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Enterprise Performance and Managers' Profiles

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Managers, Incentives and Corporate Performance: Evidence from the Czech Republic

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Summary

We study the effect of changes in management and the use of equity incentives on firm performance and market valuation using a cross-section of 706 Czech firms over the 1993-97 period. As these firms have exogenously determined ownership structures, we avoid the simultaneity problem often present in studies for transition economies where either existing managers become owners or new owners replace existing managers. And, as there were few managers in the Czech Republic with market-economy skills, we avoid the selection problem often present in studies for market economies where new managers may be better suited than existing managers to manage the firm. Controlling also for initial conditions and sector-specific effects, we find that several measures of enterprise performance are positively related with the entry of new managers, particularly if those managers were selected by private owners (rather than by the government). Equity holdings by managers appear to have no effect on corporate performance. The results suggest that changes in human capital are more important in bringing about improvements in corporate performance than equity incentives.

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Managers, Incentives and Corporate Performance: Evidence from the Czech Republic

I. Introduction

The association between corporate performance, managers and incentives is a much studied topic. One strand of literature has been motivated by the notion that financial incentives for managers—in the form of performance contracts, equity ownership, etc.—could help align the interest of owners and managers, i.e., reduce principal agent problems, and thereby improve corporate performance and increase market valuation. This has been studied extensively (for example, Murphy, 1985 for the effect of performance contracts on market valuation of firms in the U.S., and World Bank, 1996a for a review of performance contracts for state enterprises). The general finding has been that these incentives do not work well for state enterprises, especially in developing countries (and the focus of improving state enterprises' performance has subsequently shifted to privatization),[1] but work reasonably well for private firms in developed market economies (see Jensen and Zimmermann, 1985 for a review). Recent theoretical models (Aghion et al., 1994; Aghion and Blanchard, 1996) build on the existing literature and investigate the importance of incentive systems for executive performance in the context of transition economies. Some empirical evidence on the link between executive compensation and enterprise productivity growth during the initial transition period is becoming available (see Jones and Kato, 1996 for a study of Bulgarian firms).

Another strand of literature has studied the impact of changes in managers on corporate performance. The early contribution of Jensen and Meckling (1976) had highlighted the effects of managerial entrenchment and the accumulation of private benefits (rents) by managers on corporate performance. An active market for managers and take-over (threats) by shareholders would help discipline and remove entrenched managers. A number of studies have since investigated the effect of changes in management on corporate performance, for example, the effect of unexpected death of CEOs on corporate valuation (Johnson et al., 1985); the role of institutional investors in changing managers and the effects this has on corporate performance (Smith, 1996); and the role of manager turnover in the context of underdeveloped managerial markets (Djankov and Pohl, 1998). These papers generally find that changes in managers are

1 Here, the hypothesis has been that private ownership leads to better incentives to monitor managers which in turn would raise enterprise performance. A number of papers (Bailey, 1986; Bishop and Kay, 1989; Kikeri et al., 1994, Earle and Estrin, 1997) present (mostly anecdotal) evidence of the beneficial role of privatization in enhancing enterprise efficiency. With the collapse of central-planning in Central and Eastern Europe and the (then) Soviet Union interest in the theory of privatization increased. The path-breaking study in this literature (Boycko et al., 1993) was motivated by (and influenced) the Russian mass-privatization program. The model, and its subsequent refinements (Shleifer and Vishny, 1994 and 1996), focused on the separate impact of privatization, deregulation, and stabilization, as well as corruption on enterprise performance. It identified a number of specific empirically testable hypotheses on the benefits of privatization. Some of these have since been tested in a number of papers (e.g., La Porta et al, 1997, Claessens and Djankov, 1997, and Earle and Estrin, 1997) and the results support the theoretical models of privatization and enterprise restructuring.

associated with an improvement in corporate performance and market valuation (see Jensen and Zimmerman, 1985, for a review).

Both strands of literature are plagued, however, from simultaneity and selection problems. The studies of management changes in market economies may suffer from a selection problem as new managers may be better suited than existing managers to manage the firm currently. The improvement in corporate performance or market valuation associated with management changes occurs not because the old managers were entrenched, but rather because their skills-mix have become outdated. The literature on the effects of changes in managers and financial incentives in transition economies often suffers from a simultaneity problem as either existing managers become owners or new owners replace existing managers, thus confounding the effects of incentives and management changes on enterprise performance. As a result, it is difficult to test whether the changes in equity ownership (i.e., incentives) or the changes in management led to the changes in performance.

The Czech privatization experiment provides a unique opportunity to shed new light on the relationships between corporate performance on one hand and changes in managers and incentives on the other hand. Two factors contribute to the uniqueness of the Czech experience. First, privatization of many firms occurred simultaneously through a distribution of voucher points to all (adult) citizens, followed by competitive bidding, and firms' ownership ended up determined largely exogenous to firm characteristics, including its management. While there was some equity ownership by managers, very few firms ended up with large insider ownership. As a result, we avoid the simultaneity problem of either the existing managers becoming the new owners or the new, outside owners replacing the existing managers. We are thus better able than existing studies for transition economies to separate the effects of incentives on enterprise performance from those of management changes. Second, immediately following the start of the transition and the implementation of the privatization scheme, there were few managers in the Czech Republic with skills suited to the new market economy. We thus avoid the selection problem—of the skill-mix of new managers being better suited than that of the existing managers to manage the firm in changed circumstances—and can analyze the sole effects of management changes on performance and market valuation

