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Corporate Governance and Equity Prices: Evidence from the Czech and Slovak Republics

STIJN CLAESSENS*

ABSTRACT

The Czech and Slovak Republics' mass privatization scheme used voucher points distributed to the population and a competitive bidding process to change the governance of a large number of firms. Voucher prices and following secondary market prices are shown to depend upon the resulting ownership structures. The more concentrated ownership is, the higher prices are. High absolute ownership by a single domestic investor is associated with even higher voucher prices. I find some evidence that initially prices are relatively lower when a bank-sponsored investment fund has a relatively large stake in a firm. This suggests conflicts of interest.

CORPORATE GOVERNANCE IN WELL-DEVELOPED market economies is a much studied topic (see Shleifer and Vishny (1997) for a survey). It has also received much attention in the context of the transition of centrally planned economies to market economies. The need for more effective corporate governance 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 several have been tried. The Czechoslovakia 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 and about 60 percent of the Slovak economy was in private hands. As such, the Czech and Slovak mass privatization program represents a clear test case of one approach to changing corporate governance.

At the time of initiating the program, much skepticism was voiced about mass privatization. Particularly, while it would imply ownership by outside investors, it could lead to diffuse ownership and poor corporate governance. Instead, investment funds emerged which collected much of the individuals' voucher points, leading to a more concentrated ownership for many firms. Since then, the expectation has been that this more concentrated ownership

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will lead to improved corporate governance; however, only anecdotal evidence is available on the impact that investment funds have had on the way firms are managed. Too little time has passed to be able to find a discernible effect of changes in corporate governance on measures of actual firm performance.

An alternative approach is to investigate whether firms that ended up with more concentrated ownership sold for higher prices, either at the end of the voucher scheme or in the secondary market since then. In a forward-looking financial market, prices incorporate the effects of better ownership on future firm performance. If more concentrated ownership reflects better corporate governance, one would expect firm value to be increasing in ownership concentration (Shleifer and Vishny (1986)). Thus, on a cross-sectional basis, ownership structure may be a significant factor in explaining prices.

This article explores this line of reasoning. It relates various indicators of ownership concentration to voucher and secondary prices. Controlling for a number of firm and sector-specific variables, I find that several ownership concentration measures are positively related to firm value. I also find that voucher prices are even higher when a domestic investor has a majority share ownership. Relatively high ownership by bank-sponsored investment funds is not, however, positively related to voucher prices. This reflects conflicts of interest because many commercial banks are sponsors and managers of investment funds as well as creditors of individual firms. Over time, however, this effect disappears.

This article is divided into five sections beginning with a description of the voucher scheme. Section II discusses the link between ownership patterns and prices and develops the basic hypotheses to be tested. The prices and ownership patterns resulting from the voucher scheme are documented in Section III while Section IV presents the results. Conclusions are summarized in Section V.

I. The Voucher Scheme¹

A number of firms were selected for privatization and managers had to submit privatization proposals, usually to the founding ministry.² 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 was allowed prior to privatization. The privatization proposal included the amount of equity of the firm that was to remain with the state (through the National

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

² It is likely that in general, better firms were chosen for this first wave of voucher privatization (a second wave has since been completed). This selection bias should not affect the results, however, as I study only the cross-section of firms privatized through the voucher scheme.

Property Fund) in the form of temporary or permanent holdings.³ If a direct domestic or foreign investor had been identified who was willing to buy (part of) the firm, then those shares also would not be offered.⁴ Only a limited number of firms ended up with managerial or employee ownership. All remaining shares were then offered through the voucher scheme.

All citizens 18 years and older could buy, for a nominal fee, the equivalent of about \$35 (or about 25 percent of the average monthly wage at the time), a package of vouchers worth 1000 points. With these points they could bid for the shares of 1491 firms on offer or, in a prebidding "zero" round, they could offer (part of) their points to investment funds, which could then bid for shares. Round zero started February 17, 1992 and round five ended on December 22, 1992. In part due to the breakup of Czechoslovakia, final exchange of shares for points did not take place until after May 29, 1993. After the exchange of shares for points was completed, secondary market trading started at the Prague Stock Exchange (PSE) and at the two parallel trading systems in the Czech and Slovak Republics that had evolved from the systems used for the bidding process, the so-called Registranci Misto (RM) systems.

A large number of investment funds emerged on a voluntary basis; specifically, over 430 funds were established at the end of a registration period prior to the bidding rounds. 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. The funds themselves were established as joint stock companies, with the original voucherholders as shareholders of the fund and the fund's assets being its equity stakes in the various firms. As a result of active marketing campaigns by investment funds, many individuals offered all or most of their points to the funds. Funds ended up with 72 percent and individuals with 28 percent of the total number of points initially bought by individuals. Bank-sponsored funds acquired most of the points, with the ten largest bank sponsored funds holding 61 percent of all points acquired by all funds (or about 43 percent of all points initially bought by individuals). The top three sponsors alone had management contracts with funds that acquired 38 percent of all points.

