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Centrum Analiz Społeczno-Ekonomicznych

CASE

Center for Social and Economic Research

Irena Grosfeld

Iraj Hashi

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ul. Sienkiewicza 12, 00-944 Warsaw, Poland
e-mail: case@case.com.pl
http://www.case.com.pl

Contents

Irena Grosfeld

Irena Grosfeld is a professor at the National Center of Scientific Research, DELTA (Département et Laboratoire d'Economie Théorique et Apliquée) in Paris, France, and has served on the editorial boards of the periodicals Economics of Planning and The Economics of Transition. She received her PhD in economics at the University of Paris (Sorbonne) in 1978. Her chief research interests include the privatisation of state-owned enterprises, enterprise restructuring, corporate governance and reform of the financial system. She has also written on enterprise exit and wages and investment in the post-Communist transition.

Iraj Hashi

Iraj Hashi is Reader in Economics at Staffordshire University Business School in the United Kingdom. He received his PhD in economics from the University of Keele in 1980. His chief research interests include the restructuring of East European economies (especially Albania, Poland, the Czech Republic, and the former Yugoslav Republics), enterprise behaviour during the transition period, the privatisation of state-owned enterprises, the theory of labour-managed firms and employee-owned enterprises, and the economics of bankruptcy.

Preface

This volume contains the output of comparative research undertaken in 1999–2001 by Irena Grosfeld (DELTA, CNRS, Paris) and Iraj Hashi (Staffordshire University Business School) under the international comparative project "**Secondary Privatization: the Evolution of Ownership Structures of Privatized Enterprises**". The project was supported by the European Union's Phare ACE* Programme 1997 (project P97-8201 R) and was coordinated by Barbara Błaszczyk of the Center for Social and Economic Research (CASE) in Warsaw, Poland.

The support of the ACE Programme made it possible to organize the cooperation of an international group of scholars (from the Czech Republic, France, Poland, Slovenia and the U.K.). The entire project was devoted to the investigation of secondary ownership changes in enterprises privatized in special privatization schemes (i.e., mass privatization schemes and MEBOs**) in three Central European countries – the Czech Republic, Poland and Slovenia. Through a combination of different research methods, such as secondary analysis of previous research, analysis of legal and other regulatory instruments, original field research, statistical data base research and econometric analysis of individual enterprise data, the project aimed to investigate the scope, pace and trends in secondary ownership changes, the factors and barriers affecting them and the degree of ownership concentration resulting from them.

This authors of this volume investigate the actual evolution of ownership structure in firms privatized through "wholesale schemes" – voucher privatization in the Czech Republic and the National Investment Fund program in Poland – using original databases. They attempt to answer questions concerning the factors influencing this evolution and analyze the interconnections between property rights reallocation, ownership concentration, and the corporate governance of companies.

We hope that the results of this research will be of great interest for everyone interested in the little-researched question of what has happened to companies *after* privatization in transition countries.

Barbara Błaszczyk

* "Action for Cooperation in the Field of Economics".

** Management-Employee Buyouts.

Part I.
Introduction

Privatization was considered as one of the key elements of the transformation of the previously planned economies in Central and Eastern Europe. Ten years after the beginning of transition, however, a skeptical assessment of privatization strategy seems to prevail. Special privatization schemes applied by governments of most of these countries are particularly strongly criticized. Let us denote those schemes, which usually involved the transformation of the ownership of a large number of companies according to some general formula, by the term 'wholesale privatization'[1]. Based on free transfer of assets to certain segments of the population, such type of privatization is often viewed as 'artificial', unable to provide firms with 'real owners' and to bring about improvement in firms' performance. One of the main criticisms is that wholesale privatization creates diffuse ownership structure, responsible for poor corporate governance and the lack of deep restructuring.

In this paper we want to investigate the actual evolution of the ownership structure in order to find empirical evidence on whether or not such assessments are well-founded. Is indeed ownership structure in the firms emerging from wholesale privatization highly dispersed? Is there a lot of inertia in the process of reallocation of property rights? What are the determinants of the evolution of the ownership structure? We focus on firms privatized by two, quite different, wholesale schemes in the Czech Republic and in Poland, i.e., we consider firms privatized through the voucher scheme in the Czech Republic and firms included in the National Investment Funds program in Poland.

It is useful to take into account the special context in which the initial choice of 'wholesale privatization' was made by the governments of the two countries. The motivation included a variety of political and social considerations, such as the equity, social and political acceptability, and the mobilization of public support. But economic considerations were also very important. They varied, however, across countries according to the understanding by the policy makers of the role of privatization in market processes[2]. In Poland, the transfer of property to the private sector was seen as a means of improving firm incentives and its real objective was firm restructuring. More orthodox methods of privatization (IPOs, negotiated sales, auctions, etc.) were seen as more efficient from that point of view, but it soon became clear that relying exclusively on such methods would be too slow. Therefore, privatization by liquidation was speeded up and, at the same time, the NIF program was initiated. The design of this program was dominated by the concern about firm restructuring and corporate governance. For instance, a concentrated ownership structure was imposed on the firms and the funds were to be managed by highly experienced western specialists. In the Czech Republic (and before that in Czechoslovakia) privatization was understood as the precondition for the process of radical institutional change and was supposed to generate important spill-over effects. Consequently, the main concern was with the speed of the process and less attention was paid to the emerging ownership structure.

The explicit objectives of wholesale privatization notwithstanding, it was clear from the very beginning that the initial ownership structure it created would not be a permanent one. It was expected that with the development of market institutions, and notably with the development of the secondary market for shares, it would evolve into more effective forms.

It is not clear, however, how to assess the quality of wholesale privatization or, more specifically, what could be

[1] These schemes include notably mass privatization programmes implemented in Albania, Armenia, Bulgaria, Czech Republic, Estonia, Kazakhstan, Lithuania, Moldova, Mongolia, Poland, Romania, Russia, Slovenia, and Ukraine.

[2] The period of transition, sometimes considered as a natural experiment providing an unusual opportunity to test a number of theories advanced in the context of developed economies, has stimulated the debate about such important issues as: why private property matters; how the distribution of ownership rights influences corporate governance; and how corporate governance affects enterprise restructuring. Concerning the mechanism through which private property is supposed to influence firm performance, three explanations have been put forward. Firstly, privatization improves incentives; second, privatization improves human capital; and finally, privatization has important externalities – it brings about a change in expectations and behavior of agents and introduces an ownership culture in the society, thus contributing to the emergence of a market environment (for the human capital explanation, often proxied by managerial turnover, see Barberis et al. 1996; Dyck 1997).

considered as a 'good' ownership structure. The usual benchmark is concentrated ownership structure, which is commonly considered as the most efficient one. Dispersed ownership is usually viewed as inefficient, leading to insufficient monitoring of managers. However, the existing economic theory provides us with ambiguous hypotheses concerning the impact of ownership structure on firm performance. We start with a short review of this literature. Next, taking more a Coasian view, we assess the extent of reallocation of property rights since the initial privatization in Poland and in the Czech Republic. We give statistical evidence on the actual evolution of firms' ownership. This information allows the evaluation of the relative rigidity/flexibility of the initial ownership structure. It is clear that in mature market economies, the ownership structure of enterprises has evolved over a long period of time and one would not expect similar developments to take place in transition economies in less than a decade. However, given the 'artificial' form of ownership structure imposed on firms included in wholesale privatization, we may expect that, under reasonable conditions, new and more appropriate ownership configuration would emerge. Indeed, as we shall show later, the ownership structure has rapidly evolved. It has become highly concentrated and the identity of main shareholders has quickly changed. In the Czech Republic, the large majority of voucher privatized firms have a dominant owner with substantial degree of control and nearly half of them have owners with absolute control (more than 50% of voting shares). In Poland, the majority of firms in the National Investment Funds program have already been divested by NIFs and found their dominant owners. Finally, we will consider the determinants of the ownership changes. In other words, we look at the ownership structure as endogenous and try to identify how it responds to various firm specific characteristics as well as to factors characterizing the firm's environment.

Part II.
Ownership Concentration and Corporate Governance: Ambiguous Relationship

There is a large body of the literature studying the impact of ownership structure on firm performance. Most of the literature considers that corporate ownership structure does matter and has a significant effect on corporate governance and performance[3]. Following the early work by Berle and Means (1932) and until the eighties, this literature has focused on the advantages of ownership concentration. The main concern was the cost of the separation of ownership and control, or the agency costs (Jensen and Meckling, 1976; Fama and Jensen, 1983, etc.). The idea is that dispersed ownership in large firms increases the principal-agent problem due to asymmetric information and uncertainty. Because the contracts between managers and shareholders are unavoidably incomplete (future contingencies are hard to describe), shareholders must monitor managers. There is a widespread consensus that a higher degree of control by an external shareholder enhances productivity performance: more monitoring presumably increases productivity (Shleifer and Vishny, 1986). When the equity is widely dispersed, shareholders do not have appropriate incentives to monitor managers who, in turn, can expropriate investors and maximize their own utility instead of maximizing shareholder value. Concentrated ownership in the hands of outsiders is also often advocated on the ground that it facilitates the provision of capital.

More recently, the focus of the literature has shifted and several theories have been proposed to show the ambiguity of the effect of ownership concentration[4]. First, La Porta et al. (1998b) show that, in the majority of countries, large corporations have large owners who are active in corporate governance. So, monitoring the managers is not the main problem of corporate governance and the real concern is not monitoring but the risk of the expropriation of minority shareholders. A similar view has been expressed by the Becht and Roell (1999) in their review of corporate governance in continental European countries. In most of the countries studied, companies have large shareholders and the main conflict of interest lies between them and minority shareholders. Secondly, concentrated ownership may negatively affect firm performance through its impact on managerial initiative. If concentrated ownership provides incentives to control the management, it may also reduce the manager's initiative or incentives to acquire information (Aghion and Tirole, 1997). In this perspective, Burkart et al. (1997) view dispersed ownership as a commitment device ensuring that shareholders will not exercise excessive control. If the principal is concerned with providing the manager with the guarantee of non-intervention, he may choose to commit not to verify the action of management. Such inefficient monitoring technology may stimulate managerial activism (Cremer, 1995) creating, ex-ante, powerful incentives for the management. When managerial initiative and competence are particularly valuable (which may occur when firms face high uncertainty), concentrated ownership may turn out to be harmful.