For the empirical part of the paper, we use four enterprise performance parameters for a cross-section of 706 Czech firms over the period 1993-1997. In particular, we study the effect of new managers and equity incentives on: profitability; labor productivity; propensity to initiate new marketing efforts; and Tobin's Q (ratio of market to replacement value). We control for initial conditions and sector-specific effects, and also study whether additional characteristics of general managers (age, years with the firm) help explain corporate performance. We find that all four measures of enterprise performance are positively related to bringing an outsider as a new manager. Equity incentives of CEOs has an indeterminate effect on corporate performance. Indeed, for three enterprise performance measures they have a negative effect, although only for new marketing departments is this effect significant. The results suggest that changes in

managers are more important in bringing about improvements in performance than incentives in the form of equity shares.

The paper is structured as follows. Section II briefly describes the Czech privatization scheme. Section III discusses the link between management changes, incentives and performance and market valuation; it thus develops the basic hypotheses to be tested. The management changes resulting from the voucher scheme, valuation and profitability are documented in section IV while section V presents the results. Conclusions are summarized in section VI.

II. The Czech Voucher Scheme and Management Changes[2]

The Czech mass-privatization scheme took place in two phases or "waves": the first started in October 1992 and ended in June 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, during a three month period, firms were selected for privatization and managers had to submit privatization proposals, usually to the founding ministry. There were some differences in the selection of firms for the first and second wave. The first wave mainly consisted of manufacturing firms and excluded some large, vertically-integrated industrial conglomerates. Those needed extra time to be split up into smaller, independent firms. The second wave included (along with a similar group of manufacturing firms) the newly created independent firms, as well as banks and utilities.

In the first wave, several dozen firms ended up with managerial or employee ownership; in the second wave, managers of many more firms did, although ownership stakes remained low. Further taking account of shares set aside for direct investors and for restitution, remaining shares were offered through a voucher scheme. All adult citizens could bid with points for shares on offer or, in a pre-bidding "zero" round, could offer (part of) their points to investment funds, which could then bid for shares. A large number of such funds emerged (over 430 funds for the first wave and an additional 120 for the second wave) and many individuals offered all or most of their points to the funds. After the bidding rounds, point were exchanged for shares and secondary market trading started.

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. To improve price discovery, the scheme did not involve a single

2 Part of the following summary is from Claessens et al. (1997).

auction, but rather five sequential bidding rounds with price adjustments between rounds. 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, restrictions on sales limited the effects of inside information and any linkages between preferred and final ownership.

Management changes were extensive. In 1990/91, prior to the first wave of privatization, the top management of all Czechoslovak companies was "de-politicized" and general directors who were communist party members were removed from firms' management. In the majority of cases, the new general manager appointed at that time was the old technical director, i.e., an internally promoted manager. Very few outside directors were appointed, in part due to the limited supply of superior managers and a poorly functioning market for managers. In the years following privatization, however, further changes in top management occurred, in part dependent on the evolution of ownership structure for each firm.

III. Equity Incentives and Management Changes

The importance of equity incentives in changing enterprise performance has been extensively studied in the theoretical and empirical literature on corporate governance for market economies (the seminal paper is Jensen and Meckling, 1976). Most principal-agent models suggest that the incentives of top managers to behave in a profit-maximizing manner improve once they hold a stake in the performance of their firms. These models also predict that an alignment of managers' incentives with those of the owners—for example, through performance contracts, equity holdings or stock options—can increase enterprise performance and market valuation. Thus one would expect a positive association between stock holdings by top managers and corporate performance and market valuation. This was shown to hold empirically for several samples of US firms (for example, Murphy, 1985; Morck et al, 1988; Denis and Denis, 1995). The relationship may not be monotonic, however, and there are theoretical models that beyond certain levels equity incentives may not lead to improved enterprise performance (for example, Stulz, 1988). In empirical studies, this (non-monotonic) relationship has generally been confirmed for market economies (see Shleifer and Vishny, 1997 for a survey).

The relationship in transition economies between equity ownership by top managers and enterprise performance is generally more complicated. In many transition economies, equity stakes were not primarily used by firms' owners as tools to influence top managers' behavior at the margin. Rather, equity stakes provided to managers were to a significant extent used as tools to change the ownership structure of the firm itself. This was due to the systemic nature of the ownership transformation problem in transition economies and the significant political economy role of existing state enterprise managers in the process of deciding on the form of changes in enterprise ownership. Once the decision to privatize the firm was made, top managers were often given large equity stakes or acquired large equity stakes from employees in the immediate period

following privatization. Inside ownership and poor tradability of equity shares have as a result become common in some transition economies (see World Bank, 1996b). Empirical evidence to date for transition economies finds that ownership by top managers has affected enterprise restructuring negatively in several ways. Earle and Estrin (1997), in a study of Russian enterprises finds that inside owners are less likely to restructure, have more difficulty attracting outside capital, and shed less excess labor. A cross-country study (Carlin et al, 1995) based on enterprise surveys from the Czech Republic, Hungary, Poland, and Russia finds that management buy-outs result in less restructuring when compared to sales to outsiders. Survey evidence collected by the second author in Georgia and the Slovak Republic provides a similar picture. In cases where incumbent managers in these countries received equity holdings for free, managers did not value these holdings much and continued to operate as before. Furthermore, the presence of such holdings was used for entrenchment purposes, i.e., managers used their votes to prevent being ousted from their positions.