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 1989–1991, and prior

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

⁴ 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.

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. For the first round, prices (points per share) were set identically for all firms. If demand matched the supply of shares of a 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 percent 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 percent excess demand, however, no shares were sold and all shares were 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.⁵ 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, Firm Performance, and Equity Prices

The influence of the distribution of and changes in ownership on corporate governance has been much studied. One approach is to study actual individual firm performance, changes in its management, and other measures, and relate this to (changes in) ownership. This approach has been used by, among many others, Demsetz and Lehn (1985), Megginson *et al.* (1994), Denis and Denis (1995), and López-de-Silanes (1996); however, it is difficult in the context of formerly centrally planned economies. Specifically, in addition to the fact that performance data will only be available ex-post, often with a considerable lag, firm data in Central and Eastern Europe are of poor quality, and international accounting standards are not fully developed. Furthermore, since the demise of central planning, relative prices have changed dramatically and past performance measures—even if measured meaningfully—are often poor guides to future performance.

An alternative approach is to study share price behavior. In a forward-looking market, prices of firms incorporate the effects of ownership and corporate governance on future firm performance. A common implication of many models of corporate governance is that firms with more concentrated ownership structures, but otherwise identical, trade at higher prices as there is a greater incentive on the part of owners to monitor the firm and make the necessary changes in management (see Shleifer and Vishny (1997)). This ap-

⁵ In some individual cases, prices were adjusted differently by the authorities (see Shafik (1995) for further detail and some examples).

proach has been much used in developed 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. Morck, Shleifer, and Vishny (1988) and McConnell and Servaes (1990) provide evidence of a positive relationship between institutional ownership and Tobin's *Q*. 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 United States.

I pursue the latter approach here. In particular, I investigate the cross-sectional relationship between ownership concentration and equity share prices using prices from the voucher bidding rounds as well as from the secondary market. Although it was not exactly known during the bidding rounds who would ultimately be successful in acquiring equity ownership in a particular firm, much of it could be inferred, especially by the investment funds.⁶ As the rounds progressed, funds and individuals could adjust their demand for specific firms in light of the emerging ownership pattern. At the conclusion of the rounds, information on ownership was complete. Since the secondary market prices I use are from about a year after the last bidding round was closed, these can certainly be expected to reflect ownership patterns.

A misspecification can arise if the ownership structure of a firm is endogenous to its value because of informational advantages certain investors have. For example, if certain investors had private or inside information about the quality of particular firms' assets or management, then they would have been attracted to the better quality firms. As a result, better firms could have ended up with both a more concentrated ownership as well as higher prices. A simple regression of prices on indicators of ownership concentration would then be biased.

Clearly, it is not possible to control directly for the specific knowledge certain investors had about particular firms; however, the competitive process of the voucher scheme allows one to control indirectly for inside information. Through the bidding rounds much (inside) information about the firms was revealed. Shafik (1994), who analyzes the process of price evolution during the five rounds, shows, for example, that individuals adjusted their demand (and resulting prices) in response to the demand by investment funds. At the same time, firms were not sold if demand greatly (by more than 25 percent) exceeded supply and individuals were given preference if demand modestly (by less than 25 percent) exceeded supply. Due to these restrictions on sales, firms which

⁶ This was made easier by the fact that a number of investment funds had made their investment strategies known before the bidding rounds started. For example, there was one fund who had announced that it would buy a particular hotel; and several funds specialized in a particular sector or "country" (Czech or Slovak Republic), or emphasized growth or dividends. Some other investment funds had either stated that they would diversify (e.g., the fund sponsored by the Czech Savings Bank) or had little choice—because of the number of voucher points they had accumulated and regulations restricting their investment in any given company—but to diversify their investments across a large number of enterprises and be passive investors.

experienced high demand because of inside information need not have ended up with a more concentrated ownership structure (or for that matter acquired firms at lower prices).⁷ At the same time, inside information was revealed and prices were adjusted for the next round.

Information on the bidding process can thus be used to control for inside information as well as any other omitted variables regarding the quality of the firm. In particular, the relative demand of the investment funds—which had the most information and the most capacity to process that information—for a specific firm, and especially their demand in the first bidding round, is likely a good control variable. At the same time, only 38 percent of all demand in the first round resulted in actual sales. Final ownership was therefore much less influenced, which makes the demand of the funds a good control variable.

