and cash flow claims (Grossman and Hart (1988) and Harris and Raviv (1988)). But these and other examinations of the costs of concentrated ownership (Shleifer and Vishny (1995)) generally parallel closely the analysis of the owner-manager relationship in the traditional principal-agent model: a single controlling investor is supposed to pursue such typical managerial objectives as prestige, power, entrenchment, the ability to pursue pet projects, and possibly diversion of assets. The framework has been expanded by Zwiebel (1995) to consider the case of multiple small blockholders who together share the control benefits (presumed to be divisible), but the problem posed is only how to distribute those benefits, not how to resolve conflicts among objectives which are fundamentally opposed.[8] In Russia, however, as we shall show, the privatization process has resulted in a set of owners that seem likely to have very different objectives, and it is implausible that secondary markets will alter this anytime soon.[9]

[8]Jensen and Meckling (1976) analyze potential conflicts between debt and equity holders and between managerial and outside owners, and Berglof and von Thadden (1994) study the problem of differing interests between short-term and long-term investors, but the divergence of interests in these cases seems likely to be smaller than that between the state, workers, managers, and outside investors, the very diverse set of dominant actors in the Russian ownership structure.

[9]We discuss evidence on the evolution of the ownership structure in section 2c. below.

| Independ
Variables
Dominan
Type
voting) |
|---|
| PO |
| -WO |
| -MO |
| -INO |
| -OO |
| -NO |
| --Institu |
| ---Bank |
| ---Inve
Fund |
| ---Fore
Investo |
| ---Dom
Firm |
| --Indivi |
| Adj. R^2 |
| N |

Moreover, the Russian environment places relatively few constraints on the ability of controlling owners to pursue non-profit-maximizing objectives. As in other transitional economies, credit markets and bank monitoring are largely undeveloped, competitive forces are only beginning to operate in both factor and product markets, there is a general lack of reliable information to evaluate company and managerial performance, and secondary markets for shares are almost completely absent. Moreover, the weakness of the legal framework for corporate governance, especially the poor enforcement of sanctions on expropriatory behavior by managers or controlling shareholders, permits corporate decisions to be determined by the private interests of a controlling group. The corporate governance problem in Russia is therefore much greater than the conventional problem, which focusses on the tendency for managers to overconsume perquisites or pursue pet projects. Various forms of asset stripping, transfer pricing at below-market rates, "spontaneous privatization," and other forms of outright theft have been rife, and a principal challenge in Russia is to reduce such abuses as much as possible.

While the corporate finance literature has focussed on the benefits and costs of block ownership, other bodies of research have investigated particular types of ownership forms, particularly producer cooperatives, entrepreneurships, managerial buyouts, and state enterprises.[10] The basic hypothesis in these literatures is that such firms may behave not as profit maximizers, but as if they were maximizing other objectives (such as growth, employment, income stability, personal aggrandizement, political support, or other private benefits), and that they may face different constraints (for example, in access to external financing or in the costs of collective action) than "conventional" firms. Most attention has been paid to producer cooperatives and to state enterprises, both in comparison with firms owned by private outsiders, and the typical approach is to classify firms into one or the other type, assuming that firms may be discretely classified. While that assumption

[10]Bonin, Jones, and Putterman (1993) summarize much of the empirical and theoretical research on employee ownership; Boardman and Vining (1989) and Megginson, Nash, and Van Randenborgh (1994) examine the behavior of privatized enterprises; and Shleifer and Vishny (1994) model the behavior of politicians in state-owned and partially privatized firms. The literature on managerial ownership stems from Jensen and Meckling (1976) and includes Cubbin and Leach (1983), McConnell and Servaes (1990), Morck, Shleifer, and Vishny (1988), Short (1994), and Stulz (1988); while Kaplan (1989) and Smith (1990) examine the performance effects of management buyouts.

may fit some empirical situations, in Russia, as we shall show, the ownership structure of a typical industrial firm includes several groups - workers, managers, the state, and various types of private outsiders - and frequently each has substantial holdings. This creates ambiguities in the classification of firms, and it suggests that comparisons should embrace a wider set of types than in the typical pairwise comparison.

To summarize, an issue which has been relatively little addressed in studies of ownership and control in market economies, but which is critical for understanding Russia and other transitional economies, is how the conflicting interests of different types of owners are to be represented in the decision-making and manifested in the behavior of the firm.[11] To a large extent, how conflicts among owners are resolved is a political question, dependent on the idiosyncrasies of the particular parties and of the relationships peculiar to the situation. Economists have tended to relegate these issues to the black box labelled "bargaining power" and been loathe to consider them further.[12] However, where other bargaining situations have come under the scrutiny of economists (for instance, in union-management negotiations over wages and employment), the approach has generally drawn from the theory of cooperative games. Such a bargaining framework may also be applied to the problem of resolving differences among owners with different objectives.

2b. Corporate Control in a Bargaining Framework

The implication of this reasoning is that corporate control may be analyzed as the outcome of bargaining among the owners of the firm. Analogously to other bargaining games, the outcome will be a function of the different objectives and the relative bargaining power of the parties concerned. In the ownership-control example, moreover, there are some natural ways to parameterize bargaining power. The most important set of variables involves the distribution across

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[11]There is also the issue of how to characterize the environment of a multiple-owner-type-firm. If producer cooperatives face discrimination in capital markets or if state-owned firms have advantages in extracting support from the treasury, to what extent are such attributes valid for mixed worker-outsider-owned companies or mixed state-private firms?

[12]One of the consequences of avoiding these issues is an identification problem in most bargaining analyses. In general it is impossible to distinguish whether differences in outcomes are due to differences in bargaining power or differences in the objectives of the parties.

groups of voting shareholdings, which confer the right to participate in decision-making, and the concentration of ownership within the groups. We define groups of owners such that objectives may be reasonably homogeneous within groups. The motivation for including ownership concentration as a bargaining power determinant is, of course, the problems of collective action associated with exercising the influence associated with a given level of shareholding. But the presence of multiple groups complicates the conventional analysis of ownership concentration, as we must consider the level of concentration or dispersion for all groups. First, dispersion within a particular group is likely to weaken its bargaining power. Second, dispersion among other owners (with other objectives) is likely, ceteris paribus, to raise a group's bargaining power.

It is not the purpose of this paper to solve this bargaining model; indeed, to derive an explicit solution, much more structure would be necessary. Rather, our intention is only to motivate the approaches we take to organizing the data in subsequent sections of the paper: our categorization of different types of owners, our focus on control rights (voting shares), and our analysis of ownership concentration and of the interactions between different owner-types. For this purpose, it is useful to express the model slightly more formally.

The outcome of a cooperative game in which all the owners' interests are represented can be expressed as the solution to a Nash asymmetric bargaining problem:

$\Gamma = \Pi_i (F_i - \underline{F}_i)^{\alpha_i}$,

where Γ is the joint maximand for all parties, and the F_i refer to the objective functions corresponding to each of several types of owners. The underlined variables $\underline{F}_i$ refer to threat points (participation constraints), and the α_i to relative bargaining power, where, without loss of generality, we can normalize so that $\Sigma_i \alpha_i = 1$.[13]

In the analysis that follows, we group owners in a number of alternative ways:

- state versus private
- state versus private insiders versus private outsiders
- state versus employees versus managers versus private outsiders

[13]The formulation here is quite similar in some respects to the analysis of Aoki (1984), but the focus there is on different types of stakeholders, including employees, suppliers, and customers, while here it is on ownership; a more general analysis would subsume both.

- state versus employees versus managers versus institutional investors versus individual outsiders.[14]

Figure 1: Tree Structure of Types of Owners

These alternative groupings are shown in figure 1. At the top level, owners are divided into state and private. Many discussions of privatization focus only on the state-private distinction, but, as we have argued elsewhere (1995), it may be important to consider differences among private owners: insiders versus outsiders and different types of insiders and outsiders. Within insiders, we distinguish managers from workers, and within outsiders we distinguish different types of investors, including individuals and several kinds of institutions: banks, investment funds, other domestic firms, and foreign owners.[15]

The structure of this disaggregation carries implicit assumptions about the degree of similarity of different types of owners or about the probability that the different groups could form coalitions: all private owners versus the state, or insiders versus outsiders. It is possible, of course, that the coalitions that are formed in practice differ from this characterization, for instance that managers and state bureaucrats are allies, that insiders team up with the state to oppose restructuring promoted by outsiders, or that managers and some outside investors work hand-in-hand. Although anecdotal evidence of each of these examples is not hard to find, their relative prevalence in the overall pattern is more difficult to identify. We attempt to do so by analyzing the association of different types of owners in our empirical analysis, below.

Analyzed at the most disaggregated level (but not distinguishing different types of outside investors), the firm's objective function would appear as follows:

$\Gamma = (S-\underline{S})^{\alpha 1}(W-\underline{W})^{\alpha 2}(M-\underline{M})^{\alpha 3}(O-\underline{O})^{\alpha 4}$,

where S, W, M, and O, correspond to the major groups in the ownership structure of Russian enterprises: the state, workers, managers, and outsiders, respectively.

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[14]For the purpose of several analyses, we also disaggregate private institutional investors into banks, investment funds, domestic firms, and foreign investors.

[15]These distinctions may also be justified as reflecting possible differences in ownership concentration, rather than just in the objectives pursued by particular types of owners. To some extent managers may be thought of simply as a concentrated group of insiders, and some institutional investors as just a concentrated group of individual investors.

Our purpose in this paper is not to model corporate behavior explicitly, which renders it unnecessary for us to posit a precise functional form and set of arguments contained in each group's objective function. But it is not difficult to motivate this categorization of types of owners. As an example, we may suggest the following sets of arguments:

$S=S(\beta_S\pi$, Taxes, Employment, Supplies, Benefits, Votes),

$W=W(\beta_W\pi$, Employment, Wages, Hours of Work, Employee Benefits),

$M=M(\beta_M\pi$, Managerial Perquisites, Size of Firm, Other Managerial Benefits),

$O=O(\beta_O\pi$, Other Private Benefits),

where β_i is the proportionate shareholding of the i^{th} shareholder group (with i = S, W, M, and O, alternatively, and $\Sigma_i\beta_i = 1$), π = profits (shared proportionately across shareholders), and the other variables are self-explanatory.

In this formulation, each type of owner cares about profits, but only to the extent of its own ownership stake (β). Thus, an important channel through which privatization may have an impact on enterprise behavior is by raising the weight attached to profits in the objective functions of private actors (as in Boycko *et al* (1996)). The inclusion of several additional arguments in the objective functions for the state and for inside owners illustrates their tendency to pursue objectives at variance with value maximization. Omitted here are the possible negative impacts of state and inside ownership on firm performance due to lack of ability on the part of state bureaucrats or incumbent insiders, due to greater problems in raising outside capital, and due to more difficulty in transferring ownership to new owners better able to manage the company (entrenchment). The objective function for outsiders also includes arguments other than profits, however; such private benefits may be pecuniary (associated, for instance, with production complementarities or with diversion of the firm's cash flow) or nonpecuniary (for instance, amenities from control, as in Demsetz and Lehn (1985)). Some types of outside owners may be more likely to place higher weights on private benefits relative to profits: customers and suppliers, including banks, have an interest in transfer pricing arrangements that allow them to capture a higher proportion of the enterprise's cash flow.[16]

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[16]Under the assumption (as in Jensen and Meckling (1976)) that managers have complete control, outside investors have no opportunity to pursue non-value maximizing objectives, so the standard approach is to contrast outsiders who maximize value and insiders who pursue other

Turning to the bargaining power parameters, we argue that the α_i are in general likely to be functions of the ownership structure, especially the proportion of voting shares (γ) and degree of shareholding concentration (κ).[17] It is important to distinguish concentration among owners of a particular type (κ_i) from concentration among other types of owners with potentially conflicting objectives (κ_j). In addition, there could be some owner-specific variables (x_i):[18]

$\alpha_i = \alpha_i(\gamma_i, \gamma_j, \kappa_i, \kappa_j, x_i)$.

According to this approach, any action of the firm (for instance, some performance or restructuring indicator) can be related to the objective functions and bargaining power parameters, principally measures of share ownership and concentration of different kinds of owners.[19]

In our empirical analysis below, we primarily focus on the distribution and concentration of shareholdings as the determinant of relative bargaining power across owner-types. As we show, however, the ownership structure of many firms is dominated by a single type of owner: either the state, workers, managers, or outsiders. In such firms, it may be more appropriate to characterize bargaining power as completely held by the dominant owner-type; so that, if owner type *i* dominates, the objective function of the firm is the same as the owner type's:

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objectives as well. The analysis here brings out the possibility that each type of owner may attempt to use the company to produce private benefits; even if it is plausible that outside investors with no other connection to the firm are more likely than other types of owners to be oriented towards profits, the issue is ultimately an empirical one.

[17]It is important to distinguish *all shares* (β in the analysis above) from *voting shares* (γ): the proportion of ownership of all shares represents *cash flow rights* and directly affects the owner's objectives, while the proportion of ownership of voting shares represents *control rights* and directly affects the owner's bargaining power. A second-order effect on bargaining power could also come from all shares, inasmuch as a larger stake in the financial outcome of a firm might raise the willingness of a group of shareholders to bear the costs of collective action.

[18]For example, the bargaining power of worker-owners might be enhanced if employees are organized as a trade union.

[19]In this framework, ownership concentration has potential costs (as well as potential benefits, of course), given that each type of owner has an interest in some type of private benefit, in addition to the shared interest in profits. The framework thus extends work on public corporations in the U.S. by Morck, Shleifer, and Vishny (1988), and others, who discuss the non-monotonicity in the impact of managerial ownership on market value, and by Barclay and Holderness (1989), who measure the private benefits to control by the premium paid for large blocks of shares.

$\Gamma = F_i - E_i$.

Such an approach is implicit in many comparative institutional analyses, whether of state-owned versus private firms or of worker cooperatives versus conventional capitalist firms: dominant ownership by some individual or group is presumed to yield absolute control of the company. Different ownership types are thought to differ qualitatively, or at least the differences are so non-linear in the ownership shares that categories are a better approximation than are continuous variables. These studies normally specify some performance or behavioral variables as functions of dummy variables indicating the ownership form, and some other covariates.[20] In our application of this approach to the Russian data, we shall also distinguish firms for which it appears that no owner is clearly dominant, and classify these separately.

We find it useful to organize the classification of owners as shown in figure 2. At the top level, we divide firms into "old" and "new," depending on whether they existed as state enterprises prior to the beginning of economic liberalization or are recently created, *de novo*. Of course, this distinction may not always be entirely clear, as new legal entitities may be simply continuing the activities of state organizations, carrying over their structures, equipment, personnel, and ways of operating. However, prior empirical work on both Russia and East European countries has found enormous differences - in size, industry, and behavior - between firms classified as *de novo* (DNs) and those which existed in the pre-reform period.[21] In any case, our focus on describing the ownership structure in the manufacturing sector renders the argument somewhat less important, given the likely low incidence of new private firms in activities which are for the most part already overdeveloped and declining, as well as highly capital-intensive.[22] Indeed, for most purposes we shall

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[20]In most of the studies cited in Bonin, Jones, and Putterman's (1993) review of producer cooperatives, the variable of interest is a dummy equal to one for a coop and zero for a "conventional capitalist firm." The studies of private versus state ownership cited in Boardman and Vining (1989) use a dummy to indicate the two categories.

[21]See, e.g., Earle and Estrin (1995) on Poland; Earle, Estrin, and Leshchenko (1996) on Russia; and Richter and Schaffer (1996) on Russia.

[22]In fact, the poor quality of statistics on new startup companies precludes strong statements about the proportion of new private firms in manufacturing or elsewhere, but all partial indicators support the contention that entrepreneurs have formed new companies predominantly in the service sector. We present some official information on the new private sector in section 3c below.

restrict our attention to the large firms emerging from the state sector.

Figure 2: Classification of Ownership Forms (Tree)

Continuing with the group of pre-existing ("old") firms, we may divide types of owners into state ("SO") and private ("PO"). SOs are divided into firms which have been partially, but not majority privatized ("PSO"), and those which remain 100 percent state ("SSO"). As before, we divide firms dominated by private ownership, the POs, into insider- and outsider-dominated ("IO" and "OO") and IOs are divided into worker- and manager-dominated ("WO" and "MO"). In both divisions, we also distinguish a group of firms that cannot be clearly classified: "NO" refers to firms which are PO but are not clearly either IO or OO, while "INO" refers to firms which are IO but not clearly either WO or MO. Finally, institutional owners may be divided into banks, investment funds, domestic firms, and foreign investors. Each of these may be associated with somewhat different objectives and thus different enterprise behavior, although we shall see that certain types are much more numerous than others in Russia: in general, the incidence of OO firms is so low that our sample is insufficiently large to permit further disaggregation into types.[23] The precise empirical implementation of these concepts (including the definitions which we employ of "clearly classifiable" and "not clearly classifiable") is described in section 3a below.

2c. Data on the Post-Privatization Ownership Structure in Russia

Only limited information has been available concerning the results of the privatization process for the structure of corporate ownership in Russia. The State Property Committee (GKI) released data on the numbers of privatizations, including some of their characteristics, but rather little on the actual ownership results. Table 1 shows the information available from the Goskomstat (1996) on the ownership of industrial firms.[24] The only published classification divides firms into "state," "mixed," and "private," although these categories are not defined. We conjecture that "state" implies 100 percent state ownership, "private" implies 100 percent private ownership, and "mixed" contains

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[23]We do disaggregate outside investors when we analyze shareholdings and concentration, however.

[24]A few more indicators are available from the Goskomstat concerning the privatization of all enterprises, not restricted to the industrial sector. Because our sample is manufacturing firms, we report only the industry statistics of the Goskomstat.

firms that are partially state- and partially privately owned.

Table 1: Ownership Classification of Industrial Enterprises: Goskomstat Data

More information is available from several surveys. Pistor (1994) reports, based on a sample of 36 privatized firms in six regions (Moscow, Novgorod, Yaroslavl, Ivanovo, Perm, Sverdlovsk), that all employees together (workers and managers are not reported separately) owned an average of 62 percent of all shares, outsiders held an average of 19 percent, and the state retained 19 percent in 1993. Webster *et al* (1994) report on 92 privatized firms in Moscovskaya and Vladimirskaya oblasts in October 1993 that total employee ownership averaged 61 percent, of which managers held 17 percent (the size of the other holdings are unclear). Radygin (1996) reports 52 percent ownership by workers, 14 percent by management, 19.5 percent by outsiders, and 14 percent by the state, although the sampling and coverage of this study is unclear.

Much of the best information comes from the surveys organized by Joseph Blasi, and reported in Blasi (1994, 1995, and 1996), and Blasi and Shleifer (1996). Data from a survey of 127 privatized firms in 1993 indicate that insiders held on average some 65 percent of the shares in 1993, of which 9 percent was held by top managers. Outsiders held only 22 percent, while the state accounted for the remaining 13 percent. Indeed, on the general orders of magnitude of the average shareholdings of these groups in firms in the mass privatization program, there appears to be considerable agreement, also with our survey results, as we discuss below.

The existing sources of information have several drawbacks, however. The sample sizes are small, and sample selection was non-random. Moreover, with the exception of Webster *et al* (1994), it appears that all data pertain only to enterprises privatized through the State Privatization Program, omitting enterprises privatized through leasing arrangements. Yet to omit leased enterprises is to omit an important part of Russian corporate structure. Goskomstat (1996) reports over 25 percent of completed privatizations of enterprises as lease buyouts over the years 1993-95, a result consistent with our survey data (although the latter apply only to manufacturing), as we discuss below.[25]

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[25]The percentage of firms privatized through lease buyouts was 29.5, 20.8, and 29.8 of a total of 42,924, 21,905, and 10,152 firms privatized in 1993, 1994, and 1995, respectively, according to Goskomstat (1996), Table 10.4.6. Webster *et al* (1994) find that leased enterprises were 50 percent more numerous than those in the State Program in the two oblasts they studied, but this appears to be an overestimate of the importance of leased firms on a national basis.

Previous research has also omitted any analysis of firms remaining 100 percent state owned; instead the focus has always been on firms which have participated in privatization (and almost always the State Program, as noted above). For instance, in an otherwise fairly detailed study of state ownership after privatization in Russia, Pistor and Turkewitz (1996) provide no indication of the proportion of firms that had no shares privatized whatsoever. Yet both because some firms were prohibited from privatizing (particularly some of those in the military-industrial complex) and because the managers of others may have been reluctant to do so, the numbers remaining with the state could be large. As shown in Table 1, Goskomstat (1996) reports that 9 percent of industrial enterprises and 16 percent of industrial employment were in the state, municipal, or public institution categories. Again, as we show below, our results are quite consistent, enabling us to use other information these firms to provide a more complete picture of the ownership and behavior of Russian enterprises.

In addition to the sample size and selection problems, the existing studies of Russian corporate ownership suffer from lack of information about such important institutional details as the prevalence of non-voting shares. As we shall show, a significant proportion of insider and state holdings are actually non-voting, which has potentially crucial implications for corporate control in general, and for the role of outsiders in particular. More generally, our survey information is quite rich in collateral information which we exploit to draw up a fuller portrait of the corporate ownership structure.

The survey from which we draw our data was organized by the World Bank and conducted by VTsIOM (the All-Russia Center for Research on Public Opinion) in 439 companies during June and July 1994, just at the close of the voucher privatization process. 394 firms were randomly selected from a complete list of the population of manufacturing firms in Russia with at least 15 employees in 1991, stratified by industry and region to ensure representativeness. In addition to this sample, which includes both state-owned and privatized enterprises, an additional 45 manufacturing firms in the new private sector were interviewed based on regional lists of all companies. As far as we know, this data set is the largest and most representative source containing detailed ownership and other information on industrial firms in Russia. More information about the survey and sampling can be found in Lee (1996).

Table 2 shows the ownership composition of the enterprise sample. Of 430 firms which

provided sufficient information to be classified, 86 were 100 percent state-owned, 299 had undergone some, at least partial, privatization process (listed as "privatized"), and 45 were newly created private enterprises.[26] These categories do not match those of the Goskomstat (1996), because the latter does not distinguish new private firms from privatized enterprises formerly owned by the state - yet we have argued that this is an important distinction. Nonetheless, it is apparent that our sample under-represents new private firms, certainly in terms of number and possibly also in terms of employment and sales.[27] Concerning the division of "old" enterprises, those that are or were state-owned, the results are quite consistent with the Goskomstat data from table 1. Roughly one-quarter of old firms remain 100 percent state-owned, while about three-quarters have been privatized, at least partially. The overall ownership structure in old enterprises (both privatized and 100 percent state) and in *de novo* firms is analyzed in section 3a, and state ownership is analyzed in section 3b, below.

Table 2: Ownership Composition of Enterprise Sample

One potential disadvantage of the data set is that the ownership structure may have evolved significantly, particularly as the state privatizes its remaining holdings and as employees begin to sell their shares (a possibility we emphasized in Earle and Estrin (1995)). From other evidence, however, it appears that rather few such sales have taken place. The so-called "investment auctions" have followed a very slow pace, and the infamous "loans-for-shares" program covered only a small number of companies (if very valuable ones, particularly in mining industries); thus, the state share has changed little in most companies. Moreover, it appears that there have been relatively few sales by employees. According to Blasi and Shleifer (1996) the median across all firms of both employee and

[26]Having "undergone privatization" here means that a formerly state-owned enterprise has either been bought out through a leasing arrangement or that it participated in the State Privatization Program (discussed in section 3a, below), but not necessarily, as the table demonstrates, that state ownership is zero. Indeed, we shall show that some "privatized" firms remained, at the conclusion of voucher privatization in July 1994, overwhelmingly owned by the state.

[27]In fact, it is difficult to know how representative or unrepresentative our *de novo* sample is. The state and privatized firms, on the one hand, and the new private companies, on the other, were drawn from two different population lists. Incomplete reporting, and the difficulty of visiting a strictly proportional number of new private firms, resulted in the new private sector probably being under-represented in terms of numbers and over-represented in terms of employment. *De Novo* firms are discussed further in section 3a, below.

voucher fund sales was 0 percent of all shares (and only 4 and 1 percent, respectively, on average), implying that the share structure has not changed at all in more than half of their companies. Moreover, any expectations of a quick and dramatic sell-off by employees to outsiders, such as occured in Japan in the post- war period (Aoki and Kim (1995)), are contradicted by the results reported by Blasi *et al* (1997) for the year 1996, when employee ownership, both that of managers and of workers, actually rose slightly compared to the previous year. No doubt the share structure will evolve in the longer run. Regardless of how quickly it does so, however, we find it useful to analyze the ownership structure just at the conclusion of the mass phase of Russia's privatization program, which as we show accounted for the overwhelming bulk of the privatization process, and we leave to future research the investigation of the subsequent evolution of that structure.

To examine representativeness, table 3 shows the composition of the World Bank sample of "old firms" (the 394 state-owned and privatized companies, excluding the 45 firms in the new private sector) by our groupings of industry, region, and size (the definitions are explained in the tables). We also show the comparable figures from the population of 10,582 firms from which the sample was drawn. Although sample selection was stratified by industry and region, some non-representativeness in the number of enterprises crept in. It is particularly the machine-building sector (both heavy and light), already quite large in the Russian economy, which appears to be over-represented in the sample. Fuel and energy and metals and chemicals are also over-represented, while wood and construction materials and consumer goods are under-represented. When weighted by 1994 employment, however, the discrepancy is much less: for instance, 40.7 percent of Russian industrial employment was in machine-building, while the corresponding sample percentage is only 44.7 percent (see also Commander, Dhar, and Yemtsov (1996)). The survey exhibits some bias towards larger firms, but regional discrepancies between sample and population appear to be minimal. Although the sample is not perfectly representative, its coverage is broad enough (within industry) so that we believe it contains much information of value on ownership structure and corporate control in Russian industry as a whole.

Table 3: Characteristics of Sample Survey Data Compared With Goskomstat Registry

Finally, the table also shows the composition of the *de novo* sample. Although most of this paper focusses on the old firms that existed under the Soviet system, that account for nearly all

industrial output still today, and that face the difficult task of restructuring, we also analyze the ownership structure of the *de novo* firms in the next section, since they were included in the World Bank survey. Moreover, the characteristics of the new firms, as shown in table 3, contrast with those of the old in interesting ways. The biggest difference is size: 93 percent had fewer than 200 employees in 1994, while only 7 percent were in the 200-1000 range.[28] The regional distribution is also somewhat different, with disproportionate numbers of new firms in Moscow and East Siberia, and disproportionately few in West Siberia and the Northern region, although the small sample size precludes strong inferences. The industrial distribution of new and old firms is rather similar, with the exception of the greater prevalence of *de novos* in wood and construction materials (possibly associated with the boom in private construction) and their complete absence in fuel and energy.

3. The Structure of Corporate Ownership in Russian Industry

In this section, we examine the overall ownership structure in Russian manufacturing industry. Section 3a presents the basic results of the paper concerning the distribution of shares among different types of owners for both "old" (formerly and currently state-owned) and "new" (*de novo*) firms. Section 3b examines residual state ownership, including the intentions or expectations reported by respondents inside the enterprises that remain 100 percent in state hands, with respect to their possible future privatization. The extent to which the state has retained shares as well as the overall ownership structure varies widely by industrial, regional, and size categories of firms, patterns that we analyze in section 3c.

3a. Ownership Structure

Table 4 shows the share ownership structure in our sample of Russian firms as of July 1994, just after the conclusion of the voucher privatization program. The results are shown for companies that have undergone privatization, all old enterprises (including both privatized firms and those which remain in the state sector), and newly created private companies (DNs). Having "undergone privatization" here means that a formerly state-owned enterprise has either been bought out through

[28]We use 1994 employment as the size indicators for the *de novo* firms, because most did not exist in 1991.

a leasing arrangement or that it participated in the State Privatization Program (discussed in section 3b, below), but not necessarily, as the table demonstrates, that state ownership is zero. Indeed we shall show that some putatively "privatized" firms remained, at the conclusion of voucher privatization in July 1994, overwhelmingly owned by the state. By these definitions, the data set contains information on the ownership structure in 345 firms, of which 246 were privatized, 86 had not undergone privatization and thus were still held completely by the state, and 24 were new private entities.

Table 4: Ownership Structure in Privatized, All Old, and De Novo Firms

We have classified types of owners as described in section 2, above: the state, workers, managers, and outside investors, with the outsiders further divided into foreign investors, domestic banks, investment funds, other domestic firms, and individuals.[29] For the most part, this classification is unambiguous. Aside from the fact that a small proportion of owners could not be classified into these groups,[30] the chief possibility for ambiguity lies in outsiders, some of whom could be disguised insiders and others who might be state organizations. For instance, the bank might be a "pocket bank" belonging wholly to or under the control of the enterprise, and the same could be true of domestic companies. The "individuals" likely include close relatives of insiders. "Other domestic firms" might also include organizations which are partially state-owned, although they were supposed to be prohibited (for obvious reasons) from acquiring shares of companies engaged in privatization. Lacking information on them, we are forced to assume that all these groups are truly private

[29]The questionnaire grouped "former workers" together with workers and "other non-bank domestic financial intermediaries" together with investment funds, although the latter category probably is predominantly represented by voucher investment funds. The questionnaire also distinguished oblast property funds from federal organs (most importantly the Federal Property Fund), but we have combined these for the present analysis.

[30]We discarded observations where we could not determine if an important owner (with more than 10 percent of the shares) was state or private, due to insufficient information. In a few cases, the "other" category may have been a local government or municipality, for instance. Where the owner was clearly private but not clearly insider or outsider, we use the information about private shareholding, but insider and outsider shareholdings we treat as missing. Cases of clear insider ownership with ambiguity whether the owner was a manager or a worker are treated analogously.

outsiders, but we cannot completely exclude the possibility that such anomalous cases exist.

In companies that had participated in some form of privatization, we find that, on average, insiders had 66.1 percent of all shares, divided between workers (non-managerial employees) with 46.2 percent and managers with 19.6, while outsiders held 18.9; the remaining 15 percent of shares were still held by the state. The nearly two-thirds concentration of shares in the hands of insiders provides a strong confirmation of the widespread speculations (including our own (1995)) that employees, especially non-managerial workers, have been the biggest beneficiaries of the Russian privatization policies. However, outsiders' shares are not negligible, and later we shall show that they are distributed across companies unevenly enough to give outsiders dominant ownership in a substantial number of companies. Among outsiders, the most important owners are investment funds, other domestic firms, and individuals, although the last group is likely to be quite dispersed, since they acquired their stakes mostly by bidding their vouchers singly in the public auctions. By contrast with the other groups, the shareholdings of banks and foreigners are tiny, which should give pause to any hopes that either group will be playing an important role in corporate governance in the short run.

When the unprivatized enterprises that remain 100 percent state-owned are added, so that we examine all "old" firms together, the pattern shifts significantly in favor of the state. According to this data set, an average manufacturing firm remains 38 percent in state hands, while the shareholdings of all types of private owners are reduced accordingly. Moreover, the state shareholding in privatized firms tends to be much greater in bigger firms. Weighting by 1994 employment, as shown in the columns labelled "weighted" in Table 4, results in an estimate that the state holds 25 percent of "privatized" manufacturing industry, and 41.9 percent of all Russian manufacturing. Outsiders also tend to hold more shares in larger firms: among privatized firms, they hold a weighted average of 20.8 percent. Insiders' stakes, especially those of managers, tend to be larger in smaller firms; they hold a weighted average of only 42 percent of shares, divided into 30.6 percent for workers and 11 percent for managers, in all old firms. Thus, looked at another way, outsiders came away with about twice as much as managers, and insiders together have well under 50 percent; while the "mass privatization" involved only a bit over half of all (weighted) shares.