Transition economies are poorly endowed with people skilled in managing firms in a market economy. Under state ownership, top managers were mostly selected for their ability to lobby politicians for subsidies and other forms of assistance, and not for their strategic leadership. As a result, it has been difficult to find new good managers in most transition economies and the market for managers has been under-developed. Djankov and Pohl (1997), for example, document the changes in top management in a sample of Slovak firms. Although all general managers were removed from office in 1990-92, many managers regained a position in another firm (in some instances also as new owners) by 1996, although their skill-mix did not change. The weak market for general managers has likely affected the influence of equity incentives on managers' behavior. With less scope for turn-over of managers, the value of (the flow of) private incentives to incumbent managers becomes more important and can easily exceed the benefits from equity ownership. Furthermore, with the limited trading in equity shares in many transition economies, the ability of managers to obtain the true value of their equity is reduced.

A hypothesis has consequently emerged that equity incentives are not sufficient for inducing enterprise restructuring in transition economies and that changes in top managers—or more broadly, bringing in new human capital—are necessary to improve enterprise performance. This hypothesis was first put forward and tested by Barberis et al. 1996 for a sample of 452 privatized Russian shops. The study posits that privatization where managers become equity holders may enhance enterprise efficiency because top managers' incentives become better aligned with those of the owners. Privatization is found to lead to the selection of managers "who are better at running firms efficiently" (Barberis et al. 1996, p. 765). Finally, the presence of both new owners and new managers raised the likelihood of restructuring, while equity incentives of old managers did not appear to promote restructuring. The authors interpret this evidence to highlight the critical role of new human capital.

In another study, Djankov and Pohl, 1997, find that Slovak firms which had top management changes had superior performance relative to firms with no management change. There is also evidence that changes in management in individual firms may also have spillover effects. In some small former Soviet Union countries, for example, top management turnover is minimal. Yet, the few changes in top management may have a positive effect on enterprise restructuring since they signal to other managers that there is a link between tenure and performance, and leads incumbent managers to take restructuring measures in order to ensure their positions (Djankov, 1997). More generally, there has been a recognition in the literature that not only equity incentives but also management changes are necessary for enterprise restructuring (e.g., Rosen, 1992).

There are, however, two problems with the existing empirical literature for both transition and market economies on the effects of incentives and management changes on enterprise performance. First, as the discussion above suggests, the effect of top management changes in transition economies can easily be mixed up with that of equity incentives. On one hand, in many transition economies top managers typically received controlling stakes during the initial privatization process and then did not relinquish their management of the firm. On the other hand, in those firms in which outsiders obtained a controlling stake, managers were more likely changed. This suggests that the two processes—changes in incentives and management changes—are highly correlated.[3] In addition, as mentioned above, theoretical models predict that the relationship between equity ownership and enterprise performance may be flat or declining for large ownership stakes. Since in many transition economies (e.g., Russia) inside ownership stakes are large, it may be difficult to detect a relationship between equity ownership and enterprise performance.[4] In addition, the first study of changes in management in transition economies, Barberis et al. 1996, covered only retail shops which, because of relatively low capitalization, can be majority management owned—or at least could have significant equity holdings—and are likely protected from possible takeover threats. The study's findings may thus not generalize to the situation of larger firms where top management ownership is likely to remain small and the threat of take-over and management turn-over as a result of shareholders' action is larger.

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3 Indeed, in the Barberis et al. 1996 study, "there is substantial overlap between ownership change and management change. In fact, management changed in 39% of the cases in which ownership changed, but in only 11% that ownership did not change" (p. 771). Of the enterprises included in the survey, 52% had no change in mangement as well as insiders dominating ownership and 17% had both managers changed and controlling outside investors come in. Only in 31% was there thus a situation in which either management changed and no controlling outside investors emerged (6%) or management was not changed and controlling outside investors emerged (25%). The simultaneity between the two processes was thus high for this sample of shops, which is not surprising given the small capital investment involved in shops, the strong position of incumbent managers in Russia, and the fact that shops are typically owner-managed around the world. While Barberis et al. 1996 try to correct for this endogenity, how to do this is not obvious.

4 Barberis et al. 1996 try to check for non-linearity and found none, but these non-monoticities may be hard to detect.

A second problem concerns the studies for market economies. While in market economies management changes are typically not correlated with ownership changes, a selection problem may exist: new managers may simply be better suited to managing the firm. Any positive effect of replacing managers on enterprise performance may thus not necessarily result from eliminating some forms of entrenchment of the existing managers, but rather from the fact that the new managers are better suited to managing the firm in, what is possibly, a changed environment. It is possible to argue, for example, that in the late 1980s management of IBM needed to be changed, not because they had (excessive) private benefits and rents, but rather because they were not up to the task of managing the firm in a new environment with different technologies, different competitors, etc. As result, tests of the effect of changes in management in market economies may have suffered from an endogeneity problem where better new managers are brought in, and therefore firm performance improves, rather than that the removal of existing management itself led to improved corporate performance.

