

**Ownership Structure, Corporate Governance and Asset
Prices. Evidence From the Czech Privatisation Program.**

Four Essays.

Anton MARCINČIN

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Abstract

Firms demand capital and suppliers of capital, i.e. firms' owners, demand return on their sunk investment. If managers and owners shared the same objectives, or were able to specify perfect contracts, firms would have good access to capital and owners satisfying returns. In real world, however, managers' and owners' interests differ significantly, and contracts are imperfect. This is a potential source of company bad performance, low returns on equity participation and bad access to capital. Corporate governance mechanisms, that specify relations between managers and owners, set cost of capital and thus performance of firms and economy.

Theoretical literature tends to agree that ownership structure itself matters for corporate governance. This relation is very difficult to test empirically, because ownership structure does not change often enough to allow for testing. The opportunity for empirical research appeared with mass privatisation programs in Eastern Europe, where huge number of firms changed their ownership structures fairly quickly and in different directions. Therefore, in this thesis we decided to use data on the Czech Republic, which succeed to privatise thousands of firms during a five-year period. We use information from privatisation process and later generated information from stock market and about mutual funds.

The leading question of this thesis is relation between corporate governance and ownership structure. Specifically, we test whether: a) Ownership structure information is reflected in share prices, and consequently, whether b) it is a signal of people's expectation of better corporate governance rather than of insider information. We found a positive answer to both questions. Then we test actual performance. Two problems arose: It may be too early that new ownership structure would be reflected in improved performance, and that selection bias may be present. We solve selection bias and show corporate governance effects of voucher scheme. Worse-than-average firms were selected for full voucherisation, as we predicted, while better firms were voucherised only partially. Finally, we come to the question if investment privatisation funds were passive or active in exercising corporate control and look to data again. The answer is again positive.

The thesis consist of four essays and discussion. The first contains author's contribution in paper by Lastovicka, Marcincin and Mejstrik "Corporate Governance and Share Prices in Voucher Privatised Companies" which appeared as chapter in a book edited by Svejnar "The Czech Republic and Economic Transition in Eastern Europe" in 1995, and in revised version by Mejstrik, Marcincin and Lastovicka "Voucher Privatisation, Ownership Structures, and Emerging Capital Markets in the Czech Republic" which also appeared as a chapter in a book edited by Mejstrik "The Privatisation Process in East-Central Europe. Evolutionary Process of Czech Privatisation" in 1997. The second essay contains an updated version of paper by van Wijnbergen and Marcincin "Voucher Privatisation, Corporate Control and the Cost of Capital: An Analysis of the Czech Privatisation Programme" which was published as CEPR Discussion Paper in 1995

and later quoted for instance in Shleifer and Vishny's paper "A Survey of Corporate Governance" in the Journal of Finance in 1997, and in EBRD Transition report 1995. The third essay was recently published by Economics of Transition as "The Impact of Czech Privatisation Methods on Enterprise Performance Incorporating Initial Selection Bias Correction" by Marcincin and van Wijnbergen. Finally, the fourth essay is author's extension of his contribution to paper written with Shemetilo "Performance of the shares in the Investment Funds Portfolios and their strategy" and published by CERGE-EI as a Working Paper in 1995.

1 Introduction¹

In its earliest form, business was owned and managed by the same people. It was economic and technological development that brought up the need of concentration of larger amounts of capital, leading to invention of joint stock companies. The definition of joint stock company could be: It is a legal form of a firm that acquires capital both by issuing debts and offering outsiders participation on its equity. Doing so, it separates ownership from control. The equity-holders do not receive stable flow of payments, like the interest in the case of debt, but are entitled to a proportion of distributed profits (dividends) and residual value when company goes to liquidation. Dividends are paid if and when company decides to pay them. Corporate governance then studies the ways in which outside participants on firm equity assure themselves that they receive return on their investment.

There are two opposite incentives of insiders, which concern performance and dividend policy. Firstly, an incentive to improve firm's performance and pay dividends high enough to secure better access to capital in future. As a consequence, insiders (managers) can expect to be better valued on the professional job market. Secondly, there is an incentive to use company's profits to pay high salaries, build empires, and maximise sales, growth or own utility function, rather than to pay out dividends. The second incentive is in sharp contrast with equity-holders' objective of high income (or maximum profit). Insiders may consider certain minimum level of profit to be achieved in order to satisfy outsiders as their additional constraint.² The equity-holders are protected from abusing behaviour of insiders in form of votes and exit. They have the power to recall insiders (the board of directors) and replace them with someone else. Debt, in combination with bankruptcy, and take-overs are other tools that provide better discipline of insiders and improve performance of company.

If owners and managers were able to write perfect and binding contracts, which would predict all possible circumstances (like future market development, policy changes, and price changes), and state all persons obligations, imposing

¹ In describing fundamentals of theoretical framework concerning corporate governance and ownership we largely relied on Hart (1996). In June 1997, Journal of Finance published an excellent survey of corporate governance literature and thoughts by Shleifer and Vishny (1997). It was very helpful to read their article and adjust introduction to this thesis accordingly. Some definitions were adopted from Bannock's et al. (1987) dictionary.

² Then we speak about satisficing behaviour.

large penalties if anybody failed to satisfy them, no corporate governance problem would exist. Indeed, principal-agent theory assumes that it is cost-less to write perfect contract. However, in the real world, writing detail contract would be too costly, if simply not impossible. Equity-holders and managers hence write incomplete contracts, leaving revisions and renegotiations for the future. The transaction cost theory takes into account cost of contract and consequent contractual incompleteness, but put little emphasis on ex post allocation of power or control. But the very fact that contract is incomplete motivates both outsiders and insiders to strengthen their power in future negotiations.

The allocation of power than matters and ownership matters, too. To see this we take an example from Hart.³ What is a difference between buying, therefore owning a machine, and renting it? If contracting costs were zero, rental agreement can be as effective as a change in ownership. The contract would specify exact rights and duties of both parties and ownership would not matter. But once the contracting costs were high, parties are able to write only incomplete contract. Both parties understand that in circumstances not specified in contract, the owner is one to take decision. The owner has residual rights of control over machine, or residual powers. Then it makes sense to be an owner – i.e., in Hart’s terminology, to have more power.

1.1 Theoretical framework

In what follows we present brief description of theories of firm that help to explain the role of ownership. We start with standard neo-classical theory, which does not consider ownership at all, proceed to principal-agent theory, transaction cost theory, and property rights theory, and conclude with new models of Aghion, Bolton and Hart.

Standard *neo-classical theory* views firms as a black box in which inputs are combined to produce output, and the average cost of production is U-shaped. Although neo-classical theory is very useful for understanding fundamentals of economic relations, it fails to recognise incentive problems within the firm, ignores delegation of authority, i.e. firm’s hierarchical structure, and boundaries of the firm.⁴

The *principal-agent theory* assumes incentives through the quality characteristic of the input, though ignores determinants of firm’s boundaries. The

³ Ibid., p. 5.

⁴ The world would be a single firm according to this theory.

quality of input is endogenous, and depends on the effort of manager and some randomness, which is out of anyone's control.⁵ Owner and manager⁶ observe the quality, but only manager observes his own effort level and parameter of randomness. Finally, manager dislikes high effort. Since owner cannot observe manager's effort directly, he must rely on indirect measure, the quality. However, the quality is imperfect measure, as it depends on the randomness, too. The manager and owner therefore need to write a contract that would balance optimal incentives and optimal risk sharing. The principal-agent theory does not recognise that writing contract is itself costly, nor explain why ownership matters.

The *transaction cost theory* assumes three sources of transaction cost. These are unpredictable world, problematic negotiation of individual plans, and problematic formulation of negotiated plans. Since contracting cost is positive, parties would write incomplete contract, assuming in details only most predictable states of the world. That implies that revisions and renegotiations of the original contract will become common in the future. Incomplete contracts, together with asymmetry of information available to each party in the future and sunk-cost related to the contracts with existent trading partners,⁷ have *ex post* impact on economic efficiency – and, because of expectations, also *ex ante*. The transaction cost theory does not explain how relations between owner and manager would change, if they were part of the same firm, rather than two different firms. Again, it does not answer the question whether and why ownership matters.

The *property rights approach* considers ownership as a source of power when contracts are incomplete. This is because:

*“Owner of the assets has residual control rights over that asset: the right to decide all usage of the asset in any way not inconsistent with a prior contract, custom, or law.”*⁸

The relation between manager and owner, due to incompleteness of contract, involve uncertainty about each other's future behaviour, i.e. about the owner's demand for and manager's supply of quantity and quality of service. What makes incomplete contract “expensive” is relation-specific investment, and what prevents owner from doing manager's work, and vice versa, is lack of specific

⁵ Typically, quality $q = g(e, \epsilon)$, and e denotes effort, while ϵ randomness. Ibid., p.18.

⁶ The theory uses words supplier and purchaser. In our case, manager supplies his service (human capital as input) to owner, who is a purchaser of that service.

⁷ Sunk-cost resulting from contract-related investment.

⁸ Ibid., p. 30.

capital.⁹ Two parties' negotiations lead to Nash bargaining solution. Although property rights approach proves that ownership matter, it also assumes no wealth constraints. However, in the real world, agent often needs to raise funds from the outside investors, if she wanted to purchase assets.

The *Aghion-Bolton model* assumes manager and investor (owner), who write incomplete contract, about a set of future actions. There is no relation-specific investment.¹⁰ The firm, depending on action taken, produces profits to owner and private benefits to managers. Since profits and private benefits are not perfectly correlated, they are the source of conflicts in interests. Depending on positions of manager and investor, three solutions are possible in this model: If manager was not wealth constrained, he maximises sum of profit and private benefits. If manager was not an owner, but had all voting rights, he maximises only his private benefits. Finally, if investor was an owner and had right to decide on the action, he maximises firm's profit.

The situation is further complicated by the fact that large joint stock companies tend to have large number of small owners (shareholders). This is, because investors are risk averse and wealth constrained. Dispersed shareholders are unable to exercise control on day-to-day basis, as well as not willing to monitor management.¹¹ In such circumstances, managers would *de facto* have ownership rights and would maximise their own private benefits. The existence of board of directors theoretically prohibits such behaviour. But then again, the board can pursue its own goals rather than goals of dispersed owners; members of the board can even collude with managers. The theory then models and analyses role of incentive schemes for managers, firm liquidation, bankruptcy and take-overs.

Important conclusion from theories listed above is that ownership matters for corporate governance and hence for firm's performance. This is caused by inability of owners to write complete contracts with managers in the unpredictable world. The theory further predicts that too dispersed ownership further complicates relation between owners and managers, therefore, is likely to lead to inefficient corporate governance and under-performance of company.

⁹ It is simply impossible that all equity holders would manage company together. On the other hand, manager is typically lacking funds to be a solo owner.

¹⁰ Although it is easy to imagine that specific training of manager is a form of relation-specific investment.

¹¹ Costly monitoring is a public good, which gives shareholders incentives to free ride on each other.

1.2 Structure of this thesis

The literature says that ownership structure itself matters for corporate governance. Unfortunately, this relation is very difficult to test. Empirical works are rare, because ownership structures in real world do not change often enough to allow for testing. Comparisons of firms of different size, sector or country are likely to be wrongly specified. For instance, ownership structures may be typical for USA and for Germany,¹² then, comparison of American with German firms is comparison of two economies rather than two different ownership structures.¹³

Excellent opportunity for empirical corporate governance studies can be found in Eastern Europe. Privatisation programs of post-communist countries transfer ownership structures from one form (state ownership) to many others in relatively short period of time. Particularly, privatisation program of the Czech Republic changed ownership of great part of economy fairly quickly. Furthermore, it created whole range of ownership structures: single outsider ownership, management ownership, institutional ownership (where institutions were private mutual funds, banks and state owned agency National Property Fund) to almost infinitely dispersed ownership. These are the reasons why in this thesis we concentrate on the Czech Republic.

The thesis consist of four essays and discussion. The first essay contains author's contribution in paper by Lastovicka, Marcincin and Mejstrik "Corporate Governance and Share Prices in Voucher Privatised Companies" which appeared as chapter in a book edited by Svejnar "The Czech Republic and Economic Transition in Eastern Europe" in 1995, and in revised version by Mejstrik, Marcincin and Lastovicka "Voucher Privatisation, Ownership Structures, and Emerging Capital Markets in the Czech Republic" which also appeared as a chapter in a book edited by Mejstrik "The Privatisation Process in East-Central Europe. Evolutionary Process of Czech Privatisation" in 1997. In this essay we investigate, which ownership structures appeared at the end of the first wave of

¹² Simply, for historical reasons.

¹³ Boardman and Vining (1989) tried to overcome mentioned difficulties by using 500 firms from the manufacturing and mining sectors, operating on international markets with the aim of maximal profit. The authors used performance measures like return on equity, assets, sales, net income, sales on labour and assets. Another empirical study by Haskel and Szymanski (1992) showed a positive correlation between productivity, competitiveness and privatisation; its weakness lies in small and probably industry and regulation specific sample of enterprises.

voucher privatisation. We find that there are several ownership structures that, if major owners colluded, would possibly allow effective corporate control.

The second essay contains an updated version of paper by van Wijnbergen and Marcincin “Voucher Privatisation, Corporate Control and the Cost of Capital: An Analysis of the Czech Privatisation Programme” which was published as CEPR Discussion Paper in 1995 and later quoted for instance in Shleifer and Vishny’s paper “A Survey of Corporate Governance” in the *Journal of Finance* in 1997, and in EBRD Transition report 1995. In this essay we continue with investigation of expectations: how information about the ownership structure is reflected in share prices, and whether this is a signal of people’s expectation of better corporate governance rather than of insider information of owners. Then we test actual performance related to ownership structures. Two problems arise – it may be too early, and selection bias may be present.

The third essay was recently published by *Economics of Transition* as “The Impact of Czech Privatisation Methods on Enterprise Performance Incorporating Initial Selection Bias Correction” by Marcincin and van Wijnbergen. We solve selection bias problem and show corporate governance effects of voucher scheme.

Finally, the fourth essay is author’s extension of his contribution to paper written with Dmitri Shemetilo “Performance of the shares in the Investment Funds Portfolios and their strategy” and published by CERGE-EI as a Working Paper in 1995. In this essay we come to the question of mutual funds (IPFs), whether they were active or passive in exercising corporate control over large blocks of shares they acquired.

The four essays were written during 1993 to 1996. Therefore, in discussion we present brief account of opinions at the development of corporate governance and restructuring in the Czech economy and compare how they relate to results of our research.

1.2.1 Period Covered

From 1990, when discussion on privatisation started in the Czech Republic, literature on privatisation grew rapidly. In the meantime, researchers’ interests moved from initial search for efficient privatisation techniques to different complicated issues.¹⁴ This thesis started to be written in 1993, while the last calculations were made on spring 1997. It would certainly be interesting to apply

¹⁴ One of them is the influence of privatisation design on political reform or ‘sustainability’ of economic reform.

fresh data into our regressions on ownership structure influence or investment funds behaviour. But then, we again have to stop somewhere. We believe that presented studies could provide readers with useful information on corporate governance in general, and on corporate governance developments in the Czech republic, in particular.

1.2.2 Data Used

In our analyses we use information from privatisation process and later information generated from stock exchange, as well as on mutual funds participating. This data is unique to this thesis: they capture the development from 1991 to 1996. We follow selection of privatisation projects at the Privatisation Ministry, actual privatisation at the National Property Fund with the development on voucher market registered at the Centre for Voucher Privatisation, new ownership structures, and the development of share prices on the Prague Stock Exchange. Some of our databases belonged to CERGE-EI Prague or IES UK Prague, while the author of this thesis from other researchers acquired other. Particular databases are introduced within the chapters, according to their use.

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2 Voucher Privatisation and Ownership Concentration¹⁵

Abstract

Voucher privatisation was expected to generate dispersed ownership structures that would not allow efficient corporate control and preserve positions of incumbent managers. As we show, mainly thanks to participation of investment privatisation funds in the program, there are relatively few major owners in almost every firm privatised, which can collude and exercise corporate control. Results of this essay were later tested by Stijn Claessens in his paper “Corporate Governance and Equity Prices: Evidence from the Czech and Slovak Republics” published by the World Bank in 1995. Claessens came to the same conclusions.

¹⁵ The essay contains the author’s contribution in paper by Lastovicka, Marcincin and Mejstrik “Corporate Governance and Share Prices in Voucher Privatised Companies” which appeared as chapter in a book edited by Svejnar “The Czech Republic and Economic Transition in Eastern Europe” in 1995, and in revised version by Mejstrik, Marcincin and Lastovicka “Voucher Privatisation, Ownership Structures, and Emerging Capital Markets in the Czech Republic” which also appeared as a chapter in a book edited by Mejstrik “The Privatisation Process in East-Central Europe. Evolutionary Process of Czech Privatisation” in 1997. The original paper was presented at many conferences, for instance on the European Economic Association Congress in Prague in 1995.

2.1 Introduction

The Czechoslovak voucher privatization program has been one of the most controversial schemes in the transitional economies.¹⁶ On the positive side, the scheme has a number of attractive attributes. First, it makes it possible for all adult citizens to participate in the process, despite the lack of capital among the people. Second, the scheme is widely perceived to be fair. Third, it gives each individual the opportunity to invest voucher points into shares either directly or through the investment privatization funds (IPFs) - mutual funds that appeared spontaneously with the launching of privatization. Fourth, it generates share prices that reflect demand and supply and thus contributes to the creation of capital markets. Finally, the scheme distributes a significant amount of national wealth and creates a massive new constituency in favor of a market economy.

The scheme has also been viewed as having a number of shortcomings, including its complexity of implementation, low speed, limited transparency, exposure of inexperienced citizens to undue risk, and the potential for resulting in (a) inadequate corporate governance and (b) share prices that are unrelated to market prices (see Earle et. al. (1993), Kotrba and Svejnar (1994), Kyn (1992), Marcincin (1993), and Svejnar and Singer (1994) for detailed accounts).

In this chapter, we use data from Czech firms that were privatized during the first wave of voucher privatization in 1992 to examine the claims with respect to corporate governance. The corporate governance issue arises because voucher privatization turned millions of citizens into small shareholders. It may then be expected that the wide dispersion of ownership will lead to a lack of corporate governance precisely at a time when strong control is needed to discipline management and restructure the former state owned enterprises (SOEs). In the Czechoslovak case, however, the IPF's have taken a leading role in investing voucher points and it is of interest to analyze the extent to which they may achieve effective corporate governance in the privatized firms.

2.2 The Firms And IPFs In The First Wave Of Voucher Privatization

The Czech government placed shares of 943 SOEs into the first wave of voucher privatization. The shares had book value of 201 billion Czechoslovak crowns (about \$7 billion). The Slovak government included 487 SOEs, with the

¹⁶ Since the January 1993 partition of Czechoslovakia, the scheme has been divided into separate Czech and Slovak programs.

book value of shares being 85 billion crowns (about \$3 billion). In Slovakia, it was common for firms to allocate 97% of their property¹⁷ to voucher privatization, while in the Czech Republic this practice was less prevalent. Overall, Slovak enterprises undergoing voucher privatization allotted on average 74% of their equity to vouchers, while in the case of Czech enterprises the corresponding figure was 62%.

Originally, some critics had feared that the voucher process would be a privatization method of “last resort” for firms that were not attractive for potential buyers and that only the weakest firms would therefore be privatized through vouchers. A survey by the Czech Statistical Office found quite the opposite. As may be seen from Table 2.2-1, the average profitability of enterprises involved in the voucher scheme was noticeably higher and losses lower than the corresponding values among all Czech firms.

In particular, voucher firms made up 31.6% of all profit-making firms but only 13.4% of all loss-making firms in the Czech Republic in the first ten months of 1992.

An important part in the voucher privatization process was played by the IPFs. The IPFs were organized as joint-stock companies that were allowed to collect voucher points from the public and invest them in shares of companies during voucher privatization. Some of the funds were purely private, while some were established by the then still state owned banks or joint-stock companies. By the end of the registration period for the first wave, there were over 430 IPFs registered by commercial courts and the Ministry of Finance.

Before the voucher bidding for shares started, 5.8 million individuals (over two-thirds of those involved in the voucher privatization) chose to entrust all of their 1,000 voucher points to IPFs, and a further 420,000 citizens gave the funds part of their points. In total, IPFs received 72% of all vouchers in circulation, or about 6.13 billion investment points.

¹⁷ A minimum of 3% of shares of each enterprise was set aside for meeting restitution claims.

Table 2.2-1. Earnings of Firms in the Czech Republic, Jan-Oct. 1992.