The *de novo* classification shown in Table 4 was determined by examining several survey questions to distinguish firms which consistently reported that they started up with no legal

predecessors, and that they were not spin-offs or privatized units of a state organization. As we discussed in section 2, above, there is some inherent ambiguity in classifying any organization as "new," but our confidence that the distinction is valid is enhanced by the large differences between them and all "old" firms.[31] Although only 24 of the *de novo* firms (DNs) provide ownership information, it is clear (and not terribly surprising) that one of the important differences is ownership, as they show hardly any state ownership whatsoever (one firm has about 20 percent of shares owned by some state organization, perhaps a local government). What is most striking here is the importance of managerial ownership in the DNs in our sample. Nearly two-thirds of all shares are managerially owned, implying that these firms tend to be entrepreneurships, while workers own under 7 percent on average. Only nonfinancial firms and Russian individuals are represented among outsiders.

Table 5 turns to the second approach, an analysis of dominant owners following the classification shown in the ownership tree in section 2, above. Our definitions of the concepts shown there are as follows. First of all, we exclude the new private DNs. Next, we have defined an enterprise as "state-owned" (SO) if the state holds at least 50 percent of its shares. The firm is classified as "privately owned" (PO) if private owners altogether have more than 50 percent. Among POs, a firm is "insider-owned" (IO) if all insiders have more than 40 percent of shares and if they own at least as much as all outsiders.[32] The firm is "outsider-owned" (OO) if outsiders hold more than 40 percent and if they own more than the insiders. To handle situations where no type of owner is clearly dominant, we classify a firm as having "no clear owner" (NO) if neither outsiders nor insiders hold more than 40 percent (but the firm is a PO) and as "INO" if the firm is clearly an IO but neither managers nor workers dominates in the sense of owning more than 40 percent of all shares. Thus,

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[31]Earle-Estrin-Leshchenko (1996) and Richter-Schaffer (1996) examine the *de novo* firms in this data set, and Earle-Rose (1996) examine the differences in the characteristics of workers and the firms for which they work in a data set on Russian individuals, and find large differences between new and all old organizations.

[32]The 40 percent threshold is arbitrary of course, but we employ it only to illustrate the alternative, "dominant owner" approach to examining corporate control in Russia. Moreover, as we show below, dominant owners in most cases have shareholdings well above 50 percent, and the results for the classification of firms by dominant owner type are fairly robust to changes in the 40 percent threshold.

the number of POs should equal the sum of the numbers of IOs, OOs, and NOs; however, 4 firms in the sample do not have sufficient information to permit insider shares to be distinguished from outsiders.

Table 5: Ownership Category by Privatized and All Old Firms

Analyzing the privatized part of the sample in terms of dominant owners, we find that 92 percent of firms are majority privately owned POs. Just over half of all privatized firms are worker dominated WOs, while 15 percent are MOs, 9 percent are OOs, 6 percent NOs, and 10 percent INOs. Together with manufacturing firms which had not yet begun privatization, the state still dominates in one-third of manufacturing firms; because the state shareholding tends to be greater in bigger companies, the state share is 35 percent when we weight by employment. It is notable that, although the average shareholding of outsiders is small, the holdings must be rather unevenly spread, for there is nonetheless a substantial proportion of privatized firms - 9 percent unweighted, 12 percent weighted - where outsiders dominate.

The tendency for firms to fall fairly cleanly into these dominant groups is demonstrated by Table 6, which shows the ownership structure for each dominant ownership type. Reading down the table's main diagonal, the cells containing the average percentage of ownership by each type of dominant owner-group, it is plain that the classification system has worked to separate out the ambiguous cases. On average, the state owns 91.5 percent in an SO, private owners own 88.6 percent in a PO, insiders own 76 percent in an IO, workers own 67.5 percent in a WO, managers own 68.6 percent in an MO, and outside investors own 63.5 percent in an OO. By construction, the INOs and NOs have no group with over 40 percent. The fact that average investment fund ownership in OOs is 9.5 percent may be due to the legal limitations on share ownership imposed on their ownership, as discussed in section 4, below; other outside investors were not subject to this limitation. Possibly as a result, investment fund ownership is more evenly spread across dominant owner types than the other types of institutional investors.

Table 6: Ownership Structure By Type of Dominant Owner: All Old Firms

The table also shows some interesting associations of different types of owners. Among the WO, MO, and OO types, state ownership tends to be highest in MOs, although still higher in the INO and particularly the NO types (an important reason they have no clearly dominant owner). On the

other hand, both worker and outside owners are more likely to be found as minority owners with each other as the dominant owner to being the junior partner of managers in MOs: worker ownership is about 50 percent larger in OOs and outside ownership is 50 percent larger in WOs than either type of owner in MOs. Although it is difficult to draw strong conclusions on the basis of these statistical associations, there appears to be some support in the data for treating workers and managers as distinct groups, rather than lumping them together as "all employees."[33]

3b. Residual State Ownership

One of the main ambiguities of the Russian privatization process is that, as we have seen, the state has retained a large proportion of shares.[34] According to our data, and excluding the *de novo* sector, the state owned about 42 percent of all shares in old manufacturing enterprises as of July 1994, when weighted by 1994 employment. The large state shareholding results from the incompleteness of the privatization process for those firms that did undergo some form of privatization, from the fact that a significant number of firms failed to be privatized whatsoever, and from the tendency of the state to retain shares in relatively large companies. This subsection looks more closely at the issue of residual state ownership, including the distribution of state holdings and the extent of reported plans for privatization among enterprises that had yet to enter the process.[35]

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[33]One reason for the apparent affinity of worker and outside ownership could be the greater ease for outsiders, facing a given level of total insider share ownership, to control a firm with more worker ownership and less managerial ownership, due to the probably higher concentration and possibly better organization among managers relative to workers. A more complete analysis should consider what we might call the "substitutability" or "complementarity" of different types of owners. According to one hypothesis, for instance, there would be little difference between concentrated insiders (usually managers) and concentrated outsiders (usually institutional investors) – the two types may be substitutes for one another. We attempt to examine this in section 7 below, when we group managers and outside blockholders in some specifications of our performance-ownership structure equations.

[34]Russia is hardly unique in this respect; see Frydman *et al* (1993a and b) or Pistor and Turkewitz for discussions of other countries. But because of the character and speed of Russia's mass privatization, this point may be even more likely to be overlooked compared to countries following slower routes of privatization through trade sales and insider buyouts, as in Hungary, Poland, and Romania.

[35]Of course, it may be that the state has divested many of its holdings since July 1994, but it is impossible to know, since official information is lacking. Despite the notoriety of the "loans

Table 7 shows the distribution of state shares for privatized and all old firms, unweighted and weighted by employment in 1994. Although there are no partially privatized firms in the sample with a state share exceeding 70 percent, 6.7 percent of all firms that have undergone some privatization process are at least 50 percent state-owned (PSOs). When firms are weighted by their 1994 employment levels, 17.3 percent are still majority state. Indeed, the state has retained at least 10 percent of the shares in 64.8 percent, or almost two-thirds, of putatively privatized firms (weighted).

Table 7: Distribution of Residual State Ownership

The table also shows similar figures for all old firms, including those still 100 percent state-owned. From this perspective, the state is present at an ownership level of at least 10 percent in 51.4 percent, over half of all old industrial companies in Russia, and when weighted it is present in 71.7 percent. Indeed, we calculate (in the bottom row, labelled "0") that 48.5 percent of enterprises that have undergone privatization, and 35.4 percent of all old firms, have been privatized 100 percent, so that the state share is zero; but the completely privatized firms are relatively small, so that the percentage of old firms drops to 15.5 when weighted by 1994 employment. At the other extreme, just over a third (33.4 percent) of all old firms, when weighted, have the state as the majority owner. The percentage of firms with the largest state shares (60 percent and over) is greater on an unweighted than weighted basis, because the SSOs, the 100 percent state-owned firms, tend to be small relative to both the PSOs and the POs that have some state share, although the SSOs are larger than completely privatized firms.

Even in enterprises that are majority privately owned, the state may retain control through "golden shares" permitted for firms in the State Privatization Program under the Russian privatization law. Such shares, which could be issued only by the Government of Russia or the State Committee

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for shares," however, most indications point to a greatly slowed rate government divestment after the conclusion of voucher privatization. Most important should have been the "investment sales," the privatization vehicle for which 20 percent of shares in most companies had been reserved, but they appear to have gone slowly. In the only available study of changes of ownership, Blasi and Shleifer (1996) found for their sample of already privatized firms from December 1993 to December 1994 that the state shareholding declined by an average of 2.9 percent; they do not consider unprivatized enterprises.

on Administration of State Property (GKI)[36], carry veto rights over major company decisions - amendments to the company charter, liquidation, re-organization, etc. - for a three-year period. The only information that appears to be available on the extent to which golden shares were issued is Goskomstat (1996), which reports 204, 792, and 429 such cases in 1993, 1994, and 1995, respectively. This represents about 5 percent of the joint-stock companies established through privatization during those 3 years, in total.

Our ownership data represent only a snapshot of Russian industry at the conclusion of voucher privatization, and it is useful to consider whether the firms that had not yet entered any privatization process in July 1994 would be privatized in the future. The survey questionnaire asked managers of unprivatization firms to report their anticipation or intentions regarding later privatization. Table 8 shows the possible responses: "privatization planned within the next 12-18 months," "privatization delayed," or "privatization not planned." Of the 77 state-owned enterprises providing answers, just over half report that no privatization is planned, while the remaining enterprises are fairly equally divided between those reporting that privatization is planned for the near future and those reporting it has been delayed (for an unspecified reason).

Table 8: Expectations of Privatization at Unprivatized Enterprises

The table also shows the distribution of privatization expectations using 1994 employment as a weighting variable. Interestingly, the distribution shifts decisively with 47.7 percent of weighted enterprises reporting plans for privatization in the near future. Among unprivatized enterprises, size appears to be positively associated with expectations of privatizatation in the future.

3c. Ownership by Industry, Region, and Size

Although research on the impact of ownership structure on enterprise behavior usually treats ownership as exogenous, an important strand of literature (originated by Demsetz (1983) and Demsetz and Lehn (1985)) argues that the extent of concentration among outside investors is a

[36]Legally, that is. Pistor and Turkewitz (1996) note that "[e]xceeding their authority, regional GKIs or regional property funds have frequently decided to...issue a golden share. This practice forced the national GKI to adopt a special resolution that explicitly prohibited such activity." They provide no estimate of the prevalence of golden shares.

function of the costs and benefits of concentration, including the cost to investors of holding less diversified portfolios and the benefits arising from better monitoring of managers and from amenities received by controlling investors. In our view, which we elaborate in section 6, below, this argument can be extended to the issue of "identity" of owner: the relative importance of different types of owners is also likely to be related to the costs and benefits of each type. There has been some research on the factors underlying employee ownership (see the summary in Bonin *et al* (1993)), but the more general principle of the endogeneity of ownership identity seems not to have been investigated.[37]

Postponing until section 6 a broader and more detailed consideration of the determinants of ownership structure, we use the enterprise data set in this section simply to describe the variation in ownership patterns by industry, region, and size. Table 9 shows the ownership structure, both the average distribution of shares and the pattern of dominant ownership types, by industry group (branch) for all old firms.[38] It is evident that ownership differs quite significantly across branches of industry, with the state retaining large stakes in the fuel and energy, light machinery, and "other" sectors, and the lowest stakes in metals, chemicals and consumer goods. Among private owners, insiders - both workers and managers - are more commonly found in consumer goods, while outsiders prefer heavy and light machinery. Both insiders and outsiders are disproportionately represented in metals and chemicals, which are among the sectors with the highest private shares. Among outside institutional investors, investment funds are concentrated in the fuel, energy, metals, and chemicals sectors, while domestic firms have tended to avoid fuel and energy, investing in both heavy and light machinery instead. Individual investors, most of whom would have received shares through the voucher program, are more evenly distributed across sectors, although with some proclivity towards heavy machinery.

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[37]Earle and Rose (1996) use information reported by a national sample of individual workers to examine the determinants of the property status of Russian enterprises. They find no systematic differences between privatized and state-owned (non-budgetary) enterprises (except for the occupations of the workers), but quite large differences between all old enterprises and *de novo* firms.

[38]As in table 3, we have constructed the groupings of industries on the basis of Goskomstat classifications of the principal product produced by the firm; the details are described in the footnote to that table.

Table 9: Ownership Structure by Industry

The percentage distribution of firms by dominant ownership type within each industry group is shown in the panel at the bottom of table 9, providing another perspective on the heterogeneity in the ownership structure. The dominant owner types follow the organization of figure 2, above, first dividing majority state-owned firms into those that are still 100 percent state-owned (the SSOs) and those that are partially privatized (the PSOs). The probability of remaining state-owned varies widely across sectors, being highest in all types of machinery and in the miscellaneous "other" types of manufacturing. The state holds a majority stake in more than 40 percent of all firms in the fuel and energy, light machinery, wood and construction materials, and other sectors, but less than 25 percent in the others, but this result in fuel and energy in mostly accounted for by a disproportionate rate of partial privatizations. The pattern of insider dominance is fairly consistent with their average shareholdings: managers have the highest incidence of dominating consumer goods factories, while worker dominance is also found in metals and chemicals. Outsiders dominate most strongly in light machinery, secondarily in heavy machinery. Fuel and energy has a fairly high rate (16 percent) of INOs, and NOs have the highest incidence in heavy machinery.

Table 10 shows the ownership structure, both shareholdings and dominant owner-types, by region.[39] Regional variations are large, with by far the highest rate of privatization in the North Caucasus and the lowest in Moscow and Povolzhski region. Workers have particularly large shareholdings in the North Caucasus and managers do in Eastern Siberia. Outsiders have a particular lack of success in Moscow. The story appears again somewhat different when viewed in terms of dominant ownership type: outsiders, for instance, dominate in no firms in the North Caucausus, and in very few in Povolzhski and Western Siberia.

Table 10: Ownership Structure by Region

Table 11 shows the ownership structure, again both in terms of shares and dominant types, by size category, where size is measured as number of employees in 1991. Somewhat surprisingly, the relation between size and state shareholding is complex, the state stake being largest at the

[39]Regional definitions are adjusted Goskomstat categories, described in the footnote to table 3.

extremes of the distribution: 42.7 percent of shares are state-owned and 35.8 percent of firms are SOs in the smallest size category (up to 200 employees), while 48.5 percent of shares are state-owned and 50 percent of firms are state-dominated in the largest category (over 5000 employees). There is a particularly high incidence of partially privatized PSOs in the largest group. Insider ownership is most pronounced in medium-sized companies, with a particularly low incidence of IOs, especially MOs, in the largest category; outsiders have a tendency to concentrate in larger companies and are least prominent in medium-sized firms. These patterns appear fairly clear, despite the small sample sizes in several cells.

Table 11: Ownership Structure by Size (number of employees).

The observed variations along industry, region, and size dimensions suggest that there may have been significant selection effects in Russian privatization. Regarding the probability of privatization, the objectives both of the state and of enterprises no doubt had some influence. The state, or some politicians or bureaucrats, would have attempted to prevent, and in some cases actually prohibited, enterprises in "strategic sectors" and/or those with the greatest political sensitivity from privatizing. The legal regulations on leasing were rather murky and contained neither prohibited nor target lists of enterprises for privatization, so that the influence of the state on the process was only implicit, but the State Privatization Program explicitly divided firms into those slated for "mandatory privatization," those able to privatize "voluntarily" (either with GKI or cabinet approval), and those prohibited from privatization (see, e.g., Frydman *et al* (1993b) or Boycko *et al* (1995)). Mandatory privatization applied to consumer services and light manufacturing, voluntary privatization with GKI approval applied to heavy manufacturing, voluntary privatization with cabinet approval applied to the natural resource sector and the most of the Military-Industrial Complex, and privatization was prohibited in railroads, health, and education.

Despite these lists, the initiative for corporatization and privatization rested with the insiders of each firm, the formal decision being taken by the workers' collective in both the leasing arrangements and the State Program. Insiders' interests lay in the expected profitability and riskiness of the company, the advantages to be gained from control (such as ensuring jobs and social benefits), and the expected support from the state. There was genuine fear that subsidies might be cut off to enterprises once privatized; indeed, to allay this fear Yeltsin issued a decree promising continued

"non-discriminatory" support to privatizing and privatized companies in late 1992. Thus, the pattern of privatization was influenced by both state and insider interests.

Regarding the ownership structure among privatized firms, the state in some cases tried to keep control, thus affecting the relative size of state and private shareholdings, but in most cases insider interests probably predominated, given the strong control by insiders over the privatization process. Outsiders could enter only under insider-controlled voucher auctions (or in a few cases, cash auctions) or by buying shares from insiders on secondary markets. As we discuss in the next section, the insiders' choices in the State Privatization Program did affect the number of shares (both the total number and the number of voting shares, as we shall see) available to outsiders. Most importantly, those choices were influenced by the cost of buying out the company (even if tied to July 1992 book value, it may have been substantial in many cases) compared to receiving a smaller number of shares free. Outsiders' interests largely would have concerned profitability, as we argued in section 2b, but customer and supplier companies (including banks) could have had other motives as well. Thus, there appear to be reasons to suspect that ownership structure should be treated as endogenous when one investigates the effects of ownership on corporate performance.

This analysis of the ways in which the interests of various types of owners could affect the ownership structure emerging from Russian privatization would of course be complemented, in a more complete treatment of the endogeneity of ownership structure, by a consideration of variables representing the costs and benefits to different types of owners and to different levels of concentration (as in Demsetz and Lehn (1984) or Prowse (1992)). This effort we leave for section 6, below, and instead investigate here the independent statistical significance of the ownership patterns across industries, regions, and size groups of firms, which we have studied above. For this purpose, we report the results from estimating regression functions for the probability of an old enterprise to be privatized, in table 12, and for the structure of ownership, in Table 13.

Table 12: Estimating the Impact of Industry, Region, and Size on Privatization Status

Concerning the probability of privatization, table 12 shows the results from estimating a logistic function where the dependent variable takes a value of 1 if the firm has been at least partially privatized (non-SSO) and 0 otherwise, with the sample restricted to all old firms. Independent variables are dummies for categories of industries, regions, and employment sizes. Overall, the model

is highly significant (Chi-squared statistic is significant at the .0025 level). Probably due to high multicollinearity among these characteristics, there are few significant coefficients. The bottom of the table reports the results of Wald tests of the joint significance of each group of variables: the set of industry dummies is significant at the .07 level, the regional dummies at the .02 level, and the size dummies only at .49.

Table 13 contains similar results from the OLS estimation of functions of private shareholding (PSH), insider shareholding (ISH), worker shareholding (WSH), managerial shareholding (MSH), and outsider shareholding (OSH) as dependent variables, and the same groups of industry, region, and size effects on the right-hand side. F-statistics to evaluate the joint significance of the industry, regional and size dummies, respectively, are shown at the bottom of each equation. While both industry and region effects are highly significant (at the .01 level) for PSH, size is significant only at the .10 level. All three groups of variables are highly significant for ISH, but none is significant for OSH. Among insiders, region seems to have more explanatory power for WSH, while industry has more for MSH. The adjusted R^2 is not very high for any equation but it is extremely low (.0004) for OSH.

These results suggest that there may have been some selection effects in Russian privatization, whereby the probability of a firm being privatized was not random, but systematically influenced by characteristics of the firm. Regarding the structure of ownership among private owners, it appears that insider shareholding is also associated in a systematic way to industry, region, and size characteristics of the firm, but the outsider shareholding does not appear to be closely related. We can tentatively conclude that any study of the relationship between privatization and enterprise performance must reckon with the possible endogeneity of the probability of privatization, and to a lesser extent, of the ownership structure. We return to these issues in section 6, below, where we analyze a broader set of determinants of ownership structure, and in section 7, where we estimate various equations for enterprise restructuring and performance, in some cases treating ownership as endogenous.

4. Methods of Privatization and Ownership Structure

This section describes the impact of privatization on the structure of ownership in Russian

industrial enterprises which were included in the privatization process. Section 4a describes the ownership patterns emerging from the various methods of privatization, emphasizing not only the extent of private ownership, but also its division between insiders and outsiders, and the division among different types of insiders and outsiders. We examine both the distribution of shareholdings and the incidence of "dominant-owner-types," finding substantial differences in the outcomes of different privatization methods.

A neglected feature of corporate ownership in Russia is the existence of two types of shares that carry cash-flow rights but no voting rights. Section 4b discusses how non-voting shares arose and reports our estimates of their incidence, which enables us to examine the implied structure of control rights from taking only voting shares into account. While Grossman and Hart (1986) have emphasized the control dimension of ownership, and Grossman and Hart (1988) and Harris and Raviv (1988) have explicitly considered the efficiency of "one share-one vote" rules, the issue appears in a somewhat different light in Russia: because non-voting shares are held exclusively by insiders or by the state, taking them into account raises the proportion of control rights in the hands of outside investors. Finally, in section 4c, we employ regression analysis to test whether the observed differences across different methods of privatization in the structure of ownership and in the pattern of dominant owners, measured both as all shares and as voting shares, are statistically significant.

4a. Privatization Methods and Outcomes

The purpose of this section is to describe the outcomes of the various privatization methods applied to large enterprises in Russia.[40] Some authors (for instance, Blasi (1996)), have contended that essentially all methods of privatization in Russia have led to the same result: insider buyout. In fact, we find that the share ownership structure and pattern of dominant ownership varies significantly according to the method of privatization which was employed, as shown in Tables 14 and 15.

Table 14: Share Ownership Structure by Privatization Method

Table 15: Dominant Owner-Type by Privatization Method

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[40]Greater detail on the policies themselves can be found in the books by Frydman *et al* (1993b) and Boycko, Shleifer and Vishny (1995), although the latter volume omits any discussion of leasing arrangements.

The tables show the four principle methods by which large enterprises were privatized in Russia: options 1, 2, and 3 of the State Privatization Program, which was implemented from late 1992 until mid-1994, and lease buyout, whereby assets were originally leased mostly in 1990-92 and usually acquired subsequently by the employees.[41] While the most common method is clearly option 2 of the state program, the method whereby 51 percent of all shares were sold to the employees at a price of 1.7 times the July 1992 book value of the company (during a period of near hyper-inflation), it nonetheless accounts for less than half of all privatizations.[42] The main reason for the discrepancy between this result and the figures reported elsewhere (for instance, by Boycko, Shleifer, and Vishny (1995) or McFaul (1996)) is that lease buyouts are included here, although they have been nearly always omitted by other researchers.[43]

The highest proportion of insider ownership, however, appears among lease buyouts, which have 90.6 percent of all shares insider-owned and 95.5 percent of companies classifed as insider-dominated (IO). Two-thirds of the insider shares in lease buyouts belong to workers, while outsiders have only 8 percent, and the state only 1.4 percent, on average. Only 2 of 66 observations on lease buyouts are OOs and only 1 an SO. Our data set thus provides a more complete picture and shows an even greater tendency towards insider domination compared with information taken from the State Privatization Program alone.

Among the options in the State Program, the differences in results are somewhat smaller. Option 1, the method by which 25 percent of shares were given to employees free-of-charge and an

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[41]In addition, some enterprises were privatized through obscure, *perestroika* period conversion to joint-stock company and unregulated distribution of shares (usually among employees), but these cases seem to have been few in number, and none of them appear in our sample.

[42]The distribution of the 51 percent of shares among employees under Option 2 was done on the basis of applications (with deposits) to the Privatization Committee set up for each enterprise (including representatives of the administration, work collective, and local government) with each applicant receiving one share and the rest of the shares divided pro-rata among all applications. A further preference arose from the 3 month grace period for paying for the shares.

[43]While our data suggests that about 60 percent of enterprises in the State Privatization Program selected Option 2, Boycko, Shleifer, and Vishny (1995) cite a figure of 73 percent. All sources agree on the negligible importance of option 3, which was a kind of management buyout conditioned on fulfilling a performance contract.

additional 10 percent to workers and 5 percent to managers at nominal prices, yielded smaller private shareholding: on average 75 percent compared to 82.1 percent for option 2.[44] Option 1 favored workers slightly, with an average of 41.8 percent compared to 38.9 under option 2, but managers and outsiders did rather better with option 2: 18.3 and 24.8 percent, respectively, compared to 12.3 and 20.9 under option 1, on average, although we shall see in the next subsection that a bigger difference is produced when one considers only voting, rather than all shares. Only the voucher investment funds, which were subject to a legal limit of no more than 10 percent in any one firm being privatized, fared better under option 1 than 2, with 7.9 percent in the former and 4.4 percent in the latter.

The pattern of dominant ownership is somewhat different, however, among the firms privatized through the State Program. Option 1 still shows the greatest shareholdings by the state, with 21.5 percent of firms categorized as SOs. But IOs account for 80.8 percent of of option 2 firms, compared to only 50.8 of option 1. And WOs are also more common in option 2, at 49 percent compared to 33.8 percent under option 1, despite the fact that the average worker shareholding is larger with option 1. And although MOs are more common - at 15.4 percent, nearly twice - under option 2 compared to 1, OOs are actually less common - 10.6 and 12.3 percent in options 2 and 1, respectively - despite the larger average shareholdings of outsiders in companies privatized through option 2 compared to those privatized through option 1.

4b. Control Rights and Share Types

Thus far, the discussion has concerned total shareholdings, neglecting (as has every other

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[44]Both the free 25 percent and the discounted 10 percent under Option 1 had some restrictions, however: regarding the former, no employee could receive free shares worth more (in book value terms) than 20 minimum monthly salaries; regarding the latter, the discount applied only to shares worth up to 6 times the minimum monthly salary. The 5 percent reserved for managers could be worth no more than 2000 minimum salaries per person. These limitations probably explain why we find some companies privatized under Option 1 that have insider ownership less than 25 percent. Incidentally, the management (members of the company administration) were also members of the work collective, therefore also eligible to benefit from the free 25 percent and the discounted 10 percent, in addition to the discounted 5 percent reserved for them. The distribution of shares under Option 1 was determined by the Work Collective.

analysis of which we are aware) the fact that nonvoting shares do exist in Russia.[45] But if the ultimate motivation of studying ownership is to understand enterprise behavior and performance, then an analysis of the control rights vested in voting shares may be at least as important.

Nonvoting shares were created in privatized firms in two situations. First, according to the rules for option 1 in the State Program, up to 25 percent of the company's shares could be transferred to company employees for free, provided the book value of the free stock was less than an average annual wage times the number of employees and provided the shares became "Type A" preferred, non-voting shares. This design was a more-or-less explicit attempt by the policymakers to prevent widespread insider control by offering the shares free (while, under option 2, payment was required).[46] Second, state voting shareholdings were limited to no more than 20 percent of all company shares, except for enterprises in "strategic" and excepted sectors and in companies where the state could hold a golden-share (discussed in section 3.2, above) or 25.5, 38, or 51 percent of the shares as a "control block."[47] All other state-owned shares were to be "Type B" non-voting shares.[48]

The effects of these two limitations of voting rights are somewhat difficult to assess, *a priori*. While type A shares reduce the influence of insiders, raising the relative importance of voting shares

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[45]Boycko *et al* (1995), for instance, mention only one type of non-voting shares (type A, described below) in the context of describing the options from which enterprises could choose when participating in the State Privatization Program, but provide no estimates of how many non-voting shares resulted from this process nor mention the other non-voting share type (type B). No other study of which we are aware discusses the importance of voting and non-voting shares in Russian ownership structure. We are especially grateful to Ivan and Vladimir Komarov and to Andrei Baev for discussions concerning this issue.

[46]Type A shares receive regular dividends, accounting for 10 percent of profits, according to a typical Company Statute. They can be converted to ordinary voting shares on the basis of a simple majority vote of the shareholders. Unfortunately, we have no information on the extent to which this conversion has occurred.

[47]The industrial sectors included communications; production and distribution of electricity, oil and gas; mining and processing of precious metals and stones and of radioactive materials; production, design and repair of military goods; production of spirits and vodka; and publishing and printing.

[48]In addition to types A and B, there is a third type of non-voting share in Russia, where a joint-stock holds its own shares. Our data contains one such case, which has 27 percent of total company shares held in this form. In our analysis of voting shares below, we have also taken this type into account (setting the category equal to zero, and rescaling the others to sum to 100 percent).

held by outsiders and the state, type B shares reduce state control rights to the gain of all private owners. The only clear beneficiary from both types is outside investors, and indeed the type A restriction was designed to limit insider control, with the free 25 percent of shares as the teaser. But the high inflation of 1992-4 meant that the difference between free (option 1) and 1.7 times the July 1992 book value (option 2) shrank quite considerably, and managers and workers frequently seem to have found the attractions of clear control (the 51 percent stake under option 2) to be overwhelming. Nonetheless, the number of companies privatized through option 1 is not trivial, and both type A and type B shares could affect the distribution of control rights, at least in principle.

Although our survey data provides no direct information on voting and non-voting shareholdings, it is possible to make some estimates based on collateral information in the questionnaire. Regarding Type A shares, we have assumed that 25 percentage points of insider shares (or the total percentage of total insider shareholdings, where that is less than 25) in companies privatized through option 1 of the State Program are non-voting, divided between workers and managers in proportion to their total shareholdings. This calculation probably yields an upper bound on total Type A shares, both because of the limitations on the value of the free share transfer and because it was possible for a shareholders' meeting subsequently to convert the Type A shares to common shares; again, we have no company-level information on such limitations and conversions. Regarding Type B shares, we have imputed exceptions to those companies producing in sectors on the "strategic" list and for those with particular shareholdings - 25.5, 38, and 51 percent - which were also supposed to be excepted.

The results appear in tables 16 and 17, which show all privatized and option 1 firms separately, as type A shares arise only under option 1. The first pair of columns of the tables reproduce columns from tables 14 and 15, for convenience of comparison, while the second pair show the shareholdings and dominant owner-types when type A shares are subtracted, and the last pair show the same when both type A and type B are subtracted. We find that the insiders' average holding of control rights is much lower than their average holding of all shares in option 1 companies - 39.5 compared to 54.1 percent - the fall being somewhat larger for workers - from 41.8 to 29.7 percent - than for managers - from 12.3 to 9.8 percent. Measured as dominant shareholding, in table 17, the impact of this adjustment is also large, with IOs falling from 50.8 to 30.8 percent of option

1 firms, but no change in the number of MOs. The corresponding gains by outsider investors and by the state are also not inconsiderable in the option 1 companies: average shareholding of outsiders rises from 20.9 to 27.3 percent and the percentage of OOs from 12.3 to 23.1 percent, while the average state shareholding rises from 25 to 33.2 percent and th percentage of SOs from 21.5 to 29.2 percent. The biggest winner appears to be the voucher investment funds and other non-bank financial intermediaries, whose average shareholding rises from 7.9 to 10.4 percent in option 1 firms. The impact of this adjustment works in the same direction when we examine all firms - in the columns labelled "total" - although naturally it is attenuated because option 1 firms are just a fraction of the total.

