

WPS1737

POLICY RESEARCH WORKING PAPER

1737

# Ownership and Corporate Governance

## Evidence from the Czech Republic

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The Czech Republic's mass-privatization scheme improved the management of privatized firms by concentrating ownership. And contrary to expectations, banks with an (indirect) equity stake in a privatized firm have a positive influence on the firm's corporate governance.

The World Bank  
Office of the Regional Vice President  
East Asia and Pacific  
and  
Europe and Central Asia, and Middle East  
and North Africa Technical Department  
Finance and Private Sector Development Division  
March 1997



## Summary findings

The Czech Republic's mass-privatization scheme changed the governance of many firms in a short time. Claessens, Djankov, and Pohl show that mass privatization was effective in improving firm management because of the concentrated ownership structure that resulted.

For a cross section of 706 firms for the period 1992–95, they find that the more concentrated the firm's ownership, the higher the firm's market valuation and profitability. Large ownership through bank-sponsored investment funds and strategic investors appears to be particularly important in improving corporate governance and turning firms around.

They find no evidence that market valuation or profitability were lower for firms in which investment funds sponsored by a firm's main bank represented a large ownership stake. It is often argued that the firm's main bank having (indirect) ownership control could represent a conflict of interest. The empirical analysis here shows, quite the contrary, that such indirect ownership control has a significant positive influence.

On balance, banks that had an (indirect) equity stake in a firm have a positive influence on the firm's corporate governance.

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This paper — a joint product of the Office of the Regional Vice President, East Asia and Pacific, and the Finance and Private Sector Development Division, Europe and Central Asia, and Middle East and North Africa Technical Department — was presented at the International Symposium on Capital Markets and Enterprise Reform in Beijing, November 8–9, 1996. Copies of this paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Faten Hatab, room H8-087, telephone 202-473-5835, fax 202-477-8772, Internet address fhatab@worldbank.org. March 1997. (20 pages)

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**Ownership and Corporate Governance:  
Evidence from the Czech Republic**

by

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\* World Bank. This paper was presented at the International Symposium on Capital Markets and Enterprise Reform in Beijing, November 8-9, 1996. The opinions expressed do not necessarily represent those of the World Bank. We would like to thank Petr Kucera of Aspekt a.s. for help with the data and data definitions, and Bob Anderson, Cheryl Gray, Raj Desai, Ulrich Hewer, Prasad Gopalan, Daniel Oks, Katharina Pistor, Brian Pinto, Dusan Triska, Michael Walton and participants in a World Bank seminar for helpful suggestions. For comments, please contact: Tel: (202) 473-7212, Fax: (202) 477-0169, EM: [cclaessens@worldbank.org](mailto:cclaessens@worldbank.org).



## Ownership and Corporate Governance: Evidence from the Czech Republic

Corporate governance has received much attention in the context of the transition of centrally-planned economies to market economies. The need for more effective corporate governance of firms in these countries is obvious. How to achieve it has been more controversial. Various schemes for privatizing state enterprises and allocating property rights have been put forward and tried. The Czech mass privatization program was implemented through a voucher scheme with a distribution of points to citizens followed by competitive bidding. It was a bold step at changing the ownership and governance of a large part of the economy. Within a short period, about 70 percent of the Czech economy was in private hands. As such, the Czech program represents a clear test case of one approach to changing corporate governance, an approach which has likely contributed much to the superior record of the Czech Republic in enterprise restructuring relative to other transition economies.

At the time of initiating the program, much skepticism was voiced about mass privatization. Particularly, while mass privatization would imply ownership by outside investors, it could lead to diffuse ownership and poor corporate governance. Investment funds emerged, however, which collected much of the individuals' vouchers, leading to more concentrated ownership. The expectation has been that this more concentrated ownership will lead to improved corporate governance. To date, however, only anecdotal evidence is available on the impact of owners on the way firms are managed. The paper also aims to shed light on cross-country analyses which shows that Czech firms are restructuring more rapidly than firms in other transition economies (Pohl et al., 1996). One aspect which differentiates the Czech model from other countries' is in the clear ownership structure—as a result of the mass privatization program—and the large influence on firms of institutional investors—as a result of the concentrated ownership and the use of other control mechanisms, including *de facto* proxy voting.

To investigate this question directly and indirectly, we study whether firms which ended up with more concentrated ownership have higher profitability and trade for higher ratios of market to replacement value. If more concentrated ownership leads to better corporate governance, one would expect profitability and valuation to be increasing in ownership concentration. The link with profitability would be direct; the link with valuation would be indirect since in a forward-looking market, prices will incorporate the effect of better ownership on future firm performance. In market economies, where this is a much studied topic, these relationships are quite strong.

This paper relates therefore various indicators of ownership concentration to the valuation and profitability of a cross-section of firms over the period 1992-1995. For firm valuation we use Tobin's Q, which is the ratio of the market value to the accounting (i.e., replacement) value of the firm. It is measured as the market value of equity plus the face value of debt relative to the book value of net fixed assets and inventory. Controlling for some firm specific-variables, we find that several measures of ownership concentration are positively related to Tobin's Q and profitability. Qs and profitability are also higher when bank-sponsored funds have large ownership. We also find that Qs and profitability are higher when an investment fund sponsored by a firm's main bank

is a large owner. Any negative effects of conflicts of interest—possibly due to banks controlling equity—appear thus to be dominated by positive effects, as banks monitor firms closely when they also have (indirect) equity stakes.

This paper begins with a description of the privatization scheme. Section II discusses the link between ownership patterns and profitability and valuation; it thus develops the basic hypotheses to be tested. The ownership patterns resulting from the voucher scheme, valuation and profitability are documented in section III while section IV presents the results. Conclusions are summarized in section V.