	State Firms (including firms in voucher privatization)	State firms being privatized through vouchers	Share of Voucher Firms (%)
Total number of firms	3,841	965	25.1
Total earnings (m Kcs)	88,620	29,669	33.5
Number of firms reporting profits	2,478	782	31.6
- total profits (m Kcs)	112,273	32,510	29.0
Number of firms reporting losses	1,363	183	13.4
- total losses (m Kcs)	23,653	2,841	12.0

Sources: Czech Statistical Bureau, *Lidove Noviny* (Jan. 7, 1993).

Table 2.2-2. Groups of Funds in the First Wave, Based on Size of Funds.

Size of fund (investment points)	Number of funds	Share of total points (%)
Over 100 million	13	62.5
10-100 million	65	26.7
5-10 million	43	4.9
Under 10 million	308	5.9
Total	429	100.0

Source: Author's calculations.

The ten largest IPFs gained control over 51% of all investment points and the thirteen largest funds (each having over 100 million points) controlled 62.5% of voucher points (Table 2.2-2).

The concentration of voucher holding was thus quite high and, as we shall see presently, so was the resulting control by the IPFs over enterprise shares.¹⁸

¹⁸ It must be noted that until April 28, 1992, there was a very limited regulation of the IPFs. The regulation until this point in time was given only by the rules regulating the establishment of IPFs or by *ad hoc* governmental decrees. These rules were very weak and standard requirements such as a disclosure rule, diversification requirements, prevention of conflicts of interest, and rules regulating operation, were not applied in time. It was later disclosed that many IPFs had appointed to their boards of directors government officials directly involved in the voucher privatization procedure. Finally, the April 28, 1992 Law on Investment Funds and Corporations addressed this issue.

2.3 The Ownership Structure Generated By The Voucher Scheme

As mentioned earlier, the most criticized feature of the voucher scheme has been the expected inadequacy in corporate governance brought about by the high dispersion of the new owners of the privatized SOEs. Since 8.56 million citizens took part in buying shares of 1491 companies, it seemed inevitable that each company would have thousands of dispersed shareholders, none of whom would be able to influence corporate management and performance.

As we discussed earlier, however, most citizens entrusted their voucher points to the newly created IPFs, thus creating the first concentration of thousands of small shareholders. Moreover, since 842 companies offered more than 50% of their shares for vouchers, the IPFs and individual investors have become the most important owners, followed by non-voucher investors such as restituters, direct investors, and the National Property Fund. As can be seen from Table 2.6-1, the IPFs for instance have more than a 20% share in 787 companies and more than a 50% share in 334 companies. Individual investors, on the other hand, have more than a 20% stake in 739 companies, more than an 50% stake in 272 companies. The National Property Fund has more than a 50% control in 23 companies and more than a 20% stake in 118 companies. Foreign investors control 19 and domestic (direct) investors 16 companies.

We also report in Table 2.6-1 the shareholding of the largest funds and groups of funds. These figures provide an idea of how much influence individual institutions or few colluding institutions could exert over enterprise policies. As can be seen from the table, the single largest fund has a 20% share in 102 companies. The five largest funds have more than a 50% stake in 272 companies, a 40% stake in 470 companies and a 30% stake in 622 companies.

2.3.1 The Relative Importance Of Principal Shareholders

In this section we present the results of an analysis of relative power of principal shareholders. We define the group of principal shareholders as a group composed of eight principal non-voucher investors (the foreign and domestic investors, the Fund of National Property, etc.) and the 10 largest IPFs measured by share ownership in each enterprise. This group of 18 investors includes almost all shareholders with stakes greater than 1%. We next assume for the sake of our analysis that individual small shareholders have negligible relative importance. The relative importance of principal shareholder k in company j is then given by:

Table 2.3-1. Number of Companies with Different Percentages of Control by Types of Investors.

Investors	50%	40%	30%	20%	10%
Foreign Investors	33	40	45	45	51
Domestic Direct Investors	24	30	40	47	58
Temporary Hold. of NPF	56	88	135	173	293
Permanent Hold. of NPF	3	7	11	11	21
Shares to be Sold by Banks	12	17	30	47	61
Additional Restitutions	4	6	7	11	52
Single Largest Fund	146	231	442	737	895
Two Largest Funds	473	644	782	974	916
Three Largest Funds	669	760	847	892	918
Four Largest Funds	727	790	860	897	918
Five Largest Funds	754	809	867	900	918
Six Largest Funds	761	817	869	902	918
Ten Largest Funds	768	821	872	903	919

$$\text{Weighted stake}_{j,k} = (\text{Stake}_{j,k} / \sum_{k=1, \dots, 18} \text{Stake}_{j,k}) \times 100 \quad \mathbf{2-1}$$

Calculations based on equation (2-1) are presented in the Table 2.3-1, where shares of small individual shareholders are proportionally distributed to the principal shareholders in order to illustrate the control exerted by the principal shareholders under our assumptions. In this scenario, the single largest fund has a 50% control over 146 companies, while the five largest funds control 754 companies. In Table 2.6-1, the corresponding figures were 0 and 272, respectively. The assumption that small investors do not influence corporate governance thus increases substantially the importance of the principal investors, especially the IPFs. Since neither the management nor the principal shareholders can solicit proxy votes from the individual investors, the results presented in Table 2.3-1 probably reflect quite realistically the distribution of power in Czech companies.

We next examine the importance of principal shareholders when one takes into account simultaneously the extent of individual as well as the so called residual shareholders. In particular, in each company we identify the group of small individual shareholders, the few large (principal) shareholders, and the residual group of shareholders. In undertaking these calculations, we usually find that there is a relatively large number of the residual investors. We then identify the number of companies in which the principal shareholders have a controlling stake under two criteria: (1) the principal shareholders have more than 50% of company shares,

Table 2.3-2. Ownership Concentration.

Largest Shareholders			
	Criterion 1	Criterion 2	Total
Three	279	574	853
Four	446	466	912
Five	536	383	919
Largest Funds			
	Criterion 1	Criterion 2	Total
Three	85	495	570
Four	196	477	673
Five	272	438	720

or (2) the principal shareholders have a larger percentage of company shares than the residual shareholders. The first criterion is straightforward, while the second one assumes that individual shareholders are too dispersed to influence company policy. The sum of companies identified under the two criteria gives the total number of companies in which the principal shareholders arguably have complete control.

The results of our calculations are presented in Table 2.3-2. The group of the four largest shareholders can now control 912 companies, 446 of which under criterion 1 and 466 under criterion 2. A group of five largest shareholders can control 919 (or 97% of all) companies. The second part of the table demonstrates the importance of the IPFs. Should they collude, a group of the five largest funds could control 720 (i.e., 76% of all) companies.

Our calculations, based on reasonable assumptions about the intensity of involvement of small individual shareholders, thus indicate that a relatively small group of principal shareholders can in principle control corporate governance in the vast majority of privatized companies.

2.4 Conclusions

Our analysis focused on whether the outcome of voucher privatization is likely to be conducive to effective corporate governance

Using data on share ownership and assuming that small individual investors do not influence company policy, we have been able to demonstrate that in a vast majority of the privatized companies, few large (principal) investors own enough shares to be in control of the company. This finding is important because ability to control is a prerequisite for effective corporate governance. In future research it

will be important to examine whether this potential for governance has been effectively used.

2.5 References

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2.6 Appendix

Table 2.6-1. Number of Firms with Percentage Share Ownership by Types of Investors.

Voucher Investors	50%	40%	30%	20%	16%	10%	0%
Small Individual Investors	272	411	559	739	821	911	949
Investment Funds	334	498	631	787	831	876	949
Single Largest Fund	0	0	9	102	481	747	949
Second Largest Fund	0	0	0	7	164	482	946
Third Largest Fund	0	0	0	0	31	217	923
Two Largest Funds	2	25	319	673	775	860	949
Three Largest Funds	85	279	543	753	809	870	949
Four Largest Funds	196	408	605	769	822	873	949
Five Largest Funds	272	470	622	782	823	875	949
Total Vouchers	842	897	920	939	943	946	949
Non-voucher Investors							
Foreign investors	19	22	34	38	40	45	51
Domestic direct investors	16	17	28	38	42	48	58
Temporary hold. of NPF	21	27	50	108	155	182	293
Permanent hold. of NPF	2	3	7	9	11	11	21
Shares to be sold by banks	2	6	15	24	39	50	61
Additional Restitutions	2	4	5	7	9	11	52
Transfers to Municipalities	1	1	1	4	11	26	181

Note: Each cell gives the number of companies in which the given investor owns at least the percentage of shares indicated by the column heading. For example, there are 842 companies offering more than 50% of their shares for vouchers, the IPFs as a whole acquired more than 50% of shares in 334 companies, and foreign investors own at least 50% of shares in 19 companies.

3 Voucher Privatisation, Corporate Control and the Cost of Capital: An Analysis of the Czech Privatisation Program¹⁹

Abstract

Voucher privatisation programs have been criticised for leading to excessively dispersed ownership and hence failure of control and insufficient corporate governance. We analyse the results of the five auction rounds of the Czech privatisation program and subsequent stock market developments. Contrary to prior fears, dominant investors did emerge in most cases. We then show that the presence of a dominant investor led to an above average share price after correcting for all publicly known differences between the various enterprises. We use information contained in the price dynamics of the auction rounds to show that this price difference was not due to inside information available to dominant investors only but to the anticipation of better governance in the presence of a dominant investors. This led to a lower cost of capital (higher share price).

¹⁹ The essay contains paper by van Wijnbergen and Marcincin “Voucher Privatisation, Corporate Control and the Cost of Capital: An Analysis of the Czech Privatisation Programme” which was published as CEPR Discussion Paper in 1995 and later quoted for instance in Shleifer and Vishny’s paper “A Survey of Corporate Governance” in the *Jurnal of Finance* in 1997 and EBRD Transition report 1995, updated in 1997 by Marcincin. The original paper was presented on the European Economic Association Congress in Prague and CEP LSE in 1995, and other conferences.

3.1 Introduction

Across the world privatisation in post-socialist societies has been delayed by the typical legacy of socialism: a decapitalized private sector. Lack of private capital complicates privatisation by severely limiting the potential set of new owners if cash based methods were to be used.

Different countries have responded to this problem in different ways. For example in Chile privatisation was delayed until growth had created a new class of potential cash-rich entrepreneurs. In Eastern Europe this approach is considered unacceptable by many if only because the degree of state ownership was so extreme prior to 1989. Thus it should not come as a surprise that the countries where state ownership was most pervasive were in the forefront of looking at other solutions (Russia, Czecho-Slovakia). A particular approach tried in the latter two countries aimed at preserving the benefits of auction based privatisation but stipulated the use of vouchers in this process; the problem of cash constraints was resolved by handing them out for a nominal fee. In this way the political, corruption and economic problems associated with straight give-away programs would be avoided without however limiting the group of owners to those who had managed to accumulate wealth under the old regime.

However, voucher programs have an inherent problem that has led many to strongly criticise this approach (Bolton and Roland, 1992). Ultimately, the goal of privatisation is to efficiently match managers and state-owned assets and provide a set of incentives that will lead those managers to run the firms efficiently. However, the information and incentive problems inherent in the structure of a firm are such that managers left to their own devices are unlikely to do the latter without effective control mechanism in place (Hart, 1993). The criticism is that voucher programs, by distributing ownership so widely, would prevent effective control over management. Any given share owner has too little incentive to monitor himself and too much incentive to free ride on other shareholders' monitor efforts. It is this particular line of criticism that we assess in this paper based on the experience in the Czech republic with the voucher privatisation program implemented in 1993.

The literature on the Czech and Slovak privatisation program has been largely descriptive (cf Anderson, 1994, Earle, Frydman and Rapaczynsky, 1992, Shafik, 1993, and, in particular Dlouhy and Mladek, 1994). This descriptive bend is understandable given the short time period that has elapsed since its execution:

the auctions were finished in December 1992, with the actual transfer of the shares not taking place until June 1993. But the data of the various rounds are now available as are early stock market returns. It is, of course, still early to look at actual behaviour by managers and the different owners that emerged from the process. That is why we take a more indirect approach to the governance question, exploring the link between ownership structure and cost of capital.

We exploit a unique feature of the actual auction procedure followed in the Czech and Slovak programs. All firms in the first wave were auctioned off in at most five rounds (while firms in the second wave in at most six rounds) in a process designed to simultaneously exhaust all vouchers and sell all shares. In each round, the ownership structure that was emerging from the earlier rounds was public information. The investment funds, that had emerged spontaneously in the period leading up to the auctioning process, tended to buy early. Dominant foreign or domestic investors mostly came in even before the voucher process was set in motion (vouchers were given to Czech citizens only). Thus information about the presence of a dominant investor was typically already available at the time of the last round (in most but not all cases the fifth). We use these data plus early stock market quotations to assess whether concentrated ownership led, *ceteris paribus*, to higher share prices and investigate whether that was due to inside information of the dominant investors or to the anticipation of better corporate governance in their presence. The results do not support the academic criticism that has been levied against the voucher program. We show that in many cases dominant investors did emerge; that very fact has led to anticipations of better governance and hence higher share prices (lower cost of capital).

The remainder of this paper is organised as follows. In Section 3.2 we briefly describe the main features of the Czech and Slovak voucher privatisation program (a more detailed description can be found in Dlouhy and Mladek, 1994 or in Shafik, 1993). Section 3.3 analyses the bidding dynamics and the evolving ownership patterns as the rounds progressed. Section 3.4 looks at the key question, does the presence of a dominant investor lead to a lower cost of capital? Section 3.5 investigates (and rejects) an alternative explanation of the results, that dominant investors had inside information. Section 3.6 concludes.

3.2 The Czech and Slovak Privatisation Program.

Privatisation in Czecho-Slovakia was the cornerstone of a sweeping reform program in what was one of the most centralised economies of the Eastern block. It was designed to bring about quick and massive privatisation, in the hope to jump start a competitive market and proper enterprise governance and make the whole reform process irreversible. The framework for privatisation was defined by the Small Privatisation Act (approved by the federal parliament in October 1990) and Large Privatisation Act (approved in February 1991). Voucher privatisation was the most important method used in the large privatisation program.²⁰ The voucher program covered slightly over 60% of all firms, weighted by book value, that were sold in the so-called “first wave” executed in 1992/93.

3.2.1 Supply and Demand sides of the voucher market

Supply side. Privatisation project proposals by enterprise managers (known as basis projects) and by anybody else (known as competing projects) were submitted to the founding ministries of those enterprises. All projects, whether the founding ministry agreed with the proposal or not, were subsequently passed on to the Ministry for Privatisation, which was ultimately responsible for the final approval of the projects. Approved projects which involved for part or all of the firm the voucher method were submitted to the Center for Voucher Privatisation (CKP), the executor of the voucher method. Enterprises involved in the process had to establish themselves as joint-stock companies fully owned by the National Property Fund (FNM; controlled by the parliament directly). In the end, the shares of 988 Czech and 503 Slovak enterprises were offered to the public through the mean of vouchers.

Demand size. All adult citizens of Czecho-Slovakia were eligible for buying a voucher booklet containing 1000 investment points at a nominal fee of 1000 Kcs and a registration fee of 35 Kcs. The points so obtained would be the only “money” used on the voucher market. The investment points could be used only within the five rounds of voucher privatisation and had no value afterwards. Extensive information on the enterprises on offer was published in the newsletter “Kuponova privatizacia” and made available on diskettes. The promotion

²⁰ For details on the whole large privatisation program see e.g. Burger and Mejstrik (1993).

campaign of the CKP did not really catch on, however until the program was jump-started by advertisements of entirely new, spontaneously created institutions, the Investment Privatisation Funds (IPFs). These funds, all privately owned, offered to swap investment points for shares in themselves; voucher book holders who did this thus transferred the right to use the vouchers to the funds. The public could buy IPFs shares in round “zero” only. The IPFs advertised heavily to attract voucher holders.

The IPFs were crucial to the success of the voucher program. Enthusiasm for the program took off after the IPFs offered what in effect amounted to free put options on their shares: they typically guaranteed a value of at least 10,000-15,000 Kcs per booklet, or between 10 and 15 times the purchase price, after one year. Before the put option offer, sales of voucher books were stagnating at about 2 million; but in the end 8.6 million of the Czecho-Slovak citizens took part in the voucher privatisation program, individually or through the 438 funds, to buy 299.40 million shares.

3.2.2 Five rounds of the voucher privatisation

After introduction of the firms on offer and registration of the IPFs and individuals who wanted to take part in the auction process, round “zero” started. The vast majority of the citizens participating (78%) exchanged their investment points for shares of IPFs (438 funds were created, but only 429 of them actually entered the process). We will refer to those who entered the process on their own account as small investors (SI).

Each round consisted of three steps. First, the CKP would announce, per firm, the number of shares on offer and the asking price. Then investors (IPFs and SI) would send in their subscriptions for shares to the CKP (via one of many registration offices). In the third step, the CKP calculated total demand based on the subscriptions received. If demand fell short of supply, all subscriptions were allocated at the asking price and the remainder would be offered for lower price in the subsequent round. If total demand for shares exceeded the available supply by up to 25%, individuals received their full subscription, and bids by IPFs were scaled back enough to bring total demand in line with the available supply. However if total demand exceeded the number of shares by more than 25%, no sale was made at all in that round and all shares on offer were transferred into the next round while their price was adjusted upwards. Pricing irregularities, displayed in

Table 3.3-1. Dating of the privatisation rounds.

Round:	Starting Date	End of Subscription	End of Round
0	February 17	April 26	-
1	May 18	June 8	June 30
2	July 8	July 28	August 18
3	August 26	September 15	October 6
4	October 14	October 27	November 17
5	November 23	December 2	December 22

Note: Subscriptions were placed between the starting date and the end of subscription date. Resulting ownership structure and new prices for subsequent round were announced before the end of round.

Table 3.3-1, were possibly due to constrain that the total value of shares offered must not be lower than the total value of investment points available to investors prior to each round.

For each firm, the number of shares equalled the book value divided by 1000 Kcs, so the nominal cash value of a share was 1000 Kcs. In the first round, the price per share in terms of vouchers was arbitrarily set at 3 shares per 100 investment points across the board, so one voucher booklet was worth a nominal 30,000 Kcs. In each subsequent round, prices were adjusted according to mechanism described. The size of the adjustment was done in a fairly ad hoc manner with as overriding objective to avoid unused vouchers by the time all shares were sold. No initial announcement was made on the total number of rounds, so as to discourage wait and see behaviour, but there were many semi-official signals to the extent that there would be at most five rounds.

3.3 Price Developments and Bidding Dynamics

The first round started on May 18th, 1992. As already indicated, prices of shares in terms of investment points were set equal for all enterprises; the ‘market’ was expected to differentiate as the process would unfold. To prepare the ground for the analysis of the relation between emerging ownership structure and share prices, we first look at the bidding pattern of the various groups and the ownership pattern that emerged (Section 3.3.1). We then assess the price dynamics as the rounds unfolded (3.3.2).

Table 3.3-2. The use of the investment points within the rounds.

Round:	Points (bn.)	Total demand	IPFs' demand	SI' demand
1.	Remaining	8.53	6.13	2.40
	-Used	7.86 (92%)	5.84 (95%)	2.02 (84%)
	-Not used	0.67	0.29	0.38
2.	Remaining	5.55	3.80	1.75
	-Used	4.88 (87.9)	3.51 (92.4)	1.37 (78.3)
	-Not used	0.67	0.29	0.38
3.	Remaining	2.14	1.26	0.88
	-Used	1.99 (93.0)	1.25 (99.2%)	0.74 (84.1)
	-Not used	0.15	0.01	0.14
4.	Remaining	1.13	0.55	0.58
	-Used	1.00 (89)	0.55 (100)	0.45 (78)
	-Not used	0.13	0.00	0.13
5.	Remaining	0.62	0.29	0.33
	-Used	0.56 (91)	0.29 (100)	0.27 (82)
	-Not used	0.06	0.00	0.06

3.3.1 Bidding Dynamics

The precise timing of the various rounds is given in Table 3.3-1. All the time, the investor could observe changes in the prices and supply of the shares, as well as the success rate in obtaining shares of other investors. Importantly, the ownership structure established in previous rounds was fully known at the beginning of each new round. On November 17, the Center for Voucher Privatisation announced that the fifth round would be the final round.

It is important to note that, as the rounds progressed, the various actors in the drama were exposed to different type of risks. The risk small investors were exposed to was simply to be left with unused investment points as the rounds came to an end. This would clearly involve a missed opportunity but not actual cash outlays. IPFs however had issued put options equal to between ten and fifteen times the purchase value of the voucher booklets and would run the risk of getting caught short if too many points would go unused. This resulted in different intertemporal bidding patterns, as Table 3.3-2 indicates.