The hypotheses of the effects of equity incentives and top management changes can therefore best be tested in an environment where top managers received small equity stakes during the initial privatization process and where there has been limited supply of new managers with superior skills. Based on these two conditions, the Czech experience is well suited for empirical testing. First, as discussed in Section II, the privatization process prevented incumbent managers from getting significant insider control. As a result, top management changes and ownership were quite separate. Second, there were few managers with skills suited to a market economy in the Czech Republic at the start of transition and immediately following privatization. The Czech liberalization process started only in 1992—few young Czechs could enter Western business schools and return as more professional and superior managers for the new environment. The 1968 exodus of Czech professionals and their return in the early 1990s provided a supply of managers who had significant experience in Western management, but these were isolated cases. Thus the supply of qualified managers immediately the onset of transition was very limited. The Czech experience thus allows us to answer the question of the effect of new top management on enterprise performance more definitely and sheds new light on the role of equity incentives.

IV. Description of the Data

We have data on Czech firms compiled from survey data. The dataset is collected in two steps. First, financial and ownership information of 1,191 firms listed on the Prague Stock Exchange (PSE) was collected by a private local marketing firm, contracted for the purposes of this study. All financial variables were defined using international accounting standards from the onset of the survey in 1992. A number of firms do not report PSE-prices since their shares are not actively traded. We exclude therefore from our analysis firms whose shares trade less than four times in a given year. The 1992-97 data are complete for 371 firms which went through the first wave of voucher privatization. An additional set of 335 firms which went through the second wave report consistently after 1993, making altogether for 706 firms for the period 1993-

1997. Once the base dataset was collected, a second survey was performed in which interviewers visited all 706 firms that had previously supplied complete information and asked managers about their background and equity holdings. The second survey served as a basis for testing the hypotheses outlined in the previous section.

We use several variables to describe general managers (Table 1, Panel A; the definitions of all variables used in the analysis are provided in Table A1). The average duration of general managers' tenure is 4 years, with less than 10% of managers having been on the job for six or more years. This is a very short period when compared, for example, to the average of 13 years for US CEOs (Johnson et al., 1985). The main reason, as explained earlier, was the dismissal of all general managers with communist party affiliation following the election of Vaclav Klaus as a prime minister. Although general managers were changed, many of the new managers were internally promoted and the average tenure of general managers on any position with their firm was 15 years and 3 months. Approximately 8% of all managers had worked with their firms for more than 30 years; 19% of managers had worked for their firms for more than 25 years; and a third of all managers had 20 or more years of experience with their respective firms. Finally, the average age of general managers was 49 years—10 years younger than their US counterparts (Johnson et al., 1985; Morck et al, 1989; McConnell and Servaes, 1990)[5] and a year younger than their Russian counterparts (Blasi et al., 1997).[6]

The annual general managers' turnover rate in the sample was 12.0% in 1991, 17.8% in 1992, 15.2% in 1993, 15.1% in 1995, and 30.4% in 1995. The comparable estimates for annual turnover for US firms range between 9.3% (Denis and Denis, 1995) and 7.8% (Weisbach, 1988). The turnover rate for Russian CEOs was 8.4% between 1992 and 1996 (Blasi et al., 1997). The higher turnover rate in the Czech Republic was undoubtedly triggered by the dismissal of old managers by the Klaus administration in 1991-92, and the subsequent changes in management once privatization was completed. Both events did not affect Russian firms where a "de-politization" of industry did not occur and where insiders took over 58% of all firms (Blasi et al., 1997, Table 2).

The design of the Czech privatization, as discussed earlier, prevented managers from obtaining significant stakes in their respective firms. Indeed, the average share of equity holdings of general managers was only 2.5% of total equity, with only 1.8% of managers holding 20% or more, and 8.2% of managers holding 10% or more. This is low even by US standards—the average holding of US CEOs reported ranges between 11.8% (McConnell and Servaes, 1990) to 9.5% (Johnson et al., 1985) and a lower bound of 2.7% (Morck et al., 1989). It is comparable to the equity holdings in Russian firms, where general managers own 4.5% on average (Blasi et

5 Johnson et al. 1985 cover a sample of 172 US firms on the NYSE; Morck et al. cover 454 firms of the 1980 Fortune 500; McConnell and Servaes vover 1,1173 firms in 1976 and 1,093 firms in 1986.

6 Blasi et al report that between 1992 and 1996, for a sample of 332 Russian firms, 33% of all general managers were replaced, with 19% of new managers coming from the outside and 14% being internally promoted. The average age of general managers in 1996 was 50 years.

al., 1997, Table 4, p. 193).[7] In both the Czech Republic and Russia, it may be that managers underreport their equity holdings. While we suspect that this is likely, it does not affect our benchmark specification where equity holdings are taken to be a discrete choice—1 if a manager has any holding, 0 otherwise. It is difficult to argue that managers would not report small holdings.

To calculate Tobin's Q (TOBQ), 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 be reasonably 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). [8] Table 1, Panel B reports summary statistics. The mean Q is 0.804 in 1993, 0.782 in 1994, 0.768 in 1995, and 0.733 in 1996. There is a monotonic decline in mean Q over the period as the aggregate stock market went down after the initial surge in 1992. Typically in market economies 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: seven of the top ten firms (highest Qs) are in services, while eight of the bottom ten (lowest Qs) firms are in utilities. The values of Tobin's Q in 1996, for example, vary between 3.37 and 0.12. The Qs of most firms are stable over time: nine firms are in the top ten over the whole period. Those include three trading firms; two engineering and design firms; two beer producers; one construction firm; and one transport firm. Six of the bottom ten firms are water utilities.