## I. The Czech Voucher Scheme<sup>1</sup>

The Czech mass-privatization scheme happened in two phases or "waves": the first started in late 1991 and ended in mid-1993; the second started in January 1994 and ended in October the same year. In total, 988 Czech enterprises participated in the first wave and 861 (of which 185 from the first wave) enterprises in the second wave. The process followed was similar in both waves. First, firms were selected for privatization and managers had to submit privatization proposals, usually to the founding ministry. Competing proposals were also possible with the ministry of privatization approving the final proposal. As part of the preparation, firms were corporatized and the book value of equity was determined. The number of shares for sale was set proportional to the book value of equity for all firms, i.e., the book value of equity per share was identical for all firms. Only limited restructuring happened prior to privatization. The privatization proposal also determined the equity share which was to remain with the state (through the National Property Fund, NPF) in the form of temporary or permanent holdings.<sup>2</sup> If a direct domestic or foreign investor had been identified who was willing to buy (part of) the firm, then those shares would also not be offered.<sup>3</sup> In the first wave, only a limited number of firms ended up with managerial or employee ownership; in the second wave, more firms did, but the ownership stakes were still low. All remaining shares were then offered through the voucher scheme. All citizens 18 years and older could buy, for a nominal fee,<sup>4</sup> a package of vouchers worth 1000 points. With these points they could bid for the shares on offer or, in a pre-bidding "zero" round, they could offer (part of) their points to investment funds, which could then bid for shares. After the bidding rounds, points were exchanged for shares and secondary market trading started at the Prague Stock Exchange (PSE).

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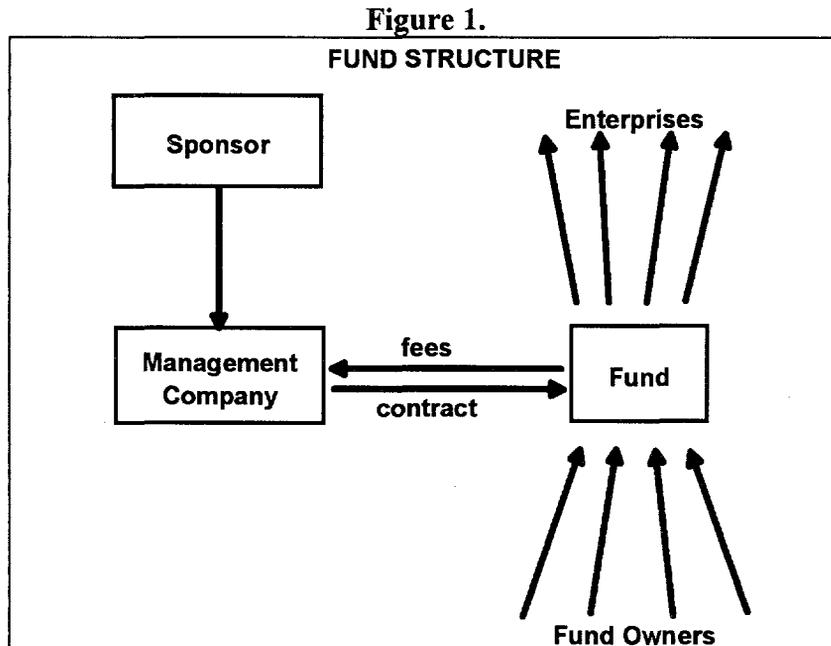
1. Anderson (1994), Shafik (1995), Mejstrik et al. (1994), and Coffee (1996) describe the mechanisms of the Czech voucher scheme for privatizing state-owned enterprises in detail. The following summary is from Claessens (1997), which in turn is largely based on Shafik (1995).

2. For all firms, 3% of shares was also set aside to be used for future restitution to individuals.

3. The fact that the shares for domestic and foreign shareholders were determined before the voucher shares could imply some selection bias, as good firms may be sold partly for cash, with relatively worse firms to be completely voucherized. Since we study the cross-section of voucherized firms, this should not affect our results.

4. In both waves, equivalent to about \$35 (or about 20-25% of the average monthly wage at the time).

A large number of investment privatization funds (IPFs) emerged on a voluntary basis; specifically, over 430 funds were established for the first wave and an additional 120 were established for the second wave. Although funds were started by various sponsors (domestic and foreign banks, corporations and individuals), most funds were sponsored by domestic banks, with several banks starting more than one fund. Sponsoring a fund involved the establishment of a management company which in turn organized the fund and continued to have a management contract with the fund (Figure 1 depicts the structure). In the first wave, the funds themselves were all established as joint stock companies, with the original voucherholders as shareholders of the fund and the fund's assets its equity stakes in the various firms. In the second wave, some funds were also established as (open-end or closed-end) trusts. As a result of active marketing campaigns by investment funds in both waves, many individuals offered all or most of their points to the funds. In the first wave funds ended up with 72% and in the second wave with 64%. Bank-sponsored funds acquired most of the points with the ten largest bank-sponsored funds holding 67 % of all points acquired by all funds (or about 44 % of all points initially bought by individuals) for the two waves combined.



The authorities designed the privatization scheme to make the most use of information available among participants and to allow for the greatest price discovery. General information was made available by the state prior to the start of the auction process on each firm covering such items as business activity, number of employees, output and profit in preceding years, and prior allocation of shares. Investment companies and banks played a major role in analyzing firms' prospects on the basis of this and other information. To improve price discovery, the scheme did not involve a single auction, but rather five sequential bidding rounds with limits on the actual sale

of each firm in each round.<sup>5</sup> The aim of the sequential bidding rounds was to reflect in the final prices the information gathering and analysis by individuals and institutions as well as any private and inside information. At the same time, the restrictions on sales limited the effects of inside information on final ownership.

## **II. Relationships between Corporate Governance and Firm Performance and Firm Valuation**

The influence of the distribution of and changes in ownership on corporate governance and firm performance and valuation has been much studied in market economies (Shleifer and Vishny, 1997, survey the literature). A common implication of many models of corporate governance is that firms with more concentrated ownership structures, but otherwise identical, have higher profitability and are valued higher as there is a greater incentive on the part of owners to monitor the firm and make the necessary changes in management. One way to test this implication is to study actual firm performance, changes in its management, and other measures, and relate this to (changes in) ownership. For market-economies, this approach has been used by, among others, Demsetz and Lehn (1985), Megginson et al. (1994), Denis and Denis (1995), and López-de-Silanes (1996). A complementary approach is to use the valuation of a firm by the market. In a forward-looking market, prices of firms can be expected to incorporate the effects of ownership and corporate governance on future performance. This approach has also been used in market economies. Levy (1983), Lease et al. (1984), and DeAngelo and DeAngelo (1985), for example, find positive relationships between stock prices and voting power for U.S. firms. Zingales (1994 and 1995) studies the relationship between the premium attributed to voting rights and ownership structures for firms at the Milan stock exchange and in the U.S.. Morck, Shleifer and Vishny (1988) provide evidence of an inverse U-shaped relationship between ownership by managers and a firm's valuation and its profitability. McConnell and Servaes (1990) confirm this and provide in addition evidence of a positive relationship between institutional ownership and a firm's valuation and its profitability. For the Czech and Slovak Republics, Claessens (1997) finds a positive relationship between concentrated ownership and voucher and secondary market prices.