Table 16: Voting Shareholding Structure by Method of Privatization

Table 17: Dominant Owner Types by Method of Privatization

The last pair of columns take into account type B as well as type A shares. Concerning the division between state and private, it appears that subtracting type B shares almost exactly cancels the effect from subtracting type A shares: thus, the average extent of privatization is little affected by these calculations. But even if the average is the same, it bears emphasis that the shareholdings, or the categorization, may have shifted for individual firms, so that these calculations may still be important when we come to relating ownership structure to some measures of firm performance. Indeed, we find, with respect to the 65 enterprises privatized through option 1, that although the number of POs is the same (51), regardless of whether one looks at "all shares" or at "all shares - type A - type B," a total of 6 firms have shifted categories: 3 in each direction.

Within private owners, however, there are substantial differences between the pattern of all shares and that of voting shares. Outsiders have 29.2 percent of voting rights in option 1 firms, almost as much as workers' 32.9 percent, a considerable drop from their 41.8 percent of all shares. Overall outsiders have 21.3 percent, more than either the state or managers. Among outsiders, the biggest gains are for investment funds and for other domestic firms. Concerning the incidence of dominant owner-types, when we take into account type A and type B shares, OOs account for just over a third of option 1 firms, half the POs, or as many as all IOs put together. Compared to the categorization by all shares, the number of OOs almost triples. Moreover, the numbers of NOs and INOs, the "ambiguous" owner-types, shrink, the INOs disappearing entirely from option 1 firms.

Overall, OOs account for 15.1 percent of all firms, almost double their 8.8 percent when measured by all shares. Although the number of WOs is the same (121) for all shares and all share less types A and B, a total of 14 firms switch categories (7 in each direction) as a result of the adjustments. Thus, these results provide some basis for the contention that it may be important to look beyond shareholdings and consider the incidence of voting rights in analyzing corporate control in Russia.

4c. Does Privatization Method Matter for Ownership?

We examined the statistical significance of the differences in the outcomes by method by estimating the following equations for shares:

$YSH = \beta_0 + \beta_1 OPTION1 + \beta_2 OPTION3 + \beta_3 LEASE\text{-}BUYOUT + X_i\gamma + u_i$

where

YSH = proportion of shares held by owner Y (alternatively, PSH, ISH, WSH, MSH, OSH, and different kinds of outsider shareholdings),

OPT1 = dummy variable = 1 if option 1 in the state program was chosen (=0 otherwise),

OPT3 = dummy variable = 1 if option 3 in the state program was chosen (=0 otherwise),

LBO = dummy variable = 1 if firm was privatized through a lease buyout (=0 otherwise),

X = vector of other factors affecting YSH (industry, region, and size controls),[49]

u = unobservable, residual factor,

β_i, γ = parameters to be estimated.

Clearly, β_0 represents the predicted value for option 2, the method of privatization that is omitted from the equation, while β_1, β_2, and β_3 represent the difference between option 2 and option 1, option 3, and lease-buyouts, respectively. The equation is estimated for all shares and voting shares separately, and the sample consists of those firms that have taken part in privatization.

Tables 18A, 18B, and 18C show the results, which in general confirm that many of the observed differences in the outcomes of the methods are large and statistically significant.

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[49]The industry controls follow the same grouping as does table 9. There are three regions: Moscow and St. Petersburg, European Russia, and Asian Rusia (including Urals, West Siberia, East Siberia, and Far East). The size controls are three categories of 1991 employment: 1-500 employees, 501-2000 employees, and over 2000 employees.

Concerning PSH, LEASE-BUYOUT is associated with 12 percent more private ownership of all shares and 10 percent more of voting shares, and OPTION1 with 5 percent less of all shares and 10 percent less of voting shares, relative to option 2. Option 3 firms show no significant difference in this or any of the other equations, although this could be due to the small number of observations in this category (corresponding to a small number of firms in the population that actually followed option 3).

Tables 18A, 18B, 18C: Estimating the Impact of Privatization Method on Ownership Structure

Because PSH = ISH + OSH, and OLS preserves additivity, the coefficients on the methods variables in the ISH and OSH regressions sum to the coefficients on the methods coefficients in the PSH equation: thus, we can see how the effects of different methods on PSH divide between ISH and OSH. Interestingly, they divide in different ways. Regarding OPTION1, estimated β_1 is statistically insignificant when all insider or outsider shares are the dependent variables, respectively. The results for voting ISH and OSH, however, show that the -10.1 result for PSH is composed of -16.0 for ISH and 5.9 for OSH. This is consistent with our discussion of the types and allocations of non-voting shares, and their tendency to raise - particularly in OPTION1 firms - the relative position of outsiders vis-a-vis insiders.

Among insiders, the division of the effects of different methods on WSH and MSH are shown in table 18B. The large positive effect of LEASE-BUYOUT on PSH and ISH turns out to be almost entirely on WSH, with the MSH coefficient small and insignificant (although positive). The negative effect of OPTION1 on ISH (measured as voting rights) is equally divided between WSH and MSH.

Among outsiders, the division of the effects among different types are shown in table 18C. The effects of OPTION1 on all shares are quite heterogeneous, with the insignificant coefficient of -2.6 on OSH accounted for by significant negative coefficients on banks and individuals and a significant positive coefficient on investment funds. The positive effect of OPTION1 on investment funds is magnified when we consider voting shareholdings, accounting for most of the coefficient of 5.9 on OSH. The results suggest that investment funds holdings in firms electing option 1 of the State Privatization Program are well over twice as large as in other privatized firms. The large negative effects of LEASE-BUYOUT on OSH are accounted for almost entirely by the effects on domestic firms and individuals: although it was predictable that outside individuals had relatively little

opportunity to acquired shares in lease buyouts, it is less clear why institutional investors other than domestic firms show no significant difference compared to option 2 of the State Program.

In general, these results show a pronounced tendency for investment funds to behave differently from the other domestic institutional investors: banks and firms. The investment funds are the only type that tends to have larger shareholdings under option 1, which we conjecture may reflect a greater aversion to insider power. Banks and firms are possibly more closely connected to insiders and therefore do not tend to avoid firms where all insider shares are voting shares and where the insiders have an outright majority. If so, then investment funds would be the primary hope for active corporate governance by outside investors on the Russian scene.

Finally, it is noteworthy that in the regressions for 8 of the 10 types of shares, the adjusted R^2 is higher when we use voting rather than all shares. As in the equations estimated in section 3c (where the sample, however, was all old, not just privatized firms), the adjusted R^2 declines drastically the more we disaggregate different types of owners. It is particularly difficult to find systematic determinants of the shareholdings of different kinds of outside owners, although investment fund shareholdings (especially voting) are somewhat of an exception.

5. Concentration and Control in the Privatized Sector

Our discussion thus far has focussed on what Demsetz (1988) has called, in a rather different context, the "identity-of-owner problem." We have argued that the assumptions of profit maximization, zero transaction costs, and perfect competition in the classic model of Coase (1960) are even less applicable to the Russian economy in transition than to well-developed market economies, and therefore that the identity of the owners of Russian corporations matters very much indeed. Different types of owners are likely to pursue divergent objectives, transaction costs are extremely high due to the absence of market institutions, and competitive forces function only poorly in Russian manufacturing industry. But the degree to which identity matters depends on the possibility for owners to exercise control. In addition to the size of the shareholding of a group of owners, an important factor affecting the ability of a group of owners to control, or to influence, the behavior of a firm in which it holds shares, is the degree to which the shareholdings are dispersed over a large number of group members or are concentrated among a small number.

In the framework outlined in section 2b, above, we argued that concentration within a group of like-minded owners affects the group's costs of collective action and therefore that the relative levels of concentration, across groups, affects the distribution of relative bargaining power among them. Moreover, if all groups are characterized by dispersed ownership, then there may be little effect of any owners on enterprise behavior, as in standard analyses of the separation of ownership and control in American corporations (Berle and Means (1932)). In Russian enterprises requiring substantial restructuring, however, the resulting agency problems are likely to have still more deleterious consequences.

An analysis of the extent of ownership concentration in Russian industry also has special interest in light of the debates on the efficacy of alternative privatization strategies.[50] Mass distribution of shares to the citizenry carries the clear risk of dispersed ownership, and voucher programs in some countries, such as Mongolia and Romania, appear to have been practically designed to produce this result. Although no information on the actual concentration resulting from the programs in those two countries is available, both the nontradability of vouchers and the insignificant role played by intermediaries in both programs could not but result in highly dispersed ownership.[51] Concentration was created in the Czech mass privatization program by permitting the establishment of Investment Privatization Funds, intermediaries in collecting vouchers from citizens and investing them in companies, but trading of vouchers was not allowed.[52] The State Privatization Program in Russia permitted both the trading of vouchers and the formation of intermediaries, the Voucher Investment Funds. Although legal regulations restricted the percentage of shares that a fund could hold in any single company (initially at 10 percent, later amended to 25 percent in the 1994 Privatization Program), it appears that the restriction was poorly enforced and frequently violated.[53]

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[50]See, e.g., Earle, Frydman, and Rapaczynski (1993) or Frydman *et al* (1993).

[51]Korsun and Murrell (1994) describe the Mongolian program. Earle (1995) analyzes the ways in which the design of the 1995-96 "mass privatization" in Romania ensured enormous dispersion of ownership.

[52]Earle and Gehlbach (1997) describe the ownership structure, including the extent of concentration of ownership among the Investment Privatization Funds, emerging from the Czech voucher program.

[53]Indeed, the design of the voucher auctions prevented any guarantee that the funds would not acquire more than 10 percent in an auction, since the usual method was simply to divide the

Thus, while compared to some other mass privatizations, the Russian program allocated relatively few shares to the general public (typically 29 percent in each company in the State Program), it did permit the possibility of significant concentration among outsiders. The question is how much concentration emerged in practice. Of course, outsiders may also have acquired shares through direct sales or on the secondary market, but however much their total shareholding, if it is held as very small blocks by many owners then their influence on enterprise behavior is likely to be weak. In this section, we draw upon information from the survey to estimate the concentration of ownership for each group, particularly focussing on the incidence and characteristics of outside blockholdings. As we argued in the introduction, the structure of ownership in terms of the identity of different groups of owners and the structure of ownership in terms of the concentration of shareholdings within groups are highly complementary, particularly where workers (whose shareholdings are likely to be quite dispersed) own a large fraction of shares. Because both the state and managers tend to be concentrated owners, we focus on the concentration among outside blockholders as a possible device for "controlling the insider control" (as expressed by Aoki (1995)).

5a. Measuring Ownership Concentration

Information on ownership concentration is notoriously difficult to obtain in any country, and Russia is no exception. Indeed, irregularities in the stockholder registries (which until recently were located only at the companies themselves[54]) and poor enforcement of disclosure rules probably conspire to make the informational picture significantly worse than average, despite our arguments that the issue may be more important than average. In this section, we describe our estimates of the extent of concentration for several types of owners based on information in the enterprise survey, on a survey of Russian individuals containing information on their use of vouchers, and on other sources.

We have stressed that the design of the State Privatization Program offered significant possibilities for ownership concentration, by permitting individuals to sell or otherwise transfer their

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available shares among the bids in proportion to their value (see Frydman *et al* (1993) or Boycko *et al* (1995) for details). Frydman *et al* (1996) present some evidence of violation of the legal ceiling on ownership.

[54]Blasi *et al* (1997) report that 46 percent of companies in their sample with over 500 employees still did not have an independent shareholders' registry in 1996.

vouchers and to invest them with Voucher Investment Funds. Indeed, according to the April 1995 New Russia Barometer Survey (Rose (1995)), only a small minority of respondents invested their vouchers directly in a company (17.6 percent), either the one for which they are employed (9.5 percent) or another one (8.1 percent), and instead most either sold their vouchers (36 percent), gave them to relatives (16 percent), or placed them with a Fund (25.2 percent).[55] Thus, the behavior of individual voucher holders is consistent with significant concentration of outside ownership.

Although we have established the possibility that outside ownership is rather concentrated, the issues of how to measure concentration and the extent of actual concentration remain. In Western research, ownership concentration is usually represented by some type of concentration ratio - the percentage of shares owned by the largest owner or the largest group of owners - and/or by managerial and directorial ownership.[56] While our enterprise data set contains no direct information on concentration, we are able to construct estimates using the survey information plus some auxiliary information and assumptions. In addition to shareholdings by different types of owners, which we have already reported, the survey questionnaire requested information on the total number of shareholders of the firm. Table 19 shows the median number by dominant owner type in privatized firms (thus excluding SSOs, which would have the state as the single owner). Overall, the median is 1000, varying from a high of 5286 in SOs to a low of 600 in MOs. On this simple measure, MOs have the most concentrated ownership. WOs are not much less concentrated, however, with a median of 700 shareholders, nor are INOs, with 1000. OOs are relatively dispersed, with a median of 1400 shareholders, but the most dispersed are the NOs, with 3550 shareholders at the median. The greater dispersion of WOs and OOs relative to MOs is also consistent with the design of the privatization program, which made it easy for individual citizens and workers to acquire small shareholdings. No information on the division of the number of owners across types of owners is

[55]Remaining respondents either kept their vouchers (2 percent), lost or had them stolen (1.7 percent), or failed to claim them (1.6 percent). These estimates are fairly consistent with those reported by Blasi *et al* (1997) on the basis of a survey conducted by VTsIOM in late 1994.

[56]For example, Berle and Means (1932) and Holderness and Sheehan (1988) use the holdings of the largest shareholder, Prowse (1992) uses the percentage holdings of the five top shareholders, Demsetz and Lehn (1985) use both the top 5 and the top 20 shareholders, Morck *et al* (1988) use the holdings of boards of directors, and Wruck (1989) uses the shareholdings of managers, directors, and other shareholders with more than 5 percent stakes.

available, but we have imputed this based on a few assumptions. As it happens, the conclusions which we draw concerning concentration are fairly robust with respect to moderate changes in these assumptions.

First, we assume that the state is monolithic as an owner. Although the Federal and Regional Property funds frequently quarrelled with each other and with regional and local governments, in most cases shares were allocated to a single agency.[57] Second, we assume that the number of managerial owners is 5 in any firm where managers have positive shareholding (86 percent of firms). We assume that the shareholdings of institutional investors in each category - banks, investment funds, other domestic firms, and foreign investors - each represent single parties. Banks and foreigners anyway account for a negligible proportion of ownership, and there is some evidence that most companies have at most a single voucher investment fund as owner (Frydman *et al* (1996) and Blasi and Shleifer (1996)).

Although the assumptions regarding institutional owners may be relatively noncontroversial, the main problem that arises is distinguishing firms that have a small number of concentrated individual outsider owners, for which purpose we must divide the number of shareholders between the two groups of workers and individuals. Fortunately, the results concerning the presence of outside individual blockholders appear to be quite robust with respect to possible assumptions. Our method is to examine alternative assumptions concerning the percentage of company employees who own shares in their companies (conditional upon WSH exceeding zero, which it does in 86 percent of privatized firms), including 10 percent, 30 percent, 70 percent, and 90 percent of employees. In each case, we allocated the residual number of shareholders, after subtracting the numbers for the other categories, to individuals, and examined the average shareholding among the individuals. If we follow Wruck (1989), and take 5 percent as the minimum stake for an individual outside or employee owner to be considered as contributing to ownership concentration, then regardless of the assumption about the percentage of employees who own shares, there are only 2 firms with average individual

[57]The survey questionnaire did request separate ownership by the federal authorities (Russian government, ministry or Federal Property Fund) and by the Oblast Property Fund, most unprivatized firms (SSOs) did not report ownership information; thus, we cannot disaggregate the state holdings with any reliability.

shareholding above this threshold.[58]

The results of this analysis are shown in table 20. The first column shows the average shareholding within each category of owner-type, averaged across all privatized firms. Thus, the figures in the rows for state and for all types of institutional investors are the same as those for their total holdings, given we have assumed that only one type of each such investor exists. Relative to their total holdings, the average shareholding shown here for managers is divided by 5, while the calculations of the number of worker and individual shareholders are described above.[59] The table also shows the percentage of firms in which these average shareholdings exceed 5, 10, and 20 percent.

Table 20: Ownership Concentration Measures

Conditional on our assumptions, the table shows that the shareholdings of workers and outside individuals are highly dispersed. Managers and outside institutional investors are much less so, however. Remarkably, 28.4 percent of firms have an average managerial stake greater than or equal to 5 percent of voting shares. For investment funds and other domestic firms, the figures are 23 and 25.5 percent respectively. When we examine the percentage of firms with average ownership by type greater than or equal to 10 percent, the importance of managers diminishes significantly, but the investment fund and domestic firm stakes only drop somewhat. The results suggest, notwithstanding the small share of outsiders in the overall ownership structure, that outsiders may be relatively influential because of the tendency for outside equity to be held by concentrated institutional investors, the topic of the next section.

5b. Ownership Concentration and Outside Blockholders

This section focusses on concentration of ownership among outside blockholders, drawing upon the estimates described in the previous section. Essentially, we take each type of institutional investor as representing a single owner, add in the cases described above where it appears that

[58]One of the two has a single individual owner holding 100 percent of the shares, while the other has 2 individual owners holding an average of 20 percent each.

[59]The figures differ slightly from those in table 14 above, because the sample is smaller by 28 firms for which information on the number of shareholders or number of employees was unavailable.

individual owners may have large stakes, and then calculate various measures of the strength of blockholders, singly and as a group.

To begin, table 21 provides further evidence on the incidence and strength of holdings of different types of outside investors. The first row contains the percentage of privatized firms in which the owner-type, indicated by the column heading, owns nothing. Most institutional investors own shares in only a small minority of companies, and outside individuals own shares in only about half. Subsequent rows show the percentage of firms where the owner-types have at least the shareholding indicated by the row. For instance, banks hold at least 1 percent of the shares in 7 percent of all privatized companies. What is remarkable is that, for each of the institutional investors, there is rather little tendency for the percentage of firms in which the investor-type has shares to fall as the percentage of shares increases (given that it is non-zero). For instance, the table indicates that 28.5 percent of firms are partially owned by investment funds (that is, have investment fund ownership greater than zero), and 32.0 percent are (at least) partially owned by domestic firms. But the percentages of firms with investment fund and domestic firm ownership greater than or equal to 5 percent are almost as high: 24.1 and 25.9 percent, respectively. Thus, only about 15 percent of investment funds stakes are less than 5 percent (but greater than zero), and 85 percent of their stakes are 5 or greater! Among domestic firms, 19 percent of their holdings are below the 5 percent level, and 81 percent at that level or above. Moreover, there is also rather little change if we look at shareholdings above 10 percent. The percentage of firms with investment fund ownership greater than or equal to 10 percent falls only to 20.2, while that of domestic firms falls to 20.6; from another perspective, 71 and 64 percent of investment fund and domestic firm stakes, respectively, are at least 10 percent. The evidence shows a strong tendency for institutional shareholders to hold large blocks, or nothing at all. By contrast, individual shareholdings decline rapidly as we consider larger magnitudes: only 45 percent of the firms that have individual shareholders have total individual shareholding equal to 10 percent or more of all shares.

Table 21: Disaggregated Outside Ownership

Given the prevalence of outside block ownership, we would like to know the incidence of different types of outside blockholders, and the distribution of other shareholdings in the firms where blockholder do, and do not exist. Table 22 shows the percentage of firms that have 10 percent or

greater blockholders of various types (BO for bank, FO for foreign investor, IFO for investment fund, FIRMO for domestic firm, and INDO for individual) and their ownership structures.

Table 22: Ownership Structure of Firms with Outside Blockholders

The table shows that 39 percent of firms had an outside blockholder with at least ten percent of the voting equity (in the column labelled "BLO," which applies to firms with any type of 10 percent or greater outside blockholder). Given the low overall ownership by outsiders -- 19.0 percent of all shares and 21.3 percent of voting shares -- the 40 percent figure is rather astounding. Among the factors contributing to this result is the fact that most firms that have blockholders have *only* one, as we can calculate from the information in the bottom row of table 22. The sum of the incidence of the different types of blockholders (i.e., the sum of the percentages of firms in the first five columns) is 46.3 percent, implying that 84 percent (39/46.3) of firms with blockholders had only one. Stated differently, only 16 percent of firms that have a 10 percent blockholder have more than one.[60]

We also find large differences in ownership structure by type of largest blockholder. Firms with no blockholder have only a trivial fraction of their shares owned by institutional investors (.8 percent on average), a much smaller rate of outside shareholding, and much higher rates of ownership by insiders. There is no appreciable difference across blockholder and non-blockholder firms in the fraction of ownership held by the state. Firms with investment fund blockholders (IFOs) have a relatively high percentage of state ownership, but low rates of ownership by insiders and other types of institutional investors. Firms with blockholders who are domestic firms (FIRMOs) tend to have a bit more insider ownership and less state.

Most strikingly, the table shows that where blockholders exist, their stakes are typically large. The mean shareholding of the investment fund in an IFO is 25.8 percent and of a domestic firm in a FIRMO is 33.5 percent. Once again this suggests that institutional investors in Russia have tended

[60]These figures may be compared with analyses of ownership concentration among the Fortune 500 companies in the U.S. Shleifer and Vishny (1986) report that the median number of blockholders (5 percent or greater) is 1, and the average is 1.4. While outside ownership is clearly much smaller in Russia than in public U.S. companies, there appears to be a similar tendency for blockholders to be found singly in companies (if at all). Zwiebel (1995) constructs a model which rationalizes this phenomenon as a result of large blockholders "creating their own space"; the presence of a large block in a firm deters other large blocks from locating in the same firm."

to acquire large stakes, or not to invest at all: it appears that outsiders may be characterized as generally "control-oriented" rather than "arms-length" sorts of investors (Berglof (1995)). A possible explanation lies in the vulnerability of minority investors under situations of strong insider control; outside investors probably realized they needed a sufficient stake to influence the behavior of the firm if they hoped to receive any return on their investment. It is also interesting that the one type of institutional ownership that appears to be an exception to this statement is bank ownership: insiders have a majority of the shares in which banks have blockholdings. The insider share is also large for domestic firms. This provides some evidence for the contention that these types of owners tend to be interested stakeholders, with ongoing relationships with the firms in which they hold shares. Moreover, blockholders (again except banks and to a smaller extent domestic firms) seem to prefer investing in companies with relatively high worker compared to managerial ownership, for a given total insider stake. The most plausible explanation, again, is the relative ease with which outside blockholders may control a firm with dispersed compared to concentrated insider ownership.

Table 23 summarizes the size distributions of various measures of outside ownership concentration. The first column contains total voting shareholding by all outsiders, and the second contains only institutional investors (INSTSH).[61] As we saw when we examined the disaggregated types of institutional investors, the fraction of firms in which institutional owners have above a certain percentage of shares (Px in the table) only falls rather slowly as the percentage (x) rises. 33 percent of all privatized firms have institutional ownership at least at the 20 percent level, and 20.6 percent of firms have institutional ownership over 30 percent.

Table 23: Measures of Outside Ownership Concentration

The rest of the columns of the table rely upon alternative definitions of blockholding and concentration. To begin, we look at the largest single outside shareholding, BLOCKSH.[62] This variable is essentially a one-owner concentration ratio, and it includes all types of outside owners, where again we assume that each type of institutional shareholding is associated with a single

[61] $INSTSH = \Sigma_{i \in I} SH_i$, where SH_i = voting share ownership of the i^{th} owner, and I={bank, investment fund, domestic firm, foreign investor}.

[62] $BLOCKSH = \max(SH_i, AVGINDSH)$, where $i \in$ {bank, investment fund, domestic firm, foreign investor}, and AVGINDSH is the ratio of the percentage of shares owned by individuals to the number of outside shareholders who are individuals.

institutional owner, and where we use the average shareholding in the individual category in firms for which that would be the largest outside shareholding. BLOCKSSH is the sum of all blockholdings, including all shareholdings of institutional investors plus the shares of the individuals in the two firms for which individual shareholding appears to be concentrated (i.e., where the average individual stake exceeds 5 percent).[63] Because of the tendency, which we have noted above, for firms with blockholders to have only a single blockholder, the three columns INSTSH, BLOCKSH, and BLOCKSSH are quite similar, suggesting that there may be little to choose between them.

The final two columns take a somewhat different approach. Here we ask what fraction of shares are owned in total by blockholders of at least a certain size in each firm; in the table, the thresholds are 10 and 20 percent.[64] The figures in the two columns are quite similar, showing again the astonishing levels of ownership concentration among outsiders: about a quarter of all privatized firms have large (10 and 20 percent or greater) blockholders who own at least 25 percent of voting shares.

5c. Privatization Methods and Outside Ownership Concentration

Does the outcome of the privatization process, in terms of the outside ownership concentration, vary with the method of privatization? In earlier sections, we found that privatization method followed by a firm contained significant predictive power for the distribution of shareholdings, both all share and voting shares, across different types of owners, controlling for industry, region, and size. Table 24 reports the results from estimating similar equations, but the dependent variables here are various measures of outside ownership concentration.

Table 24: Impact of Privatization Method on Outside Ownership Concentration

Consistently across measures, we find that, relative to firms following option 2 of the State

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[63] $BLOCKSSH = \sum_{i \in I} SH_i + AVGINDSH$, where I={bank, investment fund, domestic firm, foreign investor, and all variables are defined as before except that AVGINDSH is included only if AVGINDSH≥ 5 percent.

[64] $BLS10SH = \sum_{i \in I} SH10_i + AVGINDSH10$, where I={bank, investment fund, domestic firm, foreign investor}, $SH10_i = SH_i$ if $SH_i \geq 10$ and 0 otherwise, and AVGINDSH10 = AVGINDSH if AVGINDSH ≥ 10 and 0 otherwise. $BLS20SH = \sum_{i \in I} SH20_i + AVGINDSH20$, where I={bank, investment fund, domestic firm, foreign investor}, $SH20_i = SH_i$ if $SH_i \geq 20$ and 0 otherwise, and AVGINDSH20 = AVGINDSH if AVGINDSH ≥ 20 and 0 otherwise.

Privatization Program, that firms following option 1 tend to have more concentrated ownership and that firms following the lease-buyout method tend to have less. The differences are substantial, ranging from 6.6 to 8.1 percent more for option 1, and from 9.4 to 12.4 percent less for lease-buyouts, and they are stiatistically significant. These results suggest that method of privatization may be a suitable instrument for ownership when we estimate the relationship between ownership and performance in the next section.

6. Determinants of Ownership Structure

We have shown that the ownership structure of Russian industrial enterprises varies along several dimensions. The extent of privatization, the composition of new private owners among different types of insiders and outsiders, and the extent of ownership concentration among outside investors differ across industries, regions, and size groups of enterprises. Our analysis of the various methods of privatization applied in Russia also showed that they have had substantially different consequences for the ownership structures of the firms following them.

In this section, we broaden our consideration of the determinants of ownership structure, considering factors that affect the relative attractiveness of the firm to different types of owners. We begin by laying out a conceptual framework for analyzing these determinants, in subsection 6a; next we describe some proxies for the determinants that can be measured with our data, in subsection 6b; finally, we relate several aspects of the ownership structure to the determinants, in subsection 6c. The purpose here is not only to attempt a preliminary answer to the question whether the existing ownership structures in Russia can somehow be rationalized, as varying somehow with the benefits and costs of ownership by various groups, but also and more importantly to lay the groundwork for our later consideration of the possibility that the ownership structure should be treated as endogenous when we examine its impact upon enterprise performance (in section 7).

6a. Conceptual Framework

As mentioned in section 4, above, Demsetz (1983) and Demsetz and Lehn (1985) have argued that the concentration of ownership in large U.S. corporations is determined by the advantages and disadvantages associated with relatively diffuse and relatively concentrated structures. They cite four

factors: the "value-maximizing size of the firm," the "control potential," the presence of "systematic regulation," and the "amenity potential" from owning the firm. Although the Demsetz-Lehn (1985) study is focussed on ownership concentration in corporations owned almost entirely by outside investors,[65] these considerations provide a useful starting point in the Russian context, and for analyzing the issue of identity (which owner-*types* tend to have greater shareholdings) as well as for that of concentration.

But the Russian situation also calls for a somewhat different approach. The fact that the post-privatization ownership structure was largely the result of a recently completed privatization process means that the outcome was surely influenced by the way in which the decision-making process was organized. It was also influenced by the objectives and strategies of the actors in that process, many of whom became (or remained) owners of the companies. For most of these actors, as we have argued, typical investor considerations of return and risk would comprise only part of their objectives, which therefore bear closer examination. We begin by attempting to characterize the motivations of the main groups, including some of the conceptual determinants of ownership structure that might represent those motivations. Then we consider the ways in which the organization of the privatization process itself may have affected the ability of each type of actor to influence the outcome in accordance with its objectives. Our purpose here is to attempt, as much as possible, to characterize the data-generating process that produced the ownership structure that we observe in July 1994.

A first important group of actors in the Russian privatization process consists of state agencies: the federal government (including the President, the Prime Minister and Cabinet, the Duma, and the ministries), the federal and local GKIs, the federal and local Property Funds, and the local governments. Although a complete analysis of the interaction of all these agencies is beyond the scope of this paper, we include several variables representing the possible interests of the state in the analysis below.[66] The variables measure factors such as subsidies from the state to the company, price controls and other types of administrative interference, whether the firm is in the Military-Industrial

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[65]Indeed, Demsetz and Lehn (1985) do not distinguish inside from outside owners in their measure of ownership concentration. While a major theme of this paper is the importance of such distinctions in Russia, we would claim that the argument is not limited to transition economies.

[66]See Boycko, Shleifer, and Vishny (1995) or McFaul (1995) for discussion of the diverse objectives and the bargaining among some of these groups.

Complex, and the extent to which the firm's output is sold to the state.

A second important group of actors consists of insiders: managers and non-managerial employees who had the opportunity to acquire shares through the privatization process. Although the State Privatization Program and the lease-buyout arrangements both gave extensive preferences to acquisitions of shares by insiders, as we have discussed, the price of shares (whether in terms of cash or of vouchers, given that the latter had to be accumulated by purchases on the secondary market) may well have made a difference to cash-constrained insiders. We have argued, for example, that this consideration was particularly relevant to the choice between options 1 and 2 of the State Program. In addition to variables intended to proxy for the likely cost of firm's shares (the book value, to which the price of the 51 percent of shares under option 2 was tied, as well as the 15 percent of shares made available at a discount under option 1) and the ability to pay of managers and workers, we also examine measures of the aspects of the firm that would tend to increase its relative attractiveness to employee-owners: the firm's ownership of social assets (housing, medical clinic, kindergarten, etc.), a low level of capital requirement, and the degree of homogeneity of interests among insiders, under the reasoning that employee ownership may work better when the interests of employees are more closely aligned.[67]

Consistent with our overall analysis of the ownership structure, the third group consists of outsiders. The Demsetz-Lehn considerations are especially relevant when we consider the motivations of outside investors, although the possibility for non-value-maximizing and expropriating behavior, even outright theft, is so much greater in Russia, as we have emphasized, that the notion of "amenity value" is somewhat extended, to say the least! We analyze some proxy variables for the "potential benefits from control" and for "systematic regulation," and we also consider measures of the state of labor relations in the company, the latter perhaps particularly important to outside investors in the general context of insider power in Russia.

