Does private ownership always improve firm performance? The case of Central European Transition Economies

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Abstract

This study examines the operating performance of companies privatized in Central European Transition Economies between 1990 and 1998. Overall, we find no evidence of a significant improvement in operating performance after privatization. Contrary to the increasing empirical evidence for developed and developing countries, privatized firms in our sample experience a significant drop in efficiency and output. Our results indicate the importance of choice of a privatization method, and institutional environment for the performance of newly privatized firms in transition economies.

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1. Introduction

The debate on a desirable role of the state in a national economy and on the choice of industrial sectors to be privatized is long standing and extensive. Not all authors, however, seem to be convinced of the supremacy of private enterprises (PEs) over state ownership and the necessity to privatize some state owned enterprises (SOEs). The main controversy seems to be centered either around the rigor of theoretical arguments put forward by property rights theory or around the inconclusive empirical results on relative performance of state-owned and privately owned enterprises.

Results of early empirical studies on the relative efficiency of SOEs and PEs provide only weak support for the expected supremacy of PEs in terms of efficiency and profitability (see e.g., Boardman and Vining, 1989).[1] More recently, Dewenter and Malatesta (2001) report that PEs outperform SOEs in terms of profitability. Many of efficiency gains credited to privatization, however, should be accredited to restructuring by the government prior to privatization. Examples of successful enterprises with mixed ownership and enterprises with collective ownership were also discussed in the debate.[2] These enterprises cannot be classified as either state or privately owned and they therefore pose problems for property rights theory. While there is a paucity of theoretical work on mixed and collectively owned enterprises, empirical evidence suggests that these enterprises perform worse than PEs but better than SOEs (Boardman and Vining, 1989).

The empirical evidence on operating performance of newly privatized companies seems to be more conclusive. For example, Megginson et al. (1994), Boubakri and Cosset (1998), and D'Souza and Megginson (1999a), between them, examine the performance

[1] For example, Neuberg (1977), Bruggink (1982), Wortzel and Wortzel (1989) suggest better performance of SOEs relative to PEs, while De Alessi (1977), Stevens (1978) and Frech (1980) report higher efficiency in PEs. Fare et al. (1985), Becker and Sloan (1985) and Lewin (1982) find no substantial difference in the relative efficiency of SOEs and PEs. However, these studies are based on North American enterprises which have either a natural monopoly, or operate as a regulated duopoly, or whose output is not priced by market (competitive) forces (Boardman and Vining, 1989).

[2] Chinese township and village enterprises (TVEs) are an example of collectively owned enterprises. See also Weitzman and Xu (1993) and Bolton (1995).

of 204 privatized companies from 41 countries.[3] Overall, the results of the studies document economically and statistically significant post-privatization improvements in output, efficiency, profitability, capital investment spending, and dividend payments. There is also some evidence of employment and leverage decline after privatization.[4] The above results were echoed in studies on operating performance of newly privatized firms in developing countries (see e.g. Eckel et al., 1997; LaPorta and Lopez-de-Silanes, 1997; Ramamurti, 1997; Dewenter and Malatesta, 1997; Boubakri et al., 2001; Sun and Tong, 2002).[5]

It has, however, been noted that privatisations in transition economies[6] are different from those in other countries (see Laban and Wolf, 1993, and Boycko et al., 1994). Firstly, the size of privatization programs is much bigger and privatizations are seen as part of a wider reform of political and economic systems. Secondly, in all transition economies the state has continued to hold shares in majority of privatized companies after privatization. This situation is different from merely having to choose between public and private ownership in a limited number of companies or industries in developed countries, and it is largely dictated by politics (see e.g. Boycko et al., 1994). Finally, economies on the way from a centrally planned to a market system are typically characterized by a weak institutional and legal framework (e.g. weak property rights, shortage of human capital to restructure firms in a fast manner, etc.). As Nellis (1999) notes, an institutional vacuum can lead to stagnation and decapitalization rather than improvements in operating performance. The importance of a legal environment has been emphasized in the context of choice between different privatization methods. Megginson et al. (2003), for example, report that privatization share issues are more

[3] 98 of these firms are from 16 developed countries, while 106 are from 25 developing nations. As reported in Megginson and Netter (2001).