We pursue both approaches in this paper as we consider them complementary. Using performance and other accounting data alone to test effect of changes in corporate governance is difficult in formerly centrally planned economies. Data are of poorer quality as new accounting standards are introduced. Furthermore, since the demise of central planning, relative prices have

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5. For the first round, prices (points per share) were set identically for all firms. If demand matched the supply of shares of particular firm at that price, all shares of that firm were sold in that round. If a firm's shares were undersubscribed, those that bid received shares at that price and the remaining shares were offered in the next round. When there was modest excess demand (less than 25% excess supply), citizens were given priority over investment funds and the demand of investment funds was scaled down to clear the market. With more than 25% excess demand, however, no shares were sold and all shares were to offered again in the next round at a new price which was set at (approximately) the previous price times the ratio of demand to supply. In some individual cases, prices were adjusted differently by the authorities (see Shafik 1995 for further details and some examples).

changed dramatically and past performance measures can be poor guides to future performance. Nevertheless, firms in the Czech Republic do report quite complete information and accounting data on profitability have improved considerably since the onset of the transition. Especially in the last year of our sample, profitability can be expected to reflect some of the effects of ownership structures on corporate governance. Stock market data also have some weaknesses. While the stock market is reasonably active in the Czech Republic and the firms selected for this paper are the most liquidly traded, liquidity is clearly lower than in market-economies. Furthermore, there is much block-trading off-the-exchange, often at prices different from those on the exchange. The prices at the exchange may then be more a reflection of the valuation of firms by minority shareholders, and not necessarily incorporate the value of control. While both profitability and market valuation of firms can be expected to reflect the influence of ownership patterns, each will have some advantages and disadvantages.

For testing these relationships, we follow the approaches of Morck, Shleifer and Vishny (1988, MSV from now on) and McConnell and Servaes (1990, MS from now on). MSV and MS investigate, for samples of 371 and about 1000 US firms respectively, the cross-sectional relationship between ownership (by management and institutional investors) and Tobin's Q and profitability. Tobin's Q is defined as the ratio of the market value of a firm—value of equity, i.e., number of shares times the secondary market price, plus the market value of its debt—to the replacement value of the net fixed assets of the firm; profitability is defined as the ratio of the inflation corrected depreciation cash-flow to the replacement value of fixed assets. The higher the Tobin's Q, the more valuable the firm is considered as a going concern and the more value the market thus attributes to the ability of management to generate profits from its assets. The link between the level of profitability and the quality of corporate governance is obvious. It is likely to be very imprecise, however: many other factors can affect a given year's profitability, and there can be considerable lags between changes in corporate governance and changes in profitability. We would thus expect the relationship between ownership structure and Tobin's Q to be stronger than that between ownership structure and profitability. MSV and MS concentrate on ownership by management and institutional investors. We broaden the ownership (concentration) focus by also using the measures introduced by Demsetz and Lehn (1985) in their study of links between ownership structures and profitability. As control variables, MSV and MS use leverage (ratio of long-term debt to assets), R&D expenditures (as a ratio to assets), advertising expenditures (as a ratio to assets), and industry dummies.

Higher valuation and profitability, however, may not only be due to greater ownership concentration, but also to signaling and special abilities of certain owners. Some investors may be more able to evaluate firms—based on their better information—and their ownership may serve as a signal to other investors and thus be associated with higher profitability and higher valuation. This effect is less likely prevalent in the Czech Republic as the auction rules limited any investors with better (inside) knowledge from establishing large ownership. And, as in other countries, any excessive bidding by investors with inside knowledge in the secondary market would presumably lead to higher prices, but not necessarily to ownership by the investor with inside knowledge. While (inside) information may thus have been revealed—through the bidding process or in the secondary market—it is not necessarily associated with ownership by particular investors. Some

investors may also be better owners as they may have access to technology or know-how (as could be the case for foreign investors) or they may have special monitoring skills (as often argued in the case of banks), which may raise the firm's valuation or profitability. To allow for these possibilities, in addition to ownership concentration variables, we include information on the ownership by certain classes of investors in the regressions.

Some ownership structures may have costs, however, particularly when conflicts of interest arise. In the case of state ownership, conflicts can arise if the state in addition to maximizing share prices has other interests, such as preserving jobs. There is evidence that state-owned firms are less efficient than privately-owned firms (see Megginson et al, 1994). Particularly in the early period of transition to market economy, the state is more likely to delay firm restructuring (e.g., to maintain employment, to assure some critical inputs, etc.), negatively affecting firm performance and valuation. In the case of foreign ownership costs could arise as off-market transfer pricing between the subsidiary and its foreign owners allows the dilution of the claims of minority owners and lower profitability. Large owners in general have opportunities to expropriate value, as minority shareholders are not well protected given the weak court system in the Czech Republic.

For investment funds in the Czech Republic, conflicts of interest are a very likely possibility (see also Coffee (1996)). As noted, many funds are sponsored by commercial banks, which themselves are large creditors of the firms in which the funds hold equity stakes (see Figure 1). While many of the funds are joint stock companies, and thus formally governed by the boards elected at the annual meeting of shareholders, in practice banks exert most control. A bank-sponsored fund may have the interests of the bank as a creditor in mind when deciding in which company to invest and how to value firms. There can also be a direct dilution of other equity holders by the fund for the benefit of the bank, for example, through higher lending spreads.<sup>6</sup>

Offsetting these effects can be the better monitoring of the firm and its management by a bank when it has (indirectly) an equity stake. This is because the bank has access to more information and better incentives to monitor firms (a combination of ownership and debt claims can reduce the shareholder-debtholder agency conflicts, see Shleifer and Vishny, 1997). Both can result in higher market valuation and higher profitability as the firm is more likely to restructure with better corporate governance and as it may gain more easily access to bank financing, which indirectly can also lead to more restructuring. Because the conflicts of interest and improved monitoring effects go in opposite direction, the net effect of bank-sponsored fund ownership on the valuation of the firms and its profitability is a priori unclear. Possibly, the conflict of interest could affect the market valuation more, since the market valuation is that of the minority shareholders, while the improved monitoring may show up more in the operating profitability of a

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6. In the context of developing countries and transition economies, (indirect) ownership of firms by banks and reverse ownership of banks by firms typically raises concerns about the safety and soundness of the financial system as these cross-ownership may lead to inside (and unsound) lending. This aspect is not explicitly addressed here, but the evidence found for a positive role of banks in corporate governance of firms is of course relevant.

firm, since that is not directly affected by the dilution of minority shareholders' rights through, for example, higher lending spreads.