Profitability (PROF) is defined as gross (operating) profit over net fixed assets plus inventory. Table 1, Panel B shows it increases over time, from 0.137 in 1993 to 0.171 in 1995 on average, with a decline to 1993 levels in 1996 - 0.137. 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 until 1995 (not reported here), which suggests that the market valuation becomes a better indicator of relative profitability as accounting data start to reflect the changes in firms' performance. This trend breaks down in 1996 as stock prices show increased dispersion.

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7 Equity ownership by all managers, not just top management, is considerably higher in Russia. Estrin et al., 1997, report an average managerial owenership of 17% for their sample of firms. Since out focus is on top managers only, however, the correct comparison is with the Blasi et al., 1997, Table 2.

8 We 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 two 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.

Labor productivity (LABPRO) is defined as value added per employee. It is positively correlated with profitability. Previous studies of enterprise performance in transition economies treat labor productivity as a leading indicator of performance while profitability is a lagging indicator (Wolff, 1996). Labor productivity increases significantly over the 1992-95 period and declines somewhat in 1996. Finally, managers of enterprises responded to the question whether there has been a new marketing department established after privatization (MKTDEP). They were given a discrete choice "Yes/No". This qualitative variable is complementary to the other three indicators. About 61% of all firms had established a new marketing department by 1996, while only 24.8% had marketing departments in 1993 (Table 1, Panel B, last row).

[Table 1 here]

As control variables (Panel C), we use the firm's leverage (the ratio of assets to equity, LEV), the excess demand over supply of shares in the first round of the voucher scheme (EDEM), and sector dummies. A positive sign for leverage can be expected in regressions for Tobin's Q 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).

The excess demand variable in the fist bidding round (EDEM) is used to control for other firm characteristics (favorable location, new machinery) which may have affected prices, firm performance, and restructuring. Sector dummies ($DSEC_i$) are commonly used in studies on firm performance to capture sector-specific shocks (e.g., increased exposure to international trade), growth opportunities and other sector-specific characteristics affecting firm performance and market valuation (see discussion above).

The average size of the 706 firms in the sample is 1,100 workers. The dispersion is, however, very wide with firms with as few as 9 and as many as 49,701 workers. Few large firms account for much of the dispersion. The median size is only 382 workers, with approximately 7.8% of firms with less than 100 employees, 26.6% with less than 200 employees, 32.7% with more than 750 employees, and about a quarter of firms (24.79%) with more than 1,000 employees.[9]

Table 1, Panel D reports correlation coefficients on manager profiles (YCEO, AGE, YFIRM) and the end-period values of profitability, labor productivity, Tobin's Q, and the establishment of a new marketing department. All correlations of interest are relatively weak.

9 In comparison, the sample used in Barberis et al. (1996) has an average firm size of 25 employees.

The number of years as a general manager is positively correlated with the stock price, but negatively correlated with profitability, labor productivity, and marketing efforts in the sample. Stock prices, profitability, and labor productivity are all weakly correlated with the age of managers, while marketing efforts are weakly negatively correlated with the age of managers. Next, and in support of the hypothesis of managerial entrenchment, all corporate performance indicators are negatively related to the number of years that managers spent with their firms (YFIRM). Finally, with the exception of marketing efforts, all indicators have a weakly negative correlation with the share of equity holdings by general managers.

The hypotheses outlined in the previous section suggest a matrix structure with increasing positive correlation between corporate performance, on the one hand, and change of managers and equity holdings on the other. We provide some evidence for these hypotheses by presenting some descriptive statistics. Since the dependent variables vary greatly across sectors, we mean-difference each indicator by subtracting the mean value of the indicator for the whole sector from the individual firm's indicators. The results are reported in Table 2.

[Table 2 here]

The means for the dependent variables vary across managers' types in ways consistent with the hypothesis that outside managers provide additional value to the firm. Comparing the means statistics in the first column, we find that (relative to the average in their respective sectors) firms which are managed by insiders under-perform on all four indicators, i.e., the signs on the MTOBQ96, MPROFIT96, MLABPRO96, and MMKTDEP are all negative. The average labor productivity of insider-managed firms is almost 8% lower than the sample average. Firms that have general managers appointed by the government during 1991-92 show higher than (the sector-adjusted) average level of profitability (MPROFIT96 = 0.022), and marketing efforts (MMKTDEP = 0.041). At the opposite, those firms show lower than (the sector-adjusted) average level of stock valuation (MTOBQ96 = -0.008), and labor productivity (MLABPRO96 = -28.596). Finally, firms who have outsiders (selected by the new private owners) as managers consistently outperform the other two groups on all corporate performance indicators. In particular, they have 20% higher labor productivity than average in 1996 and their stock valuation is 10% higher than the sample average.

The raw statistics are less supportive of the hypothesis on the role of equity incentives as we compare the indicators in the second and third columns of Table 2. We divided the sample of firm in those whose managers have (any) equity and those whose managers have no equity. For three measures (MTOBQ96, MLABPRO96, MMKTDEP) do firms whose managers have equity report lower than the (sector-adjusted) average values. For only one measure (MPROFIT96) is the value for equity holders higher than the value for managers with no equity holdings. F-test analysis (not reported) indicates, however, that in none of the cases is the difference between the two samples statistically significant.