In each round, the IPFs used a larger fraction of the points still in their possession than small investors did. They set out using 95%, and, after a small dip in round two, essentially bid with everything they had in each subsequent round. In interpreting the table, note that points remaining at the beginning of each round equal points not used in the previous round plus the points used unsuccessfully in the previous round. Of course the timing of offers does not necessarily coincide with the timing of purchases; if different groups had different success rates in the

Table 3.3-3. Ownership structure of voucher investors.

Investors	>50%	50-40%	40-30%	30-20%	20-15%	15-10%	>0%
Total Vouchers	842	23	19	4	3	3	949
Small Investor	272	139	148	180	82	90	38
Privatisation Funds	334	164	133	156	44	45	73
Single Largest Fund	0	0	9	93	379	266	202
Second Largest Fund	0	0	0	7	157	318	464
Third Largest Fund	0	0	0	0	31	186	706
Two Largest Funds	2	23	294	354	102	85	89
Three Largest Funds	85	194	264	210	56	61	79

Note: Number of enterprises where given investor has x% of shares.

offer process, the two can diverge. This was clearly the case: IPFs effectively set in everything they had from round three onwards while small investors kept holding back about 20%. Nevertheless the IPFs held more investment points than small investors right up to round 5.

The two investors also focused on different groups. Figure 3.8-1 lists the total shares bought by small investors ranked by the size of the underlying firms, in blocks of 29 after ordering the firms by initial book value (group 1 contains the smallest firms, group 33 the largest). Figure 3.8-3 lists the same for IPFs. The graphs show that individuals and IPFs bought roughly comparable number of shares in small firms, but that IPFs invested substantially more in larger ones. The same appears to be true for the second wave, as Figures 3.8-2 and 3.8-4 indicate.

It is also revealing to look at the activities per round per group (Figures 3.8-1 and 3.8-3). The pattern that emerges is interesting; IPFs went quickly for the large firms (mostly in round 1 and 2); private individuals had their peak purchases of shares in large companies much later, in round five only. They seem to have followed the IPFs at a safe distance in time. Similarly, Figures 3.8-2 and 3.8-4 indicate peak purchases of IPFs in round 2 and of small investors in rounds 3 and 4.

The final statistics refer to the ownership pattern that emerged after all the firework was over. To what extent did dominant investors emerge, and who were those dominant investors? First of all, almost all the projects ‘voucherized’ were voucherized for more than 50%, in most cases for much more. In more than half of them, IPFs own more than 40 of the shares (498 out of 949). But in only 9 cases did the largest group own more than 30%. In substantially more than half of the cases, the top IPFs owned more than 15%. In most cases there were two or three large groups; in no less than 673 out of 949, the two largest groups owned over 20%. More details are given in Table 3.3-3.

Table 3.3-4. Price development in the voucher privatisation.

Round i	2	3	4	5	Note
$P_i = P_{i-1}$	28	83	107	164	Compare prices of subsequent rounds, i.e. round i and i-1
$P_i \leq P_{i-1}$	598	470	511	375	
$P_i > P_{i-1}$	323	396	331	410	
$P_{i-1} \leq P_\lambda$	596	753	777	949	Compare prices of rounds i-1 and λ
$P_{i-1} > P_\lambda$	353	196	172	0	
$D_{i-1} < S_{i-1}$ and $P_i \leq P_{i-1}$	626	509	462	429	Regular pricing
$D_{i-1} < S_{i-1}$ and $P_i > P_{i-1}$	28	135	49	181	Irregular pricing
$D_{i-1} > S_{i-1}$ and $P_i < P_{i-1}$	0	2	1	1	Irregular pricing
$D_{i-1} > S_{i-1}$ and $P_i = P_{i-1}$	0	42	155	109	Irregular pricing
$D_{i-1} > S_{i-1}$ and $P_i > P_{i-1}$	295	261	282	229	Regular pricing

Note: Share price of 135 firms increased in the 2nd round, despite excess supply in the 1st round, and share price of 2 firms decreased in the 3rd round, despite excess demand in the second round.

3.3.2 Price Dynamics

The table 3.3-4 summarises price developments per round. The first three rows of the table show that price decreases were more prevalent throughout than price increases (except for the fifth round, compare rows for $P_i \leq P_{i-1}$ and $P_i > P_{i-1}$). In the same time, however, comparison of ‘round’ prices with the final price of each share (final price = the last price associated with each share, P_λ) shows that final price used to be higher. One can arguably associate that price with the market’s final valuation. More than half of shares opened in round one at less or equal the final value. The last five rows indicate a curiosity: Together with regular pricing of shares, when large excess demand led to price increases and excess supply to price decreases, several cases of irregular pricing appeared. For example, in the third round, prices of 135 shares increased despite the previous round small demand, and prices of 42 shares remained the same despite the previous round excess demand. The reason for that could be that the government had to satisfy the following condition:

$$\sum_j P_j S_j \geq \text{Outstanding investment points} \quad \mathbf{3-1}$$

where j stands for share traded, P is the price of share in the prepared round and S number of shares supplied. The reverse, lowering prices in the face of excess demand, barely ever happened: only in four cases overall.

Does this mean that prices actually rose? Figure 3.8-5 shows that average prices seem to have gone up initially and continued to go up, with a decline setting in at the last round only. So does this imply that IPFs, since they got in early, got in cheap? Prices weighted by volume of shares actually sold in each round show different patterns, same for the both waves: Weighted prices basically did decline over the rounds. In the previous section we saw that IPFs tended to go in quickly for the big firms, with small investors delaying their purchases of the larger firms till the very end. Thus the ‘average’ price dynamics may be misleading if it hides different patterns for small and large firms. The next diagrams therefore compares price dynamics for different size of firms.

Figure 3.8-6 shows that the averages do in fact hide significant variation across size classes. Prices of large firms tended to be significantly lower than prices of small firms. Figure 3.8-7 shows the reverse picture for the second wave – prices were almost equal for each size category. Thus a more detailed analysis is necessary before one can conclude that IPFs, by getting in early, got in cheap. In fact we will see that the opposite was true.

3.4 Ownership Structure, Inside Information and Corporate Governance

In the previous sections, we saw that IPFs tended to buy early. That implies that, as the rounds unfolded, the emerging ownership structure, or more precisely, the presence of investors owning large blocks, became known. An intriguing question is, whether this information had an impact on price structure. There are at least two reasons to expect it should. The first reason is related to the diluted share ownership problem referred to in the introduction. If the presence of a dominant investor leads to better control over management, indications from earlier rounds that a dominant investor would be present should be reflected in higher share prices in later rounds. Such an effect, if found, would of course not prove that concerns about diluted ownership are misplaced; after all IPFs still have to prove themselves in actual practice. It would indicate, however, that the market expected their presence to at least alleviate the problem enough to expect higher returns to shareholders in the future.

However, there is another interpretation possible. If IPFs had superior information about the likely prospects of companies, for whatever reason, and were known to have that information, one would also expect them to bid early and their

presence in early rounds to lead to a higher eventual share price. If the inside information story is behind whatever share price effect of IPFs ownership there is, that price difference has no obvious implication for the issue of diluted share ownership. It is thus of importance to distinguish between these two competing explanations if a share price effect does exist.

In what follows we first investigate whether the emergence of a dominant shareholder in earlier rounds had a positive impact on prices later on. We then develop a simple test to distinguish between the two competing explanations offered.

3.4.1 Ownership Structure and Market Valuation

We use as indicator of market valuation the price at which the last shares were sold (P_λ). We are interested in testing whether this price reflects an impact of different ownership structures, to the extent they were known before that final round. Thus, if $\lambda = 5$, as it is in most cases, all information on ownership structure available up to round 4 (inclusive) is used; if $\lambda = 4$, i.e. the shares were sold out in round 4, only information available up to round 3 (inclusive) is used, and so on.

We consider two sets of explanatory variables which may be important for evaluation of companies. First, those concerning the companies themselves. Examples are size as measured by total number of shares offered initially²¹, profitability, indebtedness, increase in the labour force over the past three years, sectors and regions (only one out of seven appeared to be significant) and ownership structure. The second set of variables is related to the company performance on the voucher market. Those are indicators for funds' ownership, dummies for the last round λ and the ratio of demand for shares in the i -th round and supply in the subsequent round, scaled by the same ratio for the market as a whole. The dummy for λ attempts to capture 'hot stocks', i.e. stocks that were sold out early. The relative excess demand variable similarly tracks whether a particular stock was unusually oversubscribed, with "unusual" defined with respect to the overall market imbalance. For our regression, data on 949 out of 988 Czech companies were available. We do not have comparable information on the Slovak companies in the program. The specific list of variables and regression results are presented in table 3.8-1 in the appendix.

²¹ Note that there was a one-to-one relation between initial book value and number of shares offered.

The regression shows that companies that sold out early (in the first two rounds) were more expensive than those sold later, which is may be not a surprising result. The coefficients of $AdiSi_{i+1}$ also confirm that the system was run in a sensible manner; excess demand in earlier rounds led to upward pressure in later rounds, although the price setting authorities seem to have had a more dampened response to excess demand in later rounds; the coefficients on $ADiSi_{i+1}$ decline as the round number increases.

But the core result is the finding that companies with dominant investors present early on tended to be more expensive later on. Companies partially bought by funds were demanded more, and end up more expensive, than average, and the more so the larger the ipf stake. There is a similar, strongly positive effect associated with the known presence of foreign and domestic (non-IPF) dominant investors. All this fits in the hypothesis put forward sofar; the strong positive effect of a large stake by the National Property Fund is less obviously interpretable. One view could be, that the FNM was thought to maintain a stake in the “crown jewels”.

The significance of dominant ownership is tested on the second wave data from 1993 and presented in the appendix table 3.8-3. We had no data to calculate dummy for significant ownership of five IPFs, therefore we created variable of aggregate presence of IPFs, FSH. We then run regression with FSH also for the first wave data (see table 3.8-2). The results support our findings from the first regression.

We repeated similar regressions for the first wave data later on using actual stock market quotations. Clearly all variables related to auctioning dynamics ceased to be relevant. We used two data sets, one for December 1993 and one for March 1994.

3.4.2 Stock Exchange Prices - December 1993

Almost immediately after the end of the voucher privatisation, the shares started to be traded on the Prague Stock Exchange (for details see Lastovicka, Marcincin and Mejstrik, 1994). We again include two sets of variables, the first one capturing various aspects of underlying firm performance, and the second one capturing ownership structure.

The regression coefficients on variables proxying for company performance are largely as expected (see table 3.8-4); profits are more important than sales, and

the company size effect seems to have disappeared. Large companies do not get a higher share price than small companies, but more profitable ones are quoted higher than less profitable ones. The coefficients on ownership variables are interesting. The positive effect of non-IPF domestic investors and of the presence of the FNM has faded away. But the presence of a dominant foreign investor and a significant IPFs presence still have a significantly and strongly positive impact on share pricing.

3.4.3 Stock Exchange Prices - March 1994

By the end of March 1994, more companies were traded on the stock exchange, so that we could increase number of observations from 433 to 612 (Availability of financial data on companies was the only limitation which prevented us from using all companies traded). We ran the same regression as for December 1993 (Table 3.8-5).

The results for March 1994 are broadly in accord with the results for December 1993. Profits rather than sales are what matters; and the presence of dominant foreign or IPFs share holding blocks still has a strongly positive pressure on share prices. A difference is that the dummy for the presence of dominant domestic investors has again turned significant, as has the variable capturing the size effect. The dummy capturing a large FNM stake remains insignificant.

3.5 Ownership Effects on Share Prices: Inside Information or Anticipations of Better Corporate Governance?

The regression results presented in previous section establish unambiguously that the presence of a dominant non-government investor has a positive impact on share prices. The interpretation is, without further information, not obvious however; since in most cases the dominant investor likely came in early, the inside information explanation mentioned earlier cannot be ruled out. If dominant investors possess inside information and are known to do so, the mere fact of them buying into a company sends a signal to uninformed outsiders. We need more information to solve what amounts to an identification problem. In what follows we first show that a test can be based on the price dynamics as rounds unfold (section 3.5.1); we then apply this test to our data (Section 3.5.2 and 3.5.3).

3.5.1 Inside Information and Share Price Dynamics

Consider a firm whose value can be either high or low depending on information, summarised in parameter α , the value of which is known to insiders only. Insiders obviously have no incentive to reveal their information before they themselves have acted on it. Consider next a two stage auctioning process. In round 1, outsiders have no knowledge about α , they just have a prior distribution which we assume to be binomial:

$$Prob(\alpha=\alpha_H) = \pi, Prob(\alpha=\alpha_L) = 1-\pi, \quad \alpha_H > \alpha_L \quad (3-2)$$

Thus the round 1 valuation for both types of firms is:

$$V_1 = \pi V(\alpha_H) + (1-\pi)V(\alpha_L), \quad V(\alpha_L) < V_1 < V(\alpha_H) \quad (3-3)$$

Insiders have a clear incentive to buy early; they can actually cash in on their inside information because $V_H - V_1 > 0$. At the same time, low quality firms are overvalued: $V_1 > V(\alpha_L)$. Therefore insiders will only buy high quality firms. On the assumption that profit opportunities will not remain unexploited unless regulation prevents arbitrage, all high quality firms will attract a dominant investor, and no low quality firms will. We therefore get complete separation: the presence of a dominant investor acts like a signal to outsiders about the firm quality²². So in round 2 we get:

$$\begin{aligned} V_2 &= V(\alpha_H) \text{ for } \alpha = \alpha_H \\ \text{or } V_2 &= V(\alpha_L) \text{ for } \alpha = \alpha_L \end{aligned} \quad (3-4)$$

Thus outsiders who come in late (in round 2) will pay more for firms where insiders have bought in during round 1 than those insiders have paid. It is furthermore easy to show that outsiders should be indifferent between bidding early or late under risk neutrality, but will bid late if their degree of risk aversion is positive. In both cases this translates in an ‘average bid period’ later than the ‘average bid period’ for the IPFs, since they are expected to bid early.

²² Insiders clearly have an incentive to bid ϵ above V_1 so as to get all shares. Regulation prevented the IPFs from doing this however; their stake was limited to 20% (10% per individual fund and 20% per group of funds under control of a single entity).

Thus the theory predicts that if IPFs acted on inside information, and were known to do so, (A) IPFs should bid early; (B) Outsiders will on average bid later than IPFs; and (C) IPFs will pay less than outsiders. The corporate governance theory is compatible with (A) and (B) but has no implications for (C).

3.5.2 Average Round

To compare ‘timing’ behaviour of funds and small investors, we calculate the ‘Average Round’ (AVR), focusing on actual purchases rather than offers. AVR_k is defined as the sum of all the ‘round’ numbers in which a group k made a purchase, with each ‘round’ number weighed by the fraction of that group’s total number of shares bought in that specific round:

$$AVR_k = \sum_{i=1 \text{ to } 5} \Psi_{i,k}, \quad \text{with } \Psi_{i,k} = S_{i,k}/S_k \quad (3-5)$$

$k = \mathbf{F}$ (funds) or \mathbf{S} (small investors). S_k is the total number of shares bought by the k -th investor and $S_{i,k}$ the number of shares bought in the i -th round by k -th investor.

The outcome confirms that the IPFs not only bid more aggressively in the sense of using more of their points at each round, but also ended up actually buying earlier on average: the average round for IPFs was calculated at 2.08 and for small investors 3.01 (while 2.71 and 3.52, respectively, in the second wave). Thus on average IPFs bought their shares a full round earlier than small investors. This is important since the ownership pattern emerging after each round was known at the beginning of each round. Detailed inspection suggests that by and large the IPFs tried to purchase a large number of shares in the beginning of the process while small investors purchased basically equal numbers of shares in each round.

We have anyhow already seen that (A) and (B) are satisfied in the data; but since both theories are compatible with that outcome, it does not help us with identifying which one is right. So everything hinges on (C). If (C) is accepted, we still do not know anything, since (C) could obtain under both theories; but if (C) is rejected, the insiders theory is ruled out. We therefore look at the overpayment issue in the next subsection.

Table 3.5-1. Overpayments.

	First wave		Second wave	
	Small investors	IPFs	Small investors	IPFs
Minimum	-0.97	-0.97	-0.99	-0.99
25% value	-0.17	-0.21	0.00	0.00
Median	0.04	0.00	0.17	0.20
75% value	0.39	0.44	0.59	0.78
Maximum	7.41	12.00	2.94	10.50
Mean	0.11	0.23	0.28	0.51

Note. Means significantly different at 0.01 significance level.

3.5.3 Did IPF over- or underpay?

Since different prices were used in each round, it was possible to buy the same share for different amount of investment points depending on the round the shares were bought in. The price $P_{\lambda,j}$ (the last used price for enterprise ‘j’) is used as the “equilibrium” price, the marginal value of the enterprise per share. On this measure, investors who paid more than $P_{\lambda,j}$ were overpaying for their shares, while investors who paid less than $P_{\lambda,j}$ “underpaid”. Formally we define a measure of overpayment OP, indexed by investor type k (IPFs or small investor) defined as follows:

$$OP_{j,k} = \sum_{i=1 \text{ to } \lambda} [(P_{i,j} - P_{\lambda,j}) \text{Shares}_{i,j,k}] / [\text{Shares}_{j,k} P_{\lambda,j}] \quad (3-6)$$

Shares of enterprise ‘j’ bought by investor class k satisfy the obvious adding up constraint:

$$\text{Shares}_{j,k} = \sum_{i=1, \dots, \lambda} \text{Shares}_{i,j,k} \quad (3-7)$$

The results are summarised in the Table 3.5-1. The table indicates that both over- and underpayment took place, but that IPFs significantly over paid. Moreover, when weighted by the share of each purchases in the overall value bought, IPFs overpaid on a netto basis by a substantial amount: 23%. This amount was substantially larger than the corresponding amount for smaller investors. Overpayment is in strict conflict with the insiders theory; we therefore conclude that the good-governance theory is the most likely explanation of the fact that firms with known dominant investors are priced higher, given everything else, than firms without such a presence.

3.6 Conclusions

A major point of criticism against voucher privatisation methods has been the fear that they lead to share ownership too diffused to expect effective shareholders control over management. It is obviously too early to pass final judgement on this matter, but the Czech experience so far seems to suggest the early academic criticism may have been overly pessimistic.

The voucher program took off only after the spontaneous creation of Investment Funds, through which individual shareholders were aggregated into larger blocks. Whether that will lead to better governance, only time will tell; in this paper we take a more modest approach. We assess whether share prices tended to be higher when it was known that dominant investors were present, and whether that was due to anticipations of better corporate governance in that case. The Czech voucher program allows for a unique experiment because auctioning took place in a series of rounds; aggregate information on the structure of ownership emerging in earlier rounds for each firm was made public prior to each new round. This allows for a sharp test of the relation between ownership structure and share valuation, assuming reasonable proxies are found for other factors influencing share valuation.

The regression results are very clear: presence of dominant investors in earlier rounds tends to boost share prices; and the larger the IPFs contribution, the higher the price. Of the other variables some perform as expected and some did not. Reported profitability has a positive impact on share prices, while a high debt-to-book value ratio depresses share prices. At least in the auction rounds there was a size effect: given everything else, larger firms tended to be higher priced, somewhat counter to our prior expectations. But the key result is the strong positive effect on share prices of the presence of a dominant investor.

We repeated this exercise using later data on share prices not from the auction rounds but from the stock market. These gave broadly the same result with some interesting modifications. The positive impact of a large presence of the National Property fund disappeared in the stock market regressions. However, presence of a dominant foreign investor or of a dominant IPFs still boosted share valuation, as it did in the earlier auction rounds. On the impact of a strong domestic investor, the results are less clear-cut. Both in the regression using auction prices and the one using March 1994 stock market data, a significantly positive effect was found; but in the regression using December 1993 data, the relevant dummy was not significant.