The situation in the Czech Republic is similar to that in Germany where commercial banks, through proxy votes, effectively control large equity stakes in firms and in general have a large influence on firms. It has often been argued that German banks' interests may conflict with those of other equity holders, especially those whose shares are voted by the banks in proxy. This has been researched by several authors. Cable (1985) concludes that there is a positive impact of bank ownership and involvement on firms' performance in Germany. Edwards and Fisher (1994) discuss Cable's results and conclude that it is concentrated ownership, rather than any special relationships between banks and firms, which leads to improved performance. In their study of the performance of a sample of large German firms in 1975 and 1985, Gorton and Schmid (1996) reach a conclusion closer to that of Cable. They do not find evidence that there were conflicts of interest in either year. They find for 1975 that banks are special: they affect firm performance in a way which cannot be attributed to their role as blockholders. For 1985, they find no significant effects of banks on performance, but blockholders did affect performance significantly. To investigate the possibility of conflicts of interest in the Czech Republic, we separately analyze the effect of ownership by an investment fund sponsored by a firm's main bank, controlling for the relative size of the fund ownership.

### III. Data: Resulting Ownership and Prices

We have data on Czech firms compiled from the Aspekt Stock Market Database. The database contains financial and ownership information of 1191 firms listed on the Prague Stock Exchange (PSE). It is compiled on the basis of a questionnaire sent to firms by Aspekt a.s.. Starting from the first year of the survey (1992) the financial variables were defined using international accounting standards. Thus the switch to international accounting standards in only 1994 in the reporting of firms to the National Statistical Office does not affect our data-series. A number of firms do not report PSE-prices since their shares are not actively traded. The Aspekt database defines such firms as firms whose shares trade less than four times in any given year. We exclude such firms from our analysis. The 1992-95 data are complete for 371 firms which went through the first wave of voucher privatization. An additional set of 355 firms which went through the second wave report consistently after 1993, making altogether for 706 firms in the period 1993-1995.

Summary statistics on the ownership structure of the firms are presented in Table 1, Panel A. Six investor classes are distinguished: the state,<sup>7</sup> individuals, bank and non-bank sponsored IPFs, domestic direct and foreign direct investors. The ownership stakes of the major bank sponsored funds are listed separately in Table A1. Several banks have sponsored more than one

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7. Shares held by the National Property Fund (through permanent, temporary and restitution shareholdings), shares to be sold through banks, and shares not sold.

investment fund making it possible to exceed the 20% individual fund ownership threshold. Altogether, 263 non-bank sponsored funds are listed at least once as owners in our data. The largest include Harvard Capital & Consulting, Privni Cesky Fond, YSE, Prosperita, as well as two funds that became active during the second wave—Finop (founded by the Chemapol holding company in 1994), and Expandia (an insurance company). The concentration among investment funds is quite high. The top five investment funds, for example, owned on average 48.8 % (40.7 %) of a first (second) wave firm at the end of 1995, only slightly less than the average fraction owned by all funds combined, with bank-sponsored funds owning 21.2 % (9.8 %) and non-bank sponsored funds 27.6 % (30.9%). While right after the mass privatization program the National Property Fund (NPF) held shares in approximately a quarter of all firms in our sample, by the end of 1995 most shares were transferred to other investors with the state maintaining shares in only several dozens utility and service companies. In particular, at the end of 1995 the National Property Fund had ownership stakes in excess of 10% in 23 energy firms, 8 oil refineries, 7 water management firms, 4 hotels, 3 construction firms, 7 beer producers, and several individual firms in other industries.

The direct domestic investors' group comprises strategic investments by Czech firms, municipalities, as well as a small number of inside owners (managers). Only two firms report "employees" in the top 5 investors. The low averages for direct domestic and foreign investors in Table 1, Panel A reflect the fact that only 50 firms had a direct investor at the end of 1994. This number, however, increased substantially in 1995. Across firms, ownership is quite varied. The greatest ranges are typically for shares held by all individuals combined, followed by shares held by all investment funds combined. The correlations between the relative ownership of the various classes (not reported here) are all negative.

Over the five years, ownership concentration increased for the average firm, from a share held by the top 5 investors (excluding the state) of 47.2 % in 1991 to 59.4 % in 1995. When viewed from an individual investor's (e.g., bank-sponsored fund) point of view, the average stake in firms also increased, with the distribution becoming more skewed towards higher shares. Table A1 shows that this is due to portfolio realignments with the number of firms in many banks' portfolio dropping significantly. CreditAnstalt, for example, reduced the number of firms in its portfolio in half. Funds sponsored by Agrobanka and Ceska Pojistovna, on the other hand, increased the number of firms they owned. The largest increases came in the direct investors' portfolios; virtually non-existent in 1992, by 1995 strategic investors had some stake in 40% of all firms in our dataset.

Following the approach used by Demsetz and Lehn (1985) and Cable (1985), we use in the regressions the following two measures for the degree of ownership concentration: the share of equity held by the five most important investors combined,  $A5$ , and the Herfindahl index (the sum of squared ownership shares),  $H$ . Summary statistics for these measures are provided in Table 1, Panel B. Note that the magnitude of  $H$  almost doubles between 1992 and 1995.