Even with high ownership concentration, there may still be a premium for absolute majority ownership. The influence of investors is limited by legal and corporate bylaw restrictions, aimed at protecting minority shareholders.⁸ Ownership is also limited by the Company and Investment Funds Acts of the Czech and Slovak Republic which restrict investment funds' ownership to less than 20 percent of the equity of a given firm (Coffee (1996)).⁹ As a result, relatively large, but minority, blockholders may be unable to make radical changes in the way a firm is managed except with consent of a large fraction of shareholders. This consent may be difficult to obtain, however, as few small shareholders can or will bother to vote and a proxy voting system is undeveloped. This would prevent effective governance of the firm even when ownership is relatively concentrated. In general, larger absolute ownership may result in a price premium because it diminishes the need to rely on the very weak courts in the Czech and Slovak Republics to enforce ownership rights.

Control premiums need to be distinguished, however, from higher prices due to signaling and special abilities of certain owners. Ownership of domestic and foreign strategic investors and of the state was determined prior to the bidding rounds. These investors may have chosen better firms, based on better information, and their ownership may have thus served as a positive signal to other investors and led to higher prices. Some investors may also be "better" owners as they may have access to technology or know-how (as could be the case for

⁷ Hingorani *et al.*, (1995) actually show, using postvoucher prices, that the investment performance of individuals did not significantly differ from that of investment funds. Van Wijnbergen and Marcinčin (1995) actually show, compared to the price at which the last share of each firm was sold, that investment funds actually overpaid.

⁸ The minimum quorum requirement in the Czech and Slovak Republics, for example, is 30 percent and the minimum majority requirements are generally above 50 percent (for instance, more than 50 percent is required to remove directors and supervisors, and a supramajority of 66 percent is necessary for fundamental changes, such as an increase or reduction in equity, dissolution of the company, and changes in the company statutes). See further Gray (1993).

⁹ To prevent evasion through the use of multiple funds controlled by the same investment company, a further restriction is that the assets of all investment funds established by a single, individual investment company cannot represent more than 20 percent of the shares of the same issuer. While these constraints are not strictly enforced, only for two firms does a single fund own more than 30 percent.

foreign investors) or they may have special monitoring skills (as often argued in the case of banks). To allow for these possibilities, information on (prior) ownership by certain classes of investors should also be included.

Concentrated ownership structure may also have costs, however, particularly when conflicts of interest can arise. In cases of state ownership, conflicts can arise as the state can have interests in addition to maximizing share prices, such as preserving jobs. For investment funds, conflicts of interest are a very likely possibility (see also Brom and Orenstein (1994) and Coffee (1996)). As noted, most funds are sponsored by commercial banks, which themselves are large creditors of the firms in which the funds hold equity stakes. In the bidding rounds, the management of a fund sponsored by a bank may also have had the interests of the bank as a creditor in mind when deciding in which company to invest and how much to bid. This conflict of interest may have continued and also influenced the secondary market prices.¹⁰

A somewhat similar situation exists in Germany where commercial banks, through proxy votes, effectively control large equity stakes in firms and in general have a large influence on firms. From his work on Germany, Cable (1985) concludes that there is a positive impact of bank ownership and involvement on firms' performance. 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 that 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 for the Czech and Slovak Republics, I separately analyze the effect of ownership by bank-controlled investment funds from concentrated ownership. I also control for the size of the bank-sponsored fund ownership relative to the distribution of all ownership, since, when a bank has a large relative ownership stake among nonindividual shareholders and when individual shareholders behave atomistically, the bank may have more room to divert value than when its relative stake is small.

III. Data: Resulting Ownership and Prices

Summary statistics on the final ownership structure of the 1491 firms that emerged from the voucher scheme are presented in Table I, Panel A. Six

¹⁰ While the funds are joint stock companies, and thus formally governed by the boards elected at the annual meeting of shareholders, in practice individual shareholders exert little indirect control over a fund's management. In general, minority shareholders are not well protected given the weak court system in the Czech and Slovak Republics, banks thus have opportunities to expropriate value.

Table I
Summary Descriptive Statistics

Panel A shows summary statistics for the percent of shares held by the five investors classes at the end of the bidding rounds: the state (*STATE*), individuals (*IDVS*), investment privatization funds (*IPFS*), domestic strategic investors (*DOMINV*), foreign strategic investors (*FRGINV*), and shares not sold (*NOTSOLD*). Panel B contains summary statistics for two ownership concentration measures: the fraction of ownership held by the largest 10 investors (*A10*); and the Herfindahl index of ownership concentration (*H*). Panel C shows summary statistics for the voucher price of the 5th bidding round (December 22, 1992) or the earlier voucher price of those stocks that had already been sold, with the modification that stocks that were oversubscribed in the 5th round and that were not yet sold for more than 50% are dropped (*VOUCHER PRICE*); the secondary market price on November 30, 1993 at the Prague Stock Exchange (*PSE-PRICE*); and the secondary market price on December 10, 1993 at the Czech RM System (*RM-PRICE*). All prices are in logarithms.