Thirdly, concentrated ownership implies lower levels of stock liquidity which, in turn, weakens the informational role of the stock market (Holmström and Tirole, 1993). This may, again, be more valuable in an uncertain environment (Allen, 1993), or when it is essential to ensure that the management of under-performing firms changes hands. Finally, concentrated ownership is costly for large

[3] There are various definitions of corporate governance. It can be defined narrowly, as the problem of the supply of external finance to firms (Shleifer and Vishny, 1997). It can also be defined as the set of mechanisms which translate signals form the product markets and input markets into firm behavior (Berglöf and von Tadden, 1999), or as the complex set of constraints that shape the ex-post bargaining over rents (Zingales, 1997). The control of the firm does not necessarily equate with equity ownership; it also depends upon control exerted by debt-holders. So, corporate governance may affect firm performance directly, through firm's ownership and control, but also indirectly, through the financial structure of the firm. According to an even broader view of corporate governance, managers in firms characterized by the separation of ownership and control, are constrained from taking actions that are not in the interest of shareholders by several disciplining mechanisms, such as the threat of takeovers, bankruptcy procedure and managerial labor market. Competition on the product market is often considered as another disciplinary device.

[4] See Grosfeld and Tressel (2001).

shareholders because it limits diversification and reduces the owners' tolerance towards risk (Demsetz and Lehn, 1985, Heinrich, 2000). Ownership dispersion allowing greater risk diversification may positively affect investment decisions. Overall, Allen and Gale (2000) conclude that in the second best world of incomplete contracts and asymmetric information, separation of ownership and control can be optimal for shareholders. Bolton and von Thadden (1998) claim that "the issue is not whether ownership concentration per se is desirable or not. The issue rather is how often and at what points in firm's life ownership should be concentrated".

Part III.
Endogeneity of Ownership Structure

Most of the literature studying the relationship between ownership and firm performance takes ownership as an exogenous factor and analyzes the differences in performance of firms with different ownership concentration and with different types of owners. The most often studied is the role of managerial equity holdings considered as a solution to the principal-agent problem, aligning managerial interests with shareholding interests (Jensen and Meckling, 1976). A number of studies have found a non-linear relationship between managerial shareholdings and firm value: low levels of managerial ownership increase firm value but at higher levels of managerial ownership firm value decreases. The latter result was interpreted as managerial entrenchment (cf. for instance Morck et al., 1988, McConnell and Servaes, 1990, Holderness et al., 1999). The link between managerial ownership and firm performance suggested by these studies has been questioned by another strand of empirical literature triggered by the seminal paper by Demsetz and Lehn (1985). In these works ownership structure, instead of being considered as exogenous, is rather viewed as endogenously determined. Firms have different characteristics, they are subject to different constraints, and operate in different environments with different types of competitive pressures. The resulting ownership structure may be considered as responding to all these factors and constraints.

Demsetz and Lehn (1985) explicitly take ownership structure as endogenous and view its evolution as consistent with value maximization. They use a cross section study of 511 firms to show that ownership concentration is related to various characteristics of firms, in particular their size, the degree of the regulation of the given industry and the benefits that owners can gain by increasing their monitoring effort. The authors maintain that if the firm operates in an uncertain environment (proxied by the volatility of the stock prices) there is scope for the owners to gain some of the potential profits through better monitoring.

Himmelberg et al. (1999) followed Demsetz and Lehn (1985) but focused on the determinants of managerial ownership stakes and used more sophisticated econometric techniques. They used panel data to investigate the impact of observable and unobservable firm characteristics on the ownership stakes of managers. They find that managerial ownership and firm performance are determined by common characteristics, i.e., managerial ownership should be treated as endogenous.

Part IV.
Empirical Evidence from the Transition Experiment

This discussion suggests that it may not be appropriate to try to evaluate the effectiveness of wholesale privatization taking concentrated ownership as a benchmark. If we do not know what the characteristics of a 'good' ownership structure or 'good' corporate governance system are, the flexibility of the ownership structure may rather appear as a virtue. It is important that the ownership structure be able to adjust to the firm environment. It is also interesting to look at the determinants of the ownership structure. In other words, rather than considering ownership structure as exogenous and given, and looking at its impact on firm performance, we may view ownership structure as endogenously adjusting to various constraints. This perspective could be traced back to Coase. According to Coase, the distribution of property rights has no effect on economic efficiency, provided they are clearly defined and there are no transaction costs, because people can organize their transactions in ways that achieve efficient outcomes. A possible consequence of this approach could be that, in order to assess the efficiency of a privatization strategy, we should be mainly concerned with the extent to which the reallocation of property rights can take place.

The proponents of wholesale privatization could claim that their strategy relied on the Coase theorem. They could argue that ownership structure does not matter; what really matters is the possibility of freely reallocating property rights. However, the Coasian result strongly depends on the availability of contracting and re-contracting opportunities, backed by an established legal system and law enforcement. In particular, the process of evolution of ownership structure is closely related to the ease with which the original owners can maximize their gains by selling their shares (or claims) to other potential buyers. Conditions of resale play a crucial role in enabling new outsider owners to gain ownership and control of firms by buying the claims of insiders[5].

The transition economics literature is particularly rich in attempts to identify the impact of ownership and privatization on firm performance (for surveys see Carlin et al., 1995; Carlin, 1999, Djankov and Murrell, 2000). This literature usually compares the performance of privatized with state-owned enterprises; it also tries to capture the effect of ownership by different dominant groups. However, these studies are hardly comparable: they use different methodological approaches, employ different performance measures, different time periods, etc. The studies that take care of various econometric problems, and notably of the selection bias, find that privatization brings about significant and positive change in firms' behavior (see Frydman et al., 1999, Grosfeld and Nivet, 1999).

A number of studies have tried to highlight the role of dominant shareholders in privatized firms by investigating the link between privatization and firm performance under different ownership arrangements. For example, in a study of some 700 Czech firms, Weiss and Nikitin (1998) showed that ownership concentration by strategic investors other than investment funds has had a positive impact on performance while this has not been the case with ownership concentration by bank sponsored investment funds. Similar conclusions have been drawn by Claessens & Djankov (1999) study of a cross section of over 700 Czech firms between 1992 and 1997.

The beneficial role of foreign strategic owners in privatized firms has been highlighted in many studies. Carlin et al. (1995) earlier survey and many later studies show positive impact of foreign ownership on productivity growth.

The impact of privatization and ownership structure on firm performance is difficult to identify as it obviously depends on a number of factors characterizing firm environment. We may expect that strong complementarities exist between privatization and the quality of business environment, determined by such factors as institutional infrastructure (including law enforcement); development of financial markets; degree of product market competition; macroeconomic stability. For instance, in countries in which the institutional environment is weak, privatization may not

[5] Aghion and Blanchard (1998) implicitly take such Coasian view. They argue that while, *ceteris paribus*, outsider ownership is more conducive to restructuring than insider ownership, the important point is the ease with which the existing owners can transfer their ownership claims to others.

bring about expected effects. The fact that in CIS countries it is more difficult than in CEE countries to identify the effect of private property on firm performance (e.g. Djankov and Murrell, 2000) may precisely be attributed to the lack of some of these necessary complementary factors which make privatization work[6].

Taking the ambiguous relationship between ownership concentration and performance as a hypothesis to be tested, Grosfeld and Tressel (2001) found for the sample of Polish firms listed on the Warsaw Stock Exchange that there is indeed a U-shaped relationship. Firms with relatively dispersed ownership (no shareholder with more than 20 per cent of voting shares) and firms, in which one shareholder has more than 50 per cent of voting shares, have higher productivity growth than firms with an intermediate level of ownership concentration. The type of the controlling shareholder does not explain this correlation between concentration of ownership and productivity growth.

Given the particularities of the transition process, we need to consider not only the determinants of ownership concentration identified in the studies of developed market economies, but also examine transition-specific factors. In the early transition, certain groups that have obtained relative control over privatized enterprises because of the particular design of privatization schemes, may be more or less willing to allow new dominant owners to emerge. Jones and Mygind (1999) treat ownership as endogenous and look at the dynamics of ownership changes. In their study of ownership change in privatized Estonian firms they argue that the initial dominant ownership group is associated with a great deal of inertia, i.e., that the dominant group retains its dominant position for quite a long time[7].

[6] For the analysis of the complementarity between ownership and competition see Grosfeld and Tressel (2001).

[7] In their study of the role of managers and employees in the development of ownership in privatized Russian enterprises, Filatotchev, et al. (1999) have also shown that managers have been hostile to outsiders and colluded with workers to keep the outsiders out of their companies.

Part V. Wholesale Privatization in the Czech Republic and Poland

The Czech Republic and Poland embarked on the transformation process at about the same time and were led by radical reformers. In both countries, rapid privatization was recognized as a fundamental element of transformation and much effort was expended in formulating the specific methods of ownership transformation which could complete the task of ownership transformation in as short a time as possible. Both countries decided that mass privatization, involving a very large number of companies, offered them the possibility of a rapid reduction in the size and scope of state sector activities in favor of the private sector. However, despite the broad similarity of their reform program, they embarked on two different variants of mass privatization. We, first, briefly describe the essential features of the two schemes before discussing the context and their motivations.