**Table 1: Ownership and Firm Performance Statistics**  
(all in percentages)

Category	First Wave				Second Wave		
	1992	1993	1994	1995	1993	1994	1995
<b>A. Average Firm Ownership Share by Sponsor*</b>							
Bank Sponsored Investment Funds	23.1 (15.4)	23.8 (15.5)	19.8 (17.2)	21.2 (18.4)	5.8 (8.6)	7.8 (11.2)	9.8 (13.6)
Non-Bank Sponsored Investment Funds	23.8 (14.1)	24.6 (13.9)	26.1 (17.4)	27.6 (19.5)	31.0 (14.1)	30.3 (15.4)	30.9 (16.4)
Local Strategic Investors	0.1 (0.2)	0.1 (0.2)	5.1 (11.1)	6.2 (13.3)	2.1 (8.1)	6.3 (14.9)	7.6 (17.0)
Foreign Strategic Investors	0.0 (0.0)	0.0 (0.0)	2.9 (10.6)	4.3 (13.3)	1.0 (2.6)	1.2 (6.4)	2.4 (10.2)
National Property Fund	2.4 (7.4)	2.1 (7.1)	1.2 (5.7)	0.9 (0.4)	7.6 (17.5)	6.7 (16.6)	5.4 (15.6)
Total**	49.5 (15.0)	50.9 (14.2)	53.9 (14.7)	60.2 (16.1)	46.9 (19.9)	45.8 (17.4)	55.9 (21.1)
<b>B. Concentration indicators*</b>							
	1992	1993	1994	1995	Panel		
Share of top 5 investors	49.5 (15.0)	48.9 (12.7)	49.6 (15.8)	57.8 (17.5)	52.1 (14.9)		
Herfindahl Index	0.076 (0.057)	0.085 (0.081)	0.109 (0.104)	0.134 (0.125)	0.106 (0.104)		
<b>C. Firm performance indicators*</b>							
	1992	1993	1994	1995	Panel		
Tobin's Q	96.7 (52.4)	80.3 (50.1)	78.2 (44.1)	76.9 (46.3)	81.2 (48.2)		
Profitability	12.1 (11.4)	13.7 (11.6)	15.1 (11.3)	17.1 (12.6)	14.8 (11.9)		
Correlation (Tobin's Q: Profitability)	15.1	23.1	26.9	27.2	21.8		

\* Standard Deviation in Parentheses.

\*\* Residual ownership is by individuals and smaller investment funds.

To calculate Tobin's Q, we use the secondary market prices for firms traded on the PSE at the end of January following the year for which we use accounting and ownership data. This way we can reasonably be assured that the market has incorporated all available information. Using these prices, we calculate Qs as the sum of market valuation and total debt outstanding, divided

by the firm's replacement value (net fixed assets plus inventory).<sup>8</sup> Table 1, Panel C reports summary statistics. The mean Q across all five years is 0.81 which is very close to the 0.85 reported by MSV for their sample of US firms. There is a decline in mean Q over the years as the aggregate stock market went down after the initial surge in 1992. Agriculture is the only sector where mean Q increased over the period (Table A2). Typically, firms in high-skill intensive sectors and with valuable intangible assets will have high Qs, while firms in physical capital intensive industries and/or industries where the output prices are regulated will have low Qs. The sectoral dispersion of Czech firms' Qs is consistent with this: 7 of the top 10 firms (highest Qs) are in services, while 8 of the bottom 10 (lowest Qs) firms are in utilities.<sup>9</sup>

Profitability is defined as gross (operating) profit over net fixed assets plus inventory. Table 1, Panel C reports summary statistics. It increases monotonically over time in all sectors (Table A2), varying between 12 % in 1992 and 17% in 1995 on average. 7 of the top 10 firms (highest profitability) operate in the engineering and architectural design, management, accounting sectors; six of the bottom 10 operate in the basic metals and the fabricated metal products (including armaments) sectors. The correlation between Tobin's Q and profitability goes up over time, which suggests that the market valuation becomes a better indicator of relative profitability as accounting data start to reflect the changes in the firms' performance.

#### IV. Regression Results

We run the regressions using all years and all firms in each year, i.e., as an unbalanced panel. F-tests reject the hypothesis of a common constant term across firms. The Hausman-specification tests indicate that either the fixed or random effects model can be used. Following Mundlak (1978) we choose the random effects model.<sup>10</sup> The pooled OLS estimates are also reported (Table A3). We also ran cross-section OLS regressions for every year separately to investigate the behavior of the parameters over time (not reported). As control variables, we use the firm's leverage (the ratio of assets to equity) and year and sector dummies (regional dummies

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8. We have to use the face value of debt as market values of debt are not available. We do not think this introduces a bias in the regressions for three reasons. First, since all debt is floating interest rate—all fixed interest-rate debt was transferred from firms to a special agency in 1990—par and market values are close. Second, while (the risk of) non-payment could lower market values below par values, this would bias Tobin's Q downward for low Q-firms as these are more likely to risk repayment problems. This would mean that the slope-coefficients would be underestimated. Third, we also tested the relationships between the ratio of market value of equity to the book value of equity only—thus not including the value of debt—and ownership and control variables, and found similar results.

9. The Qs of most firms are stable over time: nine firms are in the top ten over the whole period. Those include 3 trading firms—Transacta (Q=2.54), KOVO (Q=2.33), Strojimport (Q=2.82); two engineering and design firms—Metrostov (Q=2.43), Plynostav Pardubice (Q=3.37); two beer producers—Prazske Pyvovary Staroprame (Q=3.13), Plzensky Prazdroj (Q=2.71); one construction firm—Vitikovicke Stavby (Q=2.49); one transport firm—Cechofracht (Q=2.68). Six of the bottom ten firms are water utilities—Vodovody a Kanalizaci Nachod (Q=0.10), Zlin (Q=0.12), Prostějov (Q=0.14), Kraslice (Q=0.13), Slovacke (Q=0.13), and Nymburk (Q=0.12).

10. From a practical standpoint, the fixed effects model is costly in terms of degrees of freedom, and in a longitudinal dataset as ours, random effects have some intuitive appeal.

are not significant).<sup>11</sup> A positive sign for leverage can be expected in the Q-regression as leverage increases the value of the tax-shield advantages derived from debt financing, thus increasing the relative value of a firm. Leverage may not, however, have a positive coefficient for the profitability regression since we use operating income as our profitability-measure, which is not influenced by the tax advantages of increased interest payments. Alternatively, for both the Q- and profitability-regression, leverage may have a negative coefficient as, according to some agency models, leverage can be negatively correlated with Q and profitability (see Harris and Raviv, 1991, for a review of the relationships between leverage, and Q and profitability).