In addition to these factors, a number of which overlap across different types of owners, we

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[67]This argument appears in Hansmann (1990), and it is developed in the transition context in Earle and Estrin (1995). Bonin *et al* (1993) point out that "diversity rather than commonality is the prevailing feature among PCs (producer cooperatives) in Western countries," suggesting the difficult of identifying conditions under which employee ownership is relatively advantageous.

also include measures of firm quality (represented by variables such as capacity utilization, fuel costs, exports to the West, and qualitative reports from managers on their firms). While it may appear that "quality" of the firm generally does not discriminate between different types of owners (inasmuch as all types of owners may be presumed to prefer a higher to a lower quality firm), we would argue that workers and/or the state view the situation differently and that quality interacts with other factors. With respect to workers, the fear of job loss may be greater in a firm with worse performance, compared to one performing better, thus the benefits to the workers from control may be higher in the former than in the latter. Indeed, producer cooperatives in market economies are frequently established when a conventional outside investor-owned firm finds itself in financial distress, and workers with quasi-rents take over the firm, exchanging higher wages for enhanced job security.[68] To some extent, this argument may also hold for managers, who also have quasi-rents and are therefore also concerned about job security if outsiders take control of the company. Finally, it is clear that the state (or certain state actors) has an interest in preventing layoffs, plant closings, shortages of supply, and cutbacks in social benefits in politically sensitive regions and sectors or of politically sensitive magnitudes; thus, the state too may be more likely, *ceteris paribus*, to hold shares of firms where such actions are threatened.

Thus far, the discussion has ignored the ways in which the process of privatization has constrained the ability of the diverse types of actors to realize their objectives. In previous sections, however, we have discussed a number of ways in which the process may have imposed such constraints. The issue then becomes the appropriate characterization of the bargaining structure: which variables are determined in which sequence by each party singly or by bargaining with others. To take one extreme, we could analyze the determination of ownership structure as a non-cooperative game, with the deicision-tree structure shown in figure 3. Following a rather legalistic view of the process, the figure shows the State first deciding whether or not to privatize an enterprise. This decision would embody the kinds of restrictions on lease-buyouts and the lists of firms subject to "compulsory," "voluntary," and "prohibited" privatization in the State Program. The figure shows,

[68] See Bonin *et al* (1993) for a summary of this literature. It is partially on this basis that we have suggested that privatization sales or giveaways to workers may be relatively advantageous in declining firms and sectors in transition economies (Earle and Estrin (1995)).

next, the decision of insiders whether to privatize, and if so which method to follow (lease-buyout, or option 1, 2, or 3 of the State Program). Conditional upon that decision, outsiders then had to decide whether to bid for shares in one of the voucher or cash auctions, or to try to arrange some direct purchase from the Property Fund. Insiders may also bid for more shares at that time as well as arrange other ways to acquire them.[69] Finally, secondary sales among private owners may take place before (as well as after) we observe the firms in July 1994, when the voucher program finished.

Figure 3: Stylized Decision Tree of the Russian Privatization Process

This analysis is useful in showing the *priority* of decision-making: first, the state; second, the insiders; last, the outsiders. It also provides a fuller picture of the impact of some possible determinants of the ownership structure. The likely effect of firm quality, for instance, is more ambiguous in the context where the state and insiders move before outsiders do: even if insiders and the state have a greater interest in controlling firms in bad shape than do outsiders, the former may use their first-mover advantage to claim most of the shares in "good" companies.

On the other hand, the decision tree ignores many important features of the Russian privatization process. To begin with, the temporal sequence was somewhat different from that shown on the figure. Leasing arrangements began to be permitted in the waning *perestroika* days of the Soviet Union, and enterprise collectives had to decide whether to participate with little knowledge of the eventual outcome of the process (e.g., whether they would become owners) or of what other alternatives for privatization might eventually be in store. So most decisions about leasing had been made before the options in the State Program were available.

For another thing (a point we have already brought up in section 4, above), not only did the state not set out any *a priori* prohibitions on privatization through lease-buyout, which were instead handled on a case-by-case basis, there was also no consistent enforcement of the several "lists" in the State Program.[70] Thus, rather than the state unilaterally deciding whether to privatize a company (and

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[69]On additional way that insiders could acquire shares directly from the state was through the so-called FARP (Fond Aktsionirovaniya Rabotnikov Predpriyatiya), which used company profits (like an ESOP) to buy about 10 percent of the shares.

[70]Radygin (1994) presents evidence of the high rate of corporatization of enterprises on the "voluntary" list as of mid-1993, possibly even exceeding the rate of those for which the process was supposed to be "compulsory." Furthermore, there is much anecdotal evidence of

what fraction of the shares to privatize), the appropriate model may be rather one of bargaining: the state made its preferences known and created a set of incentives for the process to be carried forward and then negotiated with company insiders over the implementation.[71] A better characterization of the process might be that the state and the firms bargain over inclusion in privatization. Thus, we have placed an "I" for insiders in parentheses next to the "State chooses" on the timeline.

The state could also influence the ownership structure, even beyond the initial decision to privatize. In some cases (8.2 percent of privatized firms in our sample) the state retained a majority of all shares - the case of what we have called PSOs. We have also analyzed the implications of the state's decision to limit its own voting rights, through the "type B" non-voting shares. Finally the state participated, through representatives of the Property Fund and of local governments, on the privatization commission set up for each firm: thus, the state could influence, formally as well as informally, the choice of method, the distribution of shares internally, and the allocation of shares to a public voucher auction, to an investment sale, or to a direct transfer to some favored buyer. An "(S)" representing influence of the state is added to "Insiders choose" on the timeline.

Only in relatively rare cases, however, is it likely that outside investors could have influenced such decisions. Where they did have influence on the privatization process itself, in addition to their decisions whether to purchase or bid for shares, outsiders were probably working through political connections or through their relationships with the managers of firms. For the most part, outsiders were simply left to bid for whatever shares remained once the state and insiders had filled themselves (at preferential prices), and even then they faced the competition of insiders and restrictions imposed by the state; "(I, S)" is added to "Outsiders choose" on the timeline on figure 3.

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firms that actually privatized despite their inclusion on the "prohibited" list, and firms on the "compulsory" list that did not, even by the conclusion of the program on July 1, 1994. Finally, it appears that a significant number of lease-buyouts were carried out or at least completed even after the state banned further such arrangements in 1992.

[71]Indeed, we would argue that the motivation for the insider preferences was administrative as well as political: not only did a vastly weakened state (McFaul (1995)) have to satisfy existing stakeholders (Boycko, Shleifer, and Vishny (1995)), but it also had to accomplish the process administratively. Both the lease-buyout arrangements and the State Program decentralized most of the initiative and decision-making concerning privatization, at the same time conceding significant control over the process.

Thus, it would appear that the appropriate characterization of the bargaining structure in determining the ownership structure resulting from the Russian privatization process is neither a case of "efficient bargaining," where all concerned parties are present and no efficiency-enhancing gains are overlooked, nor is it a simple non-cooperative game, where each party makes choices in a specified sequence. Rather, there was some bargaining at practically every stage of the game, with an important role for both the state and insiders throughout. Moreover, the process appears to have varied substantially across firms. Given the many ambiguities in characterizing the process, our method is simply to estimate reduced-form equations for various aspects of the ownership structure, using the forgoing discussion as our motivation for including certain determinants, but eschewing a structural interpretation of the coefficients.

6b. Measures of Determinants

The enterprise data set is rich in measures of the potential determinants of ownership structure. Summary statistics for the full set of variables we use in this analysis are shown in table 25. Most variables are measured in the year 1990 or 1991, before the privatization process began, because we would like to isolate pre-determined factors affecting ownership structure. In several cases, however, earlier information was not available, so we have been forced to use contemporaneous (July 1994) data.

The first group of variables include measures of size by employment and by sales. If larger enterprises tend to be more "strategic" from the state's point of view, then state ownership may be greater in larger firms. The standard argument concerning ownership concentration (Demsetz and Lehn (1985)) is that larger firms tend to have more diffuse ownership, because of the greater costliness, non-diversifiability of risk, and "degree of control" associated with the same proportionate ownership stake in a larger compared to a smaller company. These considerations may have varying implications across types of owners, if for instance some types of owners tend to be wealthier, less cash-constrained, and better diversified than others: outsiders compared to insiders, managers compared to workers, or institutional investors compared to individual outsiders. In each case, the former group is likely to have a lower cost of holding a large stake relative to the latter. The costliness of employee shareholding is also raised by the investment of the human capital of

employees in their firm (Meade (1972)). Moreover, the fact that the Russian privatization process constrained outsiders to take minority stakes (if substantial majority stakes, as we have seen in section 5) implies that outsiders may prefer to invest in larger firms, where their corresponding "degree of control" may be greater. Finally, if size is to some extent a proxy for the capital requirements and the complexity and heterogeneity of the firm's production, then larger firms should again be more attractive to outsiders relative to insiders (due to standard agency problems between inside owners and outside lenders and the problems of decision-making in heterogeneous companies). Although we also include measures of capital requirements, complexity, and heterogeneity below, all of the forgoing arguments work in the same direction, leading us to predict that outside ownership, especially of institutional investors, and possibly state ownership should be positively related to enterprise size.[72]

Table 25: Determinants of Ownership Structure

The second group of determinants includes various proxies for firm "quality." We have already discussed the motivation for these variables above. The proxies include capacity utilization in 1991 (CAPUT91), the percentage of revenue derived from exports to the west in 1990 (EXPW90), the percentage of costs associated with fuel inputs (FUELC90), and two qualitative measures based on the response of managers. CAPUT91 has a surprisingly high mean of 83.33 (SD=16.24), reflecting the fact that most Soviet enterprises were still operating close to capacity in the last year of the Union; nonetheless the range is large, varying from 15 to 100. EXPW90 is likely to be highly correlated with quality of the firm, as enterprises able to earn hard currency by exporting to non-CMEA countries in 1990 were favored with better technology and more investment, and they likely produced better quality products; reflecting the low level of trade between the Soviet Union and the West, the average EXPW90 is 1.40, but it ranges up to 70 percent. FUELC90 proxies the size of the oil price shock experienced by firms after price liberalization (even if quite incomplete); again the mean is low, but the variance is high. The first of the qualitative variables, PROFMAK, is a dummy variable equal to one if the response is positive to "Does your firm make profits?" A large proportion of firm managers - 86 percent - claim their firms are profitable. The second (PAYPROB) is also a

[72]We also enter size (by employment) non-linearly to permit non-monotonicities in the ownership structure - size relationship.

dummy, equal to one if the manager reported that the firm "failed to repay a bank loan or make an interest payment on time;" nearly 60 percent of managers reported affirmatively. These last two variables are unfortunately available only contemporaneously with the survey.

The next group of variables represent interests and actions of the state. We start with four measures of the association between the enterprise and the military-industrial complex (MIC).[73] These variables are included under the hypothesis that the state may be especially concerned to control the activities of, and possibly to maintain the assets (although this appears to be contradicted by the state's practice) of firms closely tied to the military - therefore, the state may tend to retain shares and to control more closely the privatization process. The first of these variables, MIC, is a dummy for affiliation with the military-industrial complex in 1994, here defined as subordination to the Goskomoboronprom; in our data, 16 percent of firms are MIC by this definition. The next three variables show the percentage of output, revenue, and sales distribution accounted for by military products sold to the state in 1990: the means (SDs) are about 8.9 (26.0), 5.7 (20.2), and 8.8 (23.7) percent, respectively.

We have some qualitative information on the current (1994) extent of "attempts of administrative interference by the federal or local governments," which we take as representing reduced possibility for profit-making by new owners (thus, likely a deterrence to outsiders, especially blockholders) as well as a further proxy for interests of the state. We have coded the responses "not applicable," "not significant," "somewhat significant," "most significant" in two dummy variables, such that ADMINT2=1 if the response is "somewhat significant" (but not "most significant") for either federal or local governments, and ADMINT3=1 if the response is "most significant" for either. Over a quarter of the sample reports at least some state intervention (the sum of the means of ADMINT2 and ADMINT3), while 10 percent report it as "most significant." PRICONT, a dummy equal to one if there are price controls or fixed profit margins on the firm's main products, perhaps comes closest to Demsetz and Lehn's (1985) notion of "systematic regulation" reducing the potential benefits from control. Nearly 40 percent of Russian firms respond affirmatively.

The role of the state also appears in the provision of subsidies to enterprises. The mean of

[73]Earle and Komarov (1996) contains a detailed description of these measures and estimates of the extent of defense conversion in Russian enterprises based upon them.

the dummy variable GOVSUP2 indicates that 26 percent of firms received some state support in 1992, while GOVASS92 shows the actual amount of support received in 1992, ranging up to 4 billion rubles. We include both variables, because the latter is missing for several cases (where GOVSUP2 = 1) and because there may be some reasons to doubt the reliability of the exact ruble figure. The final two variables measure the extent to which sales distribution channels (CHAGOV90) or revenue (REVGOV90) came from non-military sales to the state in 1990; the large difference in the means (19.3 for CHAGOV90 compared to 1.6 for REVGOV90) is due to the fact that the latter applies mainly to public goods, such as hospital supplies and textbooks.

The next two variables are intended to proxy for the complexity of the enterprise's operations, and thus some of the "potential benefits to control" (Demsetz and Lehn (1985)). ESTAB measures the number of establishments of the firm and SUBSID the number of the firm's subsidiaries in 1994. The rationale for these variables is that the performance of firms with multiple locations and complex structures may be relatively responsive to active monitoring and therefore to concentrated ownership by managers or institutional investors.

We have noted that outside investors may be deterred by contentious industrial relations, for which the next set of variables are meant to be proxies. The first two measure trade union density (percent of employees who are members), divided into old unions (pre-existing from the Soviet period), OLDUNION, and newly established unions, NEWUNION, at the time of the survey. The data show a remarkably high rate of union membership, a total of 94 percent on average. Although Russian trade unions have never been exceptionally powerful, these variables may still reflect some ability to oppose restructuring, for instance. But since we have little evidence as to whether the new or the old union tends to be stronger, we include both separately. The next two variables are dummies for, first, whether a strike has occurred or been threatened (STR_THR) in the previous 12-18 months and, second, whether a strike occurred (STRIKE), as of July 1994. In only 2 percent of companies had a strike actually occurred, although it was threatened in an additional 16 percent. The final two variables in the group are based on qualitative questions and are also intended to measure insider power. WUNION is a dummy indicating whether the union is at least a somewhat important factor in setting wages at the time of the survey: 35 percent of firm managers report it is "somewhat important" or "most important." LEXCESS is a dummy equal to one if managers report that the

"actual level of employment" exceeds the "optimal level (given the existing capital stock, technology, and level of output)" by more than 10 percent: 22 percent report it to be so.

We have argued that the costliness to insiders of purchasing shares in the firm may reduce inside and raise outside ownership. The next set of variables tries to get a handle on this idea through measures of the age of equipment, the fraction of total costs attributable to capital costs, the fraction attributable to labor, and labor productivity, with the first variable pertaining to 1994 (although it is unlikely to have changed much over the preceding four years of extremely low investment), and the other three measured in 1990. OLDEQUIP measures the percentage of equipment is more than 15 years old; we employ it as a proxy for the accounting valuation of a firm, based on historical cost plus depreciation, which is used as the basis for determining the price for insider shares in the Russian privatization. CAPCOSTS is the percentage of total cost accounted for by depreciation and interest payments to banks, and LABCOSTS is the total cost of labor (including wages and salaries, bonuses, payroll taxes, and social benefits paid from costs) as a percentage of total costs. These plus LNS_E90, sales per employee, we take as measures of the capital intensity of the firm. Not only would a capital intensive firm been more expensive for employees to purchase, outside investors would have an advantage in updating and improving the assets of a capital-intensive enterprise. Thus, we predict that insider ownership should be positively associated with OLDEQUIP and LABCOSTS and negatively associated with CAPCOSTS and LNS_E90.

The next group of variables mostly concern the interests and abilities of insiders. MANW90 and AVGW90, the average salary of managers and of all workers in 1990, are included as proxies of the ability of each to pay for shares in the firm. To some extent, they may also represent pre-existing firm "quality," inasmuch as firms in favored sectors tended to pay higher wages. We argue that the next variable, INDASS, a dummy equal to one if the firm is a member of a branch (industrial) association, is likely to raise the advantages of managerial ownership, and that of outside firms and banks. The manager is likely to be in a better position to exploit the benefits of the industry network, and cross-ownership by supplying and customer firms and banks, as well as by colluding competitors, is likely to be complementary to membership in the association.

WDIFF90, HREV90, HCHA90, and HGEOG90 are intended as alternative measures of the degree of homogeneity of the workforce, included because of the problems faced by worker

ownership when their interests are heterogeneous. WDIFF90 is the percentage wage differential between white-collar employees and production workers in 1990, and the other three variables are herfindahl indices for the concentration of revenue by type of product, the type of sales distribution channel, and the geographic scope of markets, respectively. The final four variables measure social benefits, likely to be important to workers, and the preservation of which might be a motivation for them to buy out the company. SOCBEN_P measures the percentage of profits paid out as social benefits to workers in 1993; the average was nearly 20 percent. SOCBEN_C measures the percentage of costs attributable to social benefits in 1990; the average was nearly 20 percent.[74] SOCBEN_W measures the net cost of social and non-wage benefits as a percentage of the wage fund at the time of the survey; the average was nearly 12 percent. The final variable, SOCBENNO, is simply the number of different types of social benefits the firm offered in 1990 (including kindergarten, health care facility, canteen, food shop, new housing construction, workers' domitories, resort houses, and transport); the mean is 5.5 with a range from 0 to 8.

Finally, it would be desirable to have better measures of firm-specific uncertainty, emphasized by Demsetz and Lehn (1985) as an important aspect of the potential benefits to control. While their study of U.S. data was able to draw upon the volatility of stock market returns for each company, relative to some index, there is no way of coming up with a comparable measure in Russia. We include industry and region dummies to proxy for the volatility of the firm's environment, recognizing that of course these variables may be representing other important interfirm differences as well.

6c. Estimating the Impact of Determinants on Ownership Structure

In this subsection, we report the results of ordinary least squares estimates of equations for various aspects of ownership structure, with the measures of determinants described in the previous subsection included as independent variables. We examine equations for share ownership by different types of owners and for various measures of outside ownership concentration. Our primary purpose here is to show that the determinants do indeed remove a substantial portion of the variation in each

[74]Some employee benefits in Russia, as other former Soviet countries, are listed as costs on the income statement, and others are financed as a distribution from profits; thus both categories must be included in any overall evaluation of their magnitude.

dependent variable. We do not attempt to estimate parsimonious versions of the equation, to treat what is no doubt fairly sizable multicollinearity, nor to sort out the independent effects of the determinants. That investigation we postpone for future work. Here, we instead provide only a brief interpretation of the results, which we however draw upon later when we use them as the first-stage regressions in the computation of instrumental variable estimates of the impact of ownership structure on enterprise performance.

Table 26 includes results with private share ownership (PSH), worker share ownership (WSH), managerial share ownership (MSH), and outside share ownership (OSH) as dependent variables.[75] The adjusted R^2 vary from .92 in the equation for PSH to .25 for MSH, sufficient to provide some confidence in the use of these determinants as instruments. Controlling for other factors (including employment size categories), PSH is negatively associated with 1990 sales revenue and with MIC, subordination to the State Committee for the Defense Industry. It is positively associated with the percentage of revenue derived from exports to the West, with the percentage of total costs accounted for by fuel, and the logarithm of the number of establishments (a measure of either size or, holding size constant, of complexity). PSH is negatively associated with the amount of subsidies (direct and indirect) received from the state in 1992. Because the omitted method of privatization is "none" (implying that the company has remained 100 percent state-owned), the method dummies show up highly significantly.

Table 26: Impact of Determinants on Share Ownership: Private (PSH), Workers (WSH), Managers (MSH), and Outsiders (OSH)

The equation for WSH displays fewer statistically significant determinants, again the likely result of high multicollinearity in the specification. Like PSH, WSH is negatively associated with size according to 1990 sales, but it is positively related to membership in both old and new unions, and

[75] As shown in Table 25, the data set suffers from missing values in the case of most of our determinants. While the number of cases missing is not crippling for any particular variable, the pattern is such that taken as a whole they are. For the purpose of these equations, which in this paper we use principally as first-stage equations to construct fitted values for ownership structure in instrumental variable estimates of the performance-ownership relationship, we have therefore imputed the mean value for each right-hand side determinant (not for the dependent variables) to all missing cases.

negatively related to the existence of a recent strike and to the number of fringe benefits offered by the firm in 1990. The estimated negative coefficient on strikes may be the result of some endogeneity of this variable, since we are able to measure it only contemporaneously with the ownership information, and it is possible that worker ownership has improved the industrial relations, thus decreasing the probability of a strike.[76] But the benefits result is difficult to explain: we had expected that workers would be more likely to acquire shares where there were benefits to protect.

The equation for MSH is the least satisfactory in terms of overall explanatory power, but it would appear that managers tend to avoid firms with problems paying their bank loans, with high levels of membership in either old or new unions, and with high internal wage differentials. On the other hand, MSH is positively related to one measure of military orientation: the proportion of 1990 revenue obtained from military sales to the state (CHAMIL0); and MSH is also higher when sales distribution channels in 1990 were more concentrated (measure by HCHA90) and when the firm offers more social benefits.

Finally in table 26, OSH is negatively related to the amount of government assistance received in 1992, and positively related to non-military sales to the state and to the proportion of labor costs in total costs. The latter result provides some support for our argument that the comparative advantage of outside owners, relative to inside owners, is likely to be greater in more capital-intensive firms, and that this would be reflected in the ownership structure.

Table 27 turns to a disaggregation of outside ownership between institutional and individual share ownership (INSTSH and INDSH, respectively). Because OSH = INSTSH + INDSH, these regression results show how the impact of determinants on OSH divides between its two components. Most of the OSH determinants work through INSTSH rather than INDSH: the negative relationship to government assistance in 1992 and the positive relationship with non-military sales to the state and the weight of labor in total costs (the latter appearing in INDSH, as well). In addition, the INSTSH equation shows a negative effect of MIC and a positive effect of the logarithm of the number of establishments (LNESTAB), which we have hypothesized may reflect the benefits from control by

[76]This result may provide some evidence in favor of our hypothesis (in Earle and Estrin (1995)), that worker ownership might lead to an improvement in industrial relations. If so, this coefficient suffers from simultaneity bias.

concentrated outside owners. The very low adjusted R^2 for INDSH suggests that individual motivations were either extremely heterogeneous or that they were unresponsive to the differences across firms in the characteristics we are able to measure.

Table 27: Impact of Determinants on Outside Share Ownership: Institutions (INSTSH) and Individuals (INDSH)

Table 28 further disaggregates institutional investor ownership into ownership by a bank (BSH), an investment fund (IFSH), a foreign investor (FSH), and a domestic firm (FIRMSH), with INSTSH = BSH + IFSH + FSH + FIRMSH. The results show significant heterogeneity among types of institutional owners: an apparently insignificant effect of a number of determinants on INSTSH masks significant, although opposing effects on its sub-components. One of the most interesting results is the strong positive relationship between BSH and the dummy variable for missing payments on a bank loan. Although the data do not permit us to identify the particular bank owning shares and the one to which the firm is indebted, it is hard to escape the inference that the banks are one and the same, and therefore that banks have acquired ownership of problem firms because of the debt relationship. BSH is also positively related to production of military goods (PROMIL0) and to the managerial salary (MANW90), as well as to non-military sales to the state and number of establishments, which we observed with OSH. BSH is negatively related to the threat of a strike, to the average wage in the firm (AVGW90), to the homogeneity of revenue sources (HREV90) and to the manager's report of labor excess greater than 10 percent (LEXCESS). Unlike INSTSH, BSH is not negatively related to government assistance in 1992.

Table 28: Impact of Determinants on Ownership by Outside Institutions: Banks (BSH), Investment Funds (IFSH), Foreign Investors (FSH), and Domestic Firms (FIRMSH)

The adjusted R^2 is substantially higher in the equation meant to explain IFSH than in that for BSH: .205 compared to .107, respectively. While BSH was negatively associated with medium-sized firms, IFSH is strongly positively associated with employment in the 2000-plus category. While BSH was positively associated with military production, IFSH is negatively associated, and like OSH but unlike BSH, it is negatively associated with government assistance. IFSH is also positively related to the proportion of total costs accounted for by fuel, the firm's average wage, and the worker-white collar wage differential in 1990, and negatively related to the presence of price controls on the firm's

major products, none of which appeared to be significant in the equations for INSTSH and BSH.

Ownership by foreign investors (FSH), however, shows less systematic variation than the other types of institutional investor ownership. FSH is strongly positively related to location in CAPITAL (Moscow or St. Petersburg) and to Western exports, as well as negatively to the largest employment size category, to the dummy variable for government support in 1992, and to the homogeneity of revenue sources in 1990. Like INSTSH, FIRMSH is negatively associated with MIC and the number of establishments, but it differs in being positively related to military production (PROMIL0), the dummy for government support in 1992, and strike threat and negatively related to important government administrative interference (ADMINT3) and to homogeneity of sales distribution channels.

Finally, we examine the determinants of ownership by outside blockholders, focussing on the four measures of ownership concentration developed in section 5: the share ownership of the largest single blockholder (BLOCKSH), the combined share ownership of all blockholders (BLOCKSSH), the share ownership of all 10 percent or greater blockholders (BLS10SH), and the share ownership of all 20 percent or greater blockholders (BLS20SH). Overall, the results tend to be quite similar to those for INSTSH: negative relationships with MIC, GOVASS92, LABCOSTS and positive association with CHAGOV90, but additionally with a positive relationship to STR_THR and a negative relationship with LEXCESS.

Table 29: Impact of Determinants on Ownership by Outside Blockholding: Single Blockholder (BLOCKSH), All Blockholders (BLOCKSSH), >10% Blockholders (BLS10SH), and >20% Blockholders (BLS20SH)

7. Ownership Structure and Enterprise Performance

Throughout this paper, our organization of the data has been motivated by hypotheses concerning the potential impact of ownership structure on enterprise performance. Because of the possibility that private owners may be more likely to restructure and to increase profits and productivity compared to continued ownership by the state, we have quantified the extent and the patterns of private ownership emerging in Russian industry. For similar reasons, we have distinguished owners who are insiders to the firm from those who are outsiders, and we have

considered different types of each (managers versus workers, and individuals versus various types of institutional investors) based on the hypothesis that each type may have different objectives and may face different constraints, compared with the others. We have emphasized the importance of measuring voting shareholdings because voting shares represent control rights - thus the possibility for owners to influence company behavior. Finally, our analysis of concentration of ownership was similarly motivated: the implications of a given total ownership by outsiders are very different if the outside owners consist of few entities with large holdings, compared to the situation where outside holdings are dispersed over a large number of owners. With respect to each of these aspects of ownership structure, we have found significant variation across the Russian enterprise sample.

In this section, we exploit the statistical variation that Russia offers to test the premise underlying our analysis of the ownership structure: the possibility of some relationship between enterprise performance and the various aspects of the ownership structure, as we have analyzed them. The magnitude and the speed of changes in Russia, we have argued, indeed provides an interesting quasi-experimental setting in which to investigate the effects of ownership on enterprise behavior.[77] But the nature of the ongoing transformation of the economic system in Russia has implications not only for the magnitude of change that may be observed, but also for the types of behavior that are possible and interesting to measure. We argue, in section 7a, that the conventional indicators of enterprise performance in the literatures on Western corporate governance, state ownership, and producer cooperatives are either unmeasureable or not fully appropriate in the transition context, and we describe the labor productivity variable and the indicators of restructuring behavior aggregated into a "restructuring index" that we analyze in this paper. Section 7b reports estimates of the impact of the shareholdings of different types of owners on the performance measures and section 7c on the impact of outside ownership concentration. Section 7d reports instrumental variable estimates of the impact of ownership structure, where we use industry, region, size, and method of privatization as instruments, in addition to the determinants of ownership structure investigated in section 6 above.

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[77]Indeed, the changes over 1991 to 1994 are at an order of magnitude seldom if ever seen in most "normal" situations: for instance, the mean change in real output for the firms in our sample is -52.2 percent, the mean change in nominal output is 16585.7 percent (the difference due to the near-hyperinflation in Russia over this period), and the mean change in employment is -25.2 percent.

7a. Measuring Enterprise Performance

The corporate governance literature in the West has adopted a number of alternative measures of enterprise performance: accounting profits (e.g., Demsetz and Lehn (1985), Holderness and Sheehan (1988), and Prowse (1992)), abnormal stock price increases (e.g., Wruck (1989) and Smith (1996)), and Tobin's Q (e.g., Morck *et al* (1988) and McConnell and Servaes (1990)). The literature on private versus state ownership has tended to use accounting measures of profits and revenues, due to the unavailability of stock prices for state-owned firms (e.g., Boardman and Vining (1989) and Megginson *et al* (1994)). Empirical analyses of the comparative performance of producer cooperatives versus conventional firms has focussed on technical efficiency, usually represented by disembodied total factor productivity (see the summary in Bonin *et al* (1993)). Finally, Bhagat and Black (1997) have recently included a variety of firm-value and accounting measures, concluding that some results are non-robust across the alternative performance variables, although the focus of their paper is not the effects of ownership structure, but rather of board composition.

Applying such performance indicators in the transition context, however, faces problems of both measureability and appropriateness. No reliable measures of firm value are available in the post-socialist countries, where stock markets are just beginning to operate. Similarly, the arbitrariness of socialist prices and depreciation rules implies that historical valuations of capital are meaningless, rendering it impossible to estimate production functions. Western accounting systems are poorly developed and inconsistently applied, and reported profits are unreliable in the extreme.[78]

Moreover, the conventional performance indicators are also somewhat inappropriate for the evaluation of enterprises in transition economies. Analyses of the effects of ownership concentration or of different ownership forms in developed capitalist economies are usually conducted under the implicit assumption that the firms are observed in a steady-state equilibrium, so that it is appropriate to focus directly on indicators of outcomes, such as stock price, profitability, or efficiency. In the transition situation, by contrast, firms have been subject to tremendous shocks to their environments, including drastic changes in practically all input and output markets. What is most interesting to

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[78] A current saying in Russia is that "the good manager will achieve zero profits," the implication being that any reported profits will be lost to the firm's insiders, either paid as taxes or dividends to the state or outside owners.

measure is not whether they have increased profits and productivity in a short span of time, but rather the degree to which they have begun (for instance, under the influence of new owners) to change their behavior in desirable directions. Profitability and efficiency, even leaving aside measurement problems, may be particularly poor measures of behavioral change, certainly so in the short run, because many types of restructuring may impose higher short-run costs and only increase profits and efficiency in the longer run.

Elsewhere (1995), we have attempted to categorize the goals of new corporate governance arrangements in their impact on enterprise behavior in Eastern Europe: clarifying property rights, defining the boundaries of firms, re-orienting firm objectives away from the state and towards the market, reorganizing internal enterprise structure, reallocating resources across and within firms, facilitating down-sizing and shutting-down where necessary, encouraging new investment and updating of technology, fostering restructuring of a number of other types, and reducing transaction costs associated with further evolution of the ownership structure. In this paper, we focus on one measureable outcome indicator - labor productivity - and several types of restructuring behavior: product market, employment, and unbundling (changing boundaries), as well as an index aggregating a number of different indicator variables in each of these areas.