5.1. Mass Privatization in the Czech Republic

The main method of privatization in the Czech Republic was 'voucher privatization' through which some 1700 companies were privatized in two 'waves' in 1991–92 and 1992–94. The shares of these companies were transferred to either individuals or privatization investment funds in exchange for vouchers. Privatization Investment Funds, set up by private individuals and institutions as well as state-owned banks and insurance companies, actively participated in the process as financial intermediaries. Adult citizens received vouchers[8] which they could exchange for the shares of companies in the scheme either directly by themselves or indirectly through privatization investment funds. In the latter case, they would entrust their vouchers to investment funds and become shareholders of these funds (which were joint stock companies) or unit holders in unit trusts. The funds, in turn, would use the large number of vouchers collected from their members to bid for shares of their preferred companies. Understandably, given the prevailing information asymmetry and risk aversion, the majority of citizens opted for the second alternative and entrusted their vouchers to investment funds. In the first wave, 72% of investment points available were used by funds and 28% by individuals directly. In the second wave, the percentages were 64% and 36% respectively. Moreover, the bulk of investment points controlled by funds were concentrated in the hands of a small number of funds set up by banks and financial institutions (Mládek and Hashi 1993; Brom and Orenstein 1994; Hashi 1998). In the first wave, these funds were all close-end funds but in the second wave many of them took the form of unit trusts. Later on, as part of the reform of the financial system, close-end funds were required to convert themselves to open funds by 2002. Initially, the funds were allowed to hold up to 20% of the shares of each company in the scheme, though they quickly found ways of bypassing this constraint. From 1996, some investment funds found another legal means of bypassing the 20% limit on their holding of an individual company's shares and began concentrating their shareholding in some of their portfolio companies. The funds' maximum holding in each company was later reduced to 11% and all close-end funds were required to be converted to open funds by 2002.

The shares of mass privatized companies and privatization investment funds were listed on the stock market immediately without the need for prior approval and the publication of a prospectus. The process of buying and selling of shares, and the reorganization of funds' portfolios, quickly followed the two waves – a process generally referred to as the 'third wave' of privatization. Investment funds, despite their large overall stakes, were generally not in a controlling position in their portfolio companies. In the majority of cases, because of divergent interests they could not form coalitions with other funds to gain full control of these companies (Matesova, 1995, p. 4). Many of them had

[8] Vouchers had a nominal value of 1000 investment points. The price of shares of companies in the scheme were also expressed in investment points.

ended up with shares of too many companies and wanted to reduce the size of their portfolios. The 'third wave' was partly facilitated by the generally low (and falling) share prices and a wave of mergers and acquisitions (particularly of smaller companies) which helped the evolution of a system of corporate control (Mejstrik 1997, p. 91). Many individual shareholders, preferring cash to risky shares, also entered the secondary market, selling their shares, thus further pushing down share prices[9]. A major feature of the so-called *third wave* of privatization was the take-over of investment funds. Given that PIFs (especially those set up in the first wave) were joint stock companies with a large number of shareholders, they were easy targets for aggressive bidders.

5.2. Mass Privatization in Poland

The Polish mass privatization was less spectacular than the Czech scheme, including 512 companies and 15 National Investment Funds (NIF), which were set up by the Government[10]. The management of these funds was initially entrusted to special consortia of Western and Polish partners (commercial banks, investment banks, consulting firms) selected through an international tender offer. The implementation of the program was delayed for at least four years (1991–95) for political reasons, mainly the absence of a consensus in the government and the parliament about the final list of companies in the scheme, the precise share of different beneficiaries and the specific arrangements concerning corporate governance of the NIFs. The equity of 512 companies was transferred from the state to new owners according to a common scheme – in sharp contrast to the Czech program where the outcome of the bidding process was completely unforeseeable and any number of funds, individuals and other beneficiaries could end up as new owners of the companies. The majority of shares of each company (60%) was given to the 15 National Investment Funds, with the remaining 40% going to employees (15%) and the Treasury (25%). For each company, one of the 15 NIFs received 33% of shares and thus became the 'lead fund' for that company. The remaining 27% were divided between the remaining 14 funds (each holding just under 2% of shares).

Foreign financial institutions were invited to participate, together with Polish institutions, to bid for the management of NIFs under lucrative remuneration arrangements. The aim was to bring in the fund management know-how and expertise and ensure that Polish institutions learn from their foreign partners. At the same time, foreign institutions with international reputation were expected to follow the same practice as in their own countries, and not to engage in opportunistic behavior, insider dealing and shareholder expropriation which their inexperienced Polish counterparts may be tempted to embark on. Many foreign institutions did take part in the program and most NIFs started to be managed by consortia of foreign and Polish institutions.

The citizens did not become shareholders of companies in the scheme directly but received vouchers (or certificates) which entitled them to one share in each of the 15 funds, thus becoming indirect shareholders of privatized companies. The stated aim of the program was for NIFs to restructure their portfolio companies, turn them into market oriented firms and sell them to either strategic owners or on the stock exchange. The Funds themselves were floated on the Warsaw stock exchange in June 1997 and the citizens' certificates had to be converted to Funds' shares by the end of 1998. Following a buoyant initial market, and the large-scale sale and purchase of shares, the role of the Government began to decline and private owners began to dominate the NIFs (Górzyński, 2001). Following the general meetings of shareholders, new supervisory boards were elected and the direct role of the state in the funds came to an end.

5.3. The Context and Motivation of the Two Schemes

Both wholesale privatization schemes described above were conceived with triple concern: speed up enterprise restructuring, trigger the process of institutional change and ensure political support for transformation strategy (see Grosfeld and Senik-Leygonie, 1996). However, the weight attributed to each of these objectives differed and depended upon the legacy of the previous reforms, the role of trade unions and workers' councils and the understanding of the process of economic transformation. As the result of this, the two programs differed by their scale and the selection of the enterprises, the privileges given to various categories of the participants and the degree of the regulation of the whole process. In Poland the main objective of the scheme was to create appropriate corporate governance arrangements helping in enterprise restructuring. In the Czech Republic, on the other hand, the main motivation was to contribute through the large scale mass privatization to the development of the market system. Consequently,

[9] It is estimated that up to one-third of individuals who had obtained shares in the voucher scheme sold their shares in the early post-privatization period. See The Economist Intelligence Unit (EIU), Country Report, 2nd Quarter 1995, p. 15.

[10] For details of the Polish mass privatization, see Hashi (2000).

the importance of the initial ownership structure was differently assessed.

In the Czech Republic, it was believed that the initial distribution of ownership claims did not matter very much and, in true Coasian tradition, new owners who can utilize the company's assets more efficiently will come forward – provided the market is left alone to perform its allocative function without state interference. Indeed the spontaneous development of several hundred privatization investment funds in a short space of few months was seen as the confirmation of the belief that the free operation of market forces can provide the incentive for new, and possibly more effective, agents to engage in the process. It was expected that Investment Funds would have the means and the expertise to engage in information gathering on companies in the privatization scheme and use the vouchers at their disposal more effectively than the inexperienced and unsophisticated individual voucher holders (see Mládek and Hashi 1993 for details). Furthermore, it was expected that after the exchange of vouchers for shares, Investment Funds would be able to use their human and material resources to monitor managerial performance better than the dispersed individual shareholders. In their search for greater returns, they would force portfolio company managers to engage in restructuring which would result in increased gains for all shareholders.

The concern with the unhindered operation of market forces resulted in the Czech scheme being initially characterized by a near-total absence of a regulatory framework for the operation of investment funds and their activities involving the reallocation of ownership rights. The Company law and the laws governing the operation of securities markets were very lax and the supervision of securities trading and the associated agents were left to a department in the Ministry of Finance. Privatized companies were listed on the stock exchange (to facilitate the trading of their shares and the reallocation of ownership claims) without having to publish a prospectus and without having to obtain the approval of the securities regulator. There was also no obligation on the part of companies to publish all 'material information'.

The Czech mass privatization scheme attracted much criticism right from the beginning (see, e.g., Mládek and Hashi, 1993; Brom and Orenstein, 1994; and Coffee, 1996). On the one hand, as many investment funds pointed out, their holding of 20% was, in many cases, insufficient to exercise effective control over their companies. On the other hand, it soon became clear that shareholders (especially minority owners) and creditors were in real danger of being expropriated by the managers of companies and investment funds. The Czechs introduced a new terminology in economic lexicon, *tunneling*, to describe the mechanism for the expropriation of owners by funds and or company managers (see Veverka, 1997 and Johnson et al., 2000). Also the strong links between the industrial and the financial sectors were often criticised (see Grosfeld, 1997).

The Polish policy makers were well aware of these criticisms and, consequently, decided from the very beginning that the whole privatization process should be strictly regulated[11]. In particular, the regulatory framework of the NIFs, the remuneration scheme for fund managers, and the stock exchange listing requirements were carefully designed to ensure that this process is carried out openly and that the interest of the 'less informed' investors was not betrayed by self-seeking managers of funds and companies. The main concern was to provide companies with "effective owners" and to avoid excessive dispersion of capital. The authors of the program were apparently influenced by the economic theory stressing the importance of concentrated ownership structure for effective corporate governance. They were, however, also concerned with the potential danger of expropriation of minority shareholders and, therefore, the lead funds' holdings in each company was restricted to 33% of shares.

In Poland, it was also recognised that in the absence of a well established legal system and enforceable laws, the development of financial markets in general, and the stock exchange in particular, would depend on investors feeling confident that they will not be quietly expropriated. Thus, the Commercial Code and Stock Exchange regulations require monthly, quarterly, semi-annual and annual reporting of financial information and detailed disclosure of ownership stakes beyond various thresholds (see Johnson and Shleifer, 1999 for details). Transactions between brokerage houses, investment funds and their parent or related companies are strictly prohibited and the Securities Commission is empowered to decide on violation and an appropriate punishment of violators. These guarantees were deemed unnecessary in the Czech Republic – in the hope that with less regulation the markets will develop quickly and the fear that state intervention will create impediments to the rapid development of market institutions.

5.4. Conditions for the Reallocation of Ownership Stakes

Despite differences in the motivations and the context of mass privatization, both countries believed that the initial ownership structure was temporary and that, under com-

[11] For a detailed comparison of the Czech and Polish stock market regulations, see Johnson and Shleifer (1999).

petitive pressure, it would gradually evolve towards a more effective structure. In both countries, it was expected that privatization would not only result in the restructuring of enterprises and effective corporate governance, but would also create conditions facilitating the reallocation of ownership claims from the less informed or less effective owners to more effective ones. A major issue in the privatization debate was whether a secondary market in shares would develop quickly and whether there were mechanisms in place to facilitate this secondary privatization. Aghion and Blanchard (1998), e.g., maintained that as long as a secondary market is in operation and there are no impediments to the working of this market, the ownership structure would evolve to a more effective one over time. It is therefore important to look at the conditions of resale of shares and compare the two schemes.