The absence of support for the null hypothesis on equity incentives (namely, that equity incentives lead to improved corporate performance) may be due to problems with aggregation. In particular, it may be the case that insiders who hold equity do not perform better, but that the sub-sample of new managers selected by private owners shows different results. We hence also tests whether means differ depending on equity ownership for each of the three type-of-manager groups. In each case, the results from the full sample are upheld, i.e., there is no statistically significant difference in the performance of firms led by managers with and without equity holdings (not reported). We also investigated the possibility of a selection bias, where new managers are appointed in certain type of firms, but we found no clear bias (see further Annex).

V. Hypotheses Testing

We estimate regressions using OLS specifications on all 706 firms in the sample. The benchmark specification uses dummy variables for both management changes and equity ownership by managers. The dummy SHOLDER for equity ownership by managers is always insignificant and positive only in the TOBQ regression. This confirms the evidence presented in the raw descriptive statistics that equity incentives are not sufficient to enhance performance. The dummy for manager change (OUTSIDER) is significant in three specifications and only marginally insignificant in the MKTDEP regression. It is always positive. Thus the hypothesis that appointing new managers brings about improved corporate performance is confirmed.

The coefficient on general managers' age (AGE) is marginally insignificant in most specifications, but positive in all cases. Older managers are (on average) more likely to lead their firms to better performance. A possible reason for this indeterminacy is the presence of old managers with experience in running Western firms (the 1968 Czechs). By 1997, such managers were in their late 50s and early 60s. Although a small group—only 22 of 706 managers (3.2% of total) are identified as 1968 Czechs—these managers have a large effect in the age distribution since they account for half of all managers above 60 years of age (compare to Table 1, Panel A). They do not appear to drive the results, however, since when we include a separate dummy for these managers, the overall results are not changed (but the coefficient on this dummy is highly significant and positive; not reported).

[Table 3 here]

The explanatory power of the regressions is good, with R^2s between 0.22 and 0.60, except for the marketing department indicator where the variables explain only 2% of the variation. The lower R^2s for the TOBQ regression likely reflect the fact that the PSE-prices largely reflect minority shareholder valuation. The low explanatory power of the MKTDEP specification may in part be due to the data available to us. In particular, although we know which firms have established their own marketing departments, we do not know which firms were part of an industry consortia which supplied them with marketing services. Thus we cannot distinguish

between firms which had not opened a marketing department because their managers were not inclined to do so, and firms which were supplied with this service externally.

As expected, leverage has a positive coefficient for TOBQ in the estimation. Leverage has, however, a negative coefficient for PROF, LABPRO, and MKTDEP. 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 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, on the one hand, and profitability and labor productivity, on the other, could have arisen.

The EDEM variable may be a good proxy for important but unobservable (to the econometrician) firm characteristics that help explain subsequent performance and valuation of firms. In all cases the coefficient is insignificant, however, only in the LABPRO regressions is it positive. This suggests that either inside information was not important or that, as argued in previous studies on the Czech mass privatization (Young and Hillion, 1996; Hingorani et al., 1997; van Wijnbergen and Marcinin, 1995), that investors did not effectively discriminate between firms on account of any (inside) informational advantages. This may be because the strategy of most investors, and the large investment funds in particular, was to bid with all points in the first round. This was done for fear of not being able to use all available shares (the number of rounds were not established before the privatization started and investors thus did not know how many rounds were remaining) and because some of the investment funds had issued guarantees on their rate of return, which they could fall short off if too many points were to go unused.

The signs on initial conditions (the second group of coefficients in Table 3) are always positive. The coefficients are also highly significant, as expected. The sector dummies show some interesting patterns. Agribusiness has a negative coefficient in the TOBQ and MKTDEP regressions, which turns positive (but insignificant) in the LABPRO regression. The only sector where the coefficients are uniformly negative in all regressions is Wood, while Food, Metals, and Machinery are the only three sectors with uniformly positive (albeit mostly insignificant) coefficients. F-tests for the joint significance of the sector variables show only statistically significance (at the 95% level) in the TOBQ regression. We leave them in all regressions for comparability.

As discussed, we can distinguish three different types of managers: insiders, outsiders selected by the government, and outsiders selected by the new private owners. In Table 4 we extend the analysis and study separately the impact of various types of managers using dummy variables.

[Table 4 here]

The pattern of the effects of management changes and equity incentives on corporate performance is similar to that shown by the raw statistics (Table 2). Different types of changes in managers (insiders, outsiders appointed by the government, outsiders selected by the new private owners) affect corporate performance differently. In particular, managers chosen by private owners who were not internally promoted (OUTSIDER:OWNER) perform best, followed by managers chosen from the outside by the government (OUTSIDER:GOV), with internally promoted managers the worst. Equity incentives do not have a significant effect on corporate performance, even if one distinguishes between equity incentives held by internally promoted managers versus equity incentives held by externally appointed (by the government or private owners) managers.