Although we do present some results for individual types of restructuring, we focus on the index because we view restructuring as a process of overall change which cannot be captured by any one variable and instead requires the construction of an aggregated measure of simultaneous change across several dimensions. The rationale and design of the restructuring index are described in detail in the appendix to the paper, and the descriptive statistics for the variables are shown in table 30.
Table 30: Descriptive Statistics on Performance Measures

The restructuring index, RESIND3, is a composite of eleven indicators, including the three presented below, and eight others described in the appendix. As shown in the table, its mean is .24 and it ranges from 0 to 100 (by construction).

We also investigate labor productivity as an indicator of the performance of different firms. Here we are interested in the effects of ownership structure on the level rather than the change in the dependent variable. But to control for the fact that labor productivity may vary systematically for a variety of reasons (for instance, different capital/labor ratios) across firms, we include the lagged (pre-

reform) level on the right-hand side. These equations may also be interpreted as restructuring equations, where the firm has managed to reduce employment while keeping output up, or to raise output while keeping employment down. The dependent variable is defined as the natural logarithm of the ratio of sales (S) to employment (L); as the table shows, LOG(S/L) ranges widely.

Finally, we turn to three individual indicators of the extent of restructuring.[79] DISALES is the index of dissimilarity between the structure of a firm's channels for the sale of its outputs in 1994 with that in 1990 (each enterprise provided the percentage of the value of its output obtained from sales through its own retail or wholesale network, through retail or wholesale firms independent of the enterprise, through direct sales to non-governmental customers, through non-military sales to the state, and through military production, as well as through "other" methods in 1994 and from the same six sales channels in 1990):

$DISALES = .5*\Sigma_i |SALE94_i - SALE90_i|$,

where $SALE94_i$ and $SALE90_i$ indicate the percentage of sales accounted for by a particular "distribution channel" i in the years 1994 and 1990, respectively. The range across firms of DISALES is from 0 to 100, where 0 indicates no change, and 100 indicates a complete change. The table shows that, while some firms changed the composition of their sales dramatically (indeed only 33 percent did not change the composition at all), on average there was only moderate adjustment: the mean is 35.22.

LAYOFF is the firm's layoff rate from the beginning of 1992 until the time of the survey in July 1994 (defined as the ratio of number of workers laid off during that period to the number employed in 1991). The mean layoff rate is 5 percent, with a large range: 0 to 50 percent. At least some Russian firms appear to have taken a very active approach to the excessive levels of employment inherited from the years of labor hoarding under central planning. Although the distribution of LAYOFF is evidently rightward skewed, over 70 percent of firms did engage in some layoffs.

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[79]Like RESIND3, and as further described in the appendix, each of the three individual restructuring indicators is rescaled from 0 to 100 in our regression analyses below (although this was in fact unnecessary for DISALES, because it was naturally scaled this way, and in fact we have firms at both extremes).

DEMPSPL is a measure of the extent of change in the boundaries of the firm: the ratio of the sum of the number of employees lost through split-ups and those gained through mergers to 1991 employment. The mean is even lower than the layoff rate: about 2 percent, but again the variance is large. While most companies (88 percent of them) engaged in no "unbundling" or "rebundling" of these kinds, some engaged in them to a large extent, in one case amounting to 92 percent of 1991 employment. Consistent with the general view that the size of Soviet industrial enterprises tended to exceed efficient scale (either because of excessive vertical integration or inefficient bundling of diverse activities), we find that most of the changes in firm boundaries involved split-ups (the mean is .023 across all firms), and only a tiny fraction involved mergers (the mean is .001).

7b. Estimating the Impact of Ownership Identity on Performance

Our estimating equations take the following general form:

RI = f(OWN, region, industry, size),

where RI is an indicator of restructuring (alternatively LOG(S/L), RESIND3, DISALES, LAYOFF, DEMPSPL), OWN is a specification of the relative importance of different types of owners (defined precisely below), and region, industry, and size are controls.[50]

We consider several alternative specifications of the ownership structure, based upon the disaggregation of types of owners in figures 1 and 2, above. First, we list those where the variables in OWN are proportionate voting shareholdings:

- PSH
- WSH, MSH, OSH
- WSH, MSH, INSTSH, INDSH
- WSH, MSH, BSH, IFSH, FSH, FORSH, INDSH

where the variables represent the voting shareholding of the respective group:

PSH = private

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[50]Our controls are rather parsimonious: we have three regional categories (defined in the footnotes to the tables of results), seven industry categories (as before), and three size groups. We have estimated many of the equations reported below with other specifications of these covariates, and not found any qualitative differences in the inferences one would draw concerning the ownership-performance relationship.

WSH = workers

MSH = managers

OSH = all outsiders

INSTSH = institutional outsiders

INDSH = individual outsiders

BSH = bank

IFSH = investment fund

FSH = domestic firm

FORSH = foreign investor.

As before, OSH = INSTSH + INDSH = BSH + IFSH + FSH + FORSH + INDSH.

We also perform a similar investigation where OWN is specified according to the dominant owner type of the firm. Analogous to the specifications with shareholdings, we employ the following:

- PO
- WO, MO, NO, OO, INO
- WO, MO, NO, INSTO, INDO, INO
- WO, MO, NO, BO, IFO, FO, FORO, INDO, INO

where the variables are defined analogously above. In the third and fourth specifications, we have first disaggregated OOs into INSTOs (firms with INSTSH≥INDSH) and INDOs (firms with INDSH>INSTSH) and then disaggregated INSTOs into FOs (if FSH is at least as great as each of BSH, IFSH, and FORSH), BOs (if BSH>FSH and at least as great as IFSH and FORSH), IFOs (if IFSH>FSH, IFSH>BSH, and IFSH≥FORSH), and FOROs (if FORSH is greater than each of the other shareholdings of institutional owners).[81]

Table 31 shows the results from estimating the restructuring index as a function of shareholdings, in which the four specifications of OWN are multiplied by two, because we present

[81]The priority is determined by our suppositions as to which type of owner is more likely to be dominant in the event of a tie between them: domestic firms (likely to have close ties to managers), banks (for the same reason), investment funds, and foreigners. Foreigners come last because they are probably the most outside, and they may, *ceteris paribus*, face the greatest difficulties in influencing the behavior of the firm they nominally own. That said, there are few ties in the data.

results with and without a set of region, industry, and size controls.[82] Both the dependent and the share variables are scaled as proportions (from zero to one).

Table 31: Impact of Shareholding on Restructuring

Specification 1 shows a positive impact of private shareholding on restructuring. The effect is statistically significant at the five percent level, but it is small: the full privatization of a state-owned company (PSH changing from 0 to 100) is estimated to move the restructuring index by only about .06, less than half the standard deviation in RESIND3 (.16). The result is robust to the inclusion of covariates, however.

Specification 2 disaggregates PSH, showing that the private effect is primarily due to higher ownership by managers. The estimated coefficient on MSH is much larger in this specification as well as in specifications 3 and 4, exceeding the standard deviation of RESIND3, and it is statistically significant at the 1 percent level across all six specifications.

Specification 3 shows that the lack of a significant result for outsiders is not due to heterogeneity between individual and all institutional investors: the coefficients on both are small and statistically insignificant. Specification 4 investigates the possibility that different types of institutions may have differential impacts upon enterprise performance. The results show a large, positive coefficient on IFSH - the shareholdings of investment funds - whether or not we control for covariates, while the coefficients on the other types of institutional holdings are statistically insignificant (and the point estimate is even negative for bank shareholding).[83]

Table 32 shows the results from a similar analysis of the impact of ownership on the restructuring index, but where the differences in ownership structure across firms are measured using the dominant owner framework. The results are fairly consistent with the shareholding approach:

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[82]We also report an additional specification, where variables representing "firm quality" are added to the industry, region, and size covariates. The additional covariates (descriptive statistics for which appear in table 25) include the following variables: capacity utilization in 1991 (CAPUT91), percentage of revenue derived from exports to the West in 1990 (EXPW90), percentage of fuel cost in total cost in 1990 (FUELC90), a dummy for support received from the state in 1992 (GOVSUP2), and the amount of assistance in 1992 (GOVASS2). Instrumental variables specifications are discussed in section 7d, below.

[83]When we add the "firm quality" covariates to these equations, the estimated coefficients for PSH, MSH, and IFSH are almost identical to those in the table.

the estimated coefficient on PO is statistically significant and positive, although small. The estimated MO coefficient is highly significant and larger than the PO effect in every specification. No other firm type, including WOs, INOs, NOs, and any of those dominated by institutional investors) differs significantly from SOs. The coefficients on FORO (dominant foreign ownership) are large, but too imprecisely estimated to draw any firm inferences.

Table 32: Impact of Dominant Owner Type on Restructuring

Turning to labor productivity as the outcome variable, table 33 shows the results of the shareholding approach and table 34 the results of the dominant owner approach to organizing the ownership data. PSH, private share ownership, is estimated to have a large, statistically significant impact on labor productivity: the results suggest a *ceteris paribus* increase of nearly a half percentage point in labor productivity for each increase of one point in private share ownership. The estimated impact of managerial share ownership, MSH, is even greater, with an impact of .7 to .8. Extrapolated to an evaluation of the effect of 100 percent compared to no ownership, the estimates suggest a 40-50 percent higher labor productivity for a firm completely privately owned (relative to one completely state-owned) and a 70 to 80 percent higher productivity for a firm completely managerially owned (relative to one with MSH=0).[84]

Table 33: Impact of Shareholding on Labor Productivity

In these regressions, the effect of WSH is everywhere positive, although only about half the size of MSH, and it becomes statistically significant in the specifications where covariates are included. Regarding outsiders, we again find no effect of overall outside share ownership, but that it matters to disaggregate among them. IFSH, share ownership by investment funds, has large, positive coefficient estimates, although it is statistically significant only when covariates are

[84]Lest the large magnitudes of these results be misconstrued, the Russian context must be remembered: large declines in sales for most industrial firms and smaller declines in employment. The results should be read as suggesting that managerial owners have been much more effective than the state and than most other types of private owners in reducing employment in line with the fall in sales, rather than implying that the static efficiency of managerially owned firms is 70 percent higher than other ownership forms. See our argument concerning the appropriate measures of enterprise performance in the transition in section 7a, above.

excluded.[85]

Table 34: Impact of Dominant Owner Type on Productivity

The results from investigating the implications of the dominant owner approach, shown in table 34, are quite similar in terms of private and managerial ownership, PO and MO, but elsewhere they are rather different. WO and INO have positive and statistically significant effects in every specification (the latter are after all a combined MO and WO), while the coefficient on NO is positive and significant when covariates are included. Among outsiders, individuals (INDO) have a bigger impact than do institutions (INSTO), a result that again becomes statistically significant in the specification with covariates. Once again, among institutions, only the investment fund (IFO) has a positive and statistically significant effect. Both foreign investors and domestic firms have negative coefficients, although they are not estimated to be significantly different from zero.

For a more disaggregated examination of particular types of restructuring, tables 35, 36, and 37 reproduce the specifications in tables 31 and 33 with three individual restructuring indicators, DISALES, LAYOFFI, DEMPSPLI, as the dependent variables, respectively. Overall, the results provide further evidence that shareholding by private owners, managers, and some types of outsiders - especially investment funds - lead to more restructuring by firms.[86]

Table 35: Impact of Shareholding on Restructuring: Change of Sales Structure

Table 36: Impact of Shareholding on Restructuring: Layoffs

Table 37: Impact of Shareholding on Restructuring: Split-ups and Mergers

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[85]When we add the "firm quality" covariates, the coefficient on WSH is no longer statistically significant, at conventional levels. But OSH does become significant, with an estimated coefficient of .71, larger than that for MSH. INSTSH also becomes significant, but IFSH is not. Thus, the estimated impacts of various aspects of outside ownership are somewhat sensitive to specification, in the OLS models. By contrast, the IV estimates of the impact of OSH, INSTSH, and IFSH are quite robust across alternative specifications, as we show in section 7d, below.

[86]In an earlier paper (1996), we have also estimated a variety of other specifications, for instance including measures of product market concentration, import penetration, and soft budget constraints, but the results concerning ownership were robust to these changes.

7c. Estimating the Impact of Outside Ownership Concentration on Performance

In this section, we report the results from estimating similar equations to those presented above, but rather than disaggregating different types of outside owners, here we substitute measures of ownership concentration by outside blockholders as potential determinants of corporate performance. We again investigate labor productivity and the log of labor productivity as dependent variables, and examine the impact of concentration measured in the shareholding framework (so that the concentration measure is defined as the percentage of shares held by some large owner(s), variously defined) and in the dominant type framework (so that the concentration measure is a dummy variable equal to one if concentration exceeds some threshold level). The concentration of shareholding measures are the same as those described in table 23: BLOCKSH (voting shareholding of the largest single outsider), BLOCKSSH (sum of voting shareholdings of all institutions plus individuals where the latter have at least 5 percent of the shares, on average) , BLS10SH (sum of the voting shareholdings of all outsiders with at least 10 percent of shares), and BLS20SH (sum of the voting shareholdings of all outsiders with at least 20 percent of shares).

Table 38: Impact of Outside Ownership Concentration on Restructuring: Shares

The results of adding these variables to the equation for RESIND3, where we include WSH, MSH, and OSH, with and without industry, region, and size covariates, are shown in table 38. The only consistently robust determinant of performance in these specifications, indeed in any specification we examined, is MSH, managerial ownership. None of the concentration measures appears to be systematically related to enterprise performance.[87]

In table 39, where we estimate equations within the dominant owner type framework, our concentration measures are dummies defined to be equal to one if the largest blockholder has at least 10 percent of voting shares (BLO10), if it has at least 20 percent (BLO20), if the sum of blockholders has at least 10 percent (BLOS10), and if they have at least 20 percent (BLOS20). We find robustly positive and significant coefficients on MO and the occasional positive impact of WO and OO, but

[87]We estimated a variety of other specifications, in addition to those shown in the tables. For instance, we replaced WSH, MSH, and OSH by PSH, to try to learn whether multicollinearity among the disaggregated share variables was responsible for the low significance of the concentration variables. We also tried adding the "firm quality" covariates. But in no case were the results appreciably different.

the estimated effect of concentration is negative and statistically insigificant.

Table 39: Impact of Outside Ownership Concentration on Restructuring: Types

The equations accounting for labor productivity are similar in most implications: MSH is positive and significant, OSH occasionally so (and large in impact where it is statistically significant), but the measures of concentration are negative and usually insignificant in table 40, a result that is again robust to adding the "firm quality" covariates. The final specification in the table, including all covariates and BLS20SH, produces the single case of a significant coefficient on a concentration measure, but the sign is estimated to be negative.

Table 40: Impact of Outside Ownership Concentration on Productivity: Shares

In the dominant owner specifications for productivity, shown in table 41, we again find a robust positive impact of MO, some evidence of positive effect from WO and INO (the combined worker-manager form), but nothing else systematic. None of the concentration measures show up as significant in any specification.

Table 41: Impact of Outside Ownership Concentration on Productivity: Types

The conclusion from this analysis would appear to be that considerations of "identity" - which type of outside investor holds shares - outweigh concentration of ownership among all types of outside owners in Russian corporate governance at present. While managerial ownership has a clear positive relationship with performance across a wide variety of measures and specifications in these regressions, among outsiders we could find some evidence of a positive impact only for investment funds. When we aggregate outsiders and search for positive effects of ownership concentration, we find no such evidence.

Finally, we considered the possibility that our linear specifications may conceal significant non-monotonicities in the ownership-performance relationship. Morck *et al* (1988), for instance, suggest that managerial shareholding may have two contrary effects: an incentive effect and an entrenchment effect. The former is supposed to dominate at low and high levels of ownership, while the latter dominates at moderate levels. Morck *et al* provide evidence of this non-monotonic relationship (with breakpoints at 5 and 25 percent) with respect to managers, as do Wruck (1989) with respect to managerial and blockholder ownership and McConnell and Servaes (1990) with respect to concentration among institutional investors; Prowse (1992), however, finds no evidence of non-

monotonicities with respect to concentration of ownership in Japan (indeed, he finds no any relationship whatsoever between ownership concentration and accounting profits of Japanese companies). Similarly motivated, we estimated various piecewise-linear relationships for shareholdings and concentration in the Russian enterprise data set, but the data showed no evidence of systematic relationships.

7d. Instrumental Variables Estimates of the Impact of Ownership on Performance

We have argued that there may be good *a priori* reasons to believe that the Russian privatization process contained significant selection effects, such that the ownership structure resulting from the process is likely to be associated systematically with particular characteristics of enterprises. Moreover, we showed in section 6, above, that our data produce evidence of such effects. In that section, we attempted to analyze the kinds of factors that would tend to have differential effects on the attractiveness of enterprise shares for some types of owners relative to others, and we found statistically significant relationships between many of the hypothesized determinants taken individually, as well as significant explanatory power for all of them taken as a group.

These findings, together with those of the previous two subsections, suggest the possibility that the observed association between certain types of ownership structure and measured enterprise performance may be the result of some simultaneity bias. Perhaps private ownership does not cause more restructuring and higher labor productivity, but the observed positive relationship is instead the result of a greater probability that "better" firms were privatized, and once they were included in the privatization program perhaps their ownership structures were likely to include greater private ownership, compared to the "worse" firms. Similar arguments could be adduced with respect to our findings concerning the strong positive impact of managerial ownership on performance and the somewhat weaker impact of outside investor ownership.

In this section, we attempt to take this simultaneity bias into account by using instrument variable techniques, using the determinants explored in section 6 as instruments for various dimensions of the ownership structure. Among those determinants, it is worthwhile to highlight the special importance of privatization method, which appears to us a clear case of a variable which is

highly correlated with ownership structure (as we have shown) but which is unlikely to have any independent effect on enterprise performance: any correlation between choice of method and performance should operate only through ownership structure. Our method is to use the estimated selection equations of section 6 to construct fitted values for the ownership variables, and examine the impact of these constructed measures on enterprise performance.

Tables 42 to 45 shows the results, where the fitted values are indicated by the prefix "PROB" followed by the original variable name; for instance, PROBPSH represents the fitted values from the equation for PSH in table 26, above. These results parallel the OLS estimates in tables 31, 33, 38, and 40, respectively. Tables 42 and 43 emphasize ownership identity, while tables 44 and 45 stress concentration of outside ownership. In table 42, the dependent variable is RESIND3 and in table 43 it is labor productivity. Regarding specification 1 in these two tables, the impact of private shareholding appears to be quite robust: the coefficients are slightly higher in the IV estimation than in the OLS versions, suggesting a slight negative selection bias in the privatization process, but the differences are trivial. Concerning specification 2, where we disaggregate private owners into managers, workers, and outside investors, the estimates again show consistently positive effects of managerial ownership on both restructuring and productivity, with even greater magnitude in the IV compared to the OLS estimates. By contrast with the OLS results, however, the IV estimate of the effect of outside ownership (of all types) is positive, large, and highly significant in the productivity equation.

Table 42: Impact of Shareholding on Restructuring: IV Estimates

Table 43: Impact of Shareholding on Productivity: IV Estimates

Specification 3 in tables 42 and 43 shows a positive estimated impact of ownership by institutional investors on both restructuring and productivity; the magnitude is roughly the same as for managerial ownership except in the specification for productivity with covariates, where it is substantially greater. In all cases, the impact of share ownership by individual outsider investors is estimated to be negative, results that are statistically significant in the restructuring equation. Taken at face value, this suggests that privatization to dispersed individuals may be even worse for corporate governance and performance than no privatization whatsoever, and perhaps some monitoring by the state. When we disaggregate institutional investors, in specification 4, we find evidence of positive

impacts of both investment funds (in the restructuring equation without covariates and in both productivity equations) and banks (not significant for restructuring, but large and significant for productivity).

These results appear to be quite robust to changes in specification. For instance, adding the "firm quality" covariates to the equation has only trivial effects on the coefficient and standard error estimates. The results therefore provide further support for the hypothesis that managers and certain types of outside investors have had positive impacts upon enterprise performance. The fact that the impact of ownership by outsiders and institutional investors is enhanced when we examine IV rather than OLS results suggests that the privatization process may have contained some negative bias, such that outsiders were less likely to be able to claim shares in firms in which the opportunities for restructuring and productivity improvements were great.

Tables 44 and 45 perform a similar analyis, parallel to tables 38 and 40, for measures of concentration. By contrast to the OLS results, the IV estimates show evidence of large and significant impacts of every measure of outside ownership concentration on the restructuring index (and on DISALES and LAYOFF, not shown in the tables). Although the estimated impacts of the concentration measures on labor productivity are not precisely measured, they are, by contrast with the OLS estimates, positive and large in magnitude. Taking into account the possibility of selection biases appears to strengthen the evidence that performance may indeed be positively related to concentrated outside ownership.[88]

Table 44: Impact of Ownership Concentration on Restructuring: IV Estimates

Table 45: Impact of Ownership Concentration on Productivity: IV Estimates

Finally, we again investigated the possibility that our linear specifications may be obscuring non-monotonic relationships between enterprise performance and aspects of ownership structure. To test for such possibilities, we estimated models where the impact of the instrumented shareholding and concentration variables was permitted to vary in a piecewise linear fashion (following Morck *et al* (1988), although they do not treat ownership structure as endogenous). As we also found in the OLS models (reported in section 7b and 7c, above), there was no systematic evidence of such non-

[88] Again, these results are robust to the inclusion of a set of "firm quality" covariates.

monotonicities for any of the ownership variables. Thus, the basic results of this part of the paper - the positive relation between measures of enterprise performance and private, managerial, investment fund, and concentrated outside ownership - appear to be unaffected by this extension.

8. Conclusion

A common thread in most accounts of the emerging corporate ownership structure in Russia is the low involvement by private outside owners. It is well-known that the State Privatization Program, although based on a free distribution of vouchers to every citizen, in fact granted such enormous preferences to enterprise employees that extremely high levels of insider ownership were the inevitable result. Although it has received much less attention, the other main privatization process in Russia - lease buyouts - facilitated still greater transfers to insiders, as we have shown. Moreover, the state has retained considerable shareholdings, both by not privatizing about 30 percent of enterprises, and by holding back large stakes in putatively privatized ones. For the small proportion of shares remaining for potential acquisition by private outsiders, the design of the program encouraged maximal dispersion of ownership, especially by the legislative limits on the ability of the new Voucher Investment Funds to acquire stakes in excess of 10 percent in any one company. Thus, overall, it would appear that insiders and the state dominate Russian enterprises and that outsider influence should be close to nil.

This story has significant truth, and this paper has presented evidence to substantiate much of it. We have documented the large fraction of shares that Russian privatization has transferred to insiders, including both managers and workers, and we have analyzed the holdings of the state in some detail. However, the paper has also shown that the situation may not be quite so bleak as is often claimed. For a variety of reasons, outside shareholders may wield clout in a significant fraction of Russian companies. In particular, the paper has developed several considerations that enhance the picture of the potential strength of outside investors: the unequal distribution of outsiders across companies that gives them much more than their average stakes in a significant fraction of firms, the tendency of outsiders to invest in somewhat larger companies that raises the proportion of the capital stock they may influence, the important role played by non-voting shares that may limit the control rights of inside and state shareholders, the large fraction of vouchers that citizens ultimately placed

with Voucher Investment Funds, the apparent lack of enforcement of the 10 percent limit on fund ownership in any one company, and, as a result of all of these factors, the emergence of concentrated blocks of shares, held mostly by institutional investors, that provide both the means and the motive for outside control over insider control (to paraphrase Aoki (1995)).

Among outsiders, we have shown that large blockholders tend to be investment funds and domestic firms, while the role of banks and foreign investors is minimal. Similarly to large corporations in the U.S. (Shleifer and Vishny (1986) and Zwiebel (1995)), firms with blockholders tend to have only a single blockholder. The main difference is that many Russian firms have no blöckhölder whatsoever. Yet it turns out that a non-trivial fraction of them do have one.

We have also presented evidence that the different methods of privatization applied in Russia are partially responsible for the heterogeneity of ownership structure. Unlike previous studies of Russian ownership, our data includes enterprises remaining only partially privatized, those still 100 percent state-owned (as of July 1994), and those that had been privatized in the earlier "lease-buyout" program. We have shown that the choice of privatization method carried significant implications for the extent of privatization, the relative importance of different types of private owners, and the degree of concentration among outside investors.

Throughout the paper, we have pursued the dual themes of "identity" and "concentration" of ownership. Although the zero-transaction cost world of Coase (1960), Demsetz (1983), and Demsetz and Lehn (1985) may contain no systematic relationship between corporate performance and the distribution of ownership, the situation in Russia appears to be quite different. Due to the lack of development of financial markets, institutions of contract, and the legal system, there are enormous costs to monitoring, measuring, and enforcing contracts in Russia and other transition economies. Moreover, the poor functioning of competitive markets, both factor and product, and of other corporate governance institutions, such as credit market monitoring, implies that Russia has few of the other disciplinary devices common in market economies. It is in this context that widespread asset stripping has ensued, following the breakdown of state control, in Russian enterprises. Without active monitoring of owners - whether insider or outsider - little stands in the way of a continuation of this largely destructive process.

We have argued that the new ownership structure is critical for another reason: the manifest

need for large-scale restructuring of enterprises to improve performance where possible and to liquidate where it is not. The paper has developed our point-of-view that restructuring is best understood and measured as a composite index of more-or-less simultaneous changes across several dimensions of the firm's activities, due to the many complementarities across different types of changes. We believe that this restructuring process is not only a fascinating economic phenomenon to observe and study, but that it is also a critical issue for policy in the transition context because of its many externalities: the extent and success of restructuring has welfare consequences both inside the old enterprise sector and outside in the *de novo* firms. As long as the old enterprises account for a large fraction of the economy, their performance will affect the employment and career prospects for workers, the investment opportunities for savers, the quantity and quality of goods for consumers, and the health of state finances for taxpayers. Furthermore, the growth of the new private sector depends to a significant extent on assets, including structures and equipment as well as human capital, that are bottled up in state and former state companies, until released by restructuring. This is another set of reasons, in addition to the high level of transaction costs, the poor functioning of competitive markets, and the disequilibrium situation in Russia, why we believe it would be inappropriate to treat non-value-maximizing behavior by owners or managers as mere on-the-job consumption, as utility maximization without any normative consequences.

A further motivation for our study has been that the fact that restructuring is needed on such a large scale in Russia suggests that, despite the noisiness of the environment and of the data, the researcher may be able to observe an impact from ownership structure on enterprise performance of a magnitude much larger than those detectable in stable market economies. Although it is of course quite early to investigate the ownership-performance relationship in Russia, we believe the issue to be sufficiently important and interesting to merit attention. Indeed, we have found evidence, in simple OLS specifications, of systematic effects of private ownership on several types of restructuring behavior and on labor productivity. The OLS results indicate that, among private owners, managers have the most consistently positive and statistically significant impact on performance, while we find somewhat weaker evidence for a positive impact of ownership by investment funds. Other types of private owners, including worker-owners and types of outside investors except for investment funds, do not appear to lead to performance superior to that under state ownership, nor do the OLS results

suggest any implication that concentration of outside ownership has a positive effect on performance. These results do not appear to arise from a linear specification that does not permit non-monotonicities in the relationship between enterprise performance and ownership concentration.

We have also investigated the determinants of the post-privatization corporate ownership structure in Russia. Although this study does not attempt to disentangle their independent effects, we have found evidence that characteristics of the firm likely to raise its relative attractiveness to certain types of owners, compared to others, do remove a substantial proportion of the variation in ownership structure, both the distribution of shares across different types of owners and the extent of concentration of outside ownership. Based on our finding that privatization method carries large implications for ownership structure, we have argued that this variable and other determinants, measured prior to privatization, may be suitable instruments for ownership structure.

Our final set of findings concern the results from estimating the performance-ownership relationship using those instrumental variables. Consistent with the OLS estimates, private share ownership appears to be robustly positive and significant, if sometimes small in magnitude. The findings for managerial shareholding are also robust, with a larger magnitude than private shareholding taken in total. However, the IV results show much clearer evidence of institutional ownership on performance, and consistently larger effects of outside ownership concentration, relative to the OLS estimates. This finding provides support for our contentions that the Russian privatization process was systematically biased against outside investors and that it is critical to take such selection effects into account when evaluating the impact of ownership structure on enterprise performance.

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Appendix: Measuring Restructuring

For some time now, the term "restructuring" has been the *mot de jour* in public discourse on firms, both in developed Western economies and in the transition economies of Eastern Europe and the former Soviet Union. Yet there seems to be considerable vagueness in the understanding of what the term means, in either East or West. Usually it is defined by example, when a particular action such as "downsizing," "out-sourcing," or "spinning off" of part of the firm is characterized as restructuring. But one always has a sense that no single action is in itself a sufficient condition for true restructuring to occur. And although it clearly involves changes in the behavior of the firm, no one seems to have in mind the conventional situation of a simple comparative static adjustment to a relative price shift.

Rather, to most observers, restructuring seems to imply a decisive reformation in many dimensions of the firm simultaneously. Implicitly, it is thought of as a non-convex regime switch, a qualitative leap that breaks with the past, instead of a gradual movement along some easily quantifiable dimension from one equilibrium to another. Such dramatic changes are not everyday events, but we may conceptualize them as occurring under two sets of circumstances.

First, there may be multiple equilibria in the set of institutional arrangements and practices which constitute firms. It is well-recognized that Japanese firms differ along any number of dimensions from American firms; it is also true that American firms display enormous heterogeneity. These equilibria can be thought of as local solutions to an optimization problem, the global solution to which depends on a large number of conditions and is therefore in general indeterminate. Thus, even in a world of gradually changing conditions, we would not observe smooth adjustment, but rather discrete jumps when a certain threshold in the extent of change in conditions has been reached. Restructuring in developed capitalist economies would fall into this category.

Second, the world surrounding a firm may suddenly change: the quintessential example here is the "transition" faced by firms in Eastern Europe and the former Soviet Union. Particularly in economies which adopted "big-bang" policies, firms were hit virtually overnight with massive changes in the prices of both inputs and outputs, in the availability of supplies and new technologies, in the competitiveness of their product markets -- and all of this on a scale and with a suddenness seldom if ever seen in the history of liberalizing economies. And still more importantly, the basic incentives of firms have shifted from a bureaucratic regime in which (to oversimplify) producing to the plan was predominant to one in which considerations of profits and costs have become paramount. Restructuring for these firms means drastic and complementary alteration of practically all their activities and relationships.

At the same time, often the degree and sometimes even the direction of change along any particular dimension is difficult to predict. In general, we know that Soviet-type enterprises produced to government order rather than to satisfy consumers. Not only what was produced, but to whom it was sold or distributed was specified by plan. Enterprises hoarded labor and other inputs to be able to "storm" to meet their plan targets on time. The wage structure was compressed and largely exogenous, given by detailed central regulations. The boundaries of firms were not determined by efficiency or transaction cost considerations, but again by bureaucratic edict. And their access to new technology was extremely limited. While some firms may have suffered less from any one of these

factors, to a large extent most firms exhibited most of them.[59] Thus, we look for variants of all these different kinds of changes in our measure of the extent of restructuring. Our data set contains over 20 relevant variables which we describe below. Individual indices are created by linearly rescaling the indicator variables from 0 to 100, where 0 is the value assigned to companies which restructured the least and 100 to those which restructured the most.