The factors influencing conditions of resale include the tradability of ownership rights, the anonymity of the ownership transfer, the existence of an independent share depository, the legal protection offered to owners and creditors, and the liquidity and depth of the stock market. As far as the tradability of shares is concerned, the Czech scheme gave a key role to the stock market, whereas in Poland the stock market had only a secondary role – in the former there was immediate possibility of trading while, in the latter, trading became possible gradually. Interestingly, despite the fact that the number of companies listed on Prague's main market decreased dramatically (from over a thousand to around 100), share trading (and the reallocation of ownership rights) continued on the secondary market and also off the market. In the Polish case, given that the majority of companies was not (and still is not) quoted on the stock exchange, the scope for share trading has been limited. Nevertheless, there has been a small but significant amount of sale and purchase of shares, for example employee shares and minority funds' shares.

In terms of legal protection and the law enforcement, there are significant differences between the two countries which affect the development of a secondary market in shares (see La Porta et al., 1998a for the analysis of this relationship in many countries). In the early post-privatization period, shareholders in the Czech Republic were disadvantaged because the company managers were not held legally responsible for the protection of owners and creditors, especially minority owners[12]. It is not surprising, therefore, that no private company has been able to raise funds through a public issue of shares or an Initial Public Offering in the Czech Republic – whereas the Warsaw Stock Exchange raised over a billion dollars of finance for new and existing companies and at least 138 IPOs until 1998 (see La Porta, et al. 1998a and also Johnson and Shleifer 1999)[13]. Legal provisions such as conditions of listing on the stock exchange, reporting and disclosure requirements have all contributed to a more dynamic secondary market in shares in Poland. The eventual shape of the financial markets and ownership structures in the two countries will no doubt be closely linked to this particular factor. Better protection of shareholders in Poland may result in lower concentration of ownership and a greater depth of the stock market in comparison with the Czech Republic.

We shall now turn to the actual change in the ownership structure of the mass privatized companies in the two countries.

[12] The Czech government, under the pressure from the public, media and international observers, eventually succumbed to the review of the Law on Investment Funds and Investment Companies in 1997. The revised law established an independent Securities Commission and changed some of the provisions of the old Law, especially those dealing with shareholder protection and those which enabled the managers to engage in tunneling (see Hashi, 1998 and Veverka, 1997 for details).

[13] For the volume of trading on both Prague and Warsaw stock exchanges and the volume of capital raised for new and existing companies, see Johnson and Shleifer (1999), especially tables 9–12.

Part VI.
Changes in Ownership Structure Since the Initial Privatization

In this section we concentrate on the statistical description of the ownership changes following the initial allocation of ownership stakes in the two mass privatization schemes. We want to get some evidence about the extent of reallocation of property rights. Without trying to evaluate whether the changes in ownership concentration converge to some 'optimal' model, we simply want to establish how flexible the ownership structure is.

Before proceeding with the examination of change in ownership structure, we first describe the data on which the whole study is based.

6.1. The Data

The data on Czech companies is a combination of datasets on financial indicators, ownership characteristics and employment of companies privatized in the two waves of the voucher scheme. They were prepared by a Czech commercial company (Aspekt) using official company accounts filed by joint stock companies, and Prague Securities Centre (for the identity of owners). Employment and other information were collected from company reports. The financial data is annual and covers the period of 1993–99. The dataset was purchased in early 2000 and consequently the information for 1999 is not complete for all companies. The ownership data includes the identity and the equity holdings of up to seven largest shareholders of each company since 1996. The owners are categorized into six types: other industrial groups or companies, investment funds, portfolio companies (companies engaged primarily in buying and selling of shares without any intention of interfering in management decisions), individuals, banks, and the state. The data set does not identify the shareholding of management, employees or foreign shareholders.

The data set covers the large majority of mass privatized companies. There is, however, no information on the ownership structure of companies that have left the stock exchange (because of de-listing, change in their legal status, mergers and takeovers, or bankruptcy and liquidation). Also for some of the sample companies where ownership stakes are smaller than 10%, the information on ownership is unavailable. Altogether, of the approximately 1700 mass privatized companies, we have financial information for 1328 and ownership information for 1249 firms respectively for the 1996–98 period (3 years), and for 627 and 652 firms, respectively, for the 1996–99 period (4 years). However, the number of firms with both financial and ownership data is smaller, 1079 (for 1996–98) and 276 (for 1996–99). Both samples are well distributed across the 19 sectors of economic activity (based on Prague Stock Exchange classification of sectoral activity which closely resembles NACE classification). Naturally, the larger sample is a better representation of the population of mass-privatized firms and also better for empirical work. However, the trend of change in ownership concentration is better portrayed by the smaller sample with information on firms over a longer period. We have constructed balanced panels (consisting of the same companies over the three-year or four-year periods) on which the descriptive statistics and trend of change in ownership are based. We will also present the results of our study using the unbalanced panels to ensure that all available information is utilized. For econometric work, we shall use the unbalanced panels.

The Polish data were collected from several sources. The Ministry of State Treasury (Department of Privatization) maintains some rudimentary data on the 512 companies in the National Investment Fund Program, largely for the period before their privatization. The Department is interested in monitoring the development of these companies and keeps a record of major changes in their status. Additional information was collected from the annual reports of NIFs and their portfolio companies through the publication *Monitor Polski*, NIF's reports and the reports of the Association of National Investment Funds. For some of the companies that have been floated on the stock exchange, further information was obtained from the Warsaw Stock Exchange.

Unlike in the Czech Republic, the initial ownership structure of the companies in the mass privatization scheme was uniform and fixed by the scheme (lead fund 33%; other funds 27%; employees 15% and the state 25%). The information on ownership change in the following years, collected from the variety of sources described above, identifies the largest owners of those companies which have been divested by NIFs. The shareholders are classified into six categories: other companies (domestic), other companies (foreign), financial institutions, employees of the company, individuals and other NIFs.

6.2. The evolution of Ownership

We focus on two dimensions of the evolution of ownership. First, we investigate whether ownership concentration has increased or decreased. Second, we trace any reallocation of ownership rights between different groups (individual shareholders, financial institutions, other companies, banks, state, etc.).

Czech Republic

The evidence from the Czech data points to an unambiguous increase in concentration of ownership. Table 1 highlights the broad picture of this evolution for a balanced sample from 1996 to 1999. The result for the unbalanced sample is presented as Appendix 1.

Table 1: The average share of the largest shareholder in companies privatized through the Voucher Scheme

	1996	1997	1998	1999
Mean	38.8	42.8	48.6	51.9
Median	36.3	42.0	47.5	49.7
Std. Dev.	19.3	20.4	21.5	21.8
No. of firms	652	652	652	652

Source: own calculation using Aspekt data-base.

The average holding of the largest shareholder of companies in the sample increased rapidly from 38.8% in 1996 to 51.9% in 1999. The near 40% increase over a four-year period is an indication of the dynamic nature of ownership evolution. The median figure indicates that by 1999, half of the sample firms had one shareholder with at least 50% of the firm's equity – a dramatic increase in concentration if we remember that these firms, on the whole, had widely dispersed ownership after privatization. The results for the unbalanced sample (with a much larger number of firms for 1996–98) are very similar (see Table A1 in the Appendix). Similarly, if we take the share of the largest three or five shareholders, as alternative measures of ownership concentration, we would get a very similar pattern[14].

We can now consider the second dimension of the evolution of ownership, i.e., the reallocation of ownership rights between different types of shareholders and how the dominant ownership of companies has shifted from one type of owner to another over the years. The data-set classes owners of companies into six ownership groups: other companies[15]; investment funds, individuals, portfolio companies[16]; banks; and the state. By 'dominant owner' we refer to the largest shareholder owning more than 20% of a company's shares. We use the 20% threshold following, for instance, La Porta et al. (1998b) and Grosfeld and Tressel (2001) who consider that the ownership of 20% of shares constitutes an important threshold above which the exercise of some control becomes possible.

The change in the dominant shareholder between 1996 and 1999 is summarized in Table 2, the 'ownership transformation matrix'[17]. The four-year period enables us to observe changes between different ownership groups over a longer period of time. The matrix has also been constructed for the 1996–98 period with a much larger number of firms (1273) and presented as Table A2 in the Appendix.

Table 2 shows the number of companies that have moved from one type of dominant owner to another. For example, in 1996, 281 companies had 'other company' as their dominant owner. By 1999, as a result of the transactions in the intervening period, the number of companies in this group had increased to 405. The increase came from sale and purchase of shares resulting in the transfer of 'dominance' of 18 companies from 'portfolio companies', 38 from 'investment funds', 9 from banks, 23 from the state, 25 from individuals and 63 from the group with no dominant owner.

In the same period, the number of companies with individuals as their dominant shareholder increased from 80 to 97 and those with investment funds as their dominant shareholder from 73 to 84. On the other hand the number of companies with banks or the state as the dominant shareholder decreased, from 17 to 7 (for banks) and from 46 to 13 (for the state). The number of companies with 'portfolio companies' as the dominant shareholder also decreased from 38 to 18. The tendencies identified in table 2 can be corroborated for a larger number of firms over the 1996–98 period (see Table A2 in

[14] These results are not presented in the paper but are available on request.

[15] This refers to another company engaged in some economic activity other than buying and selling of shares.

[16] This refers to companies which are primarily engaged in brokerage and buying and selling of shares.

[17] The idea of 'ownership transformation matrix', showing the change in firms' dominant ownership groups, was first used in Estrin and Roseover (1999) for Ukraine. It has also been used by Jones and Mygind (1999) for Estonia and Simoneti, et al. (2001) for Slovenia.