One possibility for the insignificant results for equity holdings may be that so far we have not used the data on the size of manager holdings. As shown earlier, there is little variation across firms and the mean share of equity held by managers is very small (2.5%). It is also not clear whether managers may have used other vehicles to invest in their firms. We nevertheless test the hypothesis that there exists a correlation between the size of each holding and manager performance by including the reported holdings instead of the dummy for holdings. The results (not reported) show no discernible pattern when the relative amount of shareholdings is included. Since it has been found that the relationship can be non-monotonic (Morck et al., 1988 report that the relationship between Tobin's Q and CEO stock ownership is positive between 0% and 1%, negative between 1% and 5%, positive between 5% and 20%, and negative after that), we also run a piece-wise linear regression. We divide managers into groups who hold less than 5%, less than 15%, and more than 15% and create a dummy for each group. Including these dummies in a similar regression as that of Table 4, we do not find any significant dummies. An alternative hypothesis may be that the results are not supportive of the theory since holdings in small firms are less valuable than equal (in terms of share of total) holdings in large firms. We run therefore another set of regressions, substituting the value of each holding (defined as the number of shares the manager holds times their market value) for the share of equity the manager owns. Again, the results (not reported) are not statistically significant.[10]

In sum, we find that the results in Tables 2 and 3 are supported in subsequent refinements of the empirical specifications. The evidence for the hypothesis that new managers help the

10 As an additional piece of sensitivity analysis, we use scatter plots to see whether the tenure (number of years associated with the firm) helps explain the relative performance of firms with insider managers. In particular, we divide the sample of insider-managed firms into firms with CEOs who had spent less than 10, less than 20, and less than 25, and more than 25 years with the firm. The scatter plots (not reported) show a non-monotonic (but statistically insignificant) relationship where managers in the 10-25 years of experience groups perform better than managers with less than 10 or more than 25 years of experience.

restructuring process is robust. The evidence on equity incentives, on the other hand, is indeterminate.

VI. Conclusions

The Czech voucher scheme provides a unique experiment for empirical research on the relationship between management profiles and corporate performance as it allows us to study the effects of management changes and incentives on performance with little concern for endogeneity or selection problems. We find that four measures of enterprise performance are positively related to the entry of new managers, especially those appointed by private owners. Equity incentives to general managers have an indeterminate effect on corporate performance. Indeed, for three enterprise performance indicators they have a negative effect, although never significant.

The main conclusion for policy makers is that post-privatization enterprise restructuring in transition economies requires new human capital, which can only occur through management changes. Countries that opted for management buy-outs or countries with insufficient entry of new managers (either expatriates or newly trained managers) may have difficulties in achieving high corporate growth.

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Table 1: Manager Characteristics and Corporate Performance
(706 Firms, Mean, Standard Deviation, Median)

A. Management Characteristics (as of February 1, 1997)

	Mean	Std. Dev.	Minimum	Maximum	Median
Years as General Manager (YCEO)	4.052	2.471	0.5	16.0	4.0
General managers with tenure of 6 or more years	9.066%				
Age in Years (AGE)	49.245	7.426	27.0	70.0	49.0
General managers over 60 years of age	6.233%				
General managers under 40 years of age	12.325%				
Equity Holdings % of total (SHARE)	2.528	11.924	0.0	56.0	0.0
General managers controlling 20% or more	1.842%				
General managers controlling 10% or more	8.215%				
Years with the Firm (YFIRM)	15.239	10.599	0.5	47.0	15.0
General managers with 30 or more years in the firms	7.791%				
General managers with 25 or more years in the firms	18.839%				
General managers with 20 or more years in the firms	34.278%				

B. Corporate performance indicators

	1993	1994	1995	1996
Tobin's Q (TOBQ)	0.804	0.782	0.768	0.733
	(0.502)	(0.441)	(0.465)	(0.508)
	0.706	0.688	0.669)	0.614)
Profitability (PROF)	0.137	0.151	0.171	0.135
	(0.116)	(0.113)	(0.126)	(0.138)
	0.117	0.125	0.139	0.121
Labor Productivity (LABPRO)	216.327	252.100	292.527	288.645
	(192.056)	(210.821)	(256.991)	(244.816)
	169.824	188.152	213.238	220.994
Share of Firms with Marketing Departments (MKTDEP)	24.8%	--	--	61.1%

C. Control Variables

	Mean	Std. Dev.	Minimum	Maximum	Median
Leverage (LEV). average for 1994-97	1.752	3.658	0.724	4.128	1.608
Size (number of employees)	1.100	2.897	9	49,701	382
Excess demand of shares (EDEM)	1.415	5.527	0.008	143.651	0.879

D. Correlation Matrix

	YCEO	AGE	SHARE	YFIRM	TOBQ: 96	PROF: 96	LABPRO: 96	MKTDEP
Years as a manager (YCEO)	1.000							
Age of the manager (AGE)	0.315	1.000						
Share of equity by manager (SHARE)	0.084	0.148	1.000					
Years with the firm (YFIRM)	0.462	0.478	0.132	1.000				
Stock valuation (TOBQ:96)	0.011	0.085	-0.001	-0.023	1.000			
Profitability (PROF:96)	-0.008	0.031	-0.012	-0.051	0.196	1.000		
Labor productivity (LABPRO:96)	-0.002	0.064	-0.045	-0.013	0.219	0.338	1.000	
Marketing efforts (MKTDEP)	-0.023	-0.005	0.042	-0.067	0.018	0.049	0.039	1.000

Note: The definitions of all variables are given in Table A1.