Having examined the change in each of the variables separately, we then aggregate them into groups defined for five dimensions of restructuring: production, employment, compensation, firm boundaries, and investment. For each group, we define a restructuring index based on the set of variables pertaining to that group, taking the mean of the individual indices and including only observations with at least two non-missing indicator variables in that group. For convenience, the index is again rescaled from 0 to 100, where 0 indicates the least amount of restructuring accomplished in our data set and 100 indicates the most. We examine the correlation of different forms of restructuring, to begin to investigate the nature of the complementarities in the adjustment process. One intriguing possibility is that firms will display movements along divergent evolutionary paths: either because of multiple equilibria or because of multiple search and learning strategies (which may themselves be thought of as multiple solutions to the decision-making problem).

Finally, we assemble two aggregate restructuring indices, taking the mean of the three production, employment, and boundaries indices to form RESIND3 and the mean of all five categorical indices to form RESIND5, in both cases using only observations for which non-missing observations are available for all categorical indices and again linearly rescaling from 0 to 100, where 0 indicates the lowest observed level, and 100 the highest level, of restructuring. The purpose of the aggregate indices is to measure the extent to which firms are adjusting when all dimensions are considered simultaneously.

The rest of the appendix details the precise method of computation of the restructuring index, using the World Bank codebook. The sample is all old enterprises (excluding 45 "DNs" and 11 firms that are neither clearly old nor clearly new). Because of severe missing value problems in the wage and investment categories, the final number of observations in the overall restructuring index RESIND5 is 96. The restructuring index with three categories, RESIND3, has 246 observations.

INDIVIDUAL RESTRUCTURING VARIABLES

Each of the following indicator variables is provided 'naturally' and as index (with "i" at the end of mnemonics).

Production

Correlation coefficients for the change in output/sales structure from 1990-94:
CORGEOG (V89 TO V96)
program:
com cormkt4=((v089-avm1)*(v090-avm2)+(v091-avm1)*(v092-avm2)+
(v093-avm1)*(v094-avm2)+(v095-avm1)*(v096-avm2))/4.

---

[59]For instance, it is much less likely that firms in the military-industrial complex faced large barriers in access to technology. But this sector was certainly subject to labor hoarding, producing to plan, compressed wage differentials, and inefficient bundling of activities.

com varmkt0=((v090-avm2)**2+(v092-avm2)**2+
(v094-avm2)**2+(v096-avm2)**2)/4.
com varmkt4=((v089-avm1)**2+(v091-avm1)**2+
(v093-avm1)**2+(v095-avm1)**2)/4.
com corgeog=cormkt4/sqrt(varmkt4*varmkt0).
CORREV (V21 TO V44) with all services (v35-v44) collapsed together
CORPROD (v10-v20)
CORSALES (V138-V164)
All negative values of correlation coefficients were truncated to 0.[90]
(all indices are defined inversely)

Employment
LAYOFF= rec226/(emp91)
TURNOVER =(hirings+separations)/emp91=(rec224+rec225)/emp91
(enter positively)
DEMP = % change in employment = (emp94-emp91)/((emp91+emp94)/2)
(enters negatively)
DEMP1 = (emp194-emp191)/((emp191+emp194)/2)
where emp1 for 94 = rec215+ .75*rec221-rec233 - .5*rec230 + .5*rec(rec230/rec215)*rec233.
(enters negatively)

Wages/ Compensation
WAGECV=ratio of coefficient of var of wages in 1994
[SD(REC237,REC238,V239)/mean(same 3 vars)] to coefficient of variation in 1990
MGRSAL= Log(rec239)
M_WSAL=managerial/worker wage = rec239/rec237
CORSOBEN = change in structure of benefits provision to employees = correlation coefficient of v516_2 to v516_9 with v517_2 to v517_9
(negative values were truncated)

Unbundling
DSUBSID = |(rec218/emp94)-(rec220/emp91)|
DFIXCONT = |(rec221/(emp94+rec221)-(rec223/emp91+rec223)|
DEMPSPL = (rec227+rec228)/emp91
(enter positively)

Investment
INVDUM = v452
INVCAT= v355

---

[90]We have also examined indexes of dissimilarity, as discussed in the text. Each of the correlation coefficients included in the index is very highly correlated with the corresponding index of dissimilarity.

(both enter negatively)

CONSTRUCTION OF CATEGORICAL INDICES

For each category above, we define a categorical index from 0 to 100, by taking the average of the individual indices (as long as at least 2 individual indices within the category are non-missing, and otherwise ignoring missing values), and rescaling them from 0 to 100. Variables computed as ratios, where numerator was equal to 0 and denumerator was missing were included into the analysis.

INVINDEX
PROINDEX
EMPINDEX
WAGINDEX
UNBINDEX

CONSTRUCTION OF AGGREGATE RESTRUCTURING INDICES

We construct an index which is the average of the five categorical indices and one which is the average of three indices, both rescaled from 0 to 100.

RESINDEX = avg (PROINDEX, EMPINDEX, WAGINDEX, UNBINDEX, INVINDEX)
RESIND3 = avg (PROINDEX, EMPINDEX, UNBINDEX)

Table 1
Ownership Classification of Industrial Enterprises in 1994: Goskomstat Data

Percent	Goskomstat Classification					
	"State"	"Municipal"	"Public Institutions"	"Private"	"Mixed without Foreigners"	"Mixed wit Foreigners"
Total Number of Enterprises	5.3	2.7	0.8	72.6	16.3	2.3
Total Number of Production Workers	16.0	1.4	0.7	25.0	55.3	1.6
Total Volume of Output	9.4	1.0	0.2	18.8	69.6	3.0

Source: Goskomstat (1996). Classifications are explained in the text.

Table 2
Ownership Composition of Enterprise Sample

	Ownership Status		
	100 % State	Privatized Firms	De Novo
Number of Enterprises			
Count	86	299	45
Row %	20.0	69.5	10.5
Employment 1994 (ths)			
Sum	130.3	565.1	1.2
Row %	19.0	81.0	0.2
Sales 1994 in bln RBS			
Sum	1404.4	7656.0	21.9
Row %	15.4	84.4	0.2

Source: Authors' calculations from sample survey data (July 1994). "Privatized" firms in this table are former state enterprises with less than 100 % state ownership.

Table 3
Composition of Sample and Population

	Sample Survey		Goskomstat Registry	De Novo Sample	
	Count	Percent	Percent	Count	Percent
Industry Categories					
FUEL & ENERGY	24	5	2	0	0
METALS & CHEMICALS	50	11	5	5	11
HEAVY MACHINERY	66	15	8	4	9
LIGHT MACHINERY	125	28	17	11	24
WOOD & CONSTRUCTION MATERIALS	62	14	21	14	31
CONSUMER GOODS	90	21	40	9	20
OTHER	22	5	9	2	4
Region Categories					
NORTH	58	13	13	4	9
VOLGA-VYATKA	26	6	6	3	7
POVOLZHSKI	56	13	11	4	9
NORTH CAUCASUS	40	9	10	4	9
URALS	67	15	14	6	13
WSIBERIA	52	12	13	2	4
ESIBERIA	34	8	8	6	13
MOSCOW	55	13	9	7	16
CENTER	51	12	18	9	20
TOTAL	439	100	100	45	100
Size Categories (1991 Employment)					
< 200	61	17	44	34	93
200-1,000	102	29	37	3	7
1,000-10,000	165	47	17	0	0
> 10,000	26	7	2	0	0
TOTAL	354	100	100	37	100

Note: Industry groups were constructed by the authors on the basis of Goskomstat categories. "Metals & Chemicals" includes ferrous and nonferrous metallurgy. "Heavy Machinery" includes electrotechnical industry, defense industry, ship-building industry and heavy machine building. "Light Machinery" includes machine tools, computers, automobiles, agricultural machinery, radio industry, communication and electronics, metal constructions and machinery repair. "Wood & Construction Materials" includes lumber, wood working industry, and construction materials. "Consumer Goods" includes textiles, clothing industry, food processing and meat and milk industry. Regions use Goskomstat grouping except that we distinguish Moscow and include Far East in "East Siberia" and both Northern and North-Western region in "North". For the De Novo sample the employment categories were computed using 1994 employment figures.

Source: Column 1,2,4, and 5 are authors' calculations from sample. Column 3 is from Lee (1996), based on Goskomstat registry of 10,582 industrial firms in Russia in 1991.

Table 4
Ownership Structure in Privatized, All Old, and De Novo Firms

Shareholding	Privatized Firms (unweighted)	Privatized Firms (weighted)	All Old Firms (unweighted)	All Old Firms (weighted)	De Novo Firms (unweighted)	De Novo Firms (weighted)
TOTAL STATE	15.0	25.0	38.0	41.9	1.4	.5
TOTAL PRIVATE	85.0	75.0	62.0	58.1	98.6	99.5
-All Insiders	66.1	54.2	48.2	42.0	71.4	62.4
--Workers	46.2	39.9	33.5	30.6	6.5	4.0
--Managers	19.6	14.3	14.3	11.0	63.6	57.2
-All Outsiders	18.9	20.8	13.8	16.1	27.1	37.1
--Banks	1.0	.7	.7	.5	.0	.0
--Investment Funds	4.5	8.6	3.3	6.6	.0	.0
--Other Domestic Firms	6.7	4.5	4.8	3.4	7.6	2.0
--Foreigners	.4	.7	.3	.5	.0	.0
--Individuals	5.9	6.2	4.3	4.8	16.2	30.7
Valid N	235	235	319	319	24	24

Note: The category "All Old Firms" includes enterprises that were partially or fully privatized and enterprises that had not begun privatization and were still held by state. 1994 employment was used to weight firms in the columns labeled "weighted".

Table 5
Dominant Owner Type

Dominant Owner Type	Privatized Firms (unweighted)	Privatized Firms (weighted)	All Old Firms (unweighted)	All Old Firms (weighted)
SO column %	8.3	20.3	32.5	38.1
PO column %	91.7	79.7	67.5	61.9
-IO column %	76.7	58.7	56.4	45.6
--WO column %	50.4	44.5	37.1	34.6
--MO column %	14.6	8.3	10.7	6.5
--INO column %	10.0	4.7	7.4	3.7
-OO column %	8.8	12.1	6.4	9.4
-NO column %	5.8	8.8	4.3	6.9
N	241	241	327	327

Note: The category "All Old Firms" includes enterprises that were partially or fully privatized and enterprises that had not begun privatization and were still held by state. 1994 employment was used to weight firms in the columns labeled "weighted". SO = state-dominated, PO = private-dominated, IO = insider-dominated, WO = worker-dominated, MO = manager-dominated, INO = insider-dominated, but not clearly by workers or managers, OO = outsider-dominated, NO = private-dominated, but unclear whether by insiders or outsiders. See text for precise definitions.

Table 6
Ownership Structure by Dominant Owner in All Old Firms

	Dominant Ownership Categories							
	SO	PO	-IO	--WO	--MO	--INO	-OO	-NO
TOTAL STATE	91.5	11.4	9.7	8.0	11.9	16.1	10.4	36.9
TOTAL PRIVATE	8.5	88.6	90.3	92.0	88.1	83.9	89.6	63.1
All Insiders	7.4	68.6	76.0	78.7	80.8	53.8	26.0	36.3
--Workers	5.9	47.7	52.4	67.5	12.2	33.3	18.7	29.6
--Managers	1.5	20.6	23.3	11.2	68.6	20.5	6.7	6.6
All Outsiders	1.1	20.0	14.3	13.3	7.3	30.2	63.5	26.8
--Banks	.0	1.0	.9	.8	.8	1.2	3.2	.0
--Investment Funds	.6	4.7	3.8	3.6	1.5	8.4	9.5	8.7
--Foreigners	.0	.5	.1	.1	.0	.0	2.9	1.5
--Domestic Firms	.0	7.0	4.6	4.2	1.4	11.0	26.0	8.8
--Individuals	.4	6.4	4.3	3.8	2.2	9.6	22.1	7.8

Note: See text and previous table note for definitions.

Table 7
Distribution of State Shareholding Across Firms
(percent)

	Privatized (unweighted)	Privatized (weighted)	All Old (unweighted)	All Old (weighted)
P100	.0	.0	22.5	19.5
P90	.0	.0	22.5	19.5
P80	.0	.0	22.5	19.5
P70	.0	.0	22.5	19.5
P60	2.9	5.1	24.3	23.1
P50	8.2	20.0	27.7	33.4
P40	13.9	24.0	31.3	36.2
P30	22.1	36.9	36.6	45.1
P20	36.5	52.8	45.7	56.1
P10	45.5	75.2	51.4	71.7
0	48.5	20.0	35.4	15.5
N	233	233	319	319

Note: The table shows the percentage of firms where the state shareholding is greater than or equal to x, with the corresponding row designated Px. The second-to-last row, labeled "0" shows the percentage of firms where state ownership is zero. The weighting variable is Employment 1994.

Table 8
Expectation of Privatization in Unprivatized Firms (SSOs)

	Privatization Not Planned	Privatization Delayed	Privatization Planned Within 12-18 months
Unweighted Count	41	19	17
%	53.2%	24.7%	22.1%
Weighted by 1994 Employment %	40.3%	12.0%	47.7%

Note: Sample was restricted to old firms that had not undergone privatization as of July 1994. The table shows enterprise managers' responses to a question on their expectation or plans concerning the future privatization of their firm.

Table 9
Ownership Structure By Industry Group

Shareholding (percent of shares)	Groups of Branches of Industry							TOTAL
	FUEL & ENERGY	METALS & CHEMICALS	HEAVY MACHINERY	LIGHT MACHINERY	WOOD & CONSTRUC. MATERIALS	CONSUMER GOODS	OTHER	
Total State	52.4	22.2	37.2	47.2	45.4	22.7	59.2	38.0
Total Private	47.6	77.8	62.8	52.8	54.6	77.3	40.8	62.0
-All Insiders	35.2	58.7	47.4	37.2	44.0	66.2	33.0	48.2
--Workers	22.8	38.2	32.6	29.5	31.0	42.8	25.6	33.5
--Managers	12.4	20.5	13.8	7.7	13.0	22.7	7.3	14.3
-All Outsiders	12.4	19.1	15.4	15.6	10.6	11.1	7.8	13.8
--Banks	.6	1.6	.4	.6	1.3	.5	.0	.7
--Investment Funds	5.6	6.1	2.2	3.5	3.7	2.0	1.9	3.3
--Domestic Firms	.6	6.8	5.8	5.3	2.4	4.8	4.3	4.8
--Foreigners	.0	.0	.7	.6	.3	.0	.0	.3
--Individuals	4.4	4.5	6.1	5.1	2.9	3.3	1.5	4.3
Dominant Owner Type (percent of firms)								
SO	57.9%	18.2%	25.0%	40.4%	41.7%	19.7%	50.0%	32.5%
-SSO	26.3%	9.1%	19.2%	35.1%	38.9%	18.4%	43.8%	26.4%
-PSO	31.6%	9.1%	5.8%	5.3%	2.8%	1.3%	6.3%	6.1%
PO	42.1%	81.8%	75.0%	59.6%	58.3%	80.3%	50.0%	67.5%
-IO	36.8%	72.7%	57.7%	41.5%	52.8%	77.6%	37.5%	56.4%
--WO	10.5%	48.5%	36.5%	31.9%	33.3%	48.7%	31.3%	37.1%
--MO	10.5%	12.1%	9.6%	5.3%	11.1%	18.4%	6.3%	10.7%
--INO	15.8%	12.1%	9.6%	4.3%	8.3%	6.6%	.0%	7.4%
-OO	.0%	6.1%	7.7%	11.7%	5.6%	1.3%	6.3%	6.4%
-NO	5.3%	3.0%	9.6%	6.4%	.0%	.0%	6.3%	4.3%
TOTAL NUMBER	19	33	52	94	36	76	16	326

Note: Sample is all old firms. See notes to table 3 for definition of industry groups..

Table 10
Ownership Structure By Region

Shareholding (percent of shares)	Regions								
	NORTH	VOLGA-VYATKA	POVOLZHSKI	NORTH CAUCASUS	URALS	WEST SIBERIA	EAST SIBERIA	MOSCOW	CENTER
Total State	43.5	38.8	47.8	6.9	47.5	30.4	34.7	49.7	30.0
Total Private	56.5	61.2	52.2	93.1	52.5	69.6	65.4	50.3	70.0
All Insiders	40.7	44.6	42.1	76.5	39.0	56.0	50.8	41.9	52.7
-Workers	28.5	35.6	30.8	56.7	25.6	39.9	25.8	26.4	38.6
-Managers	12.2	9.0	11.3	19.8	13.4	14.8	25.0	15.5	12.3
All Outsiders	15.8	16.6	10.1	16.6	13.5	13.6	14.6	8.4	17.3
-Banks	1.3	.0	.2	.0	.3	1.1	.3	.7	1.8
-Inv. Funds	4.2	5.9	3.1	2.7	3.7	2.6	.1	1.6	5.2
-Firms	4.1	1.9	4.0	8.0	4.2	5.9	6.5	4.0	4.9
-Foreigners	.8	.0	.0	.5	.0	.0	1.5	.3	.0
-Individuals	5.4	8.8	1.9	4.3	4.5	4.0	6.2	1.8	5.2
Dominant Owner Type (percent of firms)									
SO	34.7%	33.3%	44.4%	3.1%	44.7%	25.6%	28.6%	43.2%	23.7%
-SSO	30.6%	22.2%	35.6%	3.1%	34.0%	20.5%	19.0%	43.2%	15.8%
-PSO	4.1%	11.1%	8.9%	.0%	10.6%	5.1%	9.5%	.0%	7.9%
PO	65.3%	66.7%	55.6%	96.9%	55.3%	74.4%	71.4%	56.8%	76.3%
-IO	44.9%	55.6%	51.1%	93.8%	42.6%	69.2%	57.1%	45.9%	60.5%
--WO	28.6%	38.9%	37.8%	71.9%	21.3%	51.3%	23.8%	24.3%	42.1%
--MO	10.2%	5.6%	8.9%	12.5%	8.5%	7.7%	28.6%	13.5%	7.9%
--INO	6.1%	11.1%	4.4%	9.4%	12.8%	5.1%	4.8%	8.1%	5.3%
-OO	16.3%	11.1%	2.2%	.0%	6.4%	2.6%	9.5%	5.4%	5.3%
-NO	2.0%	.0%	2.2%	3.1%	6.4%	2.6%	4.8%	5.4%	10.5%
TOTAL NUMBER	49	18	45	32	47	39	21	37	38

Note: Sample is all old firms. See notes to table 3 for definition of regions.

Table 11
Ownership Structure By Size (1991 Employment)

Shareholding (percent of shares)	1991 Employment						TOTAL
	< 201	201 - 500	501 - 1000	1001 - 2000	2001 - 5000	>5000	
Total State	36.9	36.8	27.4	34.9	33.5	51.8	36.6
Total Private	63.1	63.2	72.6	65.1	66.5	48.2	63.4
-All Insiders	49.1	55.3	58.7	50.1	49.2	34.5	49.6
-- Workers	34.0	37.9	38.9	35.2	35.0	27.3	34.8
--Managers	15.0	17.3	18.3	14.9	14.2	5.5	14.3
-All Outsiders	14.0	7.9	13.9	15.0	17.3	13.8	13.9
--Banks	.6	.5	.2	.7	1.8	.3	.7
--Invest. Funds	2.1	.9	2.6	3.5	6.9	5.5	3.7
--Domestic Firm	4.9	2.4	8.6	4.5	5.0	3.0	4.8
--Foreigners	1.0	.0	.0	.4	.3	.5	.3
--Individuals	4.5	4.2	2.5	4.6	3.3	4.2	3.9
Dominant Owner Type (percent of firms)							
SO	32.6%	33.3%	23.9%	26.8%	24.1%	46.5%	30.6%
-SSO	30.2%	31.0%	21.7%	23.2%	19.0%	27.9%	25.0%
-PSO	2.3%	2.4%	2.2%	3.6%	5.2%	18.6%	5.6%
PO	67.4%	66.7%	76.1%	73.2%	75.9%	53.5%	69.4%
-IO	58.1%	59.5%	65.2%	64.3%	67.2%	32.6%	58.7%
--WO	34.9%	40.5%	41.3%	41.1%	46.6%	25.6%	38.9%
--MO	16.3%	11.9%	13.0%	10.7%	12.1%	2.3%	11.1%
--INO	4.7%	7.1%	6.5%	12.5%	8.6%	2.3%	7.3%
-OO	9.3%	.0%	8.7%	3.6%	5.2%	11.6%	6.3%
-NO	.0%	7.1%	2.2%	3.6%	3.4%	9.3%	4.2%
TOTAL NUMBER	69	60	53	41	42	24	289

Note: Sample is all old firms.

Table 12
Estimating the Impact of Industry, Region, and Size on Privatization Status

Dependent Variable = NON-SSO

Independent Variable	Estimated Coefficient	Estimated Standard Error
Constant	.41	.66
FUEL_EN	.11	.70
METAL_CH	.78	.74
L_MACH	-.42	.46
WOOD_CM	-.65	.57
CONGOODS	.50	.53
OTHER	-1.18*	.68
VOLGA_V	.41	.72
POVOLZH	-.13	.53
N_CAUCAS	2.42**	1.09
URALS	-.23	.52
WSIB	.89	.62
ESIB	.56	.76
MOSCOW	-.87	.54
CENTER	.88	.60
E<500	.30	.53
E<1000	.85	.55
E<2000	.79	.54
E<5000	.98*	.55
E>5000	.66	.56

odel Chi-squared	40.89
ignificance	.0025
	291

statistically significant at 10 % level
-statistically significant at 5 % level

ald test of 6 linear restrictions (Industry)
hi-squared = 11.82, Sig. level = 0.07
ald test of 8 linear restrictions (Region)
hi-squared = 18.25, Sig. level = 0.02
ald test of 5 linear restrictions (Size)
hi-squared = 4.42, Sig. level = 0.49

ote: Logistic function estimates. Sample includes all old firms. Dependent variable (NON-SSO) equals 1 if the firm is at least rtially privatized, and 0 if the firm is still owned 100 percent by the state. Definitions of industry, region, and size dummies may be und in tables 9, 10 and 11. The omitted categories are as follows: Heavy Machinery for the group of industry dummies, North for the oup of region dummies, and the smallest category of employment in 1991 (less than or equal 200 employees) for the last group of e dummies.

Table 13

Estimating the Impact of Industry, Region, and Size on Ownership Structure

Independent Variables	PSH B	PSH SE B	ISH B	ISH SE B	WSH B	WSH SE B	MSH B	MSH SE B	OSH B	OSH SE B
FUEL_EN	-2.3	11.0	-1.8	9.7	-2.6	8.8	2.2	6.2	-.6	5.6
METAL_CH	13.6	9.2	11.0	8.2	5.0	7.4	7.4	5.2	2.6	4.7
L_MACH	-3.2	7.2	-5.9	6.4	-1.0	5.8	-3.6	4.1	2.7	3.7
WOOD_CM	-4.8	9.2	-2.4	8.1	-1.5	7.3	.2	5.2	-2.4	4.7
CONGOODS	20.1**	7.8	24.3***	6.9	13.6**	6.3	11.6**	4.4	-4.2	4.0
OTHER	-19.2*	11.8	-13.2	10.4	-9.4	9.5	-2.2	6.7	-6.0	6.0
VOLGA_V	3.7	11.4	3.7	10.1	5.4	9.1	-1.8	6.4	.0	5.8
POVOLZH	-1.1	8.5	2.4	7.5	3.3	6.8	-.8	4.8	-3.5	4.3
N_CAUCAS	27.4***	9.4	25.6***	8.3	22.8***	7.5	2.5	5.3	1.8	4.8
URALS	-2.4	8.6	-2.8	7.6	-3.5	6.8	.6	4.8	.4	4.4
WSIB	14.0	9.2	11.9	8.2	8.7	7.5	1.2	5.3	2.1	4.7
ESIB	5.9	11.5	2.9	10.1	-9.1	9.2	11.8*	6.5	3.0	5.8
MOSCOW	-12.4	9.3	-2.7	8.2	-1.8	7.4	-1.1	5.2	-9.8**	4.7
CENTER	11.0	8.9	13.0*	7.8	12.7*	7.3	-.2	5.1	-2.0	4.5
E<250	20.2	13.2	18.0*	11.6	11.1	10.5	6.8	7.4	2.2	6.7
E<500	28.0	13.4	30.7*	11.9	16.2	10.7	14.5**	7.6	-2.7	6.8
E<1000	31.7*	13.0	28.4	11.5	16.0	10.4	11.7*	7.4	3.3	6.6
E<5000	29.1	12.5	24.6	11.1	14.7	10.0	9.7	7.0	4.5	6.4
E>5000	16.8	13.4	15.0	11.8	10.0	10.8	3.3	7.6	1.9	6.8
(Constant)	30.1	14.6	17.1	12.9	14.4	11.6	2.2	8.2	13.1	7.4
Adjusted R-squared		0.14		0.17		0.08		0.06		0.0004
N		280		280		276		276		280

*- statistically significant at 10 % level
**-statistically significant at 5 % level
***-statistically significant at 1 % level

F[6,260] I	3.73, Prob =.0014	5.72, Prob =.0000	1.97, P=.0703	3.12, P=.0053	1.03, P=.4046
F[8,260] R	2.72, Prob =.0067	2.36, Prob =.0183	2.69, P=.0073	0.62, P=.7610	1.03, P=.4046
F[5,260] S	1.89, Prob =.0959	2.20, Prob =.0553	0.69, P=.6308	1.56, P=.1722	.70, P=.62

Note: OLS estimates. Sample includes all old firms. Dependent variable is the percentage shareholding of all private, all inside, worker, manager, and all outside-owners respectively. Definitions of industry, region, and size dummies may be found in tables 9, 10 and 11. The omitted categories are as follows: Heavy Machinery for the first group of industry dummies, North for the group of region dummies, and the smallest category of employment in 1994 (less than or equal 100 employees) for the last group of size dummies.

Table 14
Ownership Structure By Method of Privatization.

Shareholding	METHOD OF PRIVATIZATION				TOTAL
	OPTION 1	OPTION 2	OPTION 3	LEASE-BUYOUT	
TOTAL STATE	25.0	17.9	8.3	1.4	15.0
TOTAL PRIVATE	75.0	82.1	91.7	98.6	85.0
-All Insiders	54.1	57.3	68.4	90.6	66.1
--Workers	41.8	38.9	41.7	61.6	46.1
--Managers	12.3	18.3	26.8	28.7	19.7
-All Outsiders	20.9	24.8	23.2	8.0	19.0
--Banks	.2	1.7	.0	.7	1.0
--Foreigners	.7	.6	.0	.0	.4
--Investment Funds	7.9	4.4	5.5	1.7	4.6
--Other Domestic Firms	7.5	9.4	4.4	1.8	6.6
--Individuals	4.2	8.4	13.3	3.7	6.0
N	61	102	3	66	232

ote: Sample is all firms that have undergone (at least partial) privatization. "Options 1, 2, and 3" refer to enterprises included in the State rivatization Program, while "Lease-buyout" refers to firms whose assets were bought by lessees.

Table 15
Dominant Ownership By Method of Privatization.

Dominant Owner Type	METHOD OF PRIVATIZATION				TOTAL
	OPTION 1	OPTION 2	OPTION 3	LEASE-BUYOUT	
SO					
Cases	14	4	0	1	19
Column %	21.5%	3.8%	.0%	1.5%	8.0%
PO					
Cases	51	100	3	65	219
Column %	78.5%	96.2%	100.0%	98.5%	92.0%
-IO					
Cases	33	84	3	63	183
Column %	50.8%	80.8%	100.0%	95.5%	76.9%
--WO					
Cases	22	51	1	47	121
Column %	33.8%	49.0%	33.3%	71.2%	50.8%
--MO					
Cases	5	16	0	14	35
Column %	7.7%	15.4%	.0%	21.2%	14.7%
--INO					
Cases	6	16	2	0	24
Column %	9.2%	15.4%	66.7%	.0%	10.1%
-OO					
Cases	8	11	0	2	21
Column %	12.3%	10.6%	.0%	3.0%	8.8%
-NO					
Cases	9	5	0	0	14
Column %	13.8%	4.8%	.0%	.0%	5.9%
TOTAL					
Count	65	104	3	66	238

Note: Sample is all firms that have undergone (at least partial) privatization. "Options 1, 2, and 3" refer to the state Privatization Progra
while "Lease-buyout" refers to firms whose assets were bought by lessees.

Table 16
Ownership Structure By Share Type

Shareholding	ALL SHARES		ALL SHARES - TYPE A		ALL SHARES - TYPE A - TYPE B	
	OPTION1	TOTAL	OPTION1	TOTAL	OPTION1	TOTAL
TOTAL STATE	25.0	15.0	33.2	17.1	27.7	14.4
TOTAL PRIVATE	75.0	85.0	66.8	82.9	72.3	85.6
-All Insiders	54.1	66.1	39.5	62.2	43.1	64.3
--Workers	41.8	46.1	29.7	42.9	32.9	44.6
--Managers	12.3	19.7	9.8	19.0	10.2	19.5
-All Outsiders	20.9	19.0	27.3	20.6	29.2	21.3
--Banks	.2	1.0	.2	1.0	.2	1.0
--Foreigners	.7	.4	.8	.5	.9	.5
--Investment Funds	7.9	4.6	10.4	5.2	11.2	5.5
--Other Domestic Firms	7.5	6.6	9.7	7.2	10.2	7.4
--Individuals	4.2	6.0	5.5	6.3	5.9	6.5
N	66	242	66	242	66	242

e: Sample includes only privatized (including partially and fully privatized) enterprises. Type A shares are non-voting shares
sferred to enterprise employees under Option 1 of the State Privatization Program. Type B shares are non-voting shares held by the
e.

Table 17
Dominant Owner By Share Type

Dominant Owner Type	ALL SHARES		ALL SHARES - TYPE A		ALL SHARES - TYPE - TYPE	
	OPTION1	TOTAL	OPTION1	TOTAL	OPTION1	TOTAL
SO						
Cases	14	19	19	24	14	16
Column %	21.5%	8.0%	29.2%	10.1%	21.5%	6.7%
PO						
Cases	51	219	46	214	51	222
Column %	78.5%	92.0%	70.8%	89.9%	78.5%	93.3%
-IO						
Cases	33	183	20	170	22	176
Column %	50.8%	76.9%	30.8%	71.4%	33.8%	73.9%
--WO						
Cases	22	121	15	114	17	121
Column %	33.8%	50.8%	23.1%	47.9%	26.2%	50.8%
--MO						
Cases	5	35	5	35	5	35
Column %	7.7%	14.7%	7.7%	14.7%	7.7%	14.7%
--INO						
Cases	6	24	0	18	0	17
Column %	9.2%	10.1%	.0%	7.6%	.0%	7.1%
-OO						
Cases	8	21	15	28	22	36
Column %	12.3%	8.8%	23.1%	11.8%	33.8%	15.1%
-NO						
Cases	9	14	5	10	7	10
Column %	13.8%	5.9%	7.7%	4.2%	10.8%	4.2%
TOTAL						
Count	65	238	65	238	65	238

Note: Sample includes only privatized (including partially and fully privatized) enterprises. Type A shares are non-voting shares transferred to enterprise employees under Option 1 of the State Privatization Program. Type B shares are non-voting shares held by t state.