Table 2: Ownership transformation matrix: change in the no. of companies and their dominant shareholder* from 1996 to 1999

Type of dominant ownership*	No. of companies in 1996	No. of companies and dominant owners in 1999							
		AS	LO	IF	BA	S	IND	No dom. owner	Total
AS (other company)	281	**229**	7	12	0	4	22	7	281
LO (portfolio company)	38	18	**2**	10	0	0	5	3	38
IF (investment fund)	73	38	0	**27**	2	0	4	2	73
BA (bank)	17	9	1	2	**2**	0	3	0	17
S (state)	46	23	1	4	0	**9**	4	5	46
IND (individuals)	80	25	2	4	0	0	**47**	2	80
No dominant owner	140	63	5	25	3	0	12	**32**	140
Total	**675**	405	18	84	7	13	97	51	**675**

* Dominant shareholder refers to the largest shareholder of a company, provided he holds more than 20% of shares. Each row shows the number of companies in each dominant ownership group in 1996 (first column) and how they have moved to other ownership groups by the end of 1999 (2nd-8th columns). Each column shows the total number of companies in each dominant group in 1999 (8th row) and their original dominant ownership group of that column (1st-7th rows). The diagonal (in bold) shows the number of companies whose dominant shareholder did not change between 96 and 99.

the Appendix). Concerning banks' equity holdings, it should be noted that although their direct holdings have been significantly reduced, the banks' role in the Czech voucher privatization was mainly due to the indirect influence through the bank-sponsored investment funds and not through direct shareholding in companies. Indeed, banks were shareholders of any significance in only 97 companies (in 1996) and this was reduced to 32 (in 1999).

A related feature of ownership evolution is the extent of control exercised by different ownership groups and how this has changed over time. Following Grosfeld and Tressel (2001), we consider three thresholds of ownership concentration (C1). When ownership concentration is high (more than 50%), the dominant owner has absolute control over the company. With intermediate levels of ownership concentration (greater than 20% and up to 50%), the dominant owner has substantial control. Finally, when the level of ownership concentration is low (20% and less), ownership is dispersed and the largest owner has very little control over the firm's affairs. Table 3 shows the number of companies in each concentration range and how they have changed over the four years for a balanced panel of 652 companies. The table also identifies the largest shareholder type in each concentration range and how that has changed. The results for an unbalanced panel are presented as Table A3 in the Appendix.

Table 3 shows several features of the process. Firstly, we can see that the number of firms with absolute shareholder control (more than 50%) has strongly increased (from 29% in 1996 to 46% in 1999) and the number of firms with dispersed ownership has fallen (from 21% in 1996 to 7% in 1999). The number of firms with intermediate ownership concentration has fallen very slightly[18]. It is important to note that the same trend can be observed in the unbalanced panel which contains a much larger number of firms in the first three years (see Table A3 in the Appendix).

Secondly, Table 3 links the dominant shareholder of companies with different degrees of ownership concentration. As we know, in the immediate post-privatization, the ownership of companies was widely dispersed. The state (through the National Property Fund, NPF) and investment funds were the only group with significant packages of shares in many companies. Table 4 summarizes the initial ownership structure of 949 companies involved in the first wave of voucher privatization.

Domestic or foreign investors (i.e., other companies) had significant stakes in a small number of companies only. In only 58 firms (6% of the total), did any individual ownership group hold more than 50% of shares (and most of these were cases where shares were allocated the NPF through the design of the privatization project of the firm).

By 1999, the ownership structure had undergone a dramatic change. In 1995 and 1996, there was a lot of transfer of ownership because of the sale of some companies and attempts to increase control over others. By 1996, two groups had emerged as significant new owners: other companies and individuals. Investment funds had remained important but the number of companies in their portfolio was significantly reduced. Portfolio companies had emerged as a player but not a very important one and with only a small number of companies in their portfolio. The direct role of banks (which during this period were mostly state-owned) and the state itself had diminished significantly with only a few companies in which these two groups have remained as dominant shareholder.

It is clear from Table 3 that over the five to six years following voucher privatization, most companies acquired a dominant owner, with nearly half of them having an owner with absolute control and over 90% of them own-

[18] If we look at the ownership concentration range in more detail, we note that the number of companies with ownership concentration between 20 and 30% has fallen while those in the range over 30% have increased.

Table 3: No. of companies and their largest shareholder in different ranges of ownership concentration*, 1996–99 (balanced panel)

Concentration range and the largest shareholder	No. of companies			
	1996	1997	1998	1999
C1 > 50%	**189 (29%)**	**215 (33%)**	**270 (41%)**	**298 (46%)**
Largest shareholder:				
Other company	125	158	191	213
Investment fund	16	20	36	34
Individual	21	20	25	33
Portfolio company	9	6	11	11
Bank	7	3	3	1
State	11	8	4	6
20%<C1 ≤ 50%	**327 (50%)**	**327 (50%)**	**319 (49%)**	**307 (47%)**
Largest shareholder:				
Other company	148	184	166	180
Investment fund	55	46	53	48
Individual	58	59	66	60
Portfolio company	24	15	19	6
Bank	9	8	5	6
State	33	15	10	7
C1 ≤ 20%	**136 (21%)**	**110 (17%)**	**63 (10%)**	**47 (7%)**
Largest shareholder:				
Other company	22	29	15	11
Investment fund	77	61	27	14
Individual	10	13	13	15
Portfolio company	5	0	1	1
Bank	4	1	2	2
State	18	6	5	4
Total	**652 (100%)**	**652 (100%)**	**652 (100%)**	**652 (100%)**

*Ownership concentration is measured by the share of the largest owner in the firm's equity (C1).
Source: own calculation based on Aspekt data-base.

Table 4: Number of companies and the extent of shareholding of different groups after after the first wave of voucher privatization

	With any holding	With holding > 20%	With holding >50%
National Property Fund	314	117	23
Investment fun	949	102	0
Other co. (foreign)	51	38	19
Other co. (domestic)	58	38	16
An individual	949	0	0
Total	949 (100%)	295 (31%)	58 (6%)

Source: Mejstrik (1997), pp. 69–72.

ers with over 20% of shares. This is a highly concentrated ownership structure compared with many transition as well as market economies[19].

Overall, we can see that three types of dominant owners (other companies, individuals and investment funds), have increased the number of companies under their control, at the expense of other shareholders. The general picture is one of a dynamic market for the sale and purchase of ownership claims, with the dominant shareholder having changed in about 40%[20] of the companies in the four years under consideration. The most interesting aspect of the evolutionary process is the flexibility with which some

[19] Becht and Roell (1999, p. 1052) report the median largest voting block in the listed companies of several mature market economies as follows: Austria 52.0%; Belgium 50.6% (BEL20 45.1%); Germany 52.1% (DAX30 11.0%); Spain 34.2%; France CAC40 20.0%; Italy 54.5%; Holland 43.5%; U.K. 9.9%; and USA below 5%. Clearly, with the exception of the US and UK (which have very liquid and active stock markets), the ownership of listed companies in other countries is quite concentrated. But they are still, in general, less concentrated than that in the Czech Republic.

[20] The total number of firms whose dominant ownership has changed can be calculated by subtracting the sum of the diagonal figures in Table 2 from the total number of firms.

shareholders, particularly banks and investment funds have sold their dominant stakes. An important outcome of the process has been the emergence of individual entrepreneurs as dominant shareholders. In a country with no private entrepreneurs (not legal ones at least), this is a truly fundamental change that has been brought about by the advent of a market economy.

Poland

The Polish scheme, due to its cautious design, had a degree of inertia built into it. Dominant owners, i.e., the 'lead funds' holding initially 33% of company shares, could not increase their share unless they were floated on the stock market or their capital was increased. Similarly, portfolio companies could not be floated on the stock market until they could meet (as any listed company) the stringent listing criteria set by the regulatory agency referred to earlier. These restrictions on further trading of shares, however, did not stop NIFs from reducing the number of firms in their portfolios. It seems that the combination of NIF's incentive system and the competitive pressure from the product and factor markets led to divestments which resulted in changes in ownership. Moreover, the concentration in the divested companies began to increase too. Table 5 represents this process.

As the table shows, the share of the largest shareholder began to increase from 1996, initially by only a small fraction (as in the previous years it would have been 33%), and then by larger amounts. By the year 2000, the largest shareholders were in near-absolute control of about one-third of companies. The process is very similar to that in the Czech Republic.

The position of National Investment Funds and their portfolio companies has rapidly evolved in the post-privatization period. Table 6 summarizes this evolution.

The state has clearly withdrawn from active ownership and participation in the affairs of these companies. In 99 companies, the state has reduced its holding to zero, while its average share in the remaining companies has fallen at about 20% level. In 239 firms, NIFs have completely disposed of their shares and left them to the new owners. Interestingly, the share of lead NIFs in their portfolio companies has slightly increased and stabilized at about 35%. A small number of companies have a second NIF as large shareholders (over 15%).

Whereas in the early days of the Polish schemes, only NIFs and the state were the main players involved, other dominant ownership groups entered the process gradually. Table 7 shows the reallocation of ownership rights from NIFs to other categories of owners and their ownership stakes.

Table 5: The average share of the largest shareholder in companies included in the National Investment Funds program

	1996	1997	1998	1999	2000
Mean	33.94	36.63	41.25	46.25	48.28
Std. Dev.	5.29	10.03	15.67	20.38	22.76
Median	33	33	33	33	33
No. of firms	512	512	512	512	512

Source: own calculation.