	Mean	Std. Dev.	Minimum	Maximum
Panel A: Ownership Variables				
<i>STATE</i>	8.37%	15.38%	0.00%	84.00%
<i>IDVS</i>	36.53%	21.62%	1.56%	96.82%
<i>IPFS</i>	39.39%	22.22%	0.00%	90.89%
<i>DOMINV</i>	3.25%	12.51%	0.00%	84.00%
<i>FRGINV</i>	1.34%	8.00%	0.00%	80.00%
<i>NOTSOLD</i>	11.12%	10.40%	1.14%	92.83%
<i>TOTAL</i>	100.00%	NA	NA	NA
Panel B: Ownership Concentration Variables				
<i>A10</i>	62.44%	20.99%	3.18%	98.06%
<i>H</i>	13.75%	13.04%	0.10%	86.51%
Panel C: Prices (In Logs)				
Voucher price	3.28	1.19	0.46	6.91
PSE-price	6.16	0.87	4.49	8.90
RM-price	5.77	0.83	4.06	9.56

investor classes at the end of the fifth bidding round are distinguished: the state (summing several classes),¹¹ individuals, investment privatization funds, domestic direct and foreign direct investors, and shares not sold. The low averages for direct domestic and foreign investors reflect the fact that only 168 firms had direct investors. The concentration among investment funds is quite high. The top ten investment funds, for example, own on average 38.36 percent, only slightly less than the average fraction owned by all funds combined. On average, bank-sponsored funds own 11.4 percent of equity and nonbank sponsored funds own 28 percent. Since bank-sponsored funds acquired much more points than nonbank sponsored funds, nonbank sponsored funds acquired larger equity stakes at lower prices. On average, about 11 percent of equity was not sold (this share is subsequently summed with that of the state).

¹¹ Shares held by the National Property Fund (through permanent, temporary, and restitution shareholdings), shares to be transferred to municipalities, and shares to be sold through banks.

Across firms, ownership is quite varied. The greatest range is for shares held by all individuals combined, followed by shares held by all investment funds combined. The correlations among the relative ownership of the various classes are all negative (not reported).

Following the approach used by Demsetz and Lehn (1985) and Cable (1985), I use the following two measures for the degree of ownership concentration: the share of equity held by the ten most important investors combined, *A10*, and the Herfindahl index (the sum of squared ownership shares), *H*. Summary statistics for these measures are provided in Table I, Panel B. To correct for the fact that the concentration variables are bounded between 0 and 1, I use the logistic transformation of these ownership variables in the regressions, with the transformed variables prefixed with *L*, i.e., *LA10* and *LH*.

I use three price series: the prices of the last (5th) bidding round for both Czech and Slovak firms on December 22, 1992, and secondary market prices for firms traded on the Prague Stock Exchange (PSE) and the Czech RM-system. The voucher prices cover 1469 firms;¹² the number of firms for which I have PSE and RM-system prices are much less as they cover only Czech firms. Since the PSE initially operated once a week and the RM system once a month, there are many dates at which the cross-section of prices can be analyzed. I select prices from November 30, 1993 for the PSE because on this date the largest number of shares (338) were traded.¹³ For the RM system, I use December 10 prices for a total of 714 stocks. As noted, the book value of equity per share is set identically for all firms. Consequentially, there is no need to further standardize prices (by dividing by the book value of equity).

All prices are converted to their logarithms for two reasons. First, the voucher prices are not Czech Koruna (CK) prices, but rather shares per point. Consequently, there is a conversion from the voucher prices to CK (PSE and RM) prices that is uniform across all stocks. Using logs allows for a direct comparison between voucher and secondary market prices and makes the regressions for voucher and secondary market prices comparable. Moreover, all three price series have fat-tailed distributions when expressed in levels. In logs, the price distributions are closer to normal (this is verified using the Jarque–Bera normality test). Table I, Panel C reports summary statistics for these log prices. The correlations between the (log of the) three prices are high, between 0.72 and 0.90, suggesting that voucher prices correspond with stock market estimates of relative values.

For almost all the firms which took part in the voucher scheme, the following firm-specific variables are available: output, profit, credit, employment (the

¹² Shafik (1995) analyzes the price determination in the voucher rounds and uses what she calls “final prices.” These are the prices in the 5th round or the earlier prices of those stocks that had already been sold, with the modification that stocks which were oversubscribed in the 5th round and which were not yet sold for more than 50 percent are dropped (this implies that in total only 22 of the 1491 stocks offered in the voucher schemes are not included). I use this final price here too.