Table 18A
Estimating the Impact of Privatization Method on Ownership Structure

ndependent Variables	Dependent Variables: Private Shareholdings					
	PSH		ISH		OSH	
	all	voting	all	voting	all	voting
Option 1	-5.3 ** (2.5)	-10.1 *** (2.3)	-2.7 (3.2)	-16.0*** (3.5)	-2.6 (3.256)	5.9* (3.6)
Option 3	-.1 (.8)	-2.2 (8.5)	-.5 (11.3)	-2.3 (2.6)	.4 (11.6)	.1 (12.7)
Lease-buyout	11.8 *** (2.5)	9.7*** (2.4)	28.2*** (3.2)	26.1*** (3.6)	-16.4*** (3.3)	-16.5*** (3.6)
Adj R^2	.382	.436	.486	.506	.125	.167
N	206	206	206	206	206	206

e: Sample includes all privatized firms. "Option 2" is the omitted category. Covariates include 3 region dummies (Moscow-St. ersburg, European Russia, Asian Russia (Siberia, Far East and Urals)), 7 industry dummies, and 3 employment size dummies. Shares are ressed in percentages.
tatistically significant at 10 % level
statistically significant at 5 % level
*-statistically significant at 1 % level

Table 18B

Independent Variables	Dependent Variables: Inside Shareholdings			
	WSH		MSH	
	all	voting	all	voting
Option 1	3.0 (4.4)	-7.8 * (4.6)	-5.8 (3.9)	-8.3** (4.0)
Option 3	-.7 (15.6)	-2.0 (16.2)	-.1 (14.0)	-.5 (14.2)
Lease-buyout	22.2*** (4.5)	20.6 *** (4.7)	5.5 (4.0)	5.0 (4.1)
Adj R^2	.147	.188	.073	.084
N	202	202	202	202

ote: Sample includes all privatized firms. "Option 2" is the omitted category. Covariates include 3 region dummies (Moscow-St. etersburg, European Russia, Asian Russia (Siberia, Far East and Urals)), 7 industry dummies, and 3 employment size dummies. Shares are xpressed in percentages.

Table 18C

Independent Variables	Dependent Variables: Outside Shareholdings									
	Banks		Investment Funds		Domestic Firms		Foreigners		Individuals	
	all	voting	all	voting	all	voting	all	voting	all	voting
Option 1	-1.6** (.8)	-1.6* (.8)	3.6** (1.6)	7.3*** (1.9)	-1.1 (2.4)	1.6 (2.6)	-.1 (.5)	.2 (9.6)	-3.4** (1.6)	-1.7 (1.8)
Option 3	-3.2 (2.9)	-3.2 (2.9)	.3 (5.7)	-.1 (6.8)	-2.5 (8.3)	-2.7 (9.3)	-1.5 (1.9)	-1.9 (2.3)	7.8 (5.6)	8.4 (6.2)
Lease-buyout	-.8 (.8)	-.9 (.8)	-2.2 (1.6)	-2.0 (1.9)	-7.4*** (2.4)	-7.6*** (2.7)	-.8 (.6)	-.9 (.7)	-4.5 *** (1.6)	-4.5*** (1.8)
Adj R^2	.009	.007	.100	.149	.042	.056	.012	.021	.079	.074
N	201	201	201	201	201	201	201	201	201	201

Note: Sample includes all privatized firms. "Option 2" is the omitted category. Covariates include 3 region dummies (Moscow-St. Petersburg, European Russia, Asian Russia (Siberia, Far East and Urals)), 7 industry dummies, and 3 employment size dummies. Shares are expressed in percentages.

*- statistically significant at 10 % level

**-statistically significant at 5 % level

***-statistically significant at 1 % level

Table 19

Number of Shareholders By Dominant Owner Type

	Dominant Ownership Type								TOTAL
	SO	PO	-IO	--WO	--MO	--INO	-OO	-NO	
ber of Shareholders									
edian	5286	1000	734	700	600	1000	1400	3550	1000
	17	222	176	121	35	17	36	10	239

mple is all privatized firms.

Table 20

Ownership Concentration Measures

Owner Type	Average Shareholding	Percentage of firms where average shareholding is		
		>=5	>=10	>=20
State	14.3	48.5	46.1	36.3
Private	.5	1.4	1.0	.5
-Insiders	.9	4.9	3.9	.5
--Workers	.4	1.5	1.0	.5
--Managers	4.1	28.4	14.7	3.4
-Outsiders	4.6	14.7	13.7	9.8
--Banks	1.1	6.4	3.9	2.9
--Foreigners	.5	2.5	2.5	1.5
--Investment Funds	5.1	23.0	18.6	12.3
--Firms	7.3	25.5	20.6	16.7
--Individuals	.6	1.0	1.0	1.0

Note: The sample consists of all privatized firms. N=204. Average Shareholding indicates the average percentage of voting shares held by each owner type. Columns labeled ">=5", ">=10" and ">=20" report percentage of firms for which the average shareholding within each group is greater than or equal 5, 10, and 20 percent, respectively.

Table 21
Disaggregated Outside Ownership

	Banks	Investment Funds	Foreigners	Domestic Firms	Individ.	Total Outsiders
0	92.5	71.5	97.8	68.0	51.3	36.0
P1	7.0	28.1	2.2	32.0	44.7	64.0
P2	6.1	27.2	2.2	30.7	38.6	61.8
P3	6.1	25.9	2.2	29.4	36.4	61.0
P4	6.1	25.0	2.2	28.1	33.8	60.5
P5	6.1	24.1	2.2	25.9	32.5	59.7
P10	3.5	20.2	2.2	20.6	21.9	54.4
P15	3.1	14.9	1.8	18.4	15.4	50.4
P20	2.6	12.7	1.3	16.2	11.8	44.7
P25	1.3	10.1	1.3	11.8	7.9	39.0
P30	.4	6.6	.9	7.9	5.7	30.3
P35	.4	4.4	.0	7.5	4.0	24.6
P40	.4	3.5	.0	6.1	4.0	22.8
P45	.0	1.8	.0	4.4	1.3	17.1
P50	.0	.0	.0	4.0	1.3	11.4

Note: Sample is all privatized firms. N=228. The table shows the percentage of firms where the shareholding is greater than or equal to x, with the corresponding row designated Px. The first row, labelled "0," shows the percentage of firms where share ownership is zero.

Table 22

Ownership Structure of Firms with Outside Blockholders

	BO	FO	IFO	FIRMO	INDO	BLO	NOBLO
Total State	5.6	13.3	20.9	8.8	5.0	14.6	14.3
Total Private	94.4	86.8	79.1	91.2	95.0	85.4	85.7
-All Insiders	52.7	24.4	38.9	45.1	10.0	43.3	78.9
--Workers	34.6	21.4	28.4	31.8	10.0	31.1	53.7
--Managers	18.1	3.0	10.5	13.3	.0	12.2	24.9
-All Outsiders	41.7	62.4	40.2	46.1	85.0	42.2	6.7
--Banks	23.0	5.3	1.3	1.5	.0	2.5	.0
--Foreigners	1.3	22.3	1.3	1.1	15.0	1.3	.0
--Investment Funds	5.5	7.6	25.8	3.2	.0	13.0	.4
--Domestic Firms	7.9	15.0	5.3	33.5	.0	17.9	.4
--Individuals	4.0	12.3	6.4	6.8	70.0	7.5	5.9
Percentage of Firms	3.6	2.3	19.3	20.2	.9	39.0	61.0

Note: Sample is all privatized firms. N=218. Shares are voting shares expressed in percentages. A firm is included in the columns labeled BO, FO, IFO, FIRMO, and INDO if it has a blockholder with at least 10 percent of voting shares of type bank, foreigner, investment fund, domestic firm, or individual, respectively. A firm is included under BLO if it has a 10 percent or greater blockholder of any type and under NOBLO if it has no such blockholder.

Table 23

Outside Ownership and Concentration

	Total Outsiders	INSTSH	BLOCKSH	BLOCKSSH	BLS10SH	BLS20SH
0	37.6	51.8	37.6	51.4	61.0	68.8
P5	57.8	44.5	45.0	45.0	39.0	31.2
P10	53.2	39.5	39.0	39.9	39.0	31.2
P15	49.1	35.8	34.4	36.2	35.8	31.2
P20	44.0	33.0	31.2	33.5	33.5	31.2
P25	39.0	28.0	23.4	28.4	25.7	23.4
P30	30.3	20.6	15.6	21.1	18.4	16.5
P35	24.3	13.8	11.9	14.7	14.7	13.3
P40	22.5	12.8	10.6	13.8	13.3	11.9
P45	17.4	8.7	6.9	9.6	9.2	8.7
P50	11.9	6.0	4.6	6.9	6.4	6.4

Note: Sample includes all privatized firms. N=218. The table shows the percentage of firms where the voting shareholding is greater than or equal to x, with the corresponding row designated Px. The first row, labelled "0" shows the percentage of firms where voting share ownership is zero. INSTSH represents the sum of all outside institutional shareholdings. BLOCKSH represents the voting shareholding of the single largest outside blockholder. BLOCKSSH represents the sum of large outside blockholders' voting shares (including banks, investment funds, firms, foreigner and individuals whose average individual shareholding was greater or equal to 5 % of the company shares). BLS10SH and BLS20SH represent the sum of all outside blockholdings greater than or equal to 10 and 20 percent, respectively.

Table 24

Estimating the Impact of Privatization Method on Blockholding

Independent Variables	Dependent Variable: Outside Blockholding				
	Instsh	Blocksh	Blockssh	Bls10sh	Bls20sh
Option 1	7.5** (3.3)	6.9** (3.0)	6.6** (3.4)	6.8** (3.4)	8.1** (3.4)
Option 3	-7.9 (11.6)	-6.4 (10.2)	-8.7 (11.9)	-9.0 (11.9)	-14.3 (11.9)
Lease-buyout	-11.3*** (3.3)	-9.6*** (3.0)	-12.4*** (3.5)	-11.8*** (3.5)	-9.4*** (3.5)
Adj R2	.13	.12	.13	.12	.12
N	201	193	193	193	193

Note: Sample includes all privatized firms. "Option 2" is the omitted category. Covariates include 3 region dummies (Moscow-St. Petersburg, European Russia, Asian Russia (Siberia, Far East and Urals)), 7 industry dummies, and 3 employment size dummies. Shares are expressed in percentages.

*- statistically significant at 10 % level

**-statistically significant at 5 % level

***-statistically significant at 1 % level

Table 25
Summary Statistics for Determinants of Ownership Structure

Variable	Mean	Std Dev	Minimum	Maximum	N	Label
EMP91	3277.71	7431.29	60.00	89756.00	335	91 employment
SIZE2	.34	.47	.00	1.00	335	91 500-2000 employees dummy
SIZE3	.36	.48	.00	1.00	335	91 over 2000 employees dummy
SALES90	215.57	1694.50	.23	24277.40	209	90 sales (in mln Rbls)
CAPUT91	83.32	16.23	15.00	100.00	274	91 capacity utiliz. (%)
EXPW90	1.40	5.83	.00	70.00	309	90 export to West (%)
FUELC90	6.58	9.44	.00	74.00	212	90 fuel/total costs (%)
PROFMAK	.86	.35	.00	1.00	383	profit-maker dummy
PAYPROB	.59	.49	.00	1.00	318	92 payment problem dummy
MIC	.16	.37	.00	1.00	380	subordinate to GKOP dummy
PROMIL90	8.86	25.98	.00	100.00	383	90 military production (%)
REVMIL90	5.67	20.23	.00	100.00	305	90 military revenue (%)
CHAMIL90	8.78	23.71	.00	100.00	280	90 mil. dist. channels (%)
ADMINT2	.16	.37	.00	1.00	383	some state intervention
ADMINT3	.10	.31	.00	1.00	383	much state intervention
PRICONT	.39	.49	.00	1.00	361	price controls
GOVSUP2	.26	.44	.00	1.00	342	92 government support
GOVASS92	38.83	255.99	.00	4000.00	324	92 gov.assistance-mil Rbls
CHAGOV90	19.29	35.60	.00	100.00	293	90 sales to government(%)
REVGOV90	1.62	10.51	.00	100.00	307	90 revenue from state (%)
ESTAB	2.35	6.43	1.00	96.00	383	# of establishments
SUBSID	1.59	2.41	1.00	26.00	358	# of subsidiaries
OLDUNION	77.56	38.11	.00	100.00	278	old union membership (%)
NEWUNION	16.96	36.37	.00	100.00	277	new union membership (%)
STR THR	.18	.38	.00	1.00	382	strike or strike threat dummy
STRIKE	.02	.14	.00	1.00	382	strike dummy
WUNION	.35	.48	.00	1.00	354	unions setting wages
LEXCESS	.22	.42	.00	1.00	373	>10 % labor 'excess'
OLDEQUIP	35.08	30.20	.00	100.00	311	old equipment, >15yrs (%)
CAPCOSTS	7.24	7.39	.00	47.50	212	90 capital/total costs (%)
LABCOSTS	28.60	18.53	.14	99.93	211	90 labor/total costs (%)
LNS E90	-3.90	.96	-6.77	-.20	197	90 labor productivity-ln
MANW90	350.76	233.41	92.00	2422.00	189	90 managerial wage
AVGW90	293.88	196.24	32.00	2627.00	262	90 firm average wage
WDIFF	-.08	.31	-.92	1.32	207	90 worker-whitecollar wage
INDASS	.53	.50	.00	1.00	382	industry association
HREV90	.89	.17	.29	1.00	307	90 revenue herfindahl
HCHA90	.86	.19	.34	1.00	284	90 distrib. channels herf.
HGEOG90	.75	.22	.28	1.00	309	90 geog. concentr. exports
BENSOC P	19.55	18.76	.02	94.80	236	93 social benefits/profit %
BENSOC C	1.87	5.06	.00	38.30	212	93 social benefits/cost %
BENSOC W	11.97	13.32	.01	92.00	174	93 social benefits/wage bill%
SOCBENNO	5.46	2.09	.00	8.00	374	90 social benefit types (No.)
OPTION1	.21	.41	.00	1.00	376	option 1 dummy
OPTION2	.34	.48	.00	1.00	376	option 2 dummy
OPTION3	.01	.09	.00	1.00	376	option 3 dummy
LEASEBO	.21	.41	.00	1.00	376	lease-buyout dummy

Table 26
Impact of Determinants on Share Ownership:
Private (PSH), Workers (WSH), Managers (MSH), and Outsiders (OSH)

	PSH		WSH		MSH		OSH	
	B	SE B	B	SE B	B	SE B	B	SE B
OPTION1	73.57	2.27	32.93	4.35	11.12	3.64	29.45	3.53
OPTION2	83.75	2.11	41.91	4.06	18.05	3.40	23.73	3.29
OPTION3	86.02	7.93	42.20	15.21	29.20	12.73	14.95	12.36
LEASEBO	95.05	2.30	60.80	4.44	26.88	3.71	7.19	3.58
FUEL EN	-16.94	3.91	-17.11	7.51	6.91	6.28	-6.86	6.09
METAL CH	1.67	3.08	-1.61	5.94	6.38	4.97	-2.73	4.79
L MACH	-.53	2.32	.59	4.48	-3.04	3.75	2.36	3.61
WOOD CM	-1.64	3.12	.38	5.98	.69	5.01	-2.48	4.86
CONGOODS	4.44	2.79	2.33	5.38	8.05	4.50	-5.82	4.35
OTHER	-2.20	3.96	-.68	7.61	2.98	6.37	-4.38	6.18
CAPITAL	2.14	2.26	6.47	4.37	-3.69	3.66	-.32	3.52
EUROPE	.95	1.72	5.63	3.32	-3.78	2.78	-.83	2.67
SIZE2	-.44	2.25	-2.82	4.34	2.08	3.63	-.01	3.50
SIZE3	-2.50	2.78	.85	5.34	-2.09	4.47	-1.32	4.33
LNSALES0	-1.53	.55	-2.45	1.05	.49	.88	.49	.85
CAPUT91	-.02	.05	-.03	.10	.07	.09	-.06	.08
EXPW90	.23	.14	.25	.27	-.25	.23	.23	.22
FUELC90	.34	.19	.10	.36	.26	.31	-.03	.30
PROFMAK	-3.23	2.28	-1.76	4.37	.68	3.66	-2.11	3.55
PAYPROB	-1.93	1.70	4.64	3.30	-5.51	2.76	-.63	2.64
MIC	-6.41	2.77	-.98	5.37	.13	4.49	-6.20	4.31
PROMIL0	.01	.03	.06	.07	-.07	.05	.01	.05
REVMIL0	.01	.06	-.11	.12	.14	.10	-.02	.10
CHAMIL0	.07	.05	-.08	.10	.17	.08	-.02	.08
ADMINT2	-.81	2.09	5.40	4.02	-3.85	3.36	-2.36	3.26
ADMINT3	.48	2.40	6.82	4.60	-2.30	3.85	-4.13	3.73
PRICONT	-2.56	1.67	.53	3.21	-.38	2.69	-2.82	2.60
GOVSUP2	.38	2.02	.22	3.89	-1.55	3.26	2.03	3.15
GOVASS92	-.01	.00	.01	.01	-.01	.01	-.01	.01
CHAGOV90	.03	.02	-.04	.05	.00	.04	.06	.04
REVGOV90	-.03	.07	-.11	.14	.17	.12	-.10	.11
LNESTAB	2.11	1.12	2.61	2.16	-2.60	1.81	2.22	1.75
LNSUBSID	.21	1.47	-.82	2.85	1.41	2.39	-.27	2.28
OLDUNION	-.03	.04	.14	.09	-.19	.07	.02	.07
NEWUNION	-.03	.05	.16	.09	-.20	.07	.00	.07
STR_THR	2.45	2.16	4.08	4.14	-6.77	3.47	5.07	3.36
STRIKE	1.94	5.62	-17.69	10.78	13.00	9.02	6.46	8.76
WUNION	.38	1.66	-1.39	3.19	-1.57	2.67	3.24	2.58
OLDEQUIP	-.03	.03	-.03	.05	-.05	.04	.06	.04
CAPCOSTS	-.09	.15	.22	.29	-.05	.24	-.26	.23
LABCOSTS	-.08	.06	.05	.12	.12	.10	-.25	.09
LNS_E90	.68	1.19	-.83	2.29	.35	1.92	.99	1.86
MANW90	.00	.01	.00	.01	-.00	.01	-.00	.01
AVGW90	.01	.01	-.00	.01	-.00	.01	.01	.01
WDIFF	-.22	3.43	9.00	6.79	-13.57	5.68	3.08	5.35
INDASS	-.93	1.56	1.26	3.01	-2.08	2.52	-.34	2.43
HREV90	6.54	5.51	4.57	10.58	5.59	8.85	-3.93	8.58
HCHA90	1.48	4.56	-8.13	8.84	11.90	7.40	-3.07	7.10
HGEOG90	-.06	4.51	-8.93	8.72	7.54	7.30	1.40	7.03
BENSOC_P	.02	.05	.02	.10	-.07	.08	.06	.08
BENSOC_C	.33	.21	.47	.41	-.45	.34	.32	.33
BENSOC_W	.12	.08	.24	.16	-.12	.13	-.02	.13
SOCBENNO	-.05	.42	-1.46	.81	1.28	.68	.14	.66
LEXCESS	-.71	1.77	-.81	3.41	3.25	2.86	-3.30	2.75
(Constant)	9.66	12.66	-.00	24.32	-10.36	20.35	19.95	19.73
Adj R squared	.92		.42		.25		.27	
N	317		313		313		317	

Table 27
Impact of Determinants on Outside Share Ownership: Institutions (INSTSH), and Individuals (INDSH)

	INSTSH		INDSH	
Variables	B	SE B	B	SE B
OPTION1	23.38	3.05	4.94	2.18
OPTION2	16.25	2.82	6.80	2.02
OPTION3	1.20	10.55	12.68	7.55
LEASEBO	4.23	3.05	2.77	2.19
FUEL EN	-4.73	5.39	-2.37	3.86
METAL CH	3.54	4.14	-6.41	2.96
L MACH	2.31	3.11	-.74	2.23
WOOD CM	3.17	4.16	-5.85	2.98
CONGOODS	.29	3.72	-6.70	2.67
OTHER	-1.43	5.28	-2.73	3.78
CAPITAL	3.17	3.01	-3.69	2.15
EUROPE	-1.66	2.30	.46	1.65
SIZE2	-.06	3.00	.01	2.15
SIZE3	.16	3.70	-1.68	2.65
LNSALES0	-.10	.73	.80	.52
CAPUT91	-.07	.07	.01	.05
EXPW90	.08	.19	.13	.14
FUELC90	-.02	.26	.03	.18
PROFMAK	-3.88	3.03	1.42	2.17
PAYPROB	1.31	2.26	-2.42	1.62
MIC	-6.00	3.69	.69	2.64
PROMIL0	.04	.05	-.05	.03
REVMIL0	-.04	.08	.02	.06
CHAMIL0	.03	.07	-.06	.05
ADMINT2	-2.60	2.81	-.19	2.02
ADMINT3	-3.49	3.19	-.62	2.28
PRICONT	-2.00	2.23	-.93	1.59
GOVSUP2	2.02	2.73	.34	1.96
GOVASS92	-.01	.00	-.00	.00
CHAGOV90	.05	.03	.01	.02
REVGOV90	-.04	.10	-.06	.07
LNESTAB	2.55	1.50	-.16	1.07
LNSUBSID	.21	1.95	-.51	1.40
OLDUNION	.02	.06	-.00	.04
NEWUNION	.01	.06	-.02	.04
STR THR	3.00	2.90	2.27	2.08
STRIKE	2.45	7.48	4.04	5.35
WUNION	.31	2.23	2.53	1.60
OLDEQUIP	.06	.04	-.01	.03
CAPCOSTS	-.31	.20	-.05	.15
LABCOSTS	-.15	.08	-.11	.06
LNS E90	1.06	1.58	-.28	1.13
MANW90	-.01	.01	.00	.01
AVGW90	.01	.01	-.00	.01
WDIFF	5.32	4.59	-3.04	3.29
INDASS	-.32	2.08	-.24	1.49
HREV90	-4.57	7.34	.83	5.25
HCHA90	-5.51	6.12	2.35	4.38
HGEOG90	-5.74	6.03	6.88	4.32
BENSOC P	.02	.07	.05	.05
BENSOC C	.02	.30	.07	.21
BENSOC W	-.02	.11	.01	.08
SOCBENNO	.65	.57	-.34	.40
LEXCESS	-3.44	2.35	.49	1.69
(Constant)	23.77	16.84	-3.67	12.06
Adj R squared	.21		.04	
N	312		312	

Table 28

Impact of Determinant on Outside Institutional Ownership: Banks (BSH), Investment Funds (IFSH), Foreign Investors (FSH), and Domestic Firms (FIRMSH)

	BSH		IFSH		FSH		FIRMSH	
	B	SE B	B	SE B	B	SE B	B	SE B
OPTION1	.47	.72	11.38	1.68	1.36	.59	10.07	2.49
OPTION2	2.23	.67	3.55	1.57	1.17	.55	9.41	2.32
OPTION3	-.81	2.48	1.11	5.78	-.71	2.03	1.90	8.57
LEASEBO	1.28	.72	1.06	1.68	.28	.59	1.51	2.50
FUEL EN	.56	1.31	1.00	3.06	-1.64	1.07	-3.91	4.54
METAL CH	1.15	.99	4.60	2.32	-1.26	.81	-1.06	3.44
L MACH	.56	.75	1.45	1.75	-.46	.61	.93	2.59
WOOD CM	2.21	.98	2.92	2.28	-.59	.80	-1.34	3.39
CONGOODS	.99	.88	1.05	2.06	-.89	.72	-.69	3.05
OTHER	-.49	1.24	.20	2.90	-1.11	1.02	.38	4.30
CAPITAL	.44	.71	2.39	1.66	1.20	.58	-1.26	2.46
EUROPE	-.44	.55	.97	1.28	-.21	.45	-2.61	1.90
SIZE2	-1.23	.71	.82	1.66	-.88	.58	1.60	2.47
SIZE3	-.62	.87	4.67	2.04	-1.38	.71	-2.18	3.02
LNSALES0	.10	.17	.29	.40	.16	.14	-.77	.60
CAPUT91	-.01	.02	-.01	.04	-.01	.01	-.04	.06
EXPW90	.02	.04	.06	.10	.07	.04	-.09	.15
FUELC90	-.08	.06	.23	.14	-.03	.05	-.13	.21
PROFMAK	-.60	.72	-1.45	1.69	.10	.59	-1.46	2.51
PAYPROB	1.61	.54	1.64	1.26	.11	.44	-2.38	1.87
MIC	-.05	.93	-1.06	2.16	-.04	.76	-5.63	3.21
PROMIL0	.02	.01	-.04	.03	-.01	.01	.06	.04
REVMIL0	-.02	.02	.06	.05	.01	.02	-.08	.07
CHAMIL0	-.00	.02	-.01	.04	-.01	.01	.05	.05
ADMINT2	-.51	.66	.21	1.54	-.16	.54	-1.88	2.29
ADMINT3	-1.00	.75	2.63	1.75	.54	.61	-5.52	2.60
PRICONT	.08	.53	-2.54	1.23	-.09	.43	.88	1.83
GOVSUP2	.02	.66	-1.06	1.53	-.87	.54	4.04	2.27
GOVASS92	.00	.00	-.01	.00	.00	.00	-.00	.00
CHAGOV90	.02	.01	-.00	.02	.01	.01	.04	.03
REVGOV90	-.02	.02	-.01	.05	.00	.02	-.02	.08
LNESTAB	.59	.36	-.83	.84	.35	.29	2.06	1.24
LNSUBSID	.71	.46	-.05	1.08	.22	.38	-1.04	1.60
OLDUNION	.02	.01	.01	.03	-.01	.01	-.00	.05
NEWUNION	.02	.01	.02	.03	-.01	.01	-.03	.05
STR THR	-1.54	.70	-.55	1.63	.68	.57	4.59	2.42
STRIKE	1.78	1.76	-1.63	4.11	-.95	1.44	3.71	6.09
WUNION	-.47	.53	-1.03	1.25	-.02	.44	1.67	1.85
OLDEQUIP	.00	.01	.02	.02	-.00	.01	.04	.03
CAPCOSTS	-.02	.05	-.08	.11	.05	.04	-.24	.17
LABCOSTS	-.03	.02	-.03	.04	.00	.02	-.10	.07
LNS E90	-.60	.37	.20	.87	-.09	.31	1.79	1.29
MANW90	.01	.00	-.01	.00	-.00	.00	-.00	.01
AVGW90	-.00	.00	.01	.00	-.00	.00	.00	.01
WDIFF	-1.17	1.11	6.80	2.58	-.08	.90	.75	3.83
INDASS	.37	.49	-1.03	1.16	-.24	.40	.37	1.71
HREV90	-3.29	1.72	-3.41	4.03	-3.27	1.41	5.51	5.97
HCHA90	.92	1.45	2.86	3.40	.48	1.19	-9.09	5.03
HGZOG90	-1.81	1.43	-2.75	3.33	-.29	1.17	-1.41	4.94
BENSOC P	.00	.02	-.03	.04	.01	.01	.03	.05
BENSOC C	.05	.07	-.01	.16	.03	.06	-.03	.24
BENSOC W	.00	.03	.01	.06	.02	.02	-.03	.09
SOCBENNO	.08	.13	.15	.31	.04	.11	.40	.46
LEXCESS	-1.52	.56	-.12	1.31	-.45	.46	-1.62	1.94
Adj R squared	.11		.21		-.04		.10	
N	312		312		312		312	

Table 29

Impact of Derminants on Ownership by Outside Blockholding: Single Blockholder (BLOCKSH), All Blockholders (BLOCKSSH), >10% Blockholders (BLS10SH), >20% Blockholders (BLS20SH)

	BLOCKSH		BLOCKSSH		BLS10SH		BLS20SH	
Variable	B	SE B	B	SE B	B	SE B	B	SE B
OPTION1	20.28	2.91	23.14	3.30	22.41	3.33	19.53	3.01
OPTION2	12.85	2.71	16.22	3.08	15.17	3.10	11.20	2.81
OPTION3	-.16	10.01	1.04	11.35	.04	11.44	-1.57	10.35
LEASEBO	5.17	2.91	5.82	3.30	5.51	3.33	4.58	3.01
FUEL EN	-3.71	5.29	-4.11	6.01	-3.70	6.05	-4.20	5.48
METAL CH	1.55	4.01	2.83	4.55	2.10	4.59	1.08	4.15
L MACH	1.77	3.02	2.57	3.43	2.78	3.45	1.78	3.12
WOOD CM	.09	3.95	2.21	4.48	1.93	4.52	-.13	4.09
CONGOODS	1.08	3.56	1.86	4.04	2.43	4.07	1.01	3.69
OTHER	.10	5.02	-.76	5.70	-.27	5.74	.56	5.20
CAPITAL	-.00	2.87	1.79	3.26	2.25	3.28	-.13	2.97
EUROPE	-.91	2.21	-1.68	2.51	-1.19	2.53	-1.18	2.29
SIZE2	1.43	2.88	.39	3.27	.25	3.29	1.52	2.98
SIZE3	2.79	3.53	1.30	4.00	1.12	4.03	2.76	3.65
LNSALES0	-.74	.70	-.53	.79	-.47	.80	-.83	.72
CAPUT91	-.03	.07	-.03	.08	-.03	.08	-.04	.07
EXPW90	-.10	.18	.04	.20	-.01	.21	-.08	.19
FUELC90	.09	.24	.07	.28	.09	.28	.04	.25
PROFMAK	-3.18	2.92	-3.17	3.32	-2.72	3.34	-3.43	3.03
PAYPROB	-2.03	2.18	-.79	2.48	-.76	2.50	-1.91	2.26
MIC	-6.63	3.74	-6.88	4.25	-6.74	4.28	-7.29	3.87
PROMIL0	.05	.04	.04	.05	.04	.05	.05	.05
REVMIL0	-.06	.08	-.05	.09	-.03	.09	-.05	.08
CHAMIL0	.06	.06	.06	.07	.05	.07	.05	.07
ADMINT2	-2.18	2.67	-3.24	3.03	-2.63	3.05	-1.63	2.76
ADMINT3	-2.17	3.03	-2.38	3.44	-2.37	3.46	-2.10	3.14
PRICONT	-.53	2.13	-.48	2.42	-.44	2.44	.16	2.21
GOVSUP2	2.89	2.65	2.27	3.00	2.28	3.03	3.45	2.74
GOVASS92	-.01	.00	-.01	.01	-.01	.01	-.01	.00
CHAGOV90	.08	.03	.10	.03	.09	.03	.08	.03
REVGOV90	-.07	.09	-.05	.10	-.05	.10	-.06	.09
LNESTAB	.97	1.45	1.97	1.64	1.76	1.65	1.17	1.50
LNSUBSID	-1.06	1.87	-.42	2.12	-.53	2.14	-.73	1.93
OLDUNION	.03	.06	.03	.06	.03	.06	.04	.06
NEWUNION	.00	.06	.01	.07	.01	.07	.01	.06
STR_THR	6.19	2.82	5.87	3.20	6.09	3.23	6.31	2.92
STRIKE	-3.25	7.11	1.47	8.06	.60	8.13	-3.40	7.35
WUNION	.52	2.16	1.04	2.45	.38	2.47	.75	2.23
OLDEQUIP	.04	.04	.04	.04	.05	.04	.05	.04
CAPCOSTS	-.24	.20	-.31	.22	-.24	.22	-.22	.20
LABCOSTS	-.18	.08	-.21	.09	-.19	.09	-.17	.08
LNS_E90	1.57	1.51	1.31	1.71	1.28	1.73	2.08	1.56
MANW90	-.01	.01	-.01	.01	-.01	.01	-.01	.01
AVGW90	.01	.01	.01	.01	.01	.01	.01	.01
WDIFF	7.23	4.47	7.07	5.07	7.51	5.11	7.17	4.62
INDASS	-.60	2.00	-.55	2.27	-.82	2.29	-.09	2.07
HREV90	-1.33	6.96	-5.63	7.90	-5.84	7.96	-2.63	7.21
HCHA90	-1.62	5.88	-2.40	6.67	-1.29	6.72	-2.40	6.08
HGEOG90	-5.93	5.76	-8.22	6.54	-7.56	6.59	-4.51	5.96
BENSOC_P	-.00	.06	.01	.07	.00	.07	-.00	.07
BENSOC_C	-.00	.28	.07	.32	.06	.32	.01	.29
BENSOC_W	.00	.11	.02	.12	.02	.12	.03	.11
SOCBENNO	.34	.54	.48	.61	.36	.62	.23	.56
LEXCESS	-3.15	2.26	-4.67	2.57	-4.46	2.59	-3.67	2.34
(Constant)	22.96	16.05	24.01	18.22	20.16	18.36	25.15	16.61
Adj R sqr.	.18		.19		.15		.14	
N	312		312		312		312	

Table 30
Summary for Statistics for Performance Indicators

	Restructuring Index	Log of 1994 Productivity
Mean	.242	1.551
Standard Deviation	.164	1.183
Maximum	1.000	4.638
Minimum	.000	-4.364
N	246	271

	DISALES	LAYOFF	DEMPSPL
Mean	35.22	.054	.024
Standard Deviation	38.42	.080	.099
Maximum	100.00	.504	.923
Minimum	.00	.000	.000
N	296	272	292

Note: Productivity is measures as sales/employment in 1994, where sales are expressed in bln of Rubels.