Table 2: Statistics on Dependent Variables
(Mean-Differenced within Sectors)

VARIABLE NAME	All Managers	All Managers without Equity	All Managers with Equity
	706 firms	470 firms	236 firms
MTOBQ96	0.000	0.004	-0.009
MPROFIT96	0.000	0.000	0.000
MLABPRO96	0.000	0.127	-0.253
MMKTDEP96	0.000	0.001	-0.002
	All Insiders	Insiders without Equity	Insiders with Equity
	475 firms	307 firms	168 firms
MTOBQ96	-0.008	-0.011	-0.002
MPROFIT96	-0.011	-0.012	-0.011
MLABPRO96	-20.336	-23.695	-14.196
MMKTDEP96	-0.021	-0.013	-0.036
	All Outsiders selected by Government	Outsiders selected by Government without Equity	Outsiders selected by Government with Equity
	52 firms	41 firms	11 firms
MTOBQ96	-0.210	-0.182	-0.295
MPROFIT96	0.022	0.019	0.035
MLABPRO96	-28.596	-29.324	-25.894
MMKTDEP96	0.041	0.027	0.099
	All Outsiders selected by Private Owners	Outsiders selected by Private Owners without Equity	Outsiders selected by Private Owners with Equity
	179 firms	122 firms	57 firms
MTOBQ96	0.081	0.106	0.026
MPROFIT96	0.022	0.021	0.027
MLABPRO96	62.264	69.969	45.789
MMKTDEP96	0.046	0.029	0.074

Table 3: Estimation Results On Manager Changes and Equity Incentives (OLS)

Explanatory Variable				
	TOBQ	PROF	LABPRO	MKTDEP
SHOLDER	0.028	-0.001	-17.824	-0.001
	(0.964)	(0.146)	(1.452)	(0.296)
OUTSIDER	0.082	0.037	44.223	0.065
	(2.317)	(3.552)	(3.364)	(1.597)
AGE	0.003	0.002	1.628	0.003
	(1.618)	(1.695	(1.938)	(0.128)
LEV	0.021	-0.001	-7.041	-0.002
	(1.734)	(0.321)	(2.154)	(0.258)
EDEM	-0.001	0.001	0.431	-0.002
	(1.024)	(0.154)	(0.259)	(2.325)
TOBQ:BEG	0.644	--	--	--
	(9.523)			
PROF:BEG	--	0.572	--	--
		(8.901)		
LABPRO:BEG	--	--	0.961	--
			(9.931)	
AGRO	-0.010	-0.023	22.319	-0.041
	(0.452)	(1.278)	(0.734)	(0.054)
WOOD	-0.148	-0.014	-11.223	-0.023
	(2.263)	(0.652	(0.445)	(0.315)
TRA	0.042	-0.002	26.672	0.025
	(0.596)	(0.142)	(2.141)	(0.406)
MIN	-0.176	0.043	29.632	-0.084
	(2.114)	(1.931)	(0.862)	(0.624)
CON	0.105	0.020	5.362	-0.136
	(1.526)	(1.112)	(0.136)	(1.814)
FOOD	0.209	0.006	20.957	0.012
	(3.514)	(0.309)	(0.536)	(0.249)
APP	0.016	0.014	-23.541	0.057
	(0.215)	(0.805)	(1.265)	(0.684)
CHEM	-0.074	0.024	-23.249	-0.024
	(1.284)	(1.284)	(0.638)	(0.551)
MET	0.021	0.010	12.624	0.051
	(1.458)	(0.724)	(0.436)	(1.321)
MACH	0.042	0.018	0.334	0.034
	(2.421)	(1.985)	(1.365)	(0.664)
Constant	0.031	-0.027	-17.331	0.332
	(0.271)	(0.824)	(0.398)	(2.348)
Adjusted R^2	0.369	0.235	0.622	0.028

Notes: All regressions are based on 706 observations. Absolute values of t-statistics in parentheses. The numeraire sectors in all cases is Financial services. Standard errors are heteroskedasticity-consistent.

Table 4: Estimation Results with Separate Dummies for Different Types of Managers (OLS)

Explanatory Variable	TOBQ	PROF	LABPRO	MKTDEP
SHOLDER:OUTMOF	-0.305	-0.146	225.869	0.917
	(0.406)	(0.926)	(0.764)	(1.042)
SHOLDER:OUTOWN	-0.285	0.396	476.546	0.948
	(0.315)	(1.418)	(1.394)	(0.452)
SHOLDER:INS	0.236	0.004	-239.651	0.405
	(0.836)	(0.159)	(1.764)	(0.928)
OUTSIDER:GOV	-0.083	0.024	10.040	0.061
	(1.705)	(1.468)	(0.527)	(0.769)
OUTSIDER:OWNER	0.144	0.043	40.714	0.057
	(3.045)	(3.326)	(2.649)	(1.148)
AGE	0.003	0.001	1.659	0.003
	(1.639)	(1.728	(1.948)	(0.077)
TOBQ:BEG	0.642	--	--	--
	(9.532)			
PROF:BEG	--	0.567	--	--
		(8.636)		
LABPRO:BEG	--	--	0.961	--
			(9.764)	
LEV	0.021	-0.001	-7.162	-0.002
	(1.746)	(0.374)	(2.176)	(0.248)
EDEM	-0.001	-0.001	0.372	-0.003
	(1.012)	(0.094)	(0.218)	(3.024)
Sector Dummies Included	Yes	Yes	Yes	Yes
Constant	0.044	-0.027	-17.957	0.344
	(0.395)	(0.859)	(0.405)	(2.436)
Adjusted R^2	0.378	0.219	0.625	0.025

Notes: All regressions are based on 706 observations. Absolute values of t-statistics in parentheses. The numeraire sectors in all cases is Financial services and the numeraire management change is an internally promoted manager. Standard errors are heteroskedasticity-consistent.