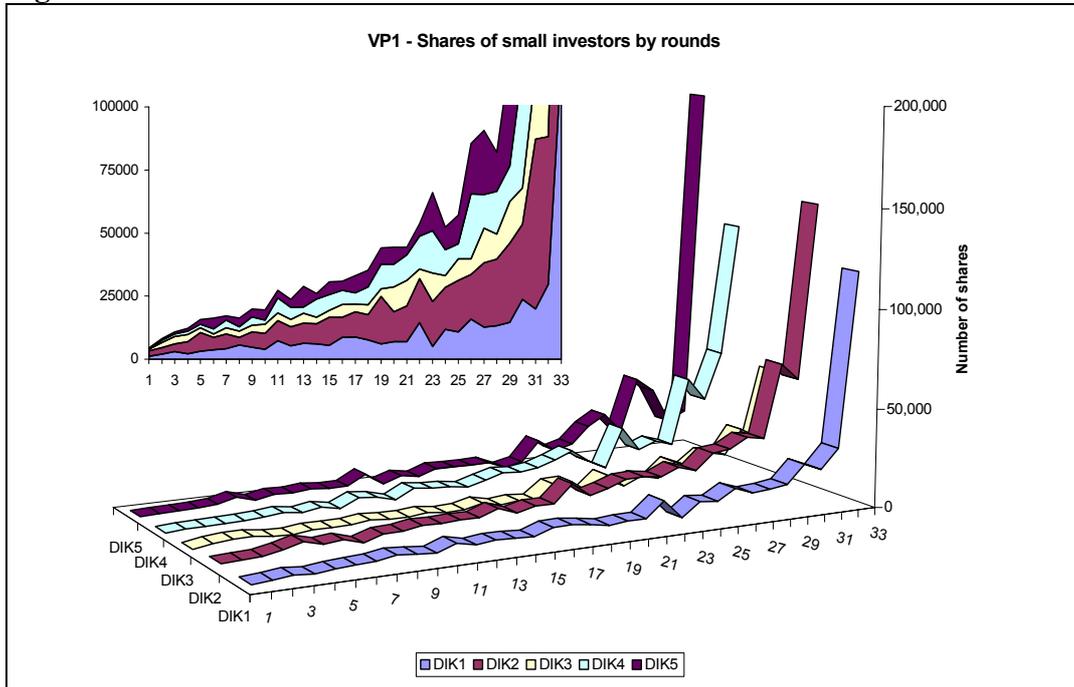
Of course a positive impact of the presence of dominant investors could be related to more than expectations of improved corporate governance. One theory would be that dominant investors possessed inside information, and by buying early (which they did, as we demonstrate) signal their inside knowledge to uninformed outsiders. We show that this theory predicts that IPFs would on average pay less than the eventual (post-separation) market value. We then show this prediction to be counterfactual. Using the price at which the last share was sold as a benchmark, IPFs overpaid by 23%, rather than underpaid. We therefore conclude that the positive impact of the presence of dominant investors on share prices was due to expectations of better corporate governance, not to the fact that those investors possessed inside knowledge.

3.7 References

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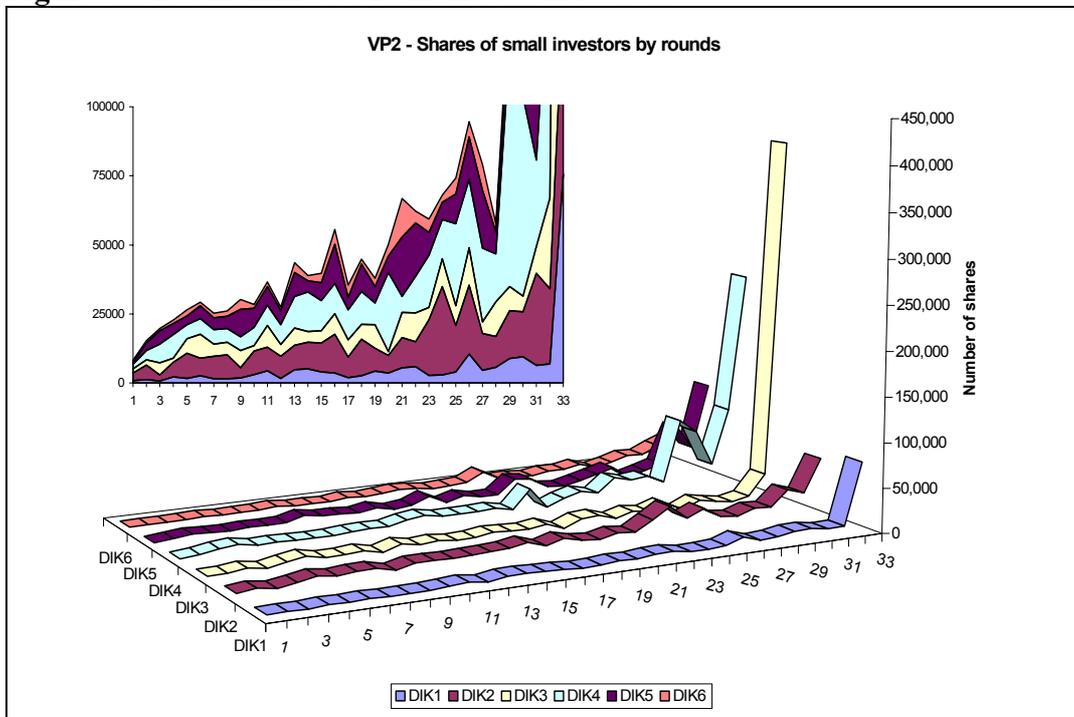
3.8 Appendix

Figure 3.8-1. Small investors in the first wave.



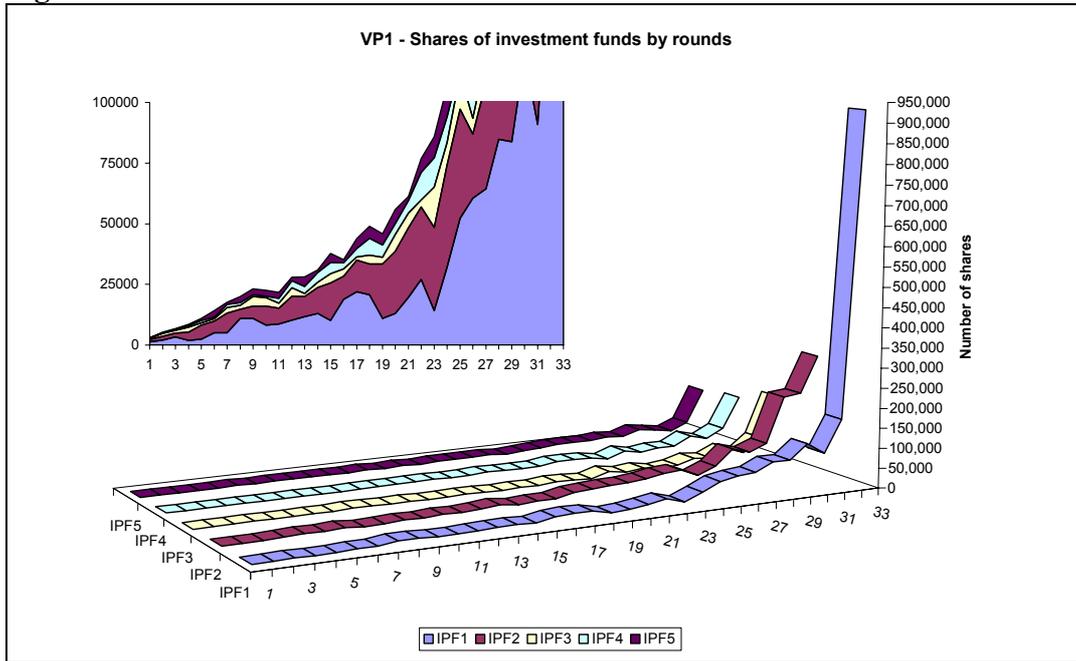
Note. Firms were sorted by their book value and grouped to 33 groups. Each group contains 29 firms, but the last which contains 28 firms. Larger firms are on the RHS.

Figure 3.8-2. Small investors in the second wave.



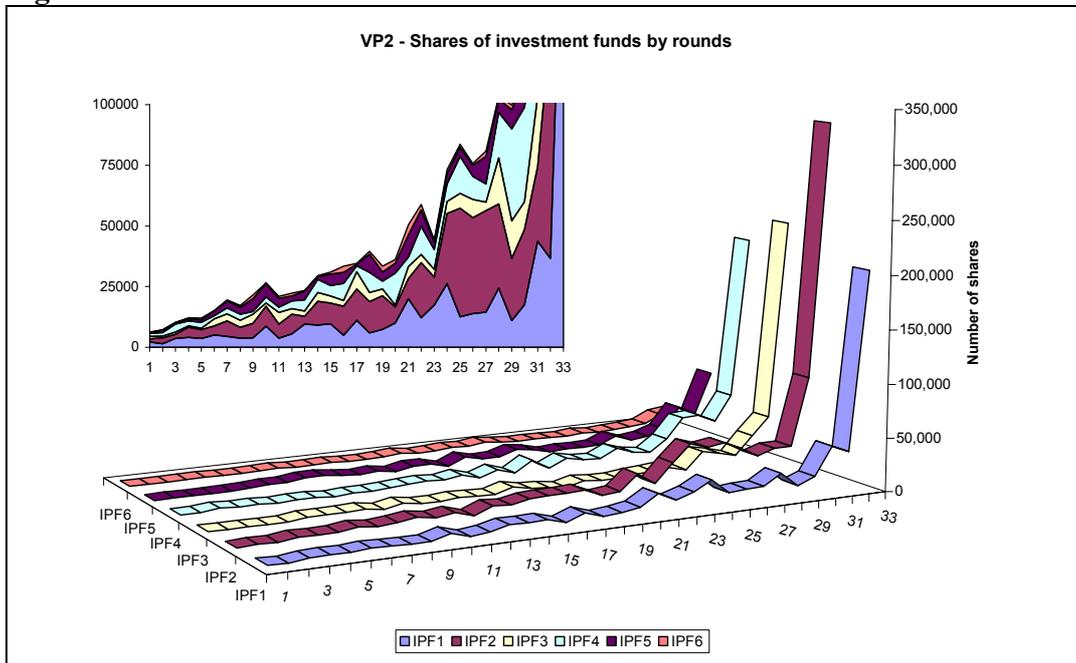
Note. Firms were sorted by their book value and grouped to 33 groups. Each group contains 26 firms, but the last which contains 29 firms. Larger firms are on the RHS.

Figure 3.8-3. IPF in the first wave.



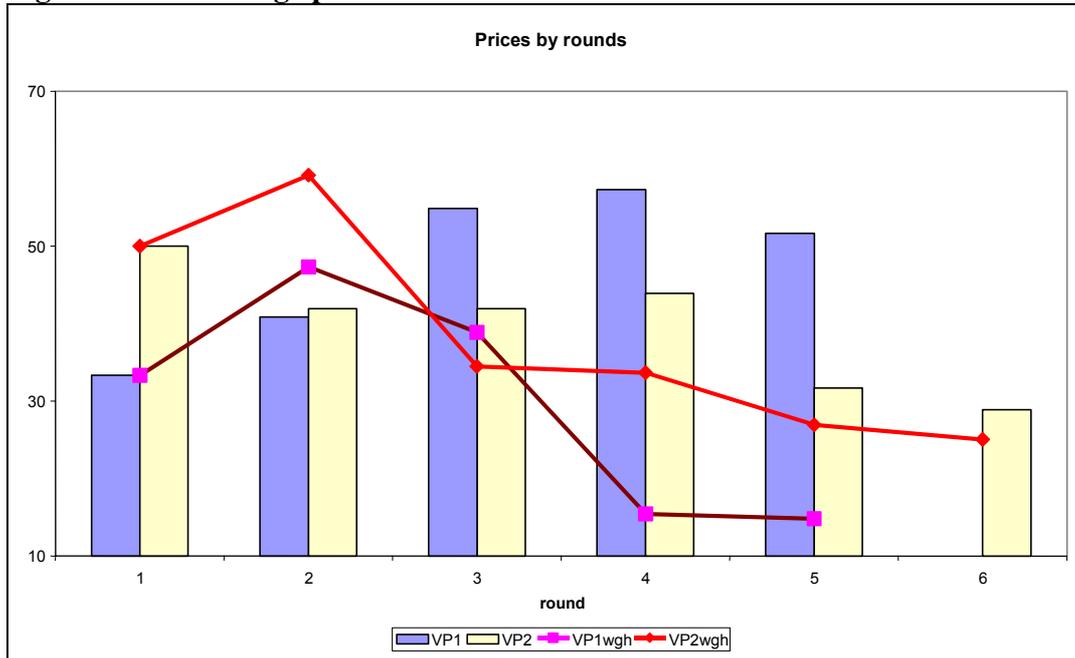
Note. Firms were sorted by their book value and grouped to 33 groups. Each group contains 29 firms, but the last which contains 28 firms. Larger firms are on the RHS.

Figure 3.8-4. IPF in the second wave.



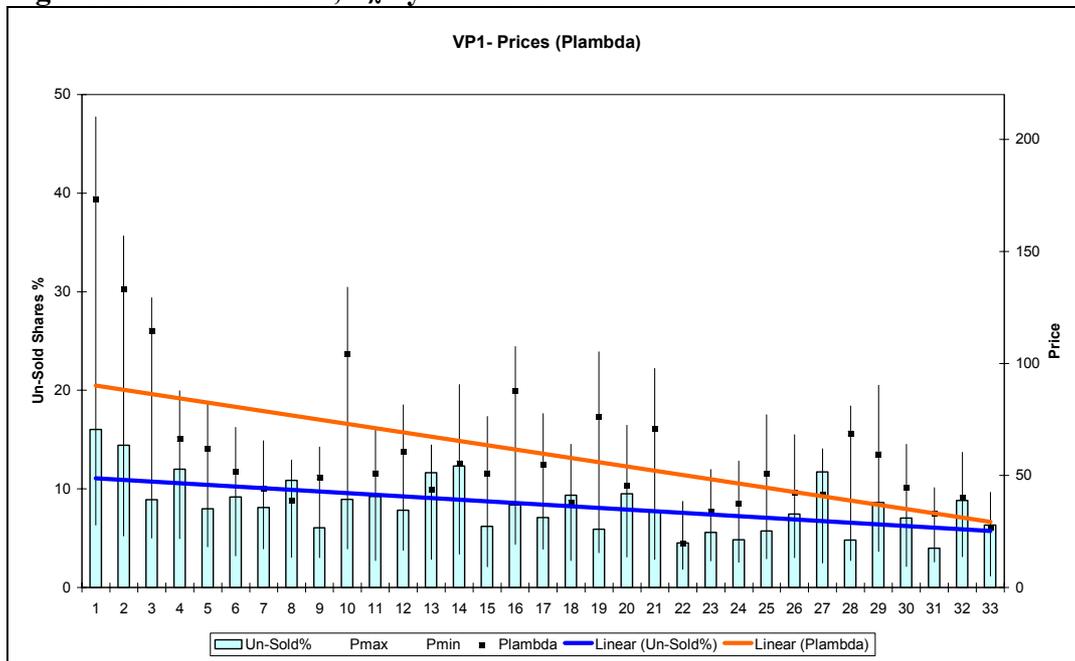
Note. Firms were sorted by their book value and grouped to 33 groups. Each group contains 26 firms, but the last which contains 29 firms. Larger firms are on the RHS.

Figure 3.8-5. Average prices in two waves.



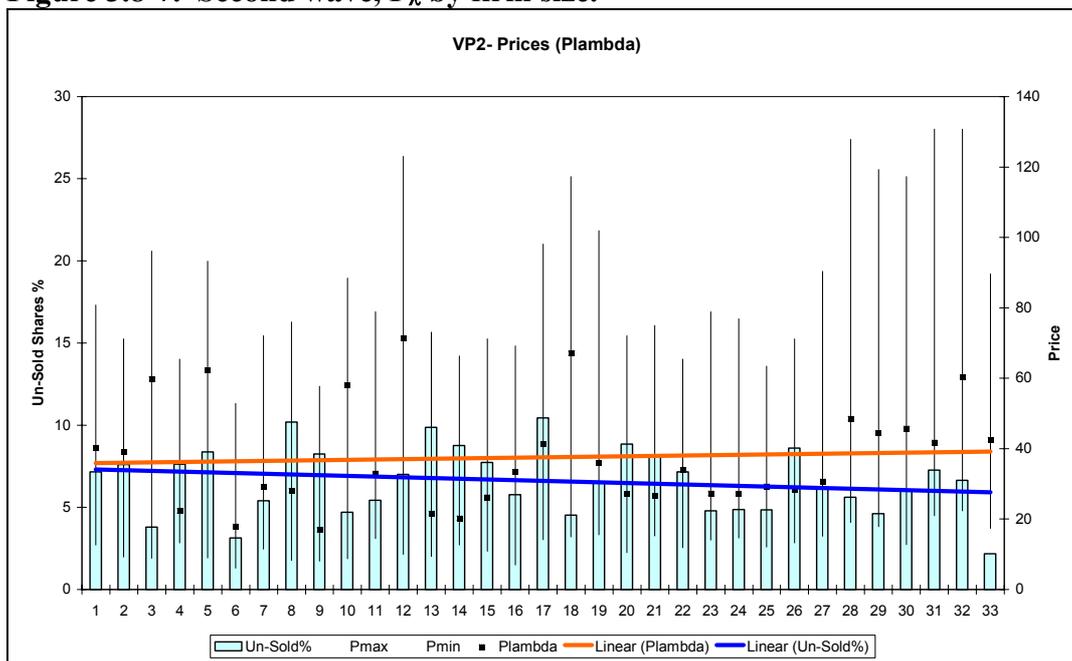
Note: Columns display simple average while lines display average weighted by number of shares actually sold in corresponding round.

Figure 3.8-6. First wave, P_λ by firm size.



Note. Firms were sorted by their book value and grouped to 33 groups. Each group contains 29 firms, but the last which contains 28 firms. Larger firms are on the RHS. Upper line shows the trend of P_λ , lower line shows trend of unsold shares.

Figure 3.8-7. Second wave, P_λ by firm size.



Note. Firms were sorted by their book value and grouped to 33 groups. Each group contains 26 firms, but the last which contains 29 firms. Larger firms are on the RHS. Upper line shows the trend of P_λ , lower line shows trend of unsold shares.

Table 3.8-1. Regression for P_λ .

variable	coefficient	t-statistic	variable	coefficient	t-statistic
constant	5.58	18.4	AD4S5	0.001	3.4
log (TNS)	-0.28	-12.2	Ind1	0.39	1.89
Π/TNS	0.02	11.4	Ind2	0.41	2.1
$(\Pi/TNS)^3$	-8E-7	-4.2	Ind3	0.87	4.4
$(\Pi/TNS)^4$	2E-9	3.6	Ind4	0.20	1.04
D/TNS	-2E-3	-4.0	Ind5	0.18	0.78
L/TNS	11.37	1.23	Ind6	0.55	2.6
FOR	0.65	5.0	Ind8	0.99	4.6
DOM	0.35	3.2	Ind9	0.64	2.6
FNM	0.43	5.7	West Boh.	0.23	2.7
IPF5	0.20	3.3	Round1	0.24	1.60
AD1S2	0.02	6.8	Round2	-9E3	-0.08
AD2S3	0.01	7.7	Round4	-0.57	-5.3
AD3S4	0.009	5.8	-		

$R^2 = 0.55$, adj. $R^2 = 0.54$, number of observations 949. Note. Official data of CKP and FNM. $\log(P_\lambda)$ = Price at which the last share was sold. $\log(TNS)$ = Log of company's total number of shares. Π/TNS = Profit in 1991 (before the privatisation), divided by total number of shares. D/TNS = Debt in 1991 divided by the total number of shares. L/TNS = Labour in 1991 minus labour in 1990, divided by total number of shares. FOR = Dummy for presence of foreign investor; = 1 if more than 0% owned. DOM = Dummy for presence of domestic investor; = 1 if more than 0% owned. FNM = Dummy for > 20% stake of the National Property Fund (in other words, dummy for relatively significant state ownership). $IPF5$ = Dummy for 5 largest funds holding more than 50% of shares. $West Boh.$ = Dummy for West Bohemia region. $AD_jS_{j+1} = (D_{j,i}/S_{j+1,i})/(\sum_i D_{j,i}/\sum_i S_{j+1,i})$, where $D_{j,i}$ is demand for firm i in round j , S is supply for firm i in round $j+1$. Aggregate demand and supply are in denominator. If supply for company shares in the round $j+1$ was zero, $AD_jS_{j+1} = 0$. $IND1, \dots, IND9$ = Dummy for sectors (9 out of 10 sectors): 1. Agriculture, 2. Heavy Industry, 3. Light Industry, 4. Construction, 5. Transport and Telecommunications, 6. Trade, 7. R&D, 8. Service, 9. Finance and Defence. $Round1$ = Dummy for ' λ ' = 1, i.e. the last shares were sold in the first round. Similarly for $Round2$ and $Round4$. Round 3 was not significant

Table 3.8-2. Regression for P_λ with FSH instead of IPF5.

variable	coefficient	<i>t</i> -statistic	variable	coefficient	<i>t</i> -statistic
constant	4.65	6.10	AD4S5	0.001	3.1
log (TNS)	-0.31	-14.1	Ind1	1.35	1.85
Π/TNS	0.017	10.3	Ind2	1.33	1.83
$(\Pi/TNS)^3$	-6E-7	-3.6	Ind3	1.80	2.5
$(\Pi/TNS)^4$	2E-9	3.0	Ind4	1.16	1.60
D/TNS	-2E-3	-4.0	Ind5	1.11	1.51
L/TNS	11.92	1.35	Ind6	1.47	2.0
FOR	0.83	6.7	Ind7	1.05	1.40
DOM	0.45	4.4	Ind8	1.97	2.7
FNM	0.53	7.4	Ind9	1.67	2.3
FSH	1.22	9.8	West Boh.	0.20	2.5
AD1S2	0.014	6.2	Round1	0.73	5.0
AD2S3	0.012	7.4	Round2	0.32	3.0
AD3S4	0.009	6.1	Round4	-0.46	-4.5

$R^2 = 0.591$, adj. $R^2 = 0.579$, number of observations 949.