¹³ The PSE opened with trading on July 13, 1993; prior to October, not more than about 100 stocks were traded.

first three for the years 1989, 1990 and 1991), book value of equity, book value of total assets, total liabilities (these for the year 1991 only), region, city, and branch of industry. I use these variables or combinations of them to control for the influence of nonownership factors on prices. I do not have all independent variables for all firms for which I have one or more prices. In the basic regression, there are 1198 usable observations for the voucher prices, 286 for the PSE prices, and 589 for the RM-prices. To control for inside information and missing information about the quality of the firms, I use the demand of the investment funds in the first bidding round for a given firm relative to the total number of shares available for that firm, *DIPF*.¹⁴

IV. Results

The following nonownership variables are significant for one or more of the three price series: employment in 1991 (*EMPLO91*), the growth rate of output of the firm between 1989 and 1991 (*OUTG*), profit in 1991 as a fraction of output (*PRO_OUT*), employment per output (*EMP_OUT*), book value of assets as a fraction of output (*BOOK_OUT*), dummies for two sectors (construction, *DUMCO*, and services, *DUMSE*), and a dummy for a region (West Bohemia, *DUMWB*). Not all variables are significant for all three price series, but to maintain comparability across the three regressions all variables significant for the voucher price (as well as all sector dummies) are included in all three regressions. Tables II and III list the results for the specifications that include *LA10* and *LH*, respectively.

The explanatory power of the regressions is good, with adjusted R^2 s between 0.41 and 0.65. The influence of firm-specific, nonownership data is much less for the PSE and RM prices than for the voucher prices, with only two or four firm-specific variables that are significant. The fact that more nonownership variables are significant for the voucher prices is perhaps to be expected: at that time, information about the final ownership was still incomplete and nonownership variables were likely used more extensively to determine the relative value of firms. In part, the differences in the results for the three regressions also reflect the variance in samples for each regression. In general, the nonownership variables are not that useful to explain prices, perhaps as the move to a market system made firm data based on a centrally planned system less relevant to predict future performance. The different results for the voucher and the other two prices may also reflect shifts in the balance between individuals and funds in the determination of prices, with individuals playing a relatively larger role in the voucher prices. Svejnar and Singer (1994) and Hingorani *et al.* (1995), for example, report that there are significant

¹⁴ The correlations between *DIPF* and the ownership variables I use are less than 0.5, suggesting that it is a good control variable. In addition to *DIPF*, I also use other or additional indicators to correct for inside information, such as the demand of funds relative to the demand of individuals, the amount sold to funds relative to their demand, the amount sold relative to the total sold or available, using data for the first as well as the second rounds, etc. Qualitatively, the results reported below are not affected when these variables are used.

Table II
Regression Results for Concentrated Ownership, using Top 10 Investors

Results for regressions of prices on: employment in 1991 (*EMPLO91*), growth of output, 1989–1991 (*OUTG*), profit in 1991 as a ratio to output (*PRO_OUT*), employment as ratio to output (*EMP_OUT*), ratio of book value to output (*BOOK_OUT*), dummy for construction sector (*DUMCO*), dummy for service sector (*DUMSE*), dummy for West Bohemia region (*DUMWB*), the demand of investment funds in the first bidding round relative to total number of shares available (*DIPF*), and the (logarithm of the) fraction of shares held by the largest 10 investors (*LA10*). All regressions are estimated using ordinary least squares (OLS), with heteroskedasticity-consistent standard errors using White's (1980) procedure reported in parentheses.

	(1) Voucher Price	(2) PSE Price	(3) RM Price
Constant	2.56 (33.33)*	5.34 (44.71)*	4.98 (81.08)*
<i>EMPLO91</i>	−0.00 (−5.75)*	0.00 (3.35)*	0.00 (2.59)*
<i>OUTG</i>	0.08 (2.25)**	0.06 (0.93)	0.01 (0.40)
<i>PRO_OUT</i>	0.27 (2.84)*	−0.02 (−0.22)	0.10 (2.02)**
<i>EMP_OUT</i>	41.13 (3.97)*	−23.49 (−1.21)	24.52 (1.99)**
<i>BOOK_OUT</i>	0.00 (2.91)*	0.00 (0.98)	0.00 (0.49)
<i>DUMCO</i>	−0.26 (−3.74)*	0.35 (3.49)*	0.09 (1.53)
<i>DUMSE</i>	0.12 (1.24)	0.36 (1.91)***	0.24 (2.97)*
<i>DUMWB</i>	0.39 (4.53)*	−0.10 (−1.13)	0.08 (1.35)
<i>DIPF</i>	0.67 (14.67)*	0.59 (13.48)*	0.67 (23.79)*
<i>LA10</i>	0.12 (3.37)*	0.13 (3.60)*	0.11 (4.69)*
Adjusted R ²	0.41	0.61	0.65
N	1198	286	589

* = p -value $\leq 1\%$, ** = p -value $\leq 5\%$, *** = p -value $\leq 10\%$.

differences between funds and individuals in the relationships between their demand for shares and some firm-specific independent variables. Greater importance of investment funds in the secondary market price determination may thus be the cause for the changes in significance and sign of coefficients between the regressions.