We run the regressions in three steps. First with the Herfindahl index (or the top 5 investors) only; second with the Herfindahl index but also including the shares for the various categories of investors to investigate their individual roles; and finally—to investigate the role of banks—also including one dummy, which is one when an investment fund sponsored by a firm's main bank has an ownership stake of more than 10%. The explanatory power of the regressions is good, with  $R^2$ s between 0.14 and 0.17 for the Tobin's Q regressions and between 0.08 and 0.10 for the profitability regressions. The lower  $R^2$ s for the profitability regression likely reflect the fact that current year profit is a poor guide to future profitability and valuation.<sup>12</sup> Furthermore, the panel-regressions document not only the cross-section variation in the variables, but also their variation over time. Lower  $R^2$ s could thus be expected. Annual cross-section regressions give  $R^2$ s comparable to those obtained in similar cross-section regressions.<sup>13</sup>

Leverage has a positive and significant coefficient for Tobin's Q. Leverage has, however, a negative coefficient for profitability. This may be because under central planning Czech firms financed their long-term investment needs differently from their working capital. Their subsequent corporatization, including the determination of the book value of equity, may have led to a negative association between high-leverage and initial profitability. The corporatization may have meant, for example, that firms which received more investment loans ended up more leveraged. Since during the transition these high capital intensive firms were generally less profitable, a negative association between leverage and profitability could have arisen. The cross-section regression using 1995 data alone suggests that this may be the explanation as the coefficient for leverage in the profitability regression turns positive.

The result for the concentration variable is that the lower the dispersion of ownership (the higher  $H$ ), the higher Tobin's Q and profitability (Table 2, regression i). Ownership by the top five investors,  $A5$ , has similarly a significantly positive influence on Tobin's Q and profitability (not

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11. We tested the joint significance of sectors and year dummies in all regressions. The sector dummies are always jointly significant at the 99% level. The year dummies are jointly significant at the 99% level for all profitability regressions; they are jointly significant for Tobin's Q in Regression (i) at the 95% level, but turn insignificant in Regressions (ii) and (iii).

12. As noted, the correlation between Tobin's Q and profitability goes up over time. In the year-by-year regressions, the  $R^2$ s then also increase for the profitability regression.

13. For example, the  $R^2$ s for the 1995-regressions (i) for Tobin's Q and profitability are respectively 0.335 and 0.228, comparable to those obtained by MSV, 0.595 and 0.429 given the poorer quality of data and weaker institutional setup in the Czech Republic compared to the U.S..

reported). In the year-by-year regressions (not reported), the significance of the ownership concentration variables actually increases over time, suggesting an improvement in the role of owners in corporate governance. In general, these results are strong and show that more concentrated ownership has a positive and increasing association with firm value and profitability.

**Table 2: Estimation Results\***  
(random effects model)

Explanatory Variable	Regression i		Regression ii		Regression iii	
	Tobin's Q	Profit	Tobin's Q	Profit	Tobin's Q	Profit
Leverage	0.076 (16.077)**	-0.002 (1.702)***	0.072 (15.677)**	-0.002 (1.262)	0.073 (15.745)**	-0.002 (1.284)
Dummy for First Wave	0.112 (3.521)**	0.018 (0.225)	0.321 (0.822)	0.025 (0.218)	0.362 (0.925)	0.018 (0.178)
Concentration (Herfindahl Index)	0.062 (1.691)***	0.104 (4.889)**	0.064 (0.817)	0.028 (0.729)	0.108 (0.732)	0.002 (0.741)
Bank Sponsored IPFs			0.196 (2.425)**	0.006 (0.186)	0.157 (1.906)***	0.009 (0.358)
Non-Bank Sponsored IPFs			-0.006 (0.065)	0.028 (0.975)	-0.007 (0.086)	0.023 (0.985)
National Property Fund			0.181 (1.492)	0.006 (0.155)	0.176 (1.512)	0.005 (0.148)
Local Strategic Investors			-0.095 (0.872)	0.056 (1.835)***	-0.104 (0.915)	0.057 (1.854)***
Foreign Strategic Investors			-0.092 (0.714)	0.058 (1.565)	-0.105 (0.784)	0.062 (1.584)
Conflict-of-interest Dummy					0.057 (2.085)**	0.002 (0.721)
Sector Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.139	0.083	0.167	0.098	0.169	0.098

\* All regressions are based on an unbalanced panel of 2490 observations. t-statistics in parentheses.

\*\* Significant at the 99% level.

\*\*\* Significant at the 90% level.

We next investigate the role of different types of shareholders by running regressions where we include the equity share for bank sponsored investment funds, non-bank sponsored investment funds, the NPF, local and foreign strategic investors. We also include the Herfindahl

index to separate the effects of different owners from the effect of ownership concentration (Table 2, regression ii).<sup>14</sup>

The coefficients for *H* is now no longer significant for either the Tobin's Q or the profitability regression. There is evidence that there is value to having large individual ownership as the coefficients are positive for local strategic ownership (significant) and foreign strategic ownership (marginally insignificant) for the profitability regression. The fact that the coefficients for strategic ownership are not significant in the Tobin's Q regressions may be because shares of firms with (large) strategic ownership are not very liquidly traded. Most importantly, the coefficient for bank-sponsored investment funds' ownership is positive and significant for the Tobin's Q regression. Since we include the aggregate stake of all (bank-sponsored) funds, we implicitly allow for the possibility of collusion among funds in affecting the corporate governance of firms.