Table 6: Changes in the equity holdings of the State and of NIFs

	1994	1995	1996	1997	1998	1999	2000
Mean state Shareholdings	100	54.07 (33.07)	25.35 (4.88)	23.62 (5.15)	22.40 (6.29)	21.82 (7.04)	21.50 (7.01)
N° of firms with 100% state equity	512	170	0	0	0	0	0
N° of firms with 0% state equity	0	0	0	0	4	60	99
N° of firms with 0% NIF equity	512	170	7	58	143	206	239
Mean shareholding of the lead NIF*	33.00 (0.02)	33.00 (0.02)	32.94 (3.77)	33.89 (5.88)	34.93 (9.03)	35.50 (10.43)	35.78 (10.88)
N° of firms with a second NIF as shareholder	0	0	3	11	18	18	15
Mean shareholdings of the second NIF*	-	-	17.47 (2.50)	20.19 (11.58)	22.02 (21.71)	23.81 (25.35)	19.62 (22.20)

* The mean value is calculated only for the companies, which still have NIFs among their shareholders.
Standard deviations are in parentheses.

Table 7: The evolution of the ownership structure in NIF companies

Largest shareholder group (more than 15% of equity)	Number of firms in 2000	Equity holdings in %, mean, (SD)
Domestic investors	193	58.61 (21.11)
Of which:		
Employees	13	55.35 (17.36)
Individuals	48	55.04 (22.70)
other firms	116	60.59 (20.28)
financial institutions	10	32.78 (37.94)
other NIF	6	35.42 (29.35)
Foreign investors*	52	73.72 (25.21)
Others:		
Firms listed on the Warsaw Stock Exchange	36**	
Liquidation	12	
Bankruptcy	68	

* For the firms with a foreign investor we do not impose the 15 % threshold of equity holdings.
** 25 of these companies are included in the group with 'domestic investors' as the main shareholder.

In the five year period, 245 NIF companies have been transferred to strategic investors, with one-fifth of them (52 companies) sold to foreign investors – a significant achievement by any criteria. 80 companies (15% of the companies in the scheme) went bankrupt or have entered the bankruptcy or liquidation processes. 36 companies (about 7% of the companies in the scheme, 25 of them with strategic investors) have satisfied the listing conditions set by the Warsaw Stock Exchange and are currently quoted on the WSE. These numbers go a long way to meeting the initial objectives of the program and are in sharp contrast with the usually negative assessment of the scheme commonly found in the Polish press.

Concerning the concentration of ownership stakes, it is striking that, on average, most strategic investors have gained an absolute control (more than 50%) of the firms' equity. Only financial institutions and other NIFs have, on average, about 33–35% of shares. The employees, who were given special privileges in the Polish mass privatization, have acquired control of a small number of companies (13).

Part VII.
Empirical Results

In the previous section we showed that the ownership of firms included in the mass privatization programs in the Czech Republic and Poland has undergone significant changes. It obviously evolved in response to a variety of internal and external factors and in the present section we test several hypotheses concerning the determinants of this evolution. We also want to investigate the mechanisms that made particular type of ownership groups come to dominate each firm. In this version of the paper we restrict our estimation to the Czech Republic. The Polish data base needs more work to be used for the regressions.

7.1. Factors Influencing the Evolution of Ownership

Overall, we expect the following factors to influence the evolution of ownership:

i. Size. Larger firms require larger capital outlay and a specific fraction of their shares commands a higher price. It should therefore be expected that larger firms, *ceteris paribus*, will be less concentrated. Moreover, risk aversion also implies that owners will be less likely to commit a larger fraction of their wealth to shares of one firm. Following the established practice in the literature, we measure size by the log value of assets of the firm[21].

ii. Uncertainty of the environment. The concentration of ownership could be explained by the desire of the owners to exercise more control and monitoring over managers and thus increase the company's net worth. Because of firms' heterogeneity, the opportunities for managerial discretion and the scope for moral hazard resulting from the agency relationship are different in different firms. It has been argued (Demsetz and Lehn, 1985; Himmelberg et al., 1999) that if a firm operates in a fairly stable market, its managerial performance can be monitored quite easily and owners will not gain much by increasing their ownership stakes and monitoring. However, when a firm operates in less certain environment, faces changing market conditions and technology, or is subject to unpredictable changes in either government policy or international competition, the control of management becomes central to the firm's prospects. In the less certain environment, there is greater opportunity for managerial shirking and, at the same time, greater benefit in monitoring by owners. Demsetz and Lehn believe that the 'noisiness of the environment', encourages owners to raise their stake in the firm and, by exercising greater control over managers, realize some of the benefits of increased control. However, given the discussion in Part II, concentrated ownership may have a negative impact on managerial initiative. In an uncertain environment this effect may turn out to be particularly important.

It is not easy to get a good proxy for the degree of uncertainty in firm environment. We propose to measure it by the standard deviation of a performance indicator over the preceding period. We use sales or operating profit as performance indicators for this purpose and calculate the standard deviation of their annual value since 1993[22].

iii. Capital intensity. Capital intensity or the rate of investment can influence the level of managerial discretion and, therefore, be a factor in shareholders' decisions to increase or decrease their holdings. Himmelberg, et al. (1999), e.g. use capital intensity as well as measures of 'soft capital' such as research and development and advertising as proxies for degrees of managerial discretion (and thus the potential for monitoring). We do not have any measure of 'soft capital' in our database. But we do have the change in the stock of fixed assets (gross or net investment in fixed assets) which we use in our regressions.

[21] It is also possible to use 'employment' as indicator of size. Given that the employment data is available for only a smaller sub-set of the sample, their use will reduce the sample size. Moreover, given the typical 'overmanning' in the early stages of transition, and the pressure for downsizing, employment may not be the best indicator of 'size'.

[22] Demsetz and Lehn (1985) and Himmelberg, et al. (1999) use the standard deviation of monthly average share prices. Given that only a small number of firms in our data-base are traded on the stock market, it is not possible to use share prices as a proxy for this purpose.

iv. The role of the identity of shareholders. The presence of some types of shareholders may facilitate or hinder the concentration of ownership. The role of initial dominant shareholders is particularly important as it may create inertia in the system. In the context of employee owned companies, Jones and Mygind (1999) maintain that the initial dominant position by employees and managers creates inertia which hinders further evolution, reflecting the hostility of the initial dominant group to further changes in ownership. Other ownership groups, however, may not be subject to this type of inertia because they are not tied to the firm as employees are.

We use two types of indicators for this purpose. First, we use dummies indicating the dominant shareholder at the beginning of the process (in 1996) or in each of the years covered by the study. Second, we use the percentage share of particular types of shareholders (investment funds, banks, individuals, etc.) to identify the impact of each group on further ownership concentration.

v. Sector specificity. Some sectors, e.g., utilities, are more likely to have dispersed ownership than other sectors because of the nature of their activities (large size, the set-up costs, sector specific uncertainty). Firms in our database are divided into identifiable economic activity groups (broadly based on NACE classification).

While some of the differences between firms that influence the owners' decisions to concentrate their holding are firm- or industry-specific and observable, others are not. The most important of these unobservable factors might be the 'quality of management', which varies from firm to firm but tends to remain fairly stable over time. Panel data techniques may be used to identify this type of unobservable factor by including fixed individual effects in the regressions. We also control for time effects including yearly dummies.

7.2. Empirical Framework and Analysis

As we have already pointed out, we are investigating two different dimensions of the process of evolution of ownership: the concentration of ownership, and the emergence of specific types of dominant owners. The first dimension can be examined by estimating the level of concentration or the change in concentration during the period of analysis. It may also be studied by considering the probability of the firm falling into one of the three ranges of ownership concentration (majority control, intermediate level of concentration and dispersed ownership). The second dimension can be considered by estimating the probability that the firm is controlled by a particular type of owner. We now examine these models in detail and present the results of econometric estimation.

i. Level of ownership concentration. We use the following model to explain the level of ownership concentration:

$$LC1_{it} = \alpha + \beta_1 LASSET_{it} + \beta_2 SDPROFIT_{it} + \\ + \sum_{j=1}^{6} \gamma_j DOMOWN96_i + \sum_{k=1}^{19} \lambda_k INDUSTRY_i + \\ + \sum_{l=1}^{3} \delta_l YEAR_i + \varepsilon_{it}$$

LC1 is the logarithmic transformation of the share of the largest shareholder in company in year t (LC1=log(C1/100-C1)[23]. LASSET is the natural logarithm of assets (in constant 1994 prices); SDPROFIT is the standard deviation of 'operating profit' (in constant 1994 prices) measured between 1993 and time t (alternatively we use the standard deviation of 'sales' or the lagged standard deviation). DOMOWN96 is a set of dummies indicating the dominant shareholder in 1996, i.e. the owner holding more than 20% of shares of the company. The subscript j varies from 1 to 6, referring to the six shareholder types: another company (AS), investment fund (IF), individual (INDIV), portfolio company (LO), bank (BANKS), and the state (STATE). There is a seventh group, firms with no dominant owner, which is used as the base group. We expect that different types of dominant shareholders may have different impacts on the process of ownership concentration. Alternatively we use DOMOWNt, indicating the dominant shareholder in year t rather than in 1996, to identify the impact of the current dominant shareholder. We use subscripts 96 or t to refer to particular dominant shareholder in either year t or 1996. INDUSTRY and YEAR are dummies indicating the sector to which the firm belongs and the year. Subscripts i and t refer to the company and time (1996-99). The full list of variables is presented in Table A4 in the Appendix. Table 8 summarizes the results. We present the results for pooled regression and for regressions with industry fixed effects and firm fixed effects.

We use both 'balanced' and 'unbalanced' panels for the estimation of the level of ownership concentration. For each panel, we estimate three equations: a basic one (with size and volatility as the main explanatory variables), and two equations in which we have added dummies for dominant

[23] Cf. Demsetz and Lehn (1985), Himmelberg et al. (1999) and Claessens and Djankov (1999), who use this measure of C1, which converts a bounded number (the simple percentage measure which varies from 0 to 100%) to an unbounded figure.

shareholder in year t or in 1996. Each equation is estimated in three formats to identify the impact of industry and firm effects.

The impact of size on ownership concentration is not significant if we control for firm fixed effects. The proxy for the noisiness of the environment has a negligible (even though significant) negative impact. Companies with current or initial dominant ownership have a higher concentration level than companies which do not or did not have a dominant owner (the base group). The explanatory power of regressions is strongly improved if we control for different types of dominant owners. The coefficient for the 'other company' group (ASt and AS96) is generally larger than the coefficient of other groups, indicating that dominance of this type of shareholder particularly increases the concentration.