Note: FSH = $\Sigma(\text{from } j=1 \text{ to } \lambda-1)IPF_{j,i}/TNS_i$, where IPF_i is a number of shares of firm i acquired by IPF in round j . If $\lambda=1$, FSH=0. For other variables see note to table 5.1.

Table 3.8-3. Regression for P_λ with FSH for the second wave, data from 1993.

variable	coefficient	<i>t</i> -statistic	variable	coefficient	<i>t</i> -statistic
constant	2.018	6.5	DOM	0.492	5.6
log (TNS)	0.052	2.13	FNM30	0.581	5.5
Π/TNS	4E-7	0.85	FSH	0.816	6.0
D/TNS	-0.184	-2.6	AD1S2	8E-3	9.4
Labour	-0.127	-2.5	AD3S4	1E-3	5.9
S/TNS	0.098	5.2	AD4S5	2E-4	6.2
Log(Depr)	-0.018	-0.73	Wave1	0.529	6.9
FOR	0.544	2.9	-		

$R^2 = 0.352$, adj. $R^2 = 0.341$, number of observations 822.

Note: Labour = (labour 1993 – labour 1991)/labour 1991, S/TNS = Sales divided by TNS, Depr = depreciation, FNM30 = Dummy for > 30% stake of the National Property Fund (in other words, dummy for relatively significant state ownership). The number is increased compared to variable FNM used in the first wave regressions as 20% stakes of FNM became more common in the second wave. Wave1 = Dummy = 1 if firm was partly privatised already in the first voucher wave. For other variables see notes to tables 5.1 and 5.2.

variable	coefficient	t-statistic	variable	coefficient	t-statistic
constant	5.06	14.3	FNM	0.19	1.77
$\log(A)$	0.038	1.42	IND2	-0.13	-1.06
Π/A	5.19	11.2	IND3	0.93	5.2
R/A	0.13	1.22	IND8	-0.29	-3.2
FOR	0.82	5.9	IND14	-0.16	-1.40
DOM	0.11	0.78	IND17	0.67	3.3
IPF5	0.27	3.6	-		

$R^2 = 0.46$, $\text{adj.}R^2 = 0.45$, number of observations 433

Note. Data from the Prague Stock Exchange. $\log(P_{PSE1993})$ = log of share price by the end of December 1993. $\log(P_{PSE1994})$ = log of share price by the end of March 1994. $\log(A)$ = Log of company's net assets, December 1992. Π/A = Profit in 1992, divided by net assets. R/A = Sales in 1992, divided by net assets. FOR = Dummy for presence of foreigner investor; = 1 if more than 0% owned. DOM = Dummy for presence of domestic investor; = 1 if more than 0% owned. FNM = Dummy for >20% stake of the National Property Fund. IPF5 = Dummy for 5 largest funds holding more than 50% of shares. IND2,... = Dummy for sectors: 2. Food production, 3. Beverages and tobacco, 5. Textile, clothing and leather goods, 6. Wooden goods, 8. Construction and construction materials, 10. Machinery, 12. Energy, 14. Trade, 17. Jewellery, glass and ceramics.

variable	coefficient	t-statistic	variable	coefficient	t-statistic
constant	3.91	11.9	IND2	-0.22	-1.66
$\log(A)$	0.13	5.3	IND3	0.79	4.2
Π/A	5.82	12.5	IND5	-0.22	-1.28
R/A	0.05	0.49	IND6	-0.12	-0.85
FOR	0.95	6.6	IND8	-0.37	-4.1
DOM	0.40	3.1	IND10	-0.25	-2.6
FNM	0.11	1.14	IND14	-0.38	-3.6
IPF5	0.24	3.2	IND17	0.69	3.2

$R^2 = 0.43$, $\text{adj.}R^2 = 0.41$, number of observations 612.

4 The Impact of Czech Privatisation Methods on Enterprise Performance Incorporating Initial Selection Bias Correction²³

Abstract

Governments with transitional economies have applied different privatisation methods, from an almost free distribution to the direct sales of state assets. While a free distribution was believed to ensure the political feasibility of the program and its fairness, direct sales, or more generally, standard privatisation methods had a significant advantage in creating concentrated ownership structures as the prerequisite to corporate control and restructuring. Many economists believe that the two goals of mass privatisation, political feasibility and creation of proper ownership incentives, contradict each other and recent empirical comparisons of enterprises seem to support their view. However, all empirical works have been based on the weak assumption that privatisation methods were applied on a randomly selected samples of enterprises, which then allowed for a direct comparison between these enterprises. Our main claim is that governments indeed selected enterprises non-randomly and therefore, the resulting selection bias must be incorporated into the analyses. To show this, we apply a Heckman two-step regression method on a sample of 559 Czech enterprises. The main point of this paper then is that performance is influenced by the selection process and combination of vouchers with outsider owners is preferred over 100% voucherisation.

²³ The essay was published by *Economics of Transition* as “The Impact of Czech Privatisation Methods on Enterprise Performance Incorporating Initial Selection Bias Correction” by Marcincin and van Wijnbergen (1997). The author of this thesis presented the paper at CEP LSE and in Sofia in 1996, at CERT Edinburgh in 1997, and at IAES Conference in Rome in 1998.

4.1 Introduction

There is now a large economic literature on the voucher scheme adopted by the Czech (then the Czechoslovak Federal) government. The more critical roots of that literature contain works by Bolton and Roland (1992), Dewatripont and Roland (1992), Roland and Verdier (1994), Roland (1996), and Vickers and Yarrow (1991), who saw the danger of a free distribution of property as leading to budgetary crises and unleashing inflation at the macroeconomic level, and preserving the position of incumbent managers, giving them few incentives to restructure on the microeconomic level. The government was consequently advised to adopt gradual reform (and gradual privatisation), which could be corrected at every step, and thus ensure more credibility to the program. A more positive view on the Czech voucher scheme can be found in papers by Aghion (1993), and Lipton and Sachs (1990), who, in contrast, claimed that the fast pace of reform, allowed by the use of vouchers, would give more credibility to the program, and therefore a better chance to succeed. A theoretical background for the speed and credibility argument could be found, for instance, in van Wijnbergen's (1992) paper on the political economy of price reform, or in Rodrik (1989).

Although the two views on reform speed as a credibility tool were completely opposite in nature, they generally found consensus in bad corporate governance consequences in the implementation of voucher schemes (see for instance Transition Report 1995). First of all, the use of vouchers was believed to create a dispersed ownership unable to affect incumbent managers. Claessens (1995), Lastovicka et al. (1995), and Marcincin (1995) showed that this might not be true, as companies could be controlled by small coalitions of investment privatisation funds and other outside owners.²⁴ Still, the question of whether

²⁴ We shall try to correct a view on the Czech privatisation program, exhibited for instance in Transition Report 1995, that 50.7% of the realised nominal stock value by December 1994 was privatised by vouchers, while only 7% through direct sales, and that many companies were from 97% privatised by vouchers. First of all, property estimated at about CZK 70 to 120 billion was privatised through restitution, CZK 21 billion through small privatisation auctions, CZK 200 to 230 billion through co-operations, CZK 480 through large privatisation and over CZK 350 billion through free transfer to municipalities. Therefore, from total property privatised, estimated at CZK 1,121 to 1,221 billion, less than half was privatised in large privatisation, which also involved the voucher method (estimates of the National Property Fund, *Hospodarske noviny*, January 23, 1995). The correct amount of voucher privatisation share on property privatised, 50.7% (almost the same as reported by Hrnčirova and Sabela, 1995, 50.6%), means that about one half of the property privatised in large privatisation went through vouchers, or that a quarter of total privatised property was privatised by vouchers, while the rest was privatised by free

investment privatisation funds would have proper incentives to be involved in costly monitoring of companies and their corporate control remained open. Second, recent evidence of restructuring changes in Poland, Hungary and the Czech Republic (see for instance Aghion et al., 1994, Belka et al., 1995, Pinto et al., 1993, and Transition Report 1995), seemed to prove that privatisation methods and restructuring measures often are not correlated (perhaps with the exception of direct sales to foreign investors), and that voucher privatised companies often showed worse results than companies privatised by other methods.²⁵ Although it was recognised that these comparisons probably suffered from the assumption of no selection bias, they were generally accepted as an empirical proof of a negative influence of the voucher privatisation method on company performance (or restructuring).

It is worth noting that comparisons of performance (or restructuring) of state-owned companies and those privatised in different ways on the basis of their own performance at the beginning of transformation, or just between themselves meet two serious problems. Firstly, an assumption of *ceteris paribus* is contradicted, because the whole environment in which they had been operating changed tremendously. This has an implication especially on the performance of state-owned companies. Even if they restructured more than privatised companies, the hypothesis that privatisation was not necessary cannot be accepted, because too many other explanatory variables are omitted. In fact, such a test is simply wrongly specified. Secondly, there is likelihood that companies were not selected randomly for privatisation by different methods (or to remain state-owned). Put simply, if foreign investors picked the best enterprises, and the worse were privatised by vouchers, then it should be no surprise that the former would show a much better performance and restructuring today than the latter. The question therefore is whether such selection bias was present, and then whether voucher privatisation was suitable for the privatisation of selected (presumably bad) enterprises.

transfers, direct sales, auctions and tenders. Secondly, a median company was privatised by vouchers from 92% in the first, and 81% in the second waves. However, using assets as a weight we come up with an average voucher stake of 64% and 43%, respectively. Note that for the second wave we considered only companies which were not listed in the first wave. See also Mejstrik (1997).

²⁵ Contrary to this, van Wijnbergen and Marcincin (1995, 1997) showed that there was a positive and significant correlation between outsider ownership, including strong groups of five investment privatisation funds, and company price on the stock exchange. This also suggests that investment privatisation funds, if they had a strong ownership position, were believed to improve (or were improving) company performance.

In this paper we briefly describe relevant features of the Czech privatisation program, then model the behaviour of the government which hoped to gain support for its reforms from fast privatisation, and thus applied both voucher distribution and direct sales methods. Then we estimate a selection rule from data available at the time of the method decision (1991) and try to estimate several measures, distinguishing between impact of corporate governance type and the selection bias. These measures involved (i) stock exchange prices in April 1995, using fresh financial data on enterprises from 1994, (ii) change in these prices with respect to equilibrium prices in the voucher market, and (iii) direct financial indicators like return on assets, return on equity, and profit margin on sales. Finally, we compare the two groups of companies and discuss the possible benefits of the voucher method for the government.

4.2 Description of the Czech Privatisation Program.

The main feature of the Czech reform was that it was fast: In November 1989, people went to the streets. In December 1989, the still-communist parliament elected Vaclav Havel as president of the country. During 1990, the first macroeconomic reforms gradually started being implemented and the legislative background for other parts of the overall reform was being prepared. At the beginning of 1991, small and large privatisation acts were approved by the parliament. In November 1991, voucher booklets, carrying the signature of Prime Minister Vaclav Klaus, started being sold. In summer 1992, the Klaus-formed party won the general elections (and in December 1992, the country split), and in 1994, the second wave of voucher privatisation took place. Finally, at the end of 1995, the country enjoyed political stability and the largest percentage of private production on GDP in the region.

A detailed look at the reform suggests that Klaus gained credibility for his reform by its fast pace, by overstating its magnitude (as suggested by Rodrik, 1989), and by not allowing the old nomenclature and incumbent managers to form an opposition to the reform in its later stages (when the status-quo bias was more likely to appear, as in Fernandez and Rodrik, 1991²⁶). All this was quite unlikely without voucher privatisation, which was an integral part of the reform program. Vouchers allowed for the fast pace of the reform, a wide participation of citizens, who started to learn the principles of capitalism, and ensured the irreversibility of

²⁶ At the beginning of reform in post-communist countries, there was no such bias, because the old status quo was widely rejected. However, in the later stages of reforms we can observe their partial reversals which is very similar to the yes - no pattern of Fernandez and Rodrik's model (p. 1152).

the reform. But at the same time, rapid implementation of voucher privatisation required, in the first place, a rapid preparation of privatisation projects (which would describe in detail each company and how its parts were to be privatised); especially, when vouchers were not the only privatisation method to be applied²⁷.

Privatisation projects were prepared by insiders as an obligation, and could also be prepared by anyone else. Out of 11,163 projects submitted by the end of 1992 (for 2,876 companies involved), about 3,500 was selected for implementation; the majority of them were projects submitted by insiders. In the first wave of voucher privatisation, almost 1,000 companies were privatised; the majority of them ended up being owned exclusively by small individual investors and investment privatisation funds. If we accept the logic of dispersed ownership (free-rider problem) and inactive investment privatisation funds, insiders were the ones who mostly benefited from vouchers. Indeed, this was their expectation and thus might have positively influenced their decision not to oppose reforms and the privatisation process. We can clearly see the trade-off between political and economic gains related to the voucher scheme. What actually happened (according to the anecdotal evidence) was that some investment funds were inactive and some were not, thus they stratified insiders into gainers (in the first case) and losers (in the second case).

There is another point linked to vouchers, worth noting. Vouchers often made the investment of direct investors cheaper, because it was enough for them to buy only a small portion of shares, rather than the majority of shares, in order to gain *de-facto* majority control. They would enter the company if they believed that they could gain fast profits (but such good enterprise would probably be sold for cash in standard sale), or buy the rest for a good price later on. This partial buy-in could also positively balance the uncertainty of the economic and political environment. Thus vouchers can also be understood as an additional economic stimulus to investors.

From a purely economic point of view, the following agents of restructuring can be distinguished in the Czech privatisation program: insiders, who meet (or not) the pressure from owners, strong outsiders, by which we understand direct investors (privatisation through direct sales, tenders, auctions), and dispersed or

²⁷ We shall correct the wide-spread belief that privatisation was executed in the method of one input, one output. Often, different operational units of one big “input” company were privatised separately by different methods, to produce many “outputs”, even in different sectors. In the case of voucher privatisation, the belief was that 100% of shares was privatised by vouchers. This also was not true, as the list of owners would often also contain foreign and domestic direct investors, National Property Fund, municipalities, banks, and restitutions.

weak outsiders by which we understand small individual shareholders and investment privatisation funds (voucher privatisation). Strong outsiders are able and willing to exercise corporate control and hence to increase the performance of companies. Weak outsiders are expected to have lower incentives to monitor and control insiders, thus company performance and restructuring will depend much on the type of insider. Following Aghion et al. (1994) and Roland (1996) one can expect, due to the insider's objective function, a systematically worse performance of companies owned by weak outsiders.

The description presented above leads us to the formulation of the hypothesis, which we test in this paper: Is performance (or the restructuring pace) of voucher privatised companies worse than those of non-voucher privatised companies? And if so, is it because bad companies were selected for voucher privatisation, or because of weak corporate governance, i.e. the wrong ownership structure generated by vouchers? Finally, is voucher privatisation recommendable at all?

4.3 The Model

Consider a government which has to decide on which company will be privatised by method A and which by method B. Method A is assumed to generate a dispersed ownership structure and thus delay restructuring, while method B is assumed to generate a well defined concentrated ownership structure and fast restructuring. In the presence of no restrictions, all companies will be privatised by method B. Now, let us assume that there are at least two important restrictions. First, a need to (i) quickly privatise a large number of enterprises so that they can undertake restructuring and bring positive results to the program as soon as possible, (ii) compensate and involve unwealthy citizens in the process, and (iii) build (through mentioned signalling) the credibility of the program and government, so that it will be re-elected. Second, only a limited bulk of potential investments is available in the short run (in other words, a limited number of potential investors can be attracted in the short period). It is clear that these two restrictions are positively correlated, because rapid privatisation ensures the credibility of the program which then attracts more investors, who, while restructuring, signal to other investors that the program is credible. This will result in the acceleration of investment influx, privatisation, consequent restructuring pace and a better chance for government to stay in power.²⁸

²⁸ We do not want to go deeper into analysing the consequences of the two restrictions, for the analysis presented, it is enough to assume the restrictions exists.

Now, let us consider a simple model. Assume a discount factor θ , $0 < \theta < 1$; value that a company privatised by method A brings to the government, Z_A , and a value that a company privatised by method B brings to the government, Z_B . It is believed that $Z_A < Z_B$, both positive. Let the number of companies to be privatised be n and, further, all companies be identical, so that n companies bring a total value to the government nZ_j , $j = A$ or B . Two periods for privatisation are available. Now, if the government decided to privatise all companies by method B, its payoff is

$$R_{BB} = mZ_B + \theta(n-m)Z_B \quad \mathbf{4-1}$$

This is because outsider investment is available only to m companies in the first period. The rest is then privatised in the second period, when more risk averse investors arrive. However, if the government decided to overcome the restriction of limited investments, it could apply method A to the remaining companies in the first period. Its respective payoff then becomes

$$R_{AB} = mZ_B + (n-m)Z_A \quad \mathbf{4-2}$$

The difference between R_{BB} and R_{AB} is positive only if $\theta > Z_A/Z_B$. If the government wanted to accelerate its gains from privatisation, in other words if it valued present more than future, then it would likely apply both methods in the first period.

In the presence of the two restrictions, the optimal choice of the government will be to privatise enterprises demanded by investors by method B, and the rest by method A. Note that the better enterprises are expected be privatised by B. Also, the proposed choice will partially correspond to Roland's (1996) policy advice that good companies should be privatised first, so that their success will signal that the program is feasible to others (including voters).

In order to specify our regression model correctly, we borrowed some ideas and tools from labour economics (particularly, from Willis and Rosen, 1979, and Revenga et al., 1992). When estimating a treatment effect on two different samples, in which one was exposed to treatment while the second was not, which are suspected not to be selected randomly, the proper method is to apply a two-step regression specified by Heckman (1979)²⁹. The basic intuition behind the model of Willis and Rosen was that one couldn't estimate the influence of given educational

²⁹ See also Greene (1981).

patterns by a simple comparison of today's earnings of graduates and a control group without correcting for their decision to join one of the patterns. Such self-selection can involve different family background and talent. Then, today's earnings can accurately measure the initial abilities of the participants rather than the impact of a given type of education (or training).³⁰

Assume the regression model in the following form. Let n be the number of companies to be privatised, Z_{ij} be the potential privatisation gain to government from company i if method j was chosen, w_i a vector of company's observed restructuring potential and u_i an unobserved part of the company's restructuring potential. The government can rank $Z_{ij}(w_i, u_i)$ for all $i = 1, \dots, n$ in descending order, and decide to privatise first m (good) companies by method B, while remaining $n-m$ by method A, because the best value of privatising a good company is ensured by method B, while the best value of privatising a bad company is ensured by method A.³¹ This can be written as

$$Z_{ij} = Z_j(w_i, u_i), \quad i = 1, \dots, n, \quad j = A \text{ or } B$$

$$i \text{ privatised by method } j \text{ if } Z_{ij} = \max(Z_{iA}, Z_{iB}) \quad \mathbf{4-3}$$

It follows that since the proposed distribution of companies to privatisation groups A and B depends on (w, u) , the actual restructuring efforts observed today may be non-random samples of the population of potential restructuring efforts, because the companies with better perspectives have a higher chance to be observed in B class, than in A. Now consider a difference in the potential privatisation gain of company i

$$Z_i^* = Z_{iA} - Z_{iB} \quad \mathbf{4-4}$$

Company i will be privatised by method A if $Z_{iA} > Z_{iB}$ and by method B if $Z_{iA} \leq Z_{iB}$. The selection rule can be specified as follows:

$$\begin{aligned} \text{Prob}(\text{select for A}) &= \text{Prob}(Z_A > Z_B) = \text{Prob}(Z^* > 0) \\ \text{Prob}(\text{select for B}) &= \text{Prob}(Z_A \leq Z_B) = \text{Prob}(Z^* \leq 0) \end{aligned} \quad \mathbf{4-5}$$

³⁰ Perhaps the easiest explanation of selection-bias correction is the following: Imagine population of blue and red balls. Put the blue balls in box A and red balls in box B. Now, is it surprising that after five years one will find that all the balls in box A are still blue and that those in box B are still red? There is no impact as a result of being in different boxes for five years, if selection bias was considered.