We also ran regressions where we included the ownership of the 12 most important bank- and non-bank sponsored funds separately (not reported). Many coefficients for the individual bank-sponsored funds were significantly positive (Komerční Banka, Česká spořitelna, Zivnostenská Banka) and only one significantly negative (Agrobanka, a bank which has recently run into liquidity problems), again suggesting a generally positive influence of bank-sponsored investment funds. Some of the non-bank sponsored funds also had positive coefficients, for example, YSE, but in total more bank-sponsored funds had significant coefficients. There is thus no evidence for value-diversion by bank-sponsored investment funds; quite the opposite, the market, i.e., the minority shareholders, appears to value their ownership, possibly because of the monitoring and signaling roles of bank involvement.<sup>15</sup>

Next we test for the importance of the monitoring versus conflicts of interest hypotheses for bank-sponsored funds. Preferably, this would involve using data on the debts of each firm to each bank and data on the equity stake of a fund sponsored by the same bank in the same firm. We do not have such data, but we do know which was the main bank for each firm. We also know which funds were sponsored by banks. Since the likelihood and magnitude of conflicts of interest depends upon the ownership stake in each firm, we create a dummy which is one when an investment fund sponsored by a firm's main bank has an ownership stake of more than 10% (and zero otherwise).<sup>16</sup> To control for the possible special value of bank-sponsored fund and other ownership, we continue to include the equity share for bank-sponsored funds, non-bank

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14. The Herfindahl index is significantly (positively) correlated only with the state ownership share. Thus collinearity between the Herfindahl index and the ownership shares is probably only affecting the coefficients for the state share.

15. One additional explanation for the positive coefficient is that the bank-sponsored investment funds really act as inside owners, which, given the many cross-linkages between banks and firms in the Czech Republic, both through ownership and employment, is not unlikely. As shown in a theoretical model by Stulz (1988) and in the empirical papers by MSV and MS, Tobin's Q and profitability can depend in an inverse U-shape way on inside ownership, with a peak at 50% ownership. The positive signs found here for bank-sponsored investment fund ownership may then also reflect the upward sloping part of this curve.

16. About 12% of all firms fall into this category.

sponsored funds, the NPF, local and foreign strategic investors. We also continue to include the Herfindahl index to control for ownership concentration effects.

Table 2, regression iii reports the results for the panel regressions. There continues to be evidence for a signaling value from general bank-sponsored fund ownership as the coefficient for bank-sponsored fund ownership remains significantly positive for the Tobin's Q regression. The coefficient for local strategic ownership (profitability-regression) remains also significantly positive. We find no support for the conflicts of interest hypothesis as the coefficient for the main-bank ownership dummy is not negative, but rather significantly positive for the Tobin's Q regression and insignificantly positive for the profitability regression.<sup>17</sup> Minority shareholders appear thus to value the role of banks. There is therefore evidence of both signaling value—through bank-sponsored funds owning part of a firm—and of a useful monitoring role by main banks. While there may be conflicts of interest, they are not strong enough to cause ownership by a main bank-sponsored-fund to be associated with lower Tobin's Q or profitability; quite the opposite, the coefficients are (significantly) positive. The year-by-year cross-section regressions (not reported) suggest that these positive effects are increasing over time as the coefficients increase in value and significance. This increasing effect corroborates Claessens (1997) who finds that, while voucher prices in the Czech and Slovak Republics were relatively lower when a bank-sponsored fund had a relatively large equity stake, this effect was not found for the later secondary market prices in the Czech Republic.

To further test the importance of general monitoring benefits versus conflicts of interest costs, we also ran regressions where included a dummy when any ownership stake was more than 20% (ratios between 15% and 30% led to similar results) as all types of blockholders can presumably monitor firms (not reported). This general blockholder dummy is highly correlated with the Herfindahl index—but not with the main-bank ownership dummy—and is in general not significant in either the valuation or profitability regression. Including it, however, does not affect the significantly positive coefficient for the main-bank ownership dummy in the valuation regression and the insignificantly positive coefficient in the profitability regression. The role of banks in corporate governance appears thus to be special, as other blockholders do not have these positive effects.

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17. The insignificance of the main-bank dummy in the profitability regression and its significance in the valuation regression could suggest that there is some dilution of earnings through main-bank sponsored fund ownership, but that the market nevertheless values bank involvement. In the OLS regressions (Table A3), however, the coefficients for the main-bank dummy are significant for both Tobin's Q and profitability (at the 90% level in the profitability regression). And for the 1995 only cross-section regressions (not reported), both bank-sponsored fund ownership and main-bank dummy are significantly positive for Tobin's Q and profitability (at the 90% level in case of the profitability regression). This suggest that indirect bank ownership is not only valued by the market, but also leads to improved firm performance.

## **V. Conclusions**

The Czech voucher scheme led to relatively concentrated ownership. Of the shares offered through the voucher scheme, two-thirds ended up with investment funds and one-third with private individuals. Analysis of market valuation and profitability across firms provides strong evidence that more concentrated ownership is associated with higher valuation and profitability. Ownership by bank-sponsored funds and strategic investors is associated with even higher valuation and profitability and thus appears to be especially useful to improve the way firms are managed. We do not find evidence that valuation or profitability was lower for firms in which investment funds sponsored by a firm's main bank have a large ownership stake; at the opposite, this variable was significantly positive in the market valuation regressions, an effect not found for other blockholders. This suggests that banks, while potentially facing some conflicts of interest, on balance provide a positive and special role in corporate governance because of their monitoring function.



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**Table A1: Mean Share (Number of Firms)  
Owned by Individual Investors\***

<b>Category</b>	<b>First Wave</b>				<b>Second Wave</b>		
	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>
Bank Sponsored Investment Funds	23.7 (358)	24.2 (356)	23.9 (309)	25.7 (306)	11.5 (168)	14.7 (175)	17.1 (189)
Including:							
Agrobanka	11.3 (42)	11.6 (41)	15.1 (46)	16.9 (46)	11.2 (36)	11.0 (39)	13.1 (41)
CreditAnstalt	13.3 (60)	13.4 (60)	13.1 (27)	13.2 (22)	9.3 (28)	11.6 (18)	13.4 (18)
Ceska Sportelna	15.2 (231)	15.2 (230)	15.9 (137)	16.1 (138)	6.1 (44)	9.9 (38)	10.9 (44)
Investicni Banka	7.8 (147)	8.3 (147)	9.2 (120)	10.5 (131)	7.4 (50)	10.3 (58)	11.7 (61)
Komerčni Banka	11.1 (121)	11.1 (121)	13.8 (103)	15.7 (103)	9.4 (24)	9.3 (30)	10.8 (30)
Zivnostenska Banka	10.2 (49)	10.6 (50)	11.0 (33)	11.5 (31)	9.1 (16)	10.5 (15)	9.9 (19)
Ceska Pojistovna	4.2 (116)	5.6 (119)	8.9 (104)	9.1 (102)	8.5 (24)	10.8 (39)	13.2 (46)
Other Banks	11.1 (26)	11.4 (26)	10.9 (30)	11.4 (29)	16.2 (10)	11.6 (10)	10.9 (13)
Non-Bank Sponsored Investment Funds	24.5 (361)	25.2 (362)	27.3 (353)	28.9 (354)	31.0 (335)	30.2 (335)	31.0 (334)
Local Strategic Investors	33.8 (3)	35.3 (4)	17.7 (109)	20.7 (111)	17.8 (38)	24.9 (85)	29.9 (85)
Foreign Strategic Investors	0.0 (0)	0.0 (0)	26.2 (42)	29.5 (54)	25.3 (8)	26.9 (13)	34.7 (23)
National Property Fund	16.8 (52)	17.0 (45)	17.1 (26)	16.8 (19)	34.4 (74)	35.3 (64)	42.2 (43)