Including industry fixed effects significantly increases the adjusted R squared. There is also a strong firm fixed effect in the first specification, again shown by increased adjusted R squared. Firm fixed effects can not be estimated when dominant ownership dummies in 1996 (DOMOWN96) are used (because the value of this dummy remains the same across the years).

ii. Change in the dominant shareholders

Here we are interested in finding out whether or not some firms are more likely to find a particular type of dominant owner. We concentrate on the three most important types of dominant shareholders (the other three being dominant in a very small number of companies). The probit model is used to estimate three equations indicating the probability of a firm being dominated by another company, an investment fund, or an individual. We use the following model to estimate these probabilities.

$$\begin{aligned}
&\Pr obDOMOWN_{ij99} = \alpha + \beta_1 LASSET_{it} + \\
&+ \beta_2 SDSALES_{it} + \beta_3 CAPINTENS_{it} + \\
&+ \gamma_j DOMOWN96_i + \sum_{m=1}^{5} \lambda_m ALLDOMOWNi + \\
&+ \sum_{k=1}^{19} \omega_k INDUSTRY_i + \sum_{l=1}^{3} \delta_l YEAR_i + \varepsilon_{it}
\end{aligned}$$

ProbDOMOWNij99 is the probability of company i finding a dominant owner of type j in 1999, with j referring to another company (AS), an investment fund (IF) or an individual (INDIV). We estimate three separate equations for each of these three dominant owners. SDSALES is the standard deviation of sales from 1993 to t, indicating the volatility of the environment. CAPINTENS is capital intensity measured by the ratio of assets to sales. DOMOWN96 is a dummy which takes the value of 1 if the dominant owner in 1996 is of type j (the same type as the dependent variable) and 0 otherwise. For clarity of presentation in the regression table, we have substituted this with three separate variables: AS96, IF96 and INDIV96. ALLDOMOWN is a set of five variables showing the total percentage shareholding of each of the other five types of shareholders in 1996 (type j not included). Again for clarity of presentation, we have replaced this with separate variables ALLAS96, ALLIF96, ALLINDIV96, ALLLO96, ALLBANKS96 and ALLSTATE96[24] (the last three referring to the total holdings of all 'portfolio companies', 'banks', and 'the state' in company i in 1996). The full list of variables is presented in Table A4 in the Appendix. These variables are expected to show the impact of each majority shareholder type on the probability of another ownership type gaining dominance of the firm in 1999. The sector and year dummies are defined as before. The results of probit estimations are presented in Table 9.

The size does not really matter for the probability of a particular type of owner becoming the dominant owner. Its coefficient has a negligible magnitude everywhere, although it is significant for 'other company' and for 'investment fund'. The coefficients of SDSALES, indicating the volatility of the environment, are consistently close to zero, indicating that sales do not affect the probability of a firm's having a particular type of owner. Using the standard deviation of operating profit or lagged values of standard deviation does not change this result.

The impact of various dominant shareholders on the probability of other types of shareholders becoming dominant should be seen in the context of the 'ownership transformation matrix' (Table 2), which showed the interaction between different types of shareholders. Initial dominance by each type has a positive impact on the probability of that type retaining dominance. This should not be confused with 'inertia' of the type discussed by Jones and Mygind (1999). When 'other company' is the dominant shareholder, it not only maintains its dominance on most of its previous holdings, it also expands its dominance by buying shares in new companies. The same is true for 'individuals' and, to a much lesser extent, for 'investment funds'.

The total shareholding of different types of shareholders in 1996 also affects the probability of a particular shareholder's gaining dominance in 1999. A greater share of 'other company' in 1996 reduces the probability of an 'investment fund' becoming the dominant owner in 1999. This means that 'other companies' are more willing to retain their holdings in their portfolio companies (again reflecting the same tendency mentioned above). The greater share of invest-

[24] Of the six groups mentioned, each equation only uses five of them, type j being excluded each time. The effect of dominant owner of type j (which is also the dependent variable) is taken into account through the variable DOMOWN96. The five variables indicate the share of other major ownership groups.

Table 8: Determinants of ownership concentration – A. Balanced Panel

	(1)			(2)			(3)		
	OLS	Industry Fixed Effects	Firm Fixed Effects	OLS	Industry Fixed Effects	Firm Fixed Effects	OLS	Industry Fixed Effects	Firm Fixed Effects
LASSET	.048* (1.89)	.052* (1.9)	-.064 (-.79)	.072*** (3.33)	.071*** (3.05)	-.056 (-.77)	O.084*** (3.48)	0.082*** (3.173)	
SDPROFIT	-5.09E-07* (-1.66)	-7.93E-07** (-2.50)	-2.93E-07 (-.51)	-5.97E-07*** (2.33)	.-8.30E-07*** (3.17)	-2.37E-07 (-.46)	-7.96^{e}-07 (2.84)	-1.03^{e}-06*** (-3.603)	
YEAR dummies	yes	yes	yes	yes	yes	yes	yes	yes	
INDUSTRY dummies		yes			yes			yes	
ASt (other company)				1.89*** 22.94	1.89*** 23.14	1.30*** 14.65			
IFt (investment fund)				1.69*** 15.86	1.69*** 15.98	1.07*** 10.52			
INDIVt (individual)				1.47*** 12.42	1.38*** 11.68	1.01*** 7.85			
LOt (portfolio company)				1.70*** 11.19	1.77*** 11.58	1.12*** 8.44			
BANKt				1.58*** 7.75	1.43*** 7.02	1.14*** 6.45			
STATEt				1.55*** 9.46	1.65*** 9.93	1.08*** 6.34			
AS96 (other company)							1.20*** 15.50	1.23*** 15.72	
IF96 (investment fund)							.95*** 9.00	1.00*** 9.35	
INDIV96 (individual)							.82*** 6.67	.78*** 6.33	
LO96 (portfolio company)							1.01*** 7.23	1.09*** 7.54	
BANK96							.68*** 2.97	.68*** 2.94	
STATE96							.84*** 6.58	.99*** 7.38	
No of observations	1097	1097	1097	1097	1097	1097	1097	1097	
Adjusted R2	.070	.094	.224	.374	.399	.392	0.238	0.267	

Notes: Dependent variable: log (C1/100-C1); t-statistics are in parentheses; * significant at 10%; ** significant at 5%; and *** significant at 1%.
List of variables: LASS is Log of Assets; SDPROFIT is the standard deviation of operating profits from 1993 to year t; AS, IF, INDIV, LO, BANK, and STATE are dummies indicating the dominant ownership of the six shareholder types (other company, investment fund, individual, portfolio company, banks and the state, respectively). Subscript t refers to the dominance of each group in year t and subscript 96 refers to dominance in 1996. See Appendix for the full list of variables.

Table 8 (continued) – B. Unbalanced Panel

	(1)			(2)			(3)		
	OLS	Industry Fixed Effects	Firm Fixed Effects	OLS	Industry Fixed Effects	Firm Fixed Effects	OLS	Industry Fixed Effects	Firm Fixed Effects
LASSET	.028** (2.27)	-.002 (-.20)	.034 (.75)	.039*** (3.81)	.018* (1.67)	.019 (.48)	.042 3.63***	.021 1.68*	
SDPROFIT	-5.32E-07*** (-2.63)	-5.39E-07*** (-2.67)	-2.05E-07 (-.47)	-3.31E-07** (-2.07)	-3.64E-07** (-2.27)	-1.96E-07 (-.52)	-5.34E-07 -2.93***	--5.77E-07 -3.15***	
YEAR dummies	yes	yes	yes	yes	yes	yes	yes	yes	
INDUSTRY dummies		yes			yes			yes	
ASt (other company)				1.79*** 49.29	1.77*** 48.97	1.28*** 31.23			
IFt (investment fund)				1.55*** 32.08	1.54*** 32.07	1.13*** 22.56			
INDIVt (individual)				1.39*** 28.14	1.38*** 27.98	1.03*** 17.74			
LOt (portfolio company)				1.54*** 22.16	1.53*** 22.05	1.17*** 18.03			
BANKt				1.57*** 15.64	1.53*** 15.27	1.05*** 10.86			
STATEt				1.42*** 26.11	1.36*** 24.50	1.03*** 15.57			
AS96 (other company)							1.14*** 30.50	1.13*** 29.80	
IF96 (investment fund)							.88*** 16.78	.86*** 16.44	
INDIV96 (individual)							.76*** 13.98	.76*** 13.80	
LO96 (portfolio company)							.86*** 11.94	.85*** 11.73	
BANK96							1.01*** 10.72	.98*** 10.35	
STATE96							.83*** 16.35	.79*** 15.12	
No of observations	4132	4132	4132	4132	4132	4132	4132	4132	
Adjusted R2	.055	.074	.170	.408	.418	.401	0.231	0.240	

Notes: Dependent variable: log (C1/100-C1); t-statistics are in parentheses; * significant at 10%; ** significant at 5%; and *** significant at 1%.
List of variables: LASS is Log of Assets; SDPROFIT is the standard deviation of operating profits from 1993 to year t; AS, IF, INDIV, LO, BANK, and STATE are dummies indicating the dominant ownership of the six shareholder types (other company, investment fund, individual, portfolio company, banks and the state, respectively). Subscript t refers to the dominance of each group in year t and subscript 96 refers to dominance in 1996. See Appendix for the full list of variables.