[4] Alexandere and Charreaux (2002) document for a sample of 19 French privatizations overall performance improvements, although for some operating performance variables the performance changes are statistically insignificant.

[5] For a more comprehensive survey of empirical studies on the performance of privatised companies in different countries see Megginson and Netter (2001).

[6] 'The transition is the movement towards a new system for the generation and allocation of resources, and it involves changing and creating institutions particularly private enterprises,' (EBRD, 1994, p.3).

likely in countries with a stronger legal tradition and greater protection of shareholders rights and minority interest.

Although strong association of privatization with more enterprise restructuring has been reported in all transition economies, the effect of different types of private owners (resulted from different privatization methods) varies between different transition economies (see Djankov and Murrell, 2002). The authors also report 'enormous' variance in the degree to which firms have responded to the changes in the institutional and policy environment. Hence, it is important to analyze factors that contribute to the differences in the success of privatization programs in transition economies.

This paper attempts to shed more light on the performance of privatized enterprises in transition economies using data on 154 Hungarian, Polish, and Czech companies that were fully or partially privatized between January 1990 and December 1998. Specifically, we examine the operating performance of privatized enterprises in the context of different privatization methods. Overall, our results contradict the results of studies on operating performance of companies privatized in developed and other developing countries suggesting an increase in operating performance after privatization (see Megginson et al., 1994; Boubakri and Cosset, 1998; D'Souza and Megginson, 1999a and 1999b; D'Souza et al., 2000; Boubakri et al., 2001) and are more consistent with the evidence documented in Dewenter and Malatesta (2001), Harper (2002), and Huang and Song (2003).

For example, privatized firms in our sample did not manage to increase profitability, and significantly reduced efficiency and output in the post-privatization period. Enterprises privatized through a mass privatization programs (Czech SOEs) achieved lower profitability in the post-privatization period compared to their counterparts privatized case-by-case. Czech companies have also maintained much higher bank borrowings after privatizations then their Polish and Hungarian counterparts.

We further document that private sector IPOs in the three transition economies underperform their privatization counterparts in terms of profitability, efficiency, capital investments and output. Firms' size and industry do not seem to influence key perform-

ance measures in selected countries. Finally, our results remain robust after controlling for cycles in industrial production in these countries.

The reminder of the paper is organized as follows. Section 2 reviews the relevant literature on operating performance of privatized enterprises in transition economies. Section 3 describes the data and the sample selection process. The methodology is explained in Section 4. Section 5 presents the empirical results. Finally, concluding remarks and suggestions for further research are set out in Section 6.

2. Operating performance of privatized enterprises in transition economies

The studies on operating performance focus on stakeholders and measure performance utilizing accounting, employment, and ownership data. For example, Earle and Estrin (1996) and Belka et al. (1994) found no evidence that privatisation encourages restructuring of Polish enterprises. The operating performance of privatized firms seems to lie between de novo private and state-owned enterprises, while the employee owners perform much better than outside owners (Belka et al., 1994). Frydman et al. (1996) and Pistor and Spicer (1996) link the relatively poor performance of mass privatization programs in Russia and the Czech Republic to insider control, arguing that insider control of privatized firms was the most important obstacle to effective restructuring. Hingorani et al. (1997), however, report that the equity value of Czech firms, privatized via a voucher scheme, are positively and significantly related to the size of insider and foreign ownership. In addition, the size of insider and foreign ownership are also positively related. Further evidence is provided by Claessens et al. (1997), who report a positive relationship between ownership concentration and a firm's performance, particularly in firms with strategic investors and bank-sponsored funds as large stakeholders. Anderson et al. (1997) study foreign participation in the Czech mass privatization program and find that foreigners prefer profitable firms in which they can obtain major shareholdings. Harper (2001) documents a significant decline in profitability (return on sales, return on total assets), net income efficiency, real sales, and employment during a two-year post-privatization period after the first wave of Czech voucher privatization. The effects of the Czech mass privatization seem to vary by size, industry, and privatization wave (Harper, 2002).