Size (*EMPLO91*) is negatively associated with voucher prices. For the PSE prices and RM prices, however, the coefficient for size is significantly positive. This suggests that, while size was initially considered a negative factor, perhaps reflecting expectations of greater difficulties in turning around large, formerly state-owned enterprises, later on, assessments changed, perhaps as

Table III
Regression Results for Concentrated Ownership, Using the
Herfindahl Index

Results for regressions of prices on: employment in 1991 (*EMPLO91*), growth of output, 1989–1991 (*OUTG*), profit in 1991 as a ratio to output (*PRO_OUT*), employment as ratio to output (*EMP_OUT*), ratio of book value to output (*BOOK_OUT*), dummy for construction sector (*DUMCO*), dummy for service sector (*DUMSE*), dummy for West Bohemia region (*DUMWB*), the demand of investment funds in the first bidding round relative to total number of shares available (*DIPF*), and the (logarithm of the) Herfindahl index of ownership concentration (*LH*). All regressions are estimated using ordinary least squares (OLS), with heteroskedasticity-consistent standard errors using White's (1980) procedure reported in parentheses.

	(1) Voucher Price	(2) PSE Price	(3) RM Price
Constant	2.80 (24.70)*	5.55 (32.16)*	5.34 (60.48)*
<i>EMPLO91</i>	−0.00 (−5.94)*	0.00 (3.08)*	0.00 (2.15)**
<i>OUTG</i>	0.08 (2.16)**	0.07 (1.02)	0.01 (0.43)
<i>PRO_OUT</i>	0.25 (2.44)*	−0.04 (−0.56)	0.10 (1.86)***
<i>EMP_OUT</i>	36.16 (3.58)*	−27.86 (−1.33)	22.54 (1.85)***
<i>BOOK_OUT</i>	0.00 (2.53)*	0.00 (0.51)	0.00 (0.65)
<i>DUMCO</i>	−0.28 (−4.10)*	0.34 (3.37)*	0.09 (1.44)
<i>DUMSE</i>	0.10 (1.05)	0.34 (1.79)***	0.20 (2.61)*
<i>DUMWB</i>	0.39 (4.52)*	−0.11 (−1.20)	0.07 (1.31)
<i>DIPF</i>	0.70 (14.80)*	0.62 (13.73)*	0.67 (23.41)*
<i>LH</i>	0.07 (1.92)***	0.05 (1.22)	0.12 (4.68)*
Adjusted R^2	0.41	0.60	0.65
<i>N</i>	1198	286	589

* = p -value $\leq 1\%$, ** = p -value $\leq 5\%$, *** = p -value $\leq 10\%$.

opinions swung toward expectations of more favorable support from the state for large firms. When significant, profitability (*PRO_OUT*), employment per output (*EMP_OUT*), and high asset intensity (*BOOK_OUT*) have a positive relationship with share prices. Profitability, and both asset and labor productivity, are thus considered an advantage. Some sector dummies are significant for all equations, but not always the same dummies for all three price series. The dummy for the construction sector is initially negative, but then turns positive for the PSE prices, perhaps reflecting a changing assessment of the sector. The positive dummy for the service sector for the PSE and RM prices is not surprising, as that sector was severely repressed under central planning.

The dummy for West Bohemia is positive for the voucher prices, a reflection of the fact that this is the more prosperous region of the Czech Republic.

The demand by the investment funds relative to the supply, *DIPF*, is always significantly positive, suggesting that a significant amount of private information was revealed through the bidding process. The results for the concentration variables used are as follows. Ownership by the top ten investors, *LA10*, has for all three prices a significantly positive influence (Table II). Similarly, the lower the dispersion of ownership (the higher *LH*), the higher the price (Table III). The sign and significance of the ownership variables also do not change between the regressions, and are robust to many alternative specifications. These results clearly show that more concentrated ownership has a positive association with share prices, even when controlling for other firm characteristics and private information.¹⁵

I investigate the existence of an absolute majority premium by running regressions where I use dummies when there is an equity share greater than 50 percent for the state, domestic, or foreign strategic investors (*CONTROLS*, *CONTROLD*, and *CONTROLF*, respectively). As noted above, no single fund is a majority owner, as investment funds are prohibited from owning more than 20 percent of a firm, and control premiums for a single fund are thus not possible. To correct for possible signaling value from ownership, I also include dummy variables when there is any ownership by the state, domestic, or foreign strategic investors (*STATESD*, *DOMESTICD*, *FOREIGND*, respectively). I run the regressions including also *LA10* to separate majority premium from the effect of ownership concentration (Table IV, results for *LH* are not reported).