Table 31
Impact of Shareholding on Restructuring: RESIND3
OLS Regression Estimates
(standard errors in parentheses)

Independent Variables: Shareholding (voting)	Dependent Variable : Restructuring Index (RESIND3)							
	Specification 1		Specification 2		Specification 3		Specificatio	
	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates	without covariates	w co
Private	.057** (.027)	.061** (.029)						
-Workers			.012 (.036)	.027 (.037)	.017 (.036)	.033 (.037)	.017 (.041)	.((.
-Managers			.156*** (.050)	.190*** (.052)	.148*** (.051)	.178*** (.052)	.152*** (.050)	.1 (.
-Outsiders			.065 (.053)	.031 (.053)				
--Institutions					.077 (.064)	.033 (.063)		
---Bank							-.264 (.241)	-. (.
---Investment Fund							.200* (.110)	.2 (.
---Foreign Investor							.048 (.311)	-. (.
---Domestic Firm							.066 (.085)	.0 (.
--Individuals					.024 (.125)	.006 (.122)	.016 (.126)	.0 (.
Adj. R^2	.015	.065	.034	.097	.025	.090	.025	
N	209	209	206	206	202	202	202	

Note:. Sample is all old firms. Covariates include 3 region dummies (Moscow-St. Petersburg, European Russia, Asian Russia (Siberia, Far East and Urals)), 7 industry sector dummies, and 3 size dummies. Voting shareholdings are expressed in proportions.

*- statistically significant at 10 % level, **-statistically significant at 5 % level, ***-statistically significant at 1 % level

Table 32
Impact of Dominant Owner Type on Restructuring: RESIND3
OLS Regression Estimates
(standard errors in parentheses)

ent t Owner	Dependent Variable : Restructuring Index (RESIND3)							
	Specification 1		Specification 2		Specification 3		Specification 4	
	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates
	.051** (.024)	.047* (.025)						
			.037 (.027)	.039 (.028)	.041 (.027)	.045 (.029)	.041 (.028)	.044 (.029)
			.091** (.037)	0.105*** (.038)	.083** (.039)	.096*** (.040)	.082** (.039)	.096** (.040)
			-.024 (.059)	-.017 (.062)	-.024 (.061)	-.016 (.063)	.083 (.039)	-.018 (.064)
			.057 (.038)	.029 (.038)				
			.092 (.068)	.057 (.069)	.092 (.069)	.062 (.071)	.092 (.069)	.063 (.071)
utions					.058 (.046)	.029 (.046)		
t							-.062 (.164)	-.100 (.169)
stment							.060 (.076)	.047 (.076)
ign r							.245 (.164)	.173 (.166)
estic							.050 (.058)	.017 (.059)
duals					.042 (.076)	.030 (.076)	.044 (.076)	.030 (.077)
	.016	.063	.016	.064	.006	.050	-.0001	.043
	215	215	211	211	200	200	200	200

Note: Sample is all old firms. Covariates include 3 region dummies (Moscow-St.Petersburg, European Russia and Asian Russia (Siberia, Far East and Urals)), 7 industry sector dummies, and 3 size dummies. Dominant owner type is defined (as described in the text) on the basis of voting shares. *- statistically significant at 10 % level
-statistically significant at 5 % level, *-statistically significant at 1 % level

Table 33
Impact of Shareholding on Productivity
OLS Regression Estimates
(standard errors in parentheses)

Independent Variables: Shareholding (voting)	Dependent Variable : Log of 1994 Productivity (Sales/Employment)							
	Specification 1		Specification 2		Specification 3		Specification 4	
	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates	without covariates	with covaria
Private	.403** (.179)	.489*** (.188)						
-Workers			.322 (.229)	.416* (.235)	.295 (.229)	.427** (.181)	.286 (.228)	.389* (.233
-Managers			.731** (.369)	.684* (.367)	.740** (.370)	.786** (.367)	.759** (.369)	.789* (.369
-Outsiders			.373 (.319)	.524 (.332)				
--Institutions					.197 (.359)	.307 (.364)		
---Bank							.142 (1.524)	-.248 (1.50
---Investment Fund							1.365** (.683)	.982 (.709
---Foreign Investor							-2.913 (2.245)	-2.43 (2.26
---Domestic Firm							-.189 (.459)	.248 (.469
--Individuals					1.173 (.821)	1.449* (.824)	.950 (.822)	1.332 (.833
Log of 1990 Productivity	.503*** (.072)	.442*** (.075)	.499*** (.073)	.439*** (.077)	.502*** (.073)	.447*** (.764)	.503*** (.073)	.449* (.0
Adj. R^2	.249	.326	.246	.319	.255	.335	.266	.3
N	156	156	153	153	149	149	149	14

Note:. Sample is all old firms. Covariates include 3 region dummies (Moscow-St. Petersburg, European Russia, Asian Russia (Siberia, Far East and Urals)), 7 industry sector dummies, and 3 size dummies. Voting shareholdings are expressed in proportions.
*- statistically significant at 10 % level, **-statistically significant at 5 % level, ***-statistically significant at 1 % level

Table 34
Impact of Dominant Owner Type on Productivity
OLS Regression Estimates
(standard errors in parentheses)

endent bles- nant Owner g)	Dependent Variable : Log of 1994 Productivity (Sales/Employment)							
	Specification 1		Specification 2		Specification 3		Specification 4	
	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates
	.399** (.159)	.500*** (.163)						
			.355** (.173)	.449** (.181)	.335** (.173)	.427** (.181)	.334** (.173)	.436** (.182)
			.594** (.259)	.642** (.253)	.587** (.271)	.688*** (.266)	.587** (.269)	.692*** (.266)
			.989** (.418)	.785* (.419)	.986** (.417)	.733* (.418)	.987** (.415)	.736* (.420)
			.160 (.248)	.297 (.251)				
			.552 (.359)	.775** (.356)	.552 (.358)	.770* (.355)	.552 (.356)	.783** (.355)
itutions					.094 (.279)	.194 (.278)		
nk							.269 (.881)	-.374 (.902)
estment							.828* (.456)	.764* (.455)
eign or							-.462 (.881)	-.113 (.878)
mestic							-.270 (.356)	-.007 (.355)
viduals					.824 (.523)	.950* (.510)	.824 (.520)	.958* (.511)
f 1990 ctivity	.505*** (.072)	.439*** (.074)	.496*** (.073)	.438*** (.076)	.500*** (.073)	.450*** (.076)	.499*** (.072)	.449*** (.077)
^{2}	.252	.340	.258	.334	.242	.346	.276	.344
	159	159	156	156	149	149	149	149

Note: Sample is all old firms. Covariates include 3 region dummies (Moscow-St.Petersburg, European Russia and Asian Russia (Siberia, Far East and Urals)), 7 industry sector dummies, and 3 size dummies. Dominant owner type is defined (as described in the text) on the basis of voting shares.
*- statistically significant at 10 % level, **-statistically significant at 5 % level, ***-statistically significant at 1 % level

Table 35
Impact of Shareholding on Restructuring: Change in Sales Structure
OLS Regression Estimates
(standard errors in parentheses)

Independent Variables: Shareholding (voting)	Dependent Variable : DISALES							
	Specification 1		Specification 2		Specification 3		Specification 4	
	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates	without covariates	with covaria
Private	.139*** (.058)	.129** (.061)						
-Workers			.063 (.078)	.055 (.080)	.076 (.079)	.066 (.081)	.083 (.079)	.069 (.081
-Managers			.157 (.111)	.171 (.115)	.134 (.112)	.145 (.116)	.137 (.113)	.144 (.115
-Outsiders			.272*** (.111)	.252** (.111)				
--Institutions					.305** (.133)	.256** (.133)		
---Bank							-.137 (.574)	-.161 (.572
---Investment Fund							.627*** (.257)	.612* (.265
---Foreign Investor							-.002 (.755)	-.198 (.762
---Domestic Firm							.236 (.175)	.186 (.176
--Individuals					.064 (.223)	.279 (.229)	.211 (.229)	.275 (.231
Adj. R^2	0.021	0.054	0.019	0.054	0.017	0.049	0.015	0.0
N	236	236	233	233	230	230	230	23

Note:. Sample is all old firms. Covariates include 3 region dummies (Moscow-St. Petersburg, European Russia, Asian Russia (Siberia, Far East and Urals)), 7 industry sector dummies, and 3 size dummies. Voting shareholdings are expressed in proportions. *- statistically significant at 10 % level, **-statistically significant at 5 % level, ***-statistically significant at 1 % level

Table 36
Impact of Shareholding on Restructuring: Layoffs
OLS Regression Estimates
(standard errors in parentheses)

ndent les: olding)	Dependent Variable : LAYOFFI							
	Specification 1		Specification 2		Specification 3		Specification 4	
	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates
e	.045* (.026)	.031 (.031)						
kers			.025 (.034)	.016 (.039)	.026 (.034)	.017 (.039)	.028 (.035)	.019 (.040)
agers			.092* (.050)	.088 (.058)	.091 (.059)	.091 (.059)	.098* (.052)	.096* (.059)
iders			.050 (.052)	.017 (.056)				
itutions					.064 (.062)	.016 (.067)		
nk							-.068 (.253)	-.148 (.268)
estment							.112 (.108)	.057 (.120)
reign tor							.195 (.323)	.168 (.346)
mestic							.035 (.087)	-.003 (.093)
viduals					-.084 (.128)	-.092 (.143)	-.093 (.130)	-.105 (.146)
R^2	0.008	-0.021	0.005	-0.024	.004	-.024	-.007	-.039
	237	221	234	218	229	213	229	213

Note:. Sample is all old firms. Covariates include 3 region dummies (Moscow-St. Petersburg, European Russia, Asian Russia (Siberia, Far East and Urals)), 7 industry sector dummies, and 3 size dummies. Voting shareholdings are expressed in proportions. *- statistically significant at 10 % level, **-statistically significant at 5 % level, ***-statistically significant at 1 % level

Table 37
Impact of Shareholding on Restructuring: Split-ups and Mergers
OLS Regression Estimates
(standard errors in parentheses)

Independent Variables: Shareholding (voting)	Dependent Variable : DEMPSPLI							
	Specification 1		Specification 2		Specification 3		Specification 4	
	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates	without covariates	with covar
Private	.030* (.017)	.046** (.021)						
-Workers			.022 (.022)	.036 (.026)	.022 (.022)	.037 (.027)	.024 (.023)	.04 (.0
-Managers			.055 * (.032)	.083** (.039)	.058* (.033)	.090** (.040)	.062* (.033)	.09 (.(
-Outsiders			.028 (.032)	.045 (.038)				
--Institutions					.063 (.039)	.074* (.045)		
---Bank							-.094 (.164)	-. (.1
---Investment Fund							.180** (.072)	.18 (.(
---Foreign Investor							.126 (.215)	(.1
---Domestic Firm							.013 (.053)	(.
--Individuals					-.036 (.060)	-.050 (.098)	-.041 (.060)	(.
Adj. R^2	.009	.018	.004	.015	.009	.018	.014	
N	251	224	248	221	243	216	243	

Note:. Sample is all old firms. Covariates include 3 region dummies (Moscow-St. Petersburg, European Russia, Asian Russia (Siberia, Far East and Urals)), 7 industry sector dummies, and 3 size dummies. Voting shareholdings are expressed in proportions. *- statistically significant at 10 % level, **-statistically significant at 5 % level, ***-statistically significant at 1 % level

Table 38
Impact of Outside Ownership Concentration on Restructuring: Shareholdings
OLS Regression Estimates
(standard errors in parentheses)

endent bles: holding g)	Dependent Variable : Restructuring Index (RESIND3)							
	Specification 1		Specification 2		Specification 3		Specification 4	
	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates
kers	.017 (.036)	.032 (.037)	.017 (.037)	.032 (.037)	.018 (.037)	.032 (.038)	.020 (.037)	.034 (.038)
agers	.148*** (.051)	.180*** (.052)	.147*** (.051)	.179*** (.053)	.147*** (.051)	.183*** (.053)	.149*** (.051)	.185 *** (.053)
iders	-.038 (.108)	-.065 (.106)	.062 (.130)	.034 (.128)	.056 (.122)	.037 (.122)	-.015 (.103)	-.043 (.103)
ksh	.158 (.145)	.141 (.141)						
kssh			.003 (.149)	-.010 (.145)				
0sh					.011 (.143)	-.010 (.141)		
0sh							.110 (.123)	.100 (.120)
R^2	.029	.093	.023	.088	.023	.085	.027	.089
	200	200	200	200	200	200	200	200

Note:. Sample is all old firms. Covariates include 3 region dummies (Moscow-St. Petersburg, European Russia, Asian Russia (Siberia, Far East and Urals)), 7 industry sector dummies, and 3 size dummies. Shares are expressed in proportions. Blocksh is the largest outside shareholding. Blockssh sums all big outside shareholdings (excluding individual outsiders when their average shareholding is smaller than .05). Bls10sh and Bls20sh include all outside shareholdings larger than 10 and 20 percent, respectively.

*- statistically significant at 10 % level, **-statistically significant at 5 % level, ***-statistically significant at 1 % level

Table 39
Impact of Outside Ownership Concentration on Restructuring: Types
OLS Regression Estimates
(standard errors in parentheses)

Independent Variables- Dominant Owner Type (voting)	Dependent Variable : Restructuring Index							
	Specification 1		Specification 2		Specification 3		Specification 4	
	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates	without covariates	with covaria
WO	.050* (.029)	.054* (.031)	.043 (.029)	.048 (.030)	.049 (.029)	.053* (.029)	.046* (.029)	.050 (.03
MO	.086** (.039)	.101*** (.040)	.083** (.039)	.098*** (.040)	.085** (.039)	.100*** (.040)	.084** (.039)	.099* (.040
INO	.001 (.066)	.011 (.069)	-.024 (.061)	-.016 (.063)	-.001 (.066)	.011 (.068)	-.015 (.063)	-.006 (.065
OO	.083* (.050)	.059 (.051)	.061 (.051)	.043 (.051)	.080* (.050)	.059 (.050)	.072* (.050)	.049 (.051
NO	.121 (.076)	.092 (.076)	.098 (.075)	.075 (.076)	.118 (.075)	.091 (.076)	.108 (.074)	.080 (.075
Blo10	-.031 (.032)	-.032 (.032)						
Blo20			-.008 (.036)	-.016 (.035)				
Blocks10					-.028 (.031)	-.032 (.032)		
Blocks20							-.020 (.032)	-.022 (.032
Adj. R^2	.010	.055	.006	.051	.010	.056	.008	.05
N	200	200	200	200	200	200	200	20

Note: Sample is all old firms. Covariates include 3 region dummies (Moscow-St.Petersburg, European Russia and Asian Russia (Siberia, Far East and Urals)), 7 industry sector dummies, and 3 size dummies. Dominant owner type is defined (as described in the text) on the basis of voting shares. Blo10 and Blo20 take on value 1 when the largest outside blockholder has more than or equal .10 or .20, respectively. Blocks10 and Blocks 20 is a dummy for the cases where the sum of large outsiders is greater than or equal .10 and .20, respectively.
*- statistically significant at 10 % level, **-statistically significant at 5 % level, ***-statistically significant at 1 % level

Table 40
Impact of Outside Ownership Concentration on Productivity: Shareholdings
OLS Regression Estimates
(standard errors in parentheses)

ndependent Variables: Shareholding voting)	Dependent Variable : Log of 1994 Productivity (Sales/Employment)							
	Specification 1		Specification 2		Specification 3		Specification 4	
	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates
Workers	.306 (.229)	.400* (.233)	.295 (.229)	.386* (.232)	.281 (.229)	.373 (.232)	.279 (.228)	.368 (.231)
Managers	.741** (.372)	.776** (.369)	.740** (.370)	.761** (.367)	.746** (.370)	.763** (.367)	.715** (.369)	.724** (.366)
Outsiders	.578 (.696)	.556 (.696)	1.173 (.821)	1.449* (.824)	1.255* (.756)	1.504** (.775)	1.298* (.689)	1.648** (.707)
Blocksh	-.309 (.881)	-.104 (.860)						
Blockssh			-.977 (.908)	-1.143 (.889)				
Bls10sh					-1.111 (.849)	-1.229 (.840)		
Bls20sh							-1.202 (.781)	-1.446* (.773)
Log of 1990 Productivity	.502*** (.073)	.449*** (.077)	.502*** (.073)	.447*** (.076)	.501*** (.073)	.446*** (.763)	.507*** (.073)	.451*** (.076)
Adj. R^2	.250	.326	.255	.335	.258	.337	.261	.343
N	149	149	149	149	149	149	149	149

Note:. Sample is all old firms. Covariates include 3 region dummies (Moscow-St. Petersburg, European Russia, Asian Russia (Siberia, Far East and Urals)), 7 industry sector dummies, and 3 size dummies. Shares are expressed in proportions. Blocksh is the largest outside shareholding. Blockssh sums all big outside shareholdings (excluding individual outsiders when their average shareholding is smaller than .05). Bls10sh and Bls20sh include all outside shareholdings larger than 10 and 20 percent, respectively

*- statistically significant at 10 % level, **-statistically significant at 5 % level, ***-statistically significant at 1 % level

Table 41
Impact of Outside Ownership Concentration on Productivity: Types
OLS Regression Estimates
(standard errors in parentheses)

Independent Variables-Dominant Owner Type (voting)	Dependent Variable : Log of 1994 Productivity (Sales/Employment)							
	Specification 1		Specification 2		Specification 3		Specification 4	
	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates	without covariates	with covariates
WO	.290 (.182)	.377** (.188)	.306* (.180)	.403** (.186)	.284 (.182)	.377** (.187)	.310* (.181)	.411** (.188)
MO	.549** (.275)	.643*** (.270)	.577** (.272)	.681** (.268)	.550** (.274)	.648*** (.269)	.572** (.274)	.679*** (.269)
INO	.847* (.453)	.562 (.451)	.961** (.421)	.710* (.424)	.839* (.447)	.564 (.447)	.926** (.438)	.694 (.441)
OO	.067 (.328)	.118 (.323)	.096 (.340)	.190 (.335)	.055 (.318)	.128 (.312)	.132 (.330)	.251 (.326)
NO	.376 (.418)	.545 (.406)	.427 (.412)	.637 (.404)	.364 (.410)	.554 (.397)	.460 (.405)	.694* (.397)
Block 10	.176 (.214)	.236 (.209)						
Block 20			.146 (.235)	.156 (.229)				
Blocks 10					.193 (.203)	.238 (.199)		
Blocks 20							.107 (.218)	.089 (.212)
Log of 1990 Productivity	.497*** (.073)	.449*** (.074)	.493*** (.073)	.439*** (.077)	.495*** (.073)	.446*** (.076)	.493*** (.073)	.445*** (.077)
Adj. R^2	.263	.342	.261	.338	.264	.343	.261	.337
N	149	149	149	149	149	149	149	149

Note: Sample is all old firms. Covariates include 3 region dummies (Moscow-St.Petersburg, European Russia and Asian Russia (Siberia, Far East and Urals)), 7 industry sector dummies, and 3 size dummies. Dominant owner type is defined (as described in the text) on the basis of voting shares. Blo10 and Blo20 take on value 1 when the largest outside blockholder has more than or equal .10 or .20, respectively. Blocks10 and Blocks 20 is a dummy for the cases where the sum of large outsiders is greater than or equal .10 and .20, respectively.

*- statistically significant at 10 % level, **-statistically significant at 5 % level, ***-statistically significant at 1 % level

Dependent Variable - Restructuring Index (RESIND3)																
Specification	1				2				3				4			
	B	SD	B	SD	B	SD	B	SD	B	SD	B	SD	B	SD	B	SD
PROBPSH	.06	.03	.06	.03												
PROBMSH					.21	.10	.29	.11	.25	.10	.35	.11	.25	.10	.34	.11
PROBWSH					.00	.06	.01	.06	.00	.06	.00	.06	.03	.06	.03	.06
PROBOSH					.06	.08	-.02	.09								
PROBINST									.28	.12	.21	.13				
PROBBSH													-.84	.54	-.65	.56
PROBIFSH													.35	.20	.34	.24
PROBFSH													1.38	.98	.47	1.19
PROBFISH													.28	.19	.18	.21
PROBINDS									-.52	.24	-.61	.27	-.66	.26	-.66	.29
covariates	no		yes		no		yes		no		yes		no		yes	
Adj R sqr.	.02		.07		.02		.09		.05		.11		.05		.11	
N	209		209		206		206		202		202		202		202	

Table 43
Impact of Shareholding on Productivity: IV Estimates

Dependent Variable - Productivity Measure(LNS_E94)																
Specification	1				2				3				4			
	B	SD	B	SD	B	SD	B	SD	B	SD	B	SD	B	SD	B	SD
PROBPSH	.53	.18	.54	.18												
PROBMSH					2.11	.59	1.13	.59	2.29	.60	1.27	.61	2.44	.60	1.39	.62
PROBWSH					-.50	.35	-.21	.34	-.54	.35	-.24	.34	-.69	.35	-.33	.35
PROBOSH					1.14	.50	1.89	.50								
PROBINST									2.46	.70	2.22	.71				
PROBBSH													8.56	3.29	5.69	3.18
PROBIFSH													4.30	1.18	2.31	1.39
PROBFSH													-3.89	6.23	8.84	6.85
PROBFISH													.49	1.12	1.23	1.14
PROBINDS									-1.22	1.41	1.00	1.50	.25	1.50	1.07	1.61
LNS_E90	50.61	8.61	39.66	8.23	44.84	8.66	34.95	8.33	43.95	8.62	35.81	8.30	44.19	8.56	36.89	8.35
covariates	no		yes		no		yes		no		yes		no		yes	
Adj R sqr.	.15		.32		.19		.34		.21		.35		.23		.35	
N	229		229		226		226		222		222		222		222	

Figure 1
Classification of Share Owners

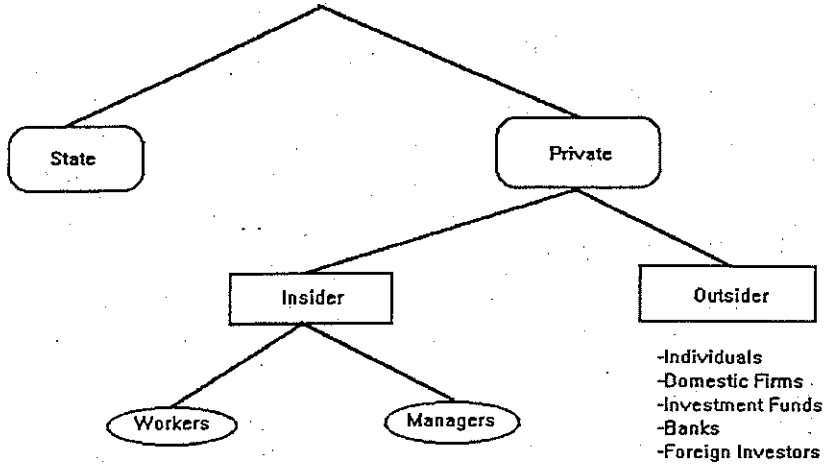


Table 44

Impact of Ownership Concentration on Restructuring: IV Estimates

Dependent Variable - Restructuring Index (RESIND3)																
Specification	1				2				3				4			
	B	SD	B	SD	B	SD	B	SD	B	SD	B	SD	B	SD	B	SD
PROBMSH	.22	.10	.32	.11	.22	.10	.33	.11	.22	.10	.33	.11	.24	.10	.35	.11
PROBWSH	-.01	.06	.00	.06	.00	.06	.00	.06	-.00	.06	.00	.06	-.01	.06	-.00	.06
PROBOSH	-.47	.20	-.56	.20	-.54	.23	-.71	.25	-.52	.22	-.71	.24	-.38	.19	-.46	.19
PROBLSH	.85	.29	.87	.30												
PROBLSSH					.81	.29	.93	.32								
PROB10SH									.84	.29	.99	.32				
PROB20SH													.75	.29	.76	.29
covariates	no		yes		no		yes		no		yes		no		yes	
Adj R sqr.	.06		.12		.05		.12		.06		.13		.05		.0001	
N	200		200		200		200		200		200		200		200	

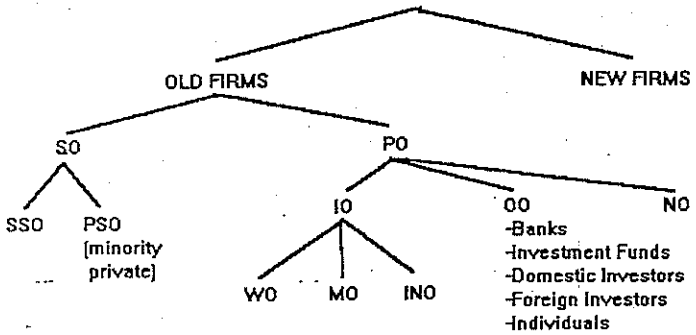
Table 45

Impact of Ownership Concentration on Produtivity: IV Estimates

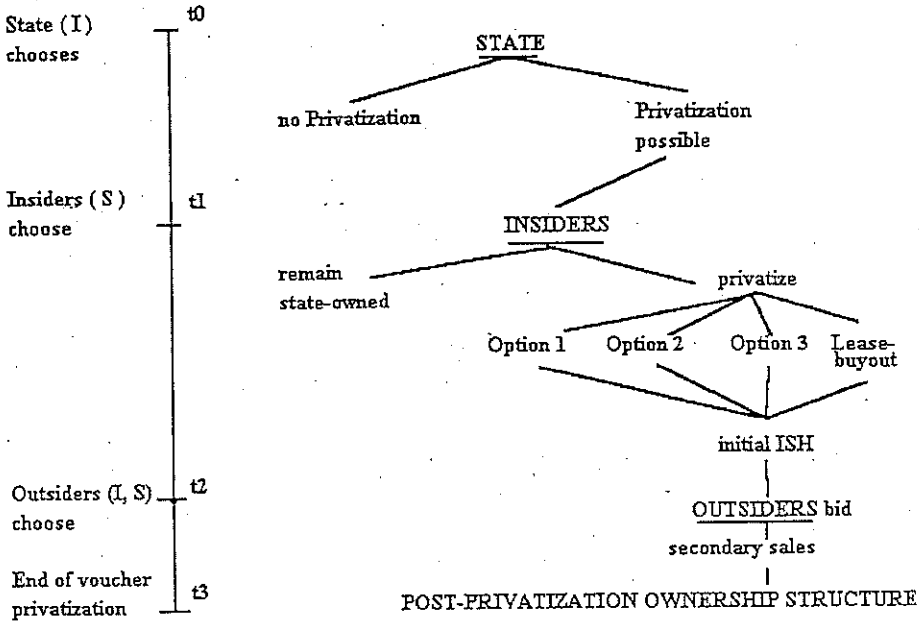
Dependent Variable - Productivity Measure(LNS E94)																
Specification	1				2				3				4			
	B	SD	B	SD	B	SD	B	SD	B	SD	B	SD	B	SD	B	SD
PROBMSH	2.22	.60	1.27	.61	2.25	.59	1.33	.61	2.26	.60	1.30	.61	2.27	.61	1.27	.62
PROBWSH	-.58	.36	-.26	.34	-.57	.35	-.26	.34	-.58	.36	-.26	.34	-.58	.36	-.25	.34
PROBOSH	.20	1.16	1.60	1.14	-1.38	1.36	.78	1.44	-.78	1.29	1.20	1.38	-.40	.11	1.21	1.07
PROBBLSH	2.03	1.73	.39	1.68												
PROBLSSH					3.85	1.73	1.42	1.80								
PROB10SH									3.26	1.75	.91	1.83				
PROB20SH													1.81	1.69	.24	1.65
LNS E4	34.99	8.70	35.99	8.34	43.50	8.62	35.53	8.32	43.71	8.65	35.59	8.33	43.31	8.70	35.49	.41
covariates	no		yes		no		yes		no		yes		no		yes	
Adj R sqr	.19		.34		.21		.35		.20		.34		.19		.34	
N	222		222		222		222		222		222		222		222	

Figure 2

Classification of Dominant Owner Type



Definitions:
Old Firms - firms, which already existed before reform
New Firms - de novo firms
SO - dominated by state
PO - dominated by private owner
SSO - 100% state-owned
PSO - partially privatized
IO - dominated by inside-owners
OO - dominated by outside-owners
NO - PO, but no clear dominant inside or outside owners
WO - dominated by workers
MO - dominated by managers
INO - IO, but no clear dominant worker or managerial owners

Figure 3

Stylized Decision Tree of the Russian Privatization Process