Most recently, studies on the performance of Chinese privatized companies provide mixed evidence. Wei et al. (2003) report a significant improvement in real output, real assets and sales efficiency, as well as a significant decrease in leverage of enterprises privatized via IPOs on the Shanghai and Shenzhen stock exchanges. Privatized firms, however, reported lower profitability in post privatization period. The results on poor post privatization profitability of Chinese firms have been echoed in Huang and Song (2003) and Sun and Tong (2003). Privatized enterprises, however, outperformed private IPOs during the same period, which provides some evidence for a combined effect of (positive) privatization and (negative) IPO effect on the long-term performance documented in previous studies (Huang and Song, 2003).

Multi-national empirical studies that include transition economies focus on privatizations in early nineties. For example, Estrin et al. (1995) found a strong relationship between viability and privatization utilizing a sample of 15 privatizations in Poland, Hungary and Czech Republic. Almost all viable enterprises were privatized and these received far more restructuring than other enterprises. Frydman et al. (1997) report that privatized firms increased revenue and productivity and reduced costs by comparison with SOEs in these countries and laid off fewer workers than their SOEs counterparts. Pohl et al. (1997) compare the progress in restructuring of privatized and state-owned firms in seven Eastern European countries. The results suggest that privatized firms outperformed comparable SOEs in terms of productivity during 1992-95. The method of privatization seems to have little effect on performance, though financing method and ownership play a significant role with regard to restructuring.

Overall, the results of the above studies seem to be less conclusive from those of non-transition countries which document performance improvements as a result of privatization. They also seem to be focused on early privatizations, and analyze operating performance using measures that are not always comparable with measures used in operating performance studies in developed and other developing countries.[7] Given the unique features of privatization programs in transition economies, and the different privatization methods followed in transition economies we contribute to the literature by extending the analysis to three transition economies that adopted different privatization meth-

[7] With the exception of Harper (2001 and 2002).

ods using a methodology identical to Megginson et al. (1994), Boubakri and Cosset (1998), D'Souza and Megginson (1999), and Boubakri et al. (2001). We also expand upon the existing literature on transition economies by comparing the performance of firms privatized case by case with private sector initial public offerings (IPOs), and by extending the period of the analysis to include most recent privatizations.

3. Data

Poland and Hungary used a case-by-case privatization procedure, where state-owned enterprises are privatized one after the other over a long period of time (in Poland and Hungary more than a decade). The Czech government, on the other hand, chose a quick mass voucher privatization program and privatized more than 1800 firms, in two waves. All these firms started trading on the Prague Stock Exchange in 1993 (first wave with 988 enterprises) and in 1995 (second wave with 861 enterprises). The vast majority of firms privatized through these two mass privatization waves have been listed in the free market (third section) of the Prague Stock Exchange. This segment is especially characterized by very low liquidity, and weak disclosure requirements.

We therefore limit our analysis only to privatized companies initially listed in the first or second market segment of the three exchanges during the years 1990 to 1998 (Warsaw Stock Exchange, Budapest Stock Exchange and Prague Stock Exchange). This ensures that privatized firms in the three countries are comparable, especially regarding disclosure requirements, liquidity and size. The sample selection starts with the resumption of the national stock exchanges: in Poland on April 16th 1991, in Hungary on June 21st, 1990, and in the Czech Republic on April 6th, 1993 and ends with privatized firms listed during the year 1998.

The privatized companies are identified from various issues of Privatization International, Stock Exchange Fact Books, Dow Jones Reuters Business Interactive (Factiva)[8],

[8] Factiva (the predecessor of Reuters Business Briefing Archives) is a comprehensive business database, with access to national and international news wires, news papers, trade journals, research reports and news pictures.

and stock market databases. Key accounting data as well as annual reports were obtained from the following sources: Thomson Financial Datastream, World Scope Disclosure, Reuters Equity 3000, Amadeus Accounting Database and various issues of Stock Exchange Fact Books.