The coefficients for *LA10* remain significantly positive for all three price series. There is evidence for a signaling value as the coefficients for any state and domestic strategic investor ownership (at the 7 percent-level) are significantly positive in the case of the voucher prices. The coefficient for any foreign ownership and that for any domestic ownership in the case of PSE-prices are significantly positive at the 7 percent level and 10 percent level, respectively. For the RM-prices, dummies for any foreign and domestic investors' ownership are significantly positive. Thus, there is consistent evidence for signaling value from domestic strategic ownership, and some evidence for signaling value from foreign ownership. Significant evidence for a control premium exists only for domestic ownership in the case of the voucher prices. For all other investors and price series, the coefficients for the control dummies are insignificant and/or negative.

¹⁵ While demand by investment funds did not necessarily translate into ownership, and the raw correlations between *DIPF* and *LA10* and *LH* are then also only 0.47 and 0.42, respectively, there may still be some simultaneity between these demand and ownership variables. Estimating demand (*DIPF*) and/or ownership concentration (*LA10* or *LH*) and price equations simultaneously (using SUR and, except for the demand or ownership concentration variables, the same set of independent variables for both equations), however, does not change the results of the positive significant coefficients for *LA10* or *LH*.

Table IV
Regression Results for Concentrated Ownership and Majority Ownership

Results for regressions of prices on: employment in 1991 (*EMPLO91*), growth of output, 1989–1991 (*OUTG*), profit in 1991 as a ratio to output (*PRO_OUT*), employment as ratio to output (*EMP_OUT*), ratio of book value to output (*BOOK_OUT*), dummy for construction sector (*DUMCO*), dummy for service sector (*DUMSE*), dummy for West Bohemia region (*DUMWB*), the demand of investment funds in the first bidding round relative to total number of shares available (*DIPF*), the (logarithm of the) fraction of shares held by the top 10 investors (*LA10*); dummies for majority ownership stakes by the state (*CONTROLS*), domestic strategic investors (*CONTROLD*), foreign strategic investors (*CONTROLF*); and dummies for any ownership by the state (*STATESD*), domestic strategic investors (*DOMESTICD*), and foreign strategic investors (*FOREIGND*). All regressions are estimated using ordinary least squares (OLS), with heteroskedasticity-consistent standard errors using White's (1980) procedure reported in parentheses.

	(1) Voucher Price	(2) PSE Price	(3) RM Price
Constant	2.53 (31.04)*	5.31 (41.86)*	4.96 (75.40)*
<i>EMPLO91</i>	-0.00 (-5.62)*	0.00 (3.14)*	0.00 (2.61)*
<i>OUTG</i>	0.07 (1.75)***	0.06 (0.90)	0.01 (0.51)
<i>PRO_OUT</i>	0.28 (2.84)*	0.02 (0.28)	0.11 (2.12)**
<i>EMP_OUT</i>	43.84 (4.06)*	-12.50 (-0.61)	27.58 (2.20)**
<i>BOOK_OUT</i>	0.00 (2.56)*	0.00 (0.79)	0.00 (0.39)
<i>DUMCO</i>	-0.24 (-3.34)*	0.31 (2.97)*	0.09 (1.42)
<i>DUMSE</i>	0.13 (1.34)	0.37 (1.85)***	0.24 (3.10)*
<i>DUMWB</i>	0.41 (4.80)*	-0.09 (-1.03)	0.09 (1.56)
<i>DIPF</i>	0.65 (13.74)*	0.56 (12.21)*	0.64 (20.18)*
<i>LA10</i>	0.08 (2.13)**	0.12 (3.28)*	0.09 (3.47)*
<i>CONTROLS</i>	0.12 (0.82)	-0.15 (-1.01)	0.15 (1.27)
<i>CONTROLD</i>	0.46 (2.54)*	-0.02 (-0.07)	0.11 (0.64)
<i>CONTROLF</i>	0.08 (0.36)	-0.35 (-0.98)	-0.26 (-1.48)
<i>STATESD</i>	0.11 (1.80)***	0.00 (0.05)	0.02 (0.46)
<i>DOMESTICD</i>	0.21 (1.96)**	0.35 (1.62)***	0.26 (2.16)**
<i>FOREIGND</i>	-0.04 (-0.22)	0.32 (1.83)***	0.25 (2.78)*
Adjusted R^2	0.42	0.62	0.65
<i>N</i>	1198	286	589

* = p -value $\leq 1\%$, ** = p -value $\leq 5\%$, *** = p -value $\leq 10\%$.

There does not appear to be evidence for a control premium, perhaps because there are offsetting costs of majority ownership. With state majority ownership, offsetting costs would be particularly likely. There is general evidence that state-owned firms are less efficient than privately-owned firms (see Shlei-

fer and Vishny (1997)). Particularly in the early period of transition to market economy, the state is more likely to want to delay firm restructuring (e.g., to maintain employment, to assure some critical inputs, etc.), negatively affecting firm performance. Offsetting costs in the case of foreign ownership could arise through off-market transfer pricing between the subsidiary and its foreign owners, which leads to the dilution of the claims of minority owners.