³¹ It would not make sense to force the privatisation of bad company by method B. The quality of company is easily observed from demand of privatisers.

or in the form:

$$\begin{aligned} Z_i^* &= \boldsymbol{\gamma}'\mathbf{w}_i + u_i \\ z_i &= 1 \quad \text{if } Z_i^* > 0 \\ z_i &= 0 \quad \text{if } Z_i^* \leq 0 \end{aligned} \quad \mathbf{4-6}$$

Where z is a dummy variable indicating the presence or absence of method A “treatment”. Our aim is to test for a difference in the current restructuring efforts of companies privatised by method A and B measured by variable y , which is a function of the company's observed specifications x_i and unobserved specifications ε_i , with respect to the of whole population. Our regression equation then is³²

$$y_i = \boldsymbol{\beta}'\mathbf{x}_i + \delta z_i + \varepsilon_i \quad \mathbf{4-7}$$

We shall also assume that ε_i and u_i have bivariate normal distribution with zero means and correlation ρ .³³ The expected value of restructuring measure y_i for voucher companies then is:

$$\begin{aligned} E[y_i | z_i = 1] &= \boldsymbol{\beta}'\mathbf{x}_i + \delta + \rho\sigma_\varepsilon\lambda_{iA} \\ E[y_i | z_i = 0] &= \boldsymbol{\beta}'\mathbf{x}_i + \rho\sigma_\varepsilon\lambda_{iB} \end{aligned} \quad \mathbf{4-8}$$

Where $\lambda_{iA} \equiv \phi(\boldsymbol{\gamma}'\mathbf{w}_i)/\Phi(\boldsymbol{\gamma}'\mathbf{w}_i) \geq 0$, $\lambda_{iB} \equiv -\phi(\boldsymbol{\gamma}'\mathbf{w}_i)/[1-\Phi(\boldsymbol{\gamma}'\mathbf{w}_i)] \leq 0$, $\rho\sigma_\varepsilon\lambda_{iA} = E[\varepsilon_i | z_i = 1]$, and $\rho\sigma_\varepsilon\lambda_{iB} = E[\varepsilon_i | z_i = 0]$. The difference in the expected value of y_i then is

$$E[y_i | z_i = 1] - E[y_i | z_i = 0] = \delta + \rho\sigma_\varepsilon(\lambda_{iA} - \lambda_{iB}) = \delta + \rho\sigma_\varepsilon[\phi_i / (\Phi_i(1-\Phi_i))] \quad \mathbf{4-9}$$

And δ measures impact of type of corporate governance and $\rho\sigma_\varepsilon$ impact of the selection bias. One can also see that by omitting λ_i from the least square regression the coefficient of the dummy variable is overestimated, as it involves also the last (positive) term.

4.4 The Data

Four data sets were applied. The first data set (Data1) contains information on all privatisation projects submitted by fall 1991 (see Figure 4.4-1). We used it to determine the probability that an insider rather than outsider privatisation project would be approved, to highlight the importance of political consensus. The second

³² The exercise was adopted from Greene (1993), p. 713-14.

³³ $(u_i, \varepsilon_i) \sim$ bivariate normal $[0, 0, 1, \sigma_\varepsilon, \rho]$

Figure 4.4-1. Time structure of data used.

→					
fall '91	spring '92	spring '92	spring '93	spring '95	spring '95
Data1	Data2	Data2	-	Data3	Data4
Privatisation projects submitted	Performance 1991 info disclosed	Selection of projects: z = 1 or 0	Companies were privatised	Performance 1994 info disclosed	Stock exchange prices

data set (Data2) describes the characteristics of “output” companies as of 1991; those characteristics which could be observed by the government at the time when it decided on privatisation methods. The third data set (Data3) contains information on the performance of companies in 1994, disclosed in April 1995, and the last data set (Data4) contains the weighted prices of April 1995 from the Prague Stock Exchange. The Ministry of Privatisation and the National Property Fund compiled the first two data sets, the third and fourth data sets were available to the public for a small fee at the Prague Stock Exchange.

In what follows, we work with two samples of enterprises. The sample of voucher privatised companies, denoted by A, consists of 230 companies on which only voucher method was applied. In other words, vouchers privatised 100% of these companies' shares, although the ownership structure today may look rather different. This is due to a gradual concentration of ownership and the later buy-in of strong outsiders. The second sample, which we exaggerate a bit and call non-voucher companies, consists of 335 companies which, though partially voucher privatised, appeared to be partially sold to strong outsiders or remained in state hands in the National Property Fund (FNM). This selection of samples was made for several reasons: (i) data availability, (ii) as we have shown and as we show below, almost every company was partially privatised by vouchers and therefore the direct sale of 100 percent of shares to the strong outsider can be viewed in this framework as outlier, (iii) this selection allows us to test the hypothesis specified in section 4.2 of this paper. In the regressions presented in the appendix we used a different specification of samples to show how our results were sensitive to the data sample choice. Particularly, we included companies owned by more than 20% by FNM (whether temporarily or permanently), banks, municipalities or restitutes, or owned by more than 0% by direct foreign or domestic investors in the non-voucher sample B1, while the other companies were included in the voucher sample A1.

Table 4.5-1. Selection of submitted projects.

Logit, dependent Variable is Winner project.

variable	coefficient	t-statistic	mean of X*	variable	coefficient	t-stat.	mean X*
Constant	1.423	5.394	-	lnME	0.130	8.272	32
lnMA	0.041	2.803	3	lnMF	0.099	7.577	3
lnMB	0.099	7.218	17	lnRES	0.054	6.070	77
lnMC	0.090	8.174	25	Insider	2.187	27.426	0.28
lnMD	0.107	9.692	70	-	-	-	-

Log likelihood -2516.251, No. of obs. 5234, Obs (Dep=1) 1791, (Dep=0) 3443. *Mean prior logarithm, in million Kcs. Winner is a dummy variable equal 1 if project was selected and 0 if it was not. Ln is a natural logarithm, and M_i is a percentage of the total property considered in the project privatised by method i . A denotes public auctions, B public tenders, C direct sales, D commercialisation of company into joint stock structure and consequent privatisation of shares, E privatisation of an already existing state owned joint stock company, and F free transfer to municipalities, pension funds, banks, or saving banks. Insider is a dummy variable equal 1 if the project was submitted by insiders and 0 otherwise. Res is a percentage of unsolved residual equal to the difference between property claimed and property distributed to all methods. Note that methods D and E very highly correlated with a voucher method. See also table 4.8-1.

4.5 Estimations.

Firstly, we estimate a possible bias from the selection of privatisation projects out of the 11,163 projects submitted. The information available for both submitted and selected projects was rather limited; only the total property of the company was considered in the project, and its distribution among different privatisation methods. In table 4.8-1 we submit the results of our estimation; clearly, projects submitted by insiders, which proposed transformation of a state-owned firm to a joint-stock company and then the application of the voucher method (the voucher method was specified separately and was highly correlated with methods D and E, which were its pre-requisites) were more likely to be successful. This is the expected result. The government signalled its willingness to apply the voucher method and managers reacted in a positive way, believing it would generate a dispersed ownership. One can see that the positive reaction of managers was crucial for privatisation at that point.

The selection of the privatisation method at this stage can be well explained by the different character of the property involved in the projects (a full description of “output” units privatised by each method can be obtained from the authors upon request). For instance, there were operational units with the character of a public utility, which belonged to big state-owned companies, and were “privatised” by municipalities (e.g. kindergartens). There were lands, houses and apartments that were “privatised” either by the individuals who had been using them, or by municipalities. Many restaurants and hotels that belonged to big companies were

Table 4.5-2. Probit estimation of selection rule.

variable	coeff.	t-ratio	mean X	variable	coeff.	t-ratio	mean X
constant	0.4652	4.491	-	S/L	-0.6145	-3.014	0.527
A/L	-0.5293	-2.740	0.805	D/L	0.5156*	0.987	0.116
Π/L	-3.2564	-3.089	0.065	-	-	-	-

Log L at convergence -334.5, at zero -378.1. Sample size: Obs (z = 1) 228 and (z = 0) 332. Correct predictions 68%. *Denotes significance at 68% level. λ_A : mean 0.829, std. 0.278. λ_B : mean -0.567, std. 0.297. Variables: A/L = assets/labour, Π/L = profit/labour, S/L = sales/labour, D/L = debts/labour. Also see table 4.8-5.

also privatised separately. Thus we can conclude that mainstream privatisation was indeed affected by insiders from the very beginning, and that the main stream was somehow related to voucher privatisation (whether it was 10 or 97% of shares to be distributed by vouchers). It is important to note that this selection bias has no impact on the average manufacturing company privatised in the Czech privatisation program.

According to our model, the government based its selection decision on observed information about restructuring potential in privatised companies. We applied all data available to us, particularly the assets to labour ratio, the profitability of labour, revenues on labour, and bank loans on labour. The estimation result suggests that undercapitalised, low profit and revenues companies were the most likely to be selected for pure voucher privatisation (see table 4.5-2; for samples A1 and B1 see table 4.8-2. The assets to labour ratio did not play any role there, while the indebtedness coefficient was negative and significant.) Indeed, this supports the assumption of the model. Having estimated the selection rule equation, we calculated a new variable lambda to be plugged into the regressions of the performance measures as a corrector of selection bias.

The measures of performance or restructuring efforts are usually constrained by data availability. From our data we could utilise the following information, as our left-hand-side variables: 1. Stock exchange prices as the best

Table 4.5-3. Description of variables.

Price = Average price of shares on Prague stock exchange in April 1995, weighted by volume traded. CHPrice = Price on equilibrium price of voucher market in 1992. ROA = Return on assets. Net income on total assets. ROE = Return on equity. Net income on total equity. SA = Sales on total assets. Sales = revenues from merchandise sold + revenues from own manufactured products sold + capitalisation + sundry operating revenues. INTR = Inventory turnover. LOEQ = Short term and long term bank loans on equity. PS = Income from operations on sales. Income from operations = earnings from operations before other items and tax. EQAS = Total equity on total assets. Z = dummy equal 1 if voucher privatised, 0 otherwise. Logarithmic transformation was applied to all variables, except for ROA and ROE.

Table 4.5-4. Estimation of Price, ChPrice, ROA, ROE and PS.

LHS:	<u>Price</u>		<u>ChPrice</u>		<u>ROA</u>		<u>ROE</u>		<u>PS</u>	
	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio
Const.	6.45	30.91	2.33	13.58	0.06	4.23	0.07	1.68	-4.96	-20.83
ROA	3.00	7.78	2.31	4.68	-	-	-	-	-0.56	-1.77
SA	0.30	5.90	-	-	0.02	2.98	0.02	1.50	-1.11	-11.45
InTr	-0.04	-1.57	-	-	-4E-3	-1.35	-	-	-	-
LoEq	-0.15	-4.59	-	-	-	-	-	-	-	-
PS	0.12	6.29	0.07	3.10	-	-	-0.01	-1.77	-	-
EqAs	-0.36	-3.50	-0.17	-1.50	0.04	4.48	0.18	7.02	0.65	3.20
Z	-1.38	-5.71	0.16	0.61	-0.05	-2.08	-0.11	-1.78	-1.47	-3.22
λ	0.74	4.81	0.10	0.56	0.03	1.90	0.08	2.00	0.59	1.96
No. of obs.	560		556		560		560		560	
R ² , adj. R ²	0.29	0.28	0.06	0.06	0.06	0.05	0.09	0.09	0.25	0.24
σ_ε	1.018		1.117		0.097		0.263		1.950	
ρ	0.725		0.088		0.291		0.307		0.301	
mean of LHS	5.458		2.107		3.93E-3		-1.27E-2		-5.685	
Z(OLS)	-0.32	-4.12	0.30	3.08	-0.01	-0.88	4E-3	0.17	-0.64	-3.87

complex evaluation measure of company performance and restructuring progress which have been made or is believed to be made. 2. Difference in prices at stock exchange in April 1995 and equilibrium prices from the voucher market in 1992. More direct measures involved 3. Return on assets, 4. Return on equity, and 5. Profit margin on sales. The selection of the explanatory, or right-hand-side, variables again depended on availability. We tried to include all variables, which could be expected to have any influence on dependent variables. For the list and description, see table 4.5-3.

In table 4.5-4 we display our estimates of the five measures. (1) Price is positively correlated with returns on assets, sales on assets, and profit on sales, and negatively correlated with inventory turnover (less inventory in stock brings a higher price; significant on 0.11), indebtedness, and equity to assets ratio (less shares outstanding for the same asset value). All this could be expected. Coefficient of Z is significant, negative and smaller than coefficient on the same dummy generated by the OLS, which is roughly the same as expected value displayed in table 4.5-5. The true negative impact of 100% voucherisation is therefore even bigger than what is observed.³⁴

³⁴ The positive coefficient of λ shows that the observed prices of voucher privatised companies are lower compared with the prices that would have been observed for the average member of this sample. At the same time it suggests that the observed prices of non-voucher privatised companies are higher compared with the prices that would have been observed for the average member of this sample. However, in this case, negative δ dominates.

Table 4.5-5. Estimation of corporate governance and selection bias impacts.

	<u>Price</u>	<u>ChPrice</u>	<u>ROA</u>	<u>ROE</u>	<u>PS</u>	<u>impact</u>
δ	-1.3747	not significant	-0.0476	-0.1109	-1.4749	true corp. gov.
$\rho\sigma_\varepsilon(\lambda_{iA} - \lambda_{iB})$	1.0294	not significant	0.0396	0.1126	0.8120	selection bias
Total	-0.3219	-	-0.0080	0.0017	-0.6629	observed value

(2) Signs of coefficients on explanatory variables for ChPrice are the same as for Price, except for the dummy variable Z. While the positive coefficient on zet calculated by the OLS regression is significant (zet observed), the true value is insignificant. There is no difference in after-voucher price development between the samples.

(3, 4) Return on assets, ROA, and Return on equity, ROE, increase with higher sales on assets and equity on assets, and decrease with higher inventory turnover or profit margin on sales, respectively. The coefficients on lambda and Z are both significant. While voucherised companies are observed to have ROA lower and ROE higher than non-voucherised, the corporate governance effects are in fact in both cases negative.

(5) Gross profit on sales, PS, is positively correlated with equity on assets, and negatively correlated with sales on assets and returns on equity. Dummy Z is negative and significant, again higher than if calculated by the OLS regression (or observed).

In the appendix tables 4.8-2, 4.8-3 and 4.8-4 we present the same calculations for different sample specification (A1 and B1; A1 consists from companies without domestic or foreign direct investor, and without other outsiders holding individually at least 20% of shares). Again, corporate governance effect of voucherisation is even more negative than observed. The post-voucher price development is the same for both the samples. Our controlling regressions thus confirmed results from first estimations.

4.6 Conclusion

Voucher privatisation is widely believed to generate the wrong ownership structure in the sense that it does not generate the right incentives to improve the performance of companies in the desired speed or way. Thus, the application of the voucher method was made highly questionable. In this paper, a simple model of government choice of privatisation techniques is presented in order to explain what may lead government to apply a combination of standard and non-standard (voucher) privatisation methods. Then, Heckman's two step regression is applied on several measures of performance. This regression is often used in labour economics when it has to correct for self-selection bias, sometimes called talent of

applicant. It appears that the stock exchange evaluates non-voucher companies higher than voucher companies and that all other examined measures tend to be higher for the first mentioned as well. For voucherised companies, the corporate governance has negative effect, which outweighs estimated impact of negative selection bias. Observed difference between fully voucherised and partly voucherised companies is always lower than true. Finally, our results suggest that comparisons between companies privatised by different privatisation methods do suffer from selection bias.

Our analysis did not show that voucher privatisation as such necessarily leads to bad corporate governance. It only shows that voucher privatisation applied in the Czech economy within certain framework of regulation led to bad corporate control. Voucher privatisation do not automatically improve market shape – that probably is the main message for reformers. Voucher privatisation is only a single step in overall reform.

It is also possible to view the stock exchange price as a measure of future performance, while other dependent variables (like profitability) as measures of restructuring already undertaken.³⁵ Then, due to the short after-privatisation period, a few differences between the samples would be observed in the measures of the recent past, and the true difference would be measured only by the measure of the future, i. e. the stock exchange price. Unfortunately, we have to accept that we do not really know what that price actually means: A majority of trading with shares (often estimated at as high as 90%) is done off the stock exchange, and the demand reflects a gradual concentration of ownership, the “third wave” of privatisation. In the first case, we can argue that the stock exchange price is the best approximation of true price, but in the second case, we are not so certain. Demand due to concentration can be very sensitive to new legislation on the protection of the minority shareholder. Demand can also reflect a concentration of market power within industries, as a response to actual or expected openness of the Czech market to foreign competition. The relationship between the stock exchange price as the LHS variable, and the detailed ownership structure together with market power as the RHS variables would be an interesting topic for future research, if data on new ownership structures were available.

Obviously, it would also help to collect more data on randomly selected companies privatised by other methods, like manager buy-outs or employee ownership. However, one should be very careful to distinguish between industry and company specific features. It would hardly make any sense to compare a few

³⁵ Here we benefited from a discussion with Francesca Cornelli.

successful state monopolies or pharmaceutical companies privatised by Western investors with the average Czech company.

4.7 References

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4.8 Appendix

Table 4.8-1. Privatisation projects submitted by November 1991.

projects	no. of	no. of	property distributed	methods (% of property)						
	projects	firms		A	B	C	D	E	F	vp.
basic	2,906	2,876	907,077	3.1	8.5	4.9	36.2	28.7	2.4	27.5
competing	8,257	1,907	976,198	4.1	3.7	19.8	20.3	10.1	3.1	16.9
Total	11,163	2,876	1,883,275	3.6	6.0	12.6	28.0	19.0	2.8	22.1

Property in million Kcs, 1991. Note that numbers of property distribution in methods are to be taken as estimates rather than exact values, as they do not add up to the total property involved. The sum of total property involved is obviously much higher than the value of all 2,876 firms.

Table 4.8-2. Probit estimation of selection rule. Samples A1 and B1.

variable	coeff.	t-ratio	mean of X	variable	coeff.	t-ratio	mean of X
constant	1.1018	11.818	-	S/L	-0.3779	-2.612	0.529
Π/L	-1.8215	-1.822	0.065	D/L	-1.1599	-2.944	0.116

Log L at convergence -295.0, at zero -324.4. Sample size: Obs ($z = 1$) 411 and ($z = 0$) 149. Correct predictions 76%. λ_A : mean 0.404, std. 0.159. λ_B : mean -1.115, std. 0.387. Variables: Π/L = profit/labour, S/L = sales/labour, D/L = debts/labour. Zet1 = 0 if temporary or permanent stakes of FNM > 20%, or restitutions > 20%, or bank temporary > 20%, or free distribution > 20%, or foreign investor > 0%, or domestic investor > 0%. Also see table A4.

Table 4.8-3. Estimation of Price, ChPrice, PS and LoEq. Samples A1 and B1.

Dep. var.:	Price		ChPrice		PS		LoEq	
Variable	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio
Constant	6.92	25.88	2.23	8.48	-4.13	-9.11	-2.85	-9.95
ROA	3.15	7.91	2.39	4.92	-	-	-	-
ROE	-	-	-	-	-0.55	-1.73	-	-
SA	0.30	5.80	-	-	-1.14	-11.68	0.10	1.66
InTr	-0.04	-1.59	-	-	-	-	0.23	6.54
LoEq	-0.16	-4.99	-	-	-	-	-	-
PS	0.12	6.45	0.06	2.93	-	-	-	-
EqAs	-0.42	-4.14	-0.17	-1.50	0.62	3.09	-1.36	-11.15
Z1	-1.43	-4.90	0.20	0.62	-1.96	-3.37	-0.75	-2.19
λ	0.77	4.34	0.19	0.97	1.07	3.01	0.43	2.03
No. of obs.	560		556		560	560		
R^2 , adj. R^2	0.27	0.26	0.08	0.07	0.23	0.23	0.30	0.29
σ_ε	1.024		1.111		2.057		1.120	
ρ	0.747		0.174		0.520		0.355	
mean of dep. var.	5.458		2.107		-5.685		-1.829	
Z1(OLS)	-0.26	-3.01	0.50	4.63	-0.33	-1.78	-0.10	-0.87

Table 4.8-4. Estimation of corp. gov. and selection bias impacts. A1, B1.

	<u>Price</u>	<u>ChPrice</u>	<u>PS</u>	<u>LoEq</u>
δ	-1.4307	not significant	-1.9582	-0.7468
$\rho\sigma_\varepsilon(\lambda_{iA} - \lambda_{iB})$	<u>1.1633</u>	not significant	<u>1.6252</u>	<u>0.6472</u>
Total	-0.2674	-	-0.3320	-0.0996

Table 4.8-5. Description of variables used in regressions.