\* These are the average shares when ownership is positive. It excludes the cases where funds do not have any ownership in particular firms.

Table A2: Breakdown by Sector

Sector Name	SIC 2 digit code	Number of Firms		Mean Q (St. dev.)				Mean Profit (St. dev.)			
		1992	1993-95	1992	1993	1994	1995	1992	1993	1994	1995
Agribusiness	01, 02, 03, 07	19	55	0.67 (0.24)	0.65 (0.28)	0.70 (0.26)	0.72 (0.28)	0.09 (0.11)	0.08 (0.09)	0.11 (0.08)	0.14 (0.10)
Wood Products & Furniture	08, 24, 25, 26, 27	14	62	0.83 (0.22)	0.61 (0.27)	0.65 (0.31)	0.60 (0.30)	0.12 (0.10)	0.19 (0.13)	0.17 (0.12)	0.21 (0.14)
Transport	09, 16, 19, 41, 45, 47, 48, 49	36	111	1.08 (0.74)	0.84 (0.43)	0.85 (0.45)	0.89 (0.61)	0.13 (0.11)	0.14 (0.10)	0.17 (0.12)	0.19 (0.13)
Mining	12, 14	1	11	1.23 (0.00)	0.66 (0.23)	0.71 (0.36)	0.58 (0.23)	0.21 (0.00)	0.17 (0.12)	0.20 (0.13)	0.23 (0.18)
Construction	15, 17	40	53	0.89 (0.47)	0.80 (0.51)	0.80 (0.52)	0.76 (0.79)	0.10 (0.09)	0.13 (0.11)	0.12 (0.07)	0.14 (0.09)
Food	20	32	54	1.27 (0.59)	1.09 (0.56)	0.95 (0.71)	0.92 (0.47)	0.12 (0.05)	0.14 (0.14)	0.17 (0.10)	0.13 (0.11)
Apparel	22, 23, 31	22	45	0.88 (0.71)	0.73 (0.37)	0.73 (0.25)	0.61 (0.23)	0.13 (0.10)	0.14 (0.08)	0.15 (0.07)	0.14 (0.07)
Chemicals	28, 29, 30	13	30	1.16 (0.52)	0.91 (0.50)	0.93 (0.38)	0.94 (0.44)	0.18 (0.11)	0.17 (0.09)	0.19 (0.07)	0.20 (0.09)
Metals	32, 33, 34	39	58	1.19 (0.52)	0.98 (0.52)	0.82 (0.40)	0.85 (0.48)	0.14 (0.10)	0.16 (0.14)	0.16 (0.11)	0.19 (0.13)
Machinery & Equipment	35, 36, 37, 38, 39	66	104	0.85 (0.54)	0.74 (0.34)	0.72 (0.32)	0.71 (0.36)	0.11 (0.08)	0.11 (0.07)	0.11 (0.08)	0.13 (0.08)
Services	50 and above (excluding 67, 73, 95)	81	113	0.88 (0.54)	0.77 (0.79)	0.73 (0.47)	0.73 (0.47)	0.11 (0.10)	0.14 (0.11)	0.15 (0.12)	0.18 (0.16)
Finance & Investment	67, 73, 95	8	9	1.09 (0.62)	1.13 (0.69)	0.98 (0.66)	1.03 (0.79)	0.21 (0.16)	0.21 (0.16)	0.24 (0.21)	0.24 (0.20)

**Table A3: Estimation Results\***  
(OLS model)

Explanatory Variable	Regression i		Regression ii		Regression iii	
	Tobin's Q	Profit	Tobin's Q	Profit	Tobin's Q	Profit
Leverage	0.061 (13.462)**	-0.005 (4.618)**	0.059 (13.402)**	-0.005 (4.457)**	0.059 (13.432)**	-0.005 (4.459)**
Dummy for First Wave	0.120 (6.178)**	0.003 (0.306)	0.053 (2.415)**	0.006 (1.251)	0.051 (2.285)**	0.008 (1.192)
Concentration (Herfindahl Index)	0.217 (2.185)**	0.014 (0.648)	0.041 (0.116)	-0.061 (1.937)**	0.011 (0.142)	-0.095 (1.952)**
Bank Sponsored IPFs			0.398 (4.415)**	0.028 (1.415)	0.303 (3.305)**	0.018 (0.415)
Non-Bank Sponsored IPFs			0.068 (0.679)	0.011 (0.452)	0.068 (0.705)	0.011 (0.468)
National Property Fund			0.311 (1.891)***	0.024 (0.742)	0.312 (1.598)	0.022 (0.741)
Local Strategic Investors			-0.215 (1.574)	0.059 (1.639)	-0.215 (1.568)	0.053 (1.642)***
Foreign Strategic Investors			-0.048 (0.289)	0.118 (2.807)**	-0.033 (0.204)	0.122 (2.845)**
Conflict-of-interest Dummy					0.123 (4.065)**	0.0138 (1.686)***
Sector Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
R-square	0.182	0.079	0.209	0.103	0.216	0.104

\* All regressions are based on an unbalanced panel of 2490 observations. t-statistics in parentheses.

\*\* Significant at the 99% level.

\*\*\* Significant at the 90% level.



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