Table 9: Probit estimates of dominant ownership group in 1999 (unbalanced panel)

	Other company	An investment fund	An individual
LASSETS	0.171E-03***	0.286E-03***	0.120E-03
	(3.244)	(3.071)	(1.426)
SDSALES	0.581E-07	0.441E-07	-0.635E-06***
	(1.226)	(0.582)	(-2.579)
CAPINTENS	0.176E-04	-0.128E-04	-0.865E-05
	(1.354)	(-.296)	(-0.214)
AS96 (other company)	0.665***		
	(14.147)		
IF96 (investment fund)		0.609***	
		(7.882)	
INDIV96 (individual)			1.239***
			(15.910)
ALLAS96		-0.008***	0.329E-03
		(-5.800)	(0.237)
ALLIF96	0.007***		-0.457E-03
	(6.529)		(-0.246)
ALLINDIV96	0.809E-03	-0.009***	
	(0.623)	(-4.090)	
ALLLO96	0.007***	0.009***	0.005
	(3.904)	(3.858)	(1.885)*
ALLBANKS96	0.007***	-0.002	0.002
	(3.127)	(-0.507)	(0.431)
ALLSTATE96	-0.009***	-0.009***	-0.004*
	(-6.034)	(-3.915)	(-1.724)
Year dummies	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes
No. of observations	6656	6656	6656
Log likelihood	-3348	1182	1254

Notes: t-ratios in brackets; * significant at 10%; ** significant at 5%; and *** significant at 1%.
List of variables: LASSET is Log of Assets; SDSALES is the standard deviation of annual sales from 1993 to year t; CAPINTENS is the ratio of assets to sales (capital intensity); AS96, IF96, and INDIV96 are dummies indicating the dominant ownership of the three groups (other company, investment fund and individuals) in 1996; ALLAS96, ALLIF96, ALLINDIV96, ALLLO96, ALLBANKS96, and ALLSTATE96 are the total shares of the six different shareholder types in 1996 in each company's equity (%).

ment funds, portfolio companies, banks and the state, on the other hand, increase the probability of 'other company' becoming dominant (given that a large proportion of companies under the domination of these groups were transferred to the 'other company' dominant group - see Table 2). The negative and significant impact of the total shareholding of individuals and the state on the probability of investment funds gaining dominance reflects the fact that very few companies have been transferred from these two groups to investment funds.

Part VIII.
Conclusions

This paper aimed at investigating the evolution of ownership structure in firms privatized through 'wholesale' schemes in the Czech Republic and Poland. We found that a significant evolution of ownership structure has taken place in both countries. Not only has there been a strong tendency towards the concentration of ownership in fewer hands, but also a large-scale reallocation of ownership rights has taken place. In the Czech Republic, starting from a highly dispersed ownership structure, the large majority of companies have found a dominant shareholder. In nearly half of them, the dominant shareholder owns more than 50% of equity and has absolute control over the firm. In Poland, starting from a particular ownership structure imposed by the privatization program, the majority of companies involved in the scheme have come out of NIF control and have found dominant owners, some 10% of whom are foreign investors.

There has also been much flexibility in both schemes with a significant reallocation of ownership claims among different groups of shareholders. Other companies and individuals have emerged as major dominant shareholders in both countries. In Poland, employees took control in a few companies. After the initial distribution of ownership claims, the ownership evolved in response to various pressures and constraints characterising the firms' environment. The conditions for the evolution of ownership were, of course, not the same in both countries. Despite a variety of shortcomings, at least in the Czech Republic, ownership evolved rapidly. Indeed, the concentration of ownership in the Czech Republic may be a response to the poor legal framework and the low level of protection of minority shareholders.

Finally, insofar as the determinants of ownership concentration are concerned, our results are not unambiguous. Observable factors alone are unable to explain in a satisfactory way the variations in ownership concentration. In some cases, controlling for industry fixed effects and firm fixed effects, allows to significantly improve the quality of regressions. But firm specific factors do not always appear significant. Dominant ownership at the beginning of the process seems to result in the firms' becoming more concentrated than firms that did not have a dominant owner in the beginning of the period. In particular, the probability of a particular shareholder's gaining dominance over a firm is closely linked to the dominant position of that group at the start and also to the share of various types of shareholders on the management board of firms.

Usually, the empirical literature looks at the impact of ownership on firm performance. And usually this type of approach is criticized because it does not take into account the problem of endogeneity of ownership structure. In this paper, we have taken ownership structure as endogenous and have looked at its determinants. The results, however, are not unambiguous. We have to continue working on the specification of the model used in order to track any endogeneity. If further regressions do not confirm that ownership and performance are both determined by unobserved fixed effects, then we might be in a better position to study the impact of ownership (especially the ownership by different types of dominant shareholders) on performance. Further work on the data set is expected to shed some light on these vexing questions.

Appendix

Table A1: The average share of the largest shareholder in companies privatized through the voucher scheme (unbalanced panel)

	1996	1997	1998	1999
Mean	38.6	42.7	47.6	52.1
Median	37.3	42.7	47.1	49.9
Std. Dev.	18.3	19.6	21.3	22.1
No. of firms	1497	1459	1316	699

Source: own calculation using Aspekt data-base.

Table A2: Ownership Transformation Matrix: Change in the number of companies and their dominant shareholder* from 1996 to 1998

Type of dominant ownership*	**No. of companies in 1996**	**No. of companies and dominant owners in 1998**							Total
		AS	LO	IF	BA	S	IND	No dom. owner	
AS (other company)	514	**399**	17	35	1	1	43	18	514
LO (portfolio company)	59	23	**7**	17	1	0	7	4	59
IF (investment fund)	137	60	3	**53**	2	1	9	9	137
BA (bank)	31	18	2	3	**5**	0	1	2	31
S (state)	136	51	8	9	2	**40**	13	13	136
IND (individuals)	144	41	2	6	1	1	**87**	6	144
No dominant owner	252	90	13	37	1	2	20	**89**	252
Total	1273	682	52	160	13	45	180	141	1273

* Dominant shareholder refers to the largest shareholder of a company, provided he holds more than 20% of shares. Each row shows the number of companies in each dominant ownership group in 1996 (first column) and how they have moved to other ownership groups by the end of 1998 (2nd-8th columns). Each column shows the total number of companies in each dominant group in 1998 (8th row) and their original dominant ownership group (1st-7th rows). The diagonal (in bold) shows the number of companies whose dominant shareholder did not change between 96 and 98.

Table A3: Number of companies and their dominant owners in different ranges of ownership concentration*, 1996–99 (unbalanced panel)

Concentration range and the Largest shareholder	No. of companies			
	1996	1997	1998	1999
C1 > 50%	409 (27%)	471 (32%)	528 (40%)	323 (46%)
Largest shareholder:				
Other company	254	335	363	231
Investment fund	33	46	74	36
Individual	39	40	53	37
Portfolio company	20	12	23	12
Bank	13	6	4	1
State	50	32	11	6
20%<C1≤ 50%	799 (53%)	748 (51%)	640 (48%)	323 (46%)
Largest shareholder:				
Other company	334	385	341	190
Investment fund	124	108	91	50
Individual	122	127	132	63
Portfolio company	52	34	30	6
Bank	25	11	10	6
State	142	83	36	8
C1 ≤L20%	289 (19%)	240 (16%)	148 (11%)	53 (8%)
Largest shareholder:				
Other company	55	63	50	13
Investment fund	155	41	29	17
Individual	31	41	29	17
Portfolio company	12	6	2	1
Bank	5	1	3	4
State	31	13	10	4
Total	1497 (100%)	1459 (100%)	1316 (100%)	699 (100%)

* Ownership concentration is measured by the share of the largest owner of a firm's equity (C1). Dominant owner refers to the largest shareholder.
Source: Aspekt data-base.

Table A4: List of variables

Variable	Description
C1	The share of largest single shareholder of a company's equity (%)
LC1	Logistic transformation of C1 (i.e., Ln[C1/(100-C1)]
LASSET	Natural logarithm of assets (in constant 1994 prices)
SDPROFIT	Standard deviation of annual 'operating profit' of each company (in constant 1994 prices) measured between 1993 and year t
DOMOWNt	Six dummies indicating the dominant shareholder in year t. They are:
ASt	1 if 'other company' is the dominant shareholder of a firm in year t, 0 otherwise
IFt	1 if 'investment fund' is the dominant shareholder of a firm in year t, 0 otherwise
INDIVt	1 if 'individual' is the dominant shareholder of a firm in year t, 0 otherwise
LOt	1 if 'portfolio company' is the dominant shareholder of a firm in year t, 0 otherwise
BANKt	1 if 'banks' is the dominant shareholder of a firm in year t, 0 otherwise
STATEt	1 if 'the state' is the dominant shareholder of a firm in year t, 0 otherwise
DOMOWN96	Six dummies indicating the dominant shareholder in 1996. They are:
AS96	1 if 'other company' is the dominant shareholder of a firm in 1996, 0 otherwise
IF96	1 if 'investment fund' is the dominant shareholder of a firm in 1996, 0 otherwise
INDIV96	1 if 'individual' is the dominant shareholder of a firm in 1996, 0 otherwise
LOt	1 if 'portfolio company' is the dominant shareholder of a firm in 1996, 0 otherwise
BANK96	1 if 'banks' is the dominant shareholder of a firm in 1996, 0 otherwise
STATE96	1 if 'the state' is the dominant shareholder of a firm in 1996, 0 otherwise
INDUSTRY	19 dummies indicating the industry to which the firm belongs (industries are classified according to the system used by Prague Stock Exchange)
YEAR	3 Dummies, indicating years of data
ProbDOMOWN99	Probability of a particular shareholder type being dominant in 1999 (dependent variable in Probit models)
SDSALES	Standard deviation of annual sales (in 1994 prices) of each company from 1993 to year t
CAPINTENS	Capital intensity measured by the ratio of assets to sales (both in 1994 prices)
ALLDOMOWN96	A set of variables showing the total percentage shareholding of each of the main shareholder types in 1996. They are:
ALLAS96	The total shareholding of all 'other companies' in each firm in 1996 (%)
ALLIF96	The total shareholding of all 'investment funds' in a firm in 1996 (%)
ALLINDIV96	The total shareholding of all 'individuals' in a firm in 1996 (%)
ALLLO96	The total shareholding of all 'portfolio companies' in a firm in 1996 (%)
ALLBANKS96	The total shareholding of all 'banks' in a firm in 1996 (%)
ALLSTATE96	The total shareholding of 'the state' in a firm in 1996 (%)

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