Rule: Z = 0 if any non-voucher method > 0%, Z1=0 if (fnmt \vee fnmp \vee free \vee bank \vee rest)>20 \vee (for \vee dom)>0.
Z = 1 otherwise.

Sample:	Z = 0		Z = 1		Z1 = 0		Z1 = 1	
variable	mean	std.	mean	std.	mean	std.	mean	std.
Ownership structure								
Insider*	0.756	0.430	0.877	0.330	0.711	0.455	0.839	0.368
Vouchers*	69.554	20.394	96.137	4.126	53.369	14.920	90.154	11.697
Foreign*	2.901	11.932	0.000	0.000	5.812	15.482	0.000	0.000
Domestic*	2.596	9.454	0.000	0.000	5.403	12.794	0.000	0.000
FNM temp*	13.292	17.028	0.066	0.996	21.906	20.428	2.761	5.912
FNM perm	0.157	1.678	0.000	0.000	0.208	2.459	0.051	0.305
Banks*	3.060	9.083	0.000	0.000	4.383	11.963	0.885	3.848
Free*	2.581	6.453	0.000	0.000	2.752	8.554	1.090	2.947
Restituents**	0.904	4.011	0.000	0.000	0.752	5.188	0.459	1.878
Residual**	4.955	4.142	3.797	4.017	5.416	5.042	4.600	6.695
Estimation of Selection rule								
C/L**	1.044	3.856	0.456	0.332	1.462	5.686	0.567	0.546
Π/L^*	0.088	0.150	0.030	0.048	0.116	0.196	0.046	0.075
R/L*	0.650	0.585	0.350	0.284	0.759	0.708	0.444	0.379
D/L*	0.140	0.209	0.081	0.117	0.186	0.282	0.090	0.113
C**	1,129	4,141	404.039	866.763	1,547	6,043	575.448	1,002
Estimation of Performance								
Price*	471.142	550.354	302.172	438.496	476.544	516.072	375.627	511.56
Price(λ)*	72.657	119.915	33.013	44.506	99.012	148.853	41.130	65.855
ROA	57E-4	0.083	14E-4	0.117	0.011	0.068	13E-4	0.107
ROE	-0.022	0.305	32E-4	0.207	77E-4	0.130	-0.020	0.304
SA	0.990	0.575	1.120	1.066	1.005	0.621	1.056	0.872
INTR	82.757	103.895	81.555	91.966	72.310	73.295	85.888	106.85
LOEQ	0.359	0.691	0.276	0.366	0.318	0.325	0.328	0.651
PS	-0.117	1.921	0.039	0.095	-0.192	2.564	-33E-4	0.781
EQAS	0.637	0.190	0.653	0.182	0.636	0.195	0.646	0.184
Lambda	-0.567	0.297	0.829	0.278	-1.115	0.387	0.404	0.159

*Denotes significantly different means for both Z and Z1, while **denotes significantly different means only for Z. Number of observations (Z=0) 332, (Z=1) 228, (Z1=0) 149, (Z1=1) 411.

5 Investment Privatisation Funds in Corporate Control³⁶

Abstract

Investment privatisation funds (IPFs) became the most important owners of firms privatised by voucher method. Therefore, restructuring in voucherised firms crucially depends on their involvement into corporate governance. In this essay we investigate whether investors evaluated corporate control oriented IPFs higher than other IPFs, as an evidence of the market's positive expectations connected to the funds' abilities to increase asset value by an active participation in the firms restructuring.

³⁶ This essay is the author's extension of his contribution to paper written with Shemetilo "Performance of the shares in the Investment Funds Portfolios and their strategy" published by CERGE-EI as a Working Paper in 1995. The paper was presented on many conferences, for example at CEP LSE in 1996.

5.1 Introduction

The IPFs became the most important player in the voucher market³⁷ and consequently, the owner of voucher privatised companies. Therefore, the efficiency of the voucher privatisation method above all depended on the activities of the funds, whether they had been involved in the companies restructuring or facilitated a concentration of ownership by other, outsider or insider, investors. If fund managers, hardly controllable and replaceable by fund owners, were satisfied with a stable income of 2% of the managed portfolio value, vouchers would not lead to the recovery of transference of ownership rights as a condition for the development of optimal ownership structures (Frydman et al., 1993).

Some IPFs were purely private, some were established by state owned banks or joint-stock companies.³⁸ Important distinction between Czechoslovak (CS) IPFs and funds appearing in other privatisation programs (for instance, Polish and Romanian) was that the first were created spontaneously, while the latter were established by governments. Also, in the CS voucher program individuals were absolutely free to choose among IPFs, or spend their vouchers by themselves.

The regulation of investment funds was very weak,³⁹ due to the lack of relevant legislation. The aim to finish voucher privatisation before the elections in summer 1992 resulted in funds being registered as joint stock companies and regulated by *ad hoc* governmental decrees. In the legislative vacuum, a majority of funds did not disclose neither their full prospectus, nor composition of their assets, nor description of operational charges, nor personal histories of the members of the board of directors. Only in April 1992 did a new law regulate the activities of IPFs. The law included a disclosure rule, diversification requirements, prevention of conflicts of interests, and rules regulating fund operation. The existing IPFs were declared investment funds, and investment companies were defined as their founders and managers. Bank-established funds were forbidden to invest in shares of their founder or other banks. The supervision of IPFs was under the commission of Finance Ministry, which in fact had only six officers with extremely limited informational and technical support.

It is not the goal of any mutual fund, including IPFs, to be a “too active” owner. Especially, the new-born IPFs had no human and technical potential to manage the restructuring of the often hundreds of companies in their portfolios. Even if they

³⁷They collected 6,111,812,300 out of total 8,565,642,000 investment points, or 71%.

³⁸ Basically, they were closed-end mutual funds, which held portfolios of shares privatised by vouchers, and had a fixed number of shares outstanding.

³⁹ Description of IPFs in this paragraph is based on Mejstrik (1994).

Table 5.2-1. Top 14 privatisation companies.

Fund	Collected points	%funds ¹	%total ²	Shares held	%funds ³	%total ⁴
SIS Ceska sporitelna	950,432,200	15.60	11.10	21,375,611	12.20	4.73
PIAS IB	724,123,600	11.90	8.45	13,594,068	7.72	3.01
HCC	638,548,000	10.50	7.45	15,225,108	8.65	3.37
VUB Invest	500,587,700	8.19	5.84	11,985,444	6.81	2.65
IKS Komerčni bank	465,530,300	7.62	5.43	11,931,808	6.78	2.64
KIS CP	334,040,900	5.47	3.90	7,623,311	4.33	1.69
PSIS	333,045,400	5.45	3.89	10,986,751	6.24	2.43
Slov. sporitelna + VSZ	168,864,400	2.76	1.97	7,707,865	4.38	1.70
Creditanstalt	166,256,000	2.72	1.94	3,610,773	2.05	0.80
Slov. invest. bank	145,100,000	2.37	1.69	4,600,000	2.63	1.70
PPF	117,624,300	1.92	1.37	4,920,213	2.80	1.09
Zivnostenska bank	117,541,500	1.92	1.37	1,885,287	1.07	0.42
Slov. poistovna	116,682,500	1.91	1.36	4,362,299	2.48	0.96
Agrobank	111,087,900	1.82	1.30	3,941,378	2.24	0.87
Total 14	4,744,364,700	77.63	55.39	119,149,916	67.71	26.36

¹100% = 6,111,812,300 points collected by all investment funds.

²100% = 8,565,642,000 points = total supply.

³100% = 175,975,880 shares acquired by all funds.

⁴100% = 452,090,103 shares, total equity of all companies privatised (also) by vouchers.

had, the noisy phase of transition⁴⁰ did not supply information about the true value of assets and the true value of investment. But the standard activity of investment fund, maximising the value of assets on the stock exchange, was for the same reasons difficult. In the following sections we first describe IPFs and then test whether they were involved in corporate governance, as a way of increasing the value of their portfolio.

5.2 Description of IPFs

Funds had different success in attracting citizens. The investment company SIS of Czech Saving Bank collected in its one investment fund 11.10% of total points supply alone. A second PIAS of Investment Bank collected in its twelve investment funds 8.5%, followed by Harvard Capital Consulting Investment Company with eight

⁴⁰ Tirole (1991) structured the transformation of Eastern European economies into two phases - noisy and mature. The noisy phase is characterised by cost, demand, financial, legal and political uncertainties. Then, capital market cannot work properly. Incorrect information and signals harm risk sharing, guided investment, measurement of asset value, the discipline of management and increase of profit opportunities.

funds and 7.5%, VUB Invest of VUB bank with one fund and 5.8%, IKS of Komerčni Bank with one fund and 5.4%, KIS of Czech Insurance with one fund and 3.9%.

Table 5.2-2. Bank cross-ownership as of June 1993.

IPFs by founder		Privatised banks and insurance companies							
		CS	IB	KB	CP	ZB	VUB	SI	SP
1. Ceska sporitelna	CS	0.0	0.5	4.9	2.0	5.0	?	?	0.0
2. Investicni bank	IB	8.8	17.0	10.8	4.1	10.4	?	0.4	0.0
3. Komerčni bank	KB	3.9	0.0	3.4	0.0	0.0	4.2	?	0.0
4. Ceska pojistovna	CP	0.2	3.0	0.7	1.0	4.0	?	?	0.0
5. VUB bank	VUB	1.6	3.5	4.3	0.0	2.5	10.8	4.1	0.0
6. Slov. invest. bank	SI	0.8	6.9	1.1	0.0	0.6	18.8	18.8	15.8
7. Slov. poistovna	SP	0.3	0.4	0.1	0.0	0.3	0.9	0.0	4.7
8. HCC		12.9	0.0	17.6	5.0	0.0	?	0.0	0.0
9. CSOB bank		0.2	1.1	0.3	0.0	0.6	?	0.0	0.0
10. Agrobank		0.6	1.1	0.3	0.1	0.6	0.4	0.0	0.0
11. Slovenska sporitelna		0.3	0.9	0.4	0.1	0.0	3.0	0.0	0.0
Total 11 invest. companies		29.6	34.4	43.9	12.3	24.0	38.1	23.3	20.5
Total by vouchers		37.0	52.0	53.0	65.0	44.0	52.0	52.0	48.0

Note: Fund of Zivnostenska bank did not own any of listed banks. Source: Centre for voucher privatisation, calculations by Marcincin and Mladek.

In total, fourteen largest investment companies collected 55.4% of all investment points available in voucher privatisation, and 77.6% of investment points collected by all participating investment companies (see table 5.2-1 for more details on the fourteen largest investment companies). Comparing the 4th and 7th columns of the table 5.2-1, i.e. the number of collected points and the number of acquired shares of companies traded in voucher privatisation, we observe that especially the largest investment companies bought in average more expensive shares. For instance, the largest SIS spent its 11.1% points for 7.7% shares. In total, the fourteen largest investment companies exchanged their 55% points for 26% of companies shares only. Further, although we speak about privatisation, among the fourteen strongest investment companies paradoxically, there were only five truly private, particularly, HCC (3rd by number of points collected), PSIS (7th), Creditanstalt (9th), PPF (11th), and Agrobank (14th). Others were undergoing partial privatisation, with controlling share package still being kept by the government.

Table 5.2-3. Basic characteristics of funds.

Funds:	Large > 10 ⁶	Medium 10 ⁵ - 10 ⁶	Small 10 ⁴ - 10 ⁵	Very small < 10 ⁴	Total
Number of shares in portfolio					
Number of funds in the group	20	63	118	104	305
Sum of inv. points (10 ⁶)	4,982 _(82%)	804 _(13%)	198 _(4%)	77 _(1%)	6,061
Average no. of inv. p. (10 ⁶)	249	13	2	1	20
Sum of shares (10 ³)	100,616 _(80%)	19,263 _(15%)	4,772 _(4%)	377 _(1%)	125,028
Average no. of shares (10 ³)	5,031	306	40	4	410
Inv. points per share	50	41	41	204	48
Average no. of companies	211	43	30	8	37
Average no. of sectors	28	14	11	5	10
Average %stake	5	5	2	1	2

Banks and insurance companies founded a majority of the largest investment companies. These were Czech and Slovak Saving banks, Investment banks, Insurance companies, Vseobecna Uverova Bank, Komerčni Bank, Austrian Creditanstalt, Zivnostenska Bank, and Agrobank. These banks were also major creditors to the privatised companies. The restructuring behaviour of bank-led IPFs was theoretically questioned by Aghion et al. (1994). His model predicted delayed restructuring in the Czech environment, where banks - thus funds controlled by banks - had no incentives to monitor enterprises.⁴¹ If we had enough observations on bank and non-bank controlled funds, correcting for their size (measured by number of investment points collected mainly due to their reputation and quality of marketing), we could test the behaviour of the two groups separately. But as stated above, we learned that basically all large funds were bank-controlled, specialised on rather expensive shares, while smaller funds were not controlled by banks and specialised on cheaper shares. The causality between fund size and share price could be explained in two ways: 1. Large funds collected too many points, therefore preferred to spend them for too expensive shares, where the probability of a fulfilled subscription was higher. 2. Large funds specialised on quasi controlling stakes (limited by a 20% restriction), driving their prices up. But, only large funds had enough points to acquire them.

⁴¹ Monitoring may be too costly and restructuring too risky in the presence of high uncertainty. Bank attitude towards companies thus depends on the government's recapitalisation reputation. Dittus (1995) argued that bank-controlled IPFs had too large portfolios to concentrate on corporate governance. Rather they used their small stakes to attract banking business through those relations. However, in his opinion, bankers wanted to separate ownership from credit appraisal.

Table 5.2-4. Average portfolio characteristics.

Funds:	Large	Medium	Small	Very small	Total
Sales/Equity	0.99	1.17	1.19	1.59*	1.31
Sales/Labour	3.81	3.65*	4.07	5.99*	4.62
Equity/Labour	660.36	442.61	562.81	516.39	528.55
Profit/Sales	11.77	11.04	11.07	14.00	12.11
Profit/Equity	27.11	23.41	26.54	37.81*	29.77
Debt/Equity	36.64	37.27	36.08	34.44	35.80

* Different from the population mean on 0.95 significance level.

Six banks and two insurance companies were (partly) privatised by vouchers, too, and although investment funds founded by bank were by law forbidden to invest in banks, they did so. The structure looked like this: A bank established a daughter investment company, often 100% owned by the bank, which managed funds not prohibited from buying banks. Table 5.2-2 gives an idea of cross ownership of 8 Czech and Slovak banks and insurance companies. Ceska sporitelna owns almost 5% of Komerčni bank and 5% of Zivnostenska bank, Investicni bank owns almost 9% of Ceska sporitelna, 17% of itself, 11% of Komerčni bank and 10% of Zivnostenska bank. Another important owner of banks is HCC, which controls 13% in Ceska sporitelna, 18% in Komerčni bank and 5% in Ceska pojistovna. The scheme continued with large companies privatising banks, as a sources of cheap credits.

In table 5.2-3 we display funds sorted by number of shares in their portfolio into four categories. This split gives us a different picture from above. Twenty large funds collected 82% of investment points and acquired almost the same percentage of shares, 80%. They paid in average slightly more points per share than medium and small funds, 50 versus 41 points. Extremely high average price was paid by very small funds, 204 points per share. This could be due to a very good average quality of their portfolio: As indicated in table 5.2-4, the portfolios of very small funds contained significantly more productive and profitable companies than portfolios of other funds⁴². Portfolios of large funds seemed to be over-diversified, containing in average 211 companies.

We have shown in tables 5.2-3 and 5.2-4 that very small funds acquired the most expensive shares of very productive companies. Was it the best way of maximising returns on investment points? In table 5.2-5 we first show the results of a simple regression of average share price on PSE (weighted by traded volume during

⁴² Spearman ranked correlation of fund size and Sales/Equity was -0.26, Sales/Labour - 0.27, both significant. Correlation of size and Profit/Equity was not significant.

Table 5.2-5. Prague Stock Exchange Price and Returns.

LHS	Inv. points	Large	Medium	constant	Very Small
PSE Price: Coeff. (t-stat.)	0.24 (7.3)	-0.46 (-2.0)	-0.42 (-3.4)	2.84 (6.2)	0.48 (4.7)
Returns: Coeff. (t-stat.)	-0.43 (-10.3)	2.56 (8.8)	0.96 (6.1)	5.83 (10.0)	-1.65 (-12.8)

Log transformation of RHS and inv. points. PSE Price: $R^2 = 0.19$, Returns: $R^2 = 0.44$

January 6 till November 4, 1994) on the number of collected investment points (continuous measure of fund size) and three dummies (large, medium and very small funds). Price and fund size are positively correlated, but after incorporating the effect of the dummy coefficients we come to the following ranking of funds: The most expensive shares were held by very small funds, then by large funds, finally by small and medium funds.

Clearly, this regression combines analyses of tables 5.2-1 and 5.2-3 indicating that few very large funds and very small funds acquired the most expensive shares. The second regression, displayed in the same table, second row, with the same RHS, but with returns on invested points⁴³ instead of price as the LHS variable, showed large funds having maximal returns, followed by medium, small and very small funds.⁴⁴

5.3 The Model

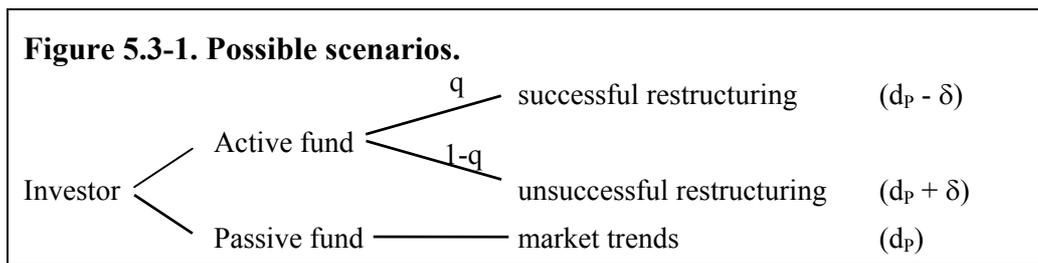
Voucher privatisation created a need for a stock market, established in the summer 1993. But this was a market during the noisy phase, when shares' histories was not longer than three years, when companies refused to disclose basic information and felt no advantage of being publicly traded, when outsider investors tried to collect enough shares for take-overs,⁴⁵ and when many citizens felt enthusiastic from gaining at the voucher market and tried to multiply their success at real stock exchange. Critiques of the voucher method predicted a huge excess supply of shares (thus their under-pricing), due to a preference of a presumably large part of Czech population to exchange their shares for cash and for immediate consumption.⁴⁶

⁴³ $\text{Returns}_i = (\sum P_{\text{PSE},ij} \sum \text{Shares}_{ij} / \sum P_{\text{VP},ij} \sum \text{Shares}_{ij}) / (\sum P_{\text{PSE},mj} \sum \text{Shares}_{mj} / \sum P_{\text{VP},mj} \sum \text{Shares}_{mj})$. Returns on investment normalised by median value. P stands for price, PSE for Prague Stock Exchange, VP for voucher privatisation, i for fund, j for company and m for median size fund.

⁴⁴ Again, although returns and number of points are negatively correlated, the final effect is dominated by dummy coefficients, so that returns of large funds are the highest.

⁴⁵ What could be an easier way than bribing governmental officials or IPFs managers.

⁴⁶ Which produced fears that voucher privatisation would lead to high inflation.



Three types of investors were expected to form a demand side. These were outsider or insider “corporate control” investors specialising in a few shares (a single company, fund or sector), sophisticated arbitrarrians, and a lot of noisy traders. By noisy traders we follow Shleifer and Summers’ definition (1990) of not fully rational investors whose reactions are subject to beliefs or sentiments unjustified by fundamental news.

In fact, the noisy trader approach suited the Czech environment in 1993 - 1994 extremely well, given the quality of information, uncertainty, and experience and skills of a majority of investors. Even the initial pricing of fund shares, in some cases ten-times higher than in 1996, responded well to the changing mood of noisy traders as in Lee et al. (1990).

Assume now two basic types of funds, active and passive. An active fund tries to increase the value of its assets by an active restructuring of companies held, while a passive fund manages a well diversified portfolio to outperform the market (see also Figure 5.3-1). The obvious distinction between the two types are their percentage holdings; an active fund needs higher stakes to have influence in managed companies, while a passive fund's stakes are generally smaller. A passive fund simply copies market trends, bearing only market risk, while an active fund bears an extra risk connected to its restructuring deals. Thus, an active fund will outperform the market with probability q and underperform the market with probability $1-q$. The q depends on the investors’ belief in an active fund’s ability to restructure companies.