To directly test the conflicts of interest hypothesis for bank-sponsored funds requires both 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. I do not have data on these debts, but I have information on which funds were sponsored by banks.¹⁶ Since the likelihood of conflicts of interest may also depend upon ownership distribution for each firm, I create a dummy *CONTBNK* that indicates when one or two bank-sponsored funds have an ownership stake in a particular firm which is larger than 50 percent of the ownership of all nonindividual shareholders combined (the state, direct investors, and all investment funds combined). To control for possible signaling value through bank-sponsored fund ownership, I include a dummy *BANK* if the top one and/or top two funds are bank-sponsored.

Table V reports the results. I find some support for the conflicts of interest hypothesis as the coefficient for *CONTBNK* is significantly negative for the voucher prices. There is also evidence for signaling value from bank-sponsored fund ownership as the coefficient for *BANK* is significantly positive for the voucher price series. These significant effects are not found, however, for the PSE and RM prices. For the voucher prices, there is therefore evidence of both signaling value, through a bank-sponsored fund owning part of a firm, and of the perception of conflicts of interest—as *relatively* large ownership by a bank-sponsored-fund is associated with lower prices. These effects disappear over time, however.

V. Conclusions

The Czech and Slovak 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. Of the shares owned by investment funds, 72 percent are owned by the top ten funds. Analysis of market prices provides strong evidence that more concentrated ownership is associated with higher prices. Majority ownership by domestic investors is associated with even higher prices and thus appears to be especially useful to change the way firms are managed. Firms with state and foreign majority owners do not have higher prices, suggesting that control by these investors entails costs for (minority) shareholders through decreased firm efficiency or dilution of property rights. I find some evidence that prices were initially relatively lower for those firms in which bank-sponsored invest-

¹⁶ I thank Anton Marcinčín for providing me with this information.

Table V
Regression Results for Concentrated Ownership and Bank-Sponsored Fund Ownership

Results for regressions of prices on: employment in 1991 (*EMPLO91*), growth of output, 1989–1991 (*OUTG*), profit in 1991 as a ratio to output (*PRO_OUT*), employment as ratio to output (*EMP_OUT*), ratio of book value to output (*BOOK_OUT*), dummy for construction sector (*DUMCO*), dummy for service sector (*DUMSE*), dummy for West Bohemia region (*DUMWB*), the demand of investment funds in the first bidding round relative to total number of shares available (*DIPF*), the (logarithm of the) fraction of shares held by the top 10 investors (*LA10*); a dummy when a bank-sponsored fund had a equity stake among nonindividual shareholders of more than 50% (*CONTBNK*), and a dummy in case a bank-sponsored fund was the first or second largest investment fund (*BANK*). All regressions are estimated using ordinary least squares (OLS), with heteroskedasticity-consistent standard errors using White's (1980) procedure reported in parentheses.

	(1) Voucher Price	(2) PSE Price	(3) RM Price
Constant	2.51 (31.45)*	5.31 (41.15)*	4.99 (76.26)*
<i>EMPLO91</i>	–0.00 (–5.68)*	0.00 (3.15)*	0.00 (2.53)*
<i>OUTG</i>	0.08 (2.05)**	0.06 (0.95)	0.01 (0.36)
<i>PRO_OUT</i>	0.27 (3.24)*	0.00 (0.01)	0.10 (1.89)***
<i>EMP_OUT</i>	44.17 (4.15)*	–19.37 (–0.98)	23.01 (1.85)***
<i>BOOK_OUT</i>	0.00 (2.87)*	0.00 (0.86)	0.00 (0.52)
<i>DUMCO</i>	–0.23 (–3.32)*	0.36 (3.55)*	0.11 (1.80)***
<i>DUMSE</i>	0.14 (1.43)	0.34 (1.73)***	0.24 (3.02)*
<i>DUMWB</i>	0.38 (4.40)*	–0.10 (–1.16)	0.08 (1.36)
<i>DIPF</i>	0.63 (14.03)*	0.58 (12.70)*	0.67 (22.87)*
<i>LA10</i>	0.09 (2.52)*	0.10 (2.52)*	0.12 (5.05)*
<i>CONTBNK</i>	–0.24 (–2.84)*	–0.12 (–1.12)	–0.02 (–0.25)
<i>BANK</i>	0.27 (4.00)*	0.10 (1.13)	–0.02 (–0.47)
Adjusted R^2	0.42	0.61	0.65
<i>N</i>	1192	286	587

* = p -value $\leq 1\%$, ** = p -value $\leq 5\%$, *** = p -value $\leq 10\%$.

ment funds have a *relatively* large stake. This suggests that bank-sponsored investment funds may initially have been perceived to face some conflicts of interest. Later price series do not exhibit this pattern, however.

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