Different risks characteristic for the two types of funds influence discounts with which they are traded. The discount of passive fund is d_p , expressing general market trends. The discount of an active fund then is $d_p - \delta$ or $d_p + \delta$, depending on market beliefs. The expected discount of an active fund then is

$$E(d_A) = q(d_p - \delta) + (1-q)(d_p + \delta) \quad \mathbf{5-1}$$

setting $E(d_A) = d_A$ we come with the expression for probability q :

$$q = 0.5 + (d_P - d_A)/(2\delta) \quad \mathbf{5-2}$$

If investors were risk neutral, believing that fund's restructuring activities cannot change its discount neither downwards nor upwards, $q = 0.5$. However, finding $d_P \neq d_A$ implies positive or negative expectations connected to corporate governance. Investors can observe risk connected to funds as a variance of their portfolio value. The lower is variance, the lower discount can be expected. Corporate governance oriented funds thus can outperform passive funds only if average stakes were negatively correlated with portfolio variance.

We have mentioned that corporate governance attitudes towards funds must be proportional to their percentage stakes. Hence, as the measure of fund type we can use average percentage stake across all shares in the portfolio. In this way, we can separate purely control oriented funds from passive or mixed funds. An average stake is easily defined as

$$AS_i = n^{-1} \sum (Shares_{ij}/Shares_{im}) \quad \mathbf{5-3}$$

and i denotes particular fund, j particular company in i -th portfolio, $j = 1, \dots, n$, and m total number of shares issued by j . Finally, the 1-discount can be calculated as

$$d_{it} = P_i Shares_{it} / \sum_j (P_{ijt} Shares_{ij}) \quad \mathbf{5-4}$$

where the value of the fund's assets in time t is in the nominator and value of the fund's portfolio in time t is in the denominator. Note that we use 1-discount in the following regressions rather than discount alone to avoid computations with small numbers.

There are a few control variables available in our test of correlation between fund type and discount. First of all, it is a size variable, measured by the number of investment points collected. The second is diversification (if it is not simply correlated with size). Figure 5.9-1 displays size and diversification for funds sorted by AS variable. Funds with higher AS also tend to be larger and more diversified. In the same picture, we see the initial price. This is the average price paid by fund for shares on the voucher market.

Table 5.4-1. Description of variables.

Variable	Mean	S. Deviation	Minimum	Maximum	Total
1-Discount	0.50	0.14	0.23	0.82	
IPF share price (KC)	611.31	317.23	106.61	1,241.17	
IPF share price adj. (KC)	571.71	294.12	169.22	1,221.35	
Size (m. investment points)	77.01	114.50	0.28	465.53	2,464
Initial price (inv. points)	38.84	16.65	14.10	81.44	
Diversification	71.56	65.73	15.00	267.00	
Average stake AS (%)	4.75	2.85	0.03	9.52	
No. of IPF observations	19.59	3.49	10.00	23.00	
No. of firms observations	21.22	1.46	17.47	23.00	
Portfolio value (m. KC)	1,813.35	2,726.76	9.92	10,208.50	58,027

Note: Discount is higher than the true value, because other assets and Slovak shares were not counted. Adjusted IPF price calculated as if nominal share value was 1000 KC. Diversification is number of firms in portfolio. Our sample contains 40% of total investment points collected all funds, and 33% of total shares acquired by all funds.

5.4 The Data

In our analyses we use several characteristics of fund (size, number of shares in portfolio, percentage stakes), prices from voucher privatisation, discounts on the Prague Stock Exchange and respective variance of portfolios values. Size and number of shares were announced during and shortly after voucher privatisation. From this same period, we have data on the funds' portfolios and percentage stakes. More recent data were kept secret or hard to get by funds. Similarly, funds did not disclose information on their discounts for a long time. Thus we have to assume that the initial structure of the portfolio reflects the type of fund and did not change over time significantly. This is especially true for active funds, less so for passive funds.

The funds were publicly traded shortly after the opening of Prague Stock Exchange (fall 1993). But until February 1994, few shares were actually sold. Finally, the trading was irregular. Therefore, in this chapter we use a different approach than in the papers by Marcincin and Shemetilo (1995a,b). Instead of using daily data, extrapolated for missing tradings, weighted monthly data over longer period were used. In this way, we obtained 23 discounts for 32 funds (February 1994 till December 1995). Also, here we use observations on all funds (in Marcincin and Shemetilo 10 funds were selected from each side of the *AS* distribution, the most extreme cases), with *AS* continuous (there it was a dummy), and with a new variable initial price.

Table 5.5-1. Estimation of 1-Discount, I.

variable	coefficient	t-stat	variable	coefficient	t-stat
constant	-1.670	-8.6	Trend	0.032	15.1
Points	0.049	3.4	No. firms	-0.101	-4.0
<i>Average Stake</i>	0.047	3.2	-		

Number of observations 736. $R^2=0.29$, Adj. $R^2=0.28$. Logarithm transformation.

In table 5.4-1 selected descriptive statistics of data are listed. The average 50% discount is higher than the true value, because we did not count other assets belonging to the fund, and shares of Slovak companies. However, the correction could be only a very few percentage points, because few Czech funds invested in Slovakia. It could be argued that even the maximal average stake of 9.5% is too low for corporate control. First, this is an average stake, second, as was shown in chapter three, even such a low stake can be important in companies with otherwise dispersed ownership. To see how much of our sample is relevant, we can compare the total number of investment points collected by sample funds and their total number of shares acquired, with the respective numbers of the whole fund population. Our sample thus contains 40% of the total investment points collected by all funds, and 33% of the total shares acquired by all funds

Picture 5.9-2 displays the average share price of funds, adjusted for the same nominal value 1000 Kc, average initial price paid for firm shares and discount. It seems that these three are well correlated, suggesting that even two years after voucher privatisation, voucher price remained a very good predictor of fund share price and discount.

5.5 Estimation

The regression estimation of coefficients of size, number of firms (shares), average stake and trend (or time dummy), presented in the table 5.5-1 show positive correlation between average stake and 1-discount, i.e., negative correlation between stake and discount. In Table 5.9-1 we add portfolio variance on the RHS. Average stake is not significant and changed a sign, then, but risk and discount are properly positively correlated. Finally, in table 5.9-2 we skip average stake and see positive correlation between the risk and discount. This corresponds to the probability q higher than 0.5 in our simple model.

Greater fund involvement in corporate governance in the Czech environment is reflected by a higher evaluation of the fund, i.e. by a lower discount. We test the impact of IPFs involvement in corporate governance also

Table 5.6-1. Companies and IPFs. Variance of firm shares.

variable	coefficient	t-statistic
constant	795,419	3.67
one large fund	-241,656	-2.59
two large funds	73,042	0.70
three large funds	-18,532	-0.30

Obs. 415, R2 = 0.02, LHS mean 194,052.

from other way around. In table 5.6-1 we show that companies, in which funds have high stakes, have lower variance of their share price.

5.6 Empirical Evidence

Our estimation suggests a higher market evaluation for active funds. This could be a good motivation for funds to be active and to participate in the restructuring of firms. We have one source of relevant empirical evidence. The survey of Czech manufacturing enterprises by Zemplerova et al. (1995)⁴⁷ showed that 70% of the firms in the sample replaced the majority of managers in the last three years. The division of a former bigger firm created 55% of firms, and 50% changed their internal organisational structure. On average, only 50% of the products were the same as three years ago, while 28% were modified, and 22% were completely new. According to the ownership categories, based on the dominant owner, the least innovative were state and IPF-dominated firms. The state firms produced 62% of unchanged products, 27% of modified products, and 11% of completely new products. IPF owned firms produced 57% of unchanged products, 28% of modified products, and 15% of completely new products.

⁴⁷ Quoted, for instance, by Transition Report 1995 of EBRD.

The cumulative measure of restructuring efforts⁴⁸ displayed in table 5.6-2 shows a very clear relation between restructuring and ownership category. Owners on the left hand side of the table are the least restructuring, while owners on the right hand side are the most restructuring. The ranking is as predicted by theory: state is at the bottom, management ownership is similar to worker ownership,⁴⁹ dispersed ownership of small investors, though outsiders, is worse than ownership by IPFs, and ownership by domestic outsider is worse than by foreign outsider.

Table 5.6-2. Ownership and Restructuring (% distribution).

Owners:		Insiders				Outsiders			Total
Restructuring	State	Mng	Worker	SI	IPF	DInv	FInv		
Low	%	55	51	47	45	34	35	6	44
Medium	%	26	34	32	33	38	20	50	32
High	%	19	15	21	22	28	45	44	24
nobs		62	47	28	9	29	20	16	242

Source: Zemplerova, Lastovicka and Marcincin (1995), p. 26, table 16, modified.

Note: Insiders: managers and workers, Outsiders: Small investors, IPFs, Domestic investors and Foreign investors. Category Others is skipped from the table.

5.7 Conclusion

In this chapter we have shown that funds with higher percentage stakes in companies held are valued less risky than passive funds. We interpret this, given the quality of data applied, as possible evidence of the market's positive expectations connected to the funds' abilities to increase asset value by an active participation in the companies restructuring. Generally, this role is not typical for funds and may be only temporary, as a response to the present Czech environment. Particularly, we mean a lack of arbitrage opportunities on stock exchange, given the low number of shares traded, lack of credible information, insider trading, the existent quality of stock exchange regulation, which all together increase the risk of arbitrage over acceptable limits. Secondly, there may be a lack of wealthy outsider investors willing to pay for the funds' large stakes opportunity value. Thirdly, this could be due to existent qualifications of human capital available to IPFs.

⁴⁸ Several measures were applied, equally weighted in the final indicator.

⁴⁹ Workers ownership may easily mean that the main force behind restructuring are managers, anyway. The picture may be biased by the new small-size entries, which naturally did not need restructuring in the first or second year of existence, and were all owned by managers.

The question, whether funds do restructure or do not, would be better answered by an analyses similar to that presented in Chapter three or four. Still, data on changes in ownership structures are missing, and a collection of individual data would be necessary. The study then would require more resources and a longer period. But, since many countries have employed voucher privatisation, and since funds are often the only protection against completely dispersed ownership structures, and our research suggests that the answer could be actually positive, more research would be valuable.

5.8 References

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5.9 Appendix

Figure 5.9-1. Size, Diversification and Initial Price.

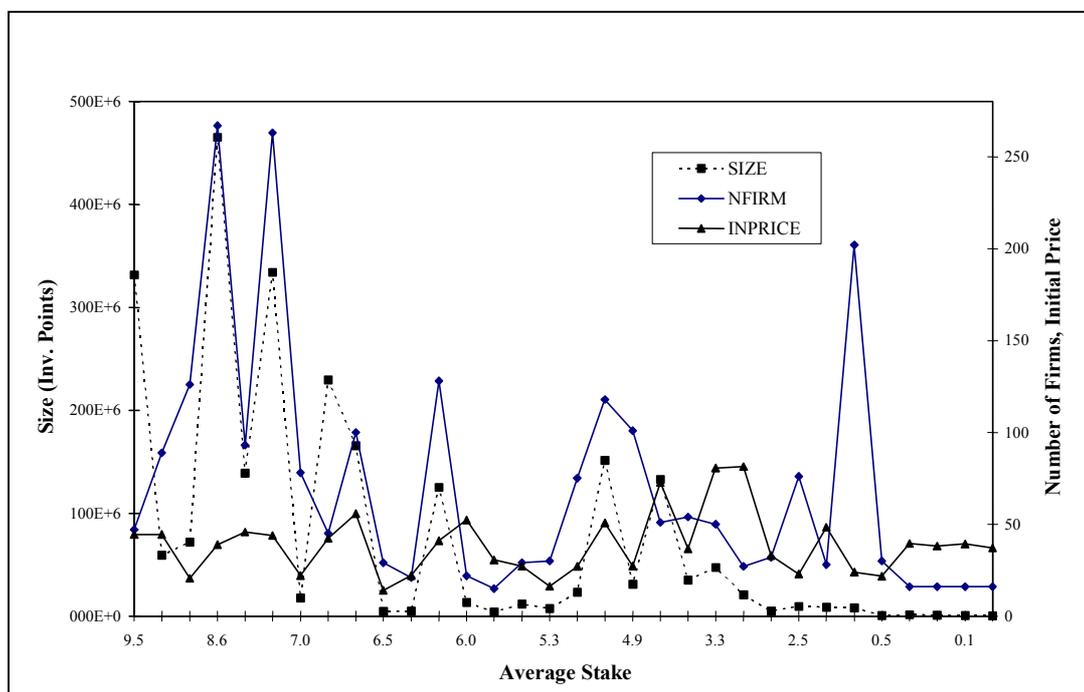


Figure 5.9-2. Prices and 1-Discount

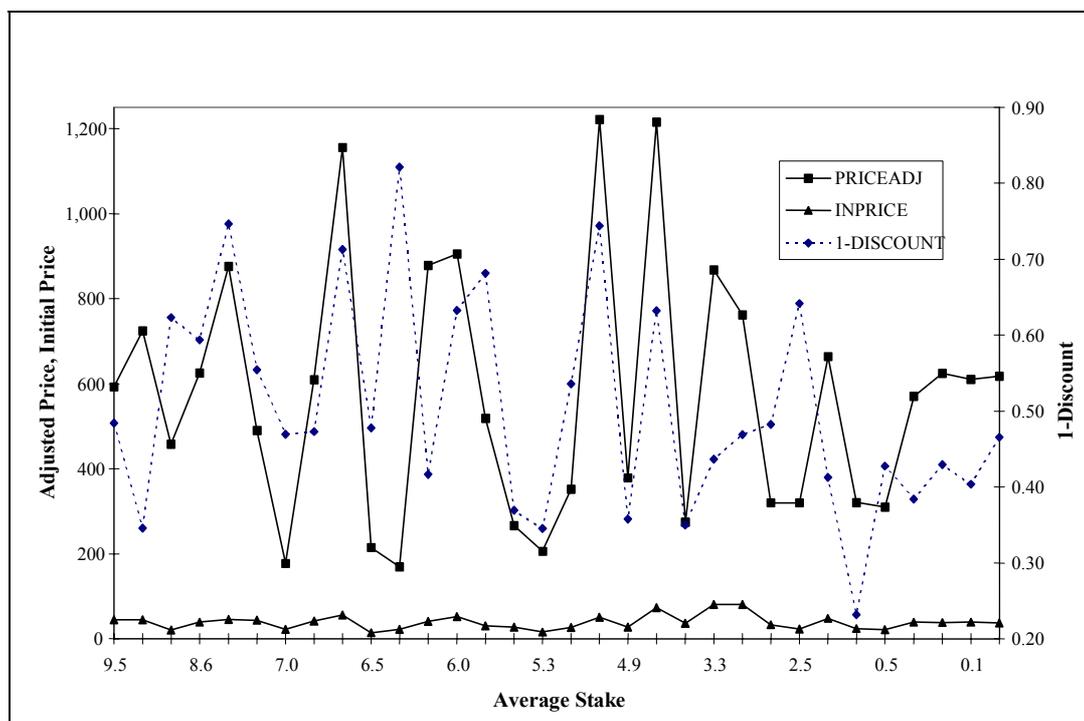


Table 5.9-1. Estimation of Discount II.

variable	coefficient	t-stat	variable	coefficient	t-stat
constant	-1.765	-6.58	Trend	0.032	15.3
Points	0.153	1.39	No. firms	-0.195	-5.8
<i>Average Stake</i>	-0.049	1.12	<i>Var(Portfolio)</i>	-0.095	-4.1

Number of observations 736. $R^2=0.31$, Adj. $R^2=0.30$. Logarithm transformation.

Table 5.9-2. Estimation of Discount III.

variable	coefficient	t-stat	variable	coefficient	t-stat
constant	-1.598	-6.58	Trend	0.032	15.3
Points	0.106	1.39	No. firms	-0.195	-5.8
-			<i>Var(Portfolio)</i>	-0.059	-4.9

Number of observations 736. $R^2=0.30$, Adj. $R^2=0.29$. Logarithm transformation.

6 Discussion

Four essays presented in this dissertation were written during the period 1993 to 1996. They all try to test whether ownership structure matters for corporate governance. The Czechoslovak voucher privatisation program was taken as laboratory for the tests.

The question answered in the first essay was about dispersion of ownership structure and possibility that incumbent managers stay uncontrolled. The answer is simple – if small investors did not matter, then there were other investors, notably investment privatisation funds (IPFs) and direct investors, who could apply control. Although the answer seems to be obvious, it was not in 1993.

In the second essay we use voucher privatisation and early stock exchange data to explore whether presence of dominant investor was evaluated by higher share price. The answer was positive. Then, we ask whether this was due to inside information available to dominant investor or anticipation of better corporate governance. Our model predicts that inside information by IPFs would be revealed by their early bids and lower price paid. Small investors would, in opposite, bid later and pay higher price. Our findings suggested that IPFs indeed bid earlier, but paid substantially higher price. We conclude that positive impact of dominant investor on share price was not due to inside knowledge but rather expectation of better corporate governance. In this essay we do not make any judgements whether ownership structure created by voucher method would lead to better corporate governance.

The third essay shows that comparisons between different privatisation techniques may suffer from the selection bias. This is because governments chose different quality firms for privatisation by different methods. We found the presence of the bias and calculate true corporate governance effects. Fully voucherised firms showed, *ceteris paribus*, the worst performance in 1994 due to bad corporate governance.

The fourth essay investigates negative correlation between IPFs ownership stake in firms and its own discount. High average stake is understood as the best signal that fund is corporate governance oriented. One could possibly argue that large funds had no other choice but spend collected investment points at high stakes or, that funds collected high stakes in order to sell them later on with a higher risk premium. In our estimation, we controlled for number of points collected (negative correlation) and number of different shares bought (positive

correlation). It is also clear from graphs 5.9-1 and 5.9-2 that size itself cannot be the only explanation of high stakes. The second argument implicitly assumes that stakes could be traded very quickly, or that some other stakeholder takes care of firm until fund could sell its stakes. Funds could plan to sell their high stakes, but even then it would be rational to involve themselves into corporate control so that their stakes do not lose value due to mismanagement.

There are several points necessary to be kept in mind if this dissertation was to be considered in broader context of the Czech privatisation and later development. First of all, it was not a goal of this thesis to investigate Czech privatisation, rather, it was the goal to test theory on the Czech laboratory. Secondly, we argue that higher concentration of ownership, reflected in share evaluation, may lead to better corporate governance. The contra argument is that higher concentration was motivated by chance of future resale with a premium, rather than corporate governance. Here we can answer that even if there was this motive, and very likely in many cases it was, still, rational investors would control firms in a period between purchase and sale, so that value of share packages would not decrease. Thirdly, we apply data of voucher privatised firms, whether partly or completely. We did not have data on firms privatised out-of-voucher privatisation to compare with. But according to our simple model in the third essay we argue that firms demanded by direct investors were probably in better shape (had better restructuring potential) and showed better performance exactly due to better corporate governance, than fully voucherised firms. Fourthly, there could be a very serious argument that investors anticipated type of governmental behaviour that would delay settlement of ownership enforcement rights, especially, would neglect rights of minor shareholders. Then, minor stake would have positive value only if there was other minor shareholder who wanted to acquire factual majority stake. Once there was majority owner, value of minor stakes could be zero. Rational behaviour of factual majority owner in completely unregulated environment could be either to collect shares from minor owners for low price and ensure himself 51% majority, or 'tunnel' firm, i.e. transfer its revenues and assets to other, his own firm. The choice depended on relevant costs. Such anticipation would be, however, an important part of IPFs' inside knowledge and would have implication to their behaviour, modelled in the second essay.

Finally, we basically claim that voucher privatisation created good starting conditions for effective corporate governance and restructuring (though we are also aware that fully voucherised firms suffered from bad corporate governance, see

essay 3). Prospects for fast development of the Czech economy were, therefore, highly positive. In 1998, we see that this initially good potentials were not exploited and restructuring was delayed. This led many to accept the idea that voucher scheme was bad from the very beginning, because it did not create proper ownership structures, by which the whole discussion of voucher privatisation returned to the very beginning.

Our opinion is quite different. We hold that voucher scheme indeed provided good starting condition for economic growth, but the discussion should be reoriented towards the role of government in the process. Particularly, if government did not try to build institutional framework necessary for efficient operation of firms (whether state-owned, privatised in any form or *de-novo*) and officially relied on some sort of 'wild-capitalistic' solutions, then economic results could not be better. So the question rather is, whether voucher privatisation was too fast to allow the parallel preparation of regulatory framework, or if it was pure failure of government policy to prepare such framework.