The sample firms have at least one annual observation in both the pre-privatization period (i.e. years -2 to -1) and the post-privatization period (i.e. years +1 to +2), where the year of privatization (i.e. the year of listing) is defined as year 0. To avoid a delisting bias in the generated sample, all privatized firms delisted till the end of year 2000 are included in the database. A further selection criterion was the availability of unconsolidated accounting data based on either International Accounting Standards or US-Generally Accepted Accounting Principles. In addition, insurance companies and firms from the banking industry are excluded, as their operating and financial profile differs relative to firms from the real sector. These selection criteria yield a sample of 154 companies: 43 from Poland, 28 from Hungary and 82 from the Czech Republic. Panel A of Table 1 reports the number of privatizations by calendar year.

Insert Table 1 about here

The means, medians and standard deviations of key accounting variables are given in Panel B of Table 1. The median average net income (average of the pre- and the post-privatization period) is highest for Hungarian privatizations (USD 4.8 million; inflation adjusted) and lowest for Czech privatized firms (USD 2.9 million; inflation adjusted). Other descriptive statistics (like the median values of average sales, total assets, total equity, or number of employees) indicate that privatized firms in the Czech Republic seem to be larger than their counterparts in Poland and Hungary. For example, the median of average sales (inflation adjusted) is USD 126.4 million in the Czech Republic, USD 90.2 million in Poland, and USD 76.0 million in Hungary.

4. Methodology

Djankov and Murrell (2002) emphasize the importance of presenting results in studies on transition economies so that they could be accurately compared with the rest of the

literature. To be comparable with the empirical results documented in other studies testing the economic impact of privatization programs, we examine the same variables used in Megginson et al. (1994; hereafter referred to as MNR), Boubakri and Cosset (1998; hereafter referred to as BC), D'Souza and Megginson (1999a; hereafter referred to as DM), or Boubakri et al. (2001, hereafter referred to as BCG) and test the same hypotheses. Specifically, our study tries to determine whether privatization increases (1) profitability, (2) operating efficiency, (3) capital investment expenditure, (4) output, (5) dividend payments, and decreases (6) employment levels, and (7) leverage. The ratios used to compare financial and operating performance before and after privatization are:[9]

Profitability:

Return on Sales (ROS) = Net profit after tax divided by sales

Return on Assets (ROA) = Net profit after tax divided by total assets

Return on Equity (ROE) = Net profit after tax divided by total equity

Operating efficiency:

Sales efficiency (SALEFF) = Sales divided by number of employees, normalized to unity in the year of privatization (year 0)

Net income efficiency (NIEFF) = Net income divided by number of employees, normalized to unity in the year of privatization (year 0)

Capital Expenditure:

Capital expenditures to sales (CESA) = Capital Expenditure divided by sales

Capital expenditures to assets (CETA) = Capital expenditures divided by total assets

[9] Some or all of these variables are also used to measure the operating performance of firms in non-privatization related studies (see e.g. Kabir and Roosenboom, 2003, Lewis et al., 2001, or Kim et al., 2003).

Output:

Real Sales (RSAL) = Nominal sales (in USD) deflated by the consumer price index, normalized to unity in the year of privatization (year 0)

Employment:

Total employment (EMPL) = Total number of employees

Leverage:

Long term debt to assets (LTDTA) = Long term debt divided by total assets

Dividends:

Dividends to sales (DIVSAL) = Cash dividends divided by sales

Payout ratio (PAYOUT) = Cash dividends divided by net income after tax

First, we compute the above specified ratios for every firm for two years before and two years after privatization. We then calculate means and medians of cross section of the firms, for each ratio, for the pre-privatization (years, -2 to -1) and post-privatization (years, +1 to +2) period. The year of privatization (year 0) is excluded from the analysis, because it includes both public and private ownership phases of the firm.

Except for real sales, sales efficiency, and net income efficiency, we use nominal data to calculate ratios. For calculations of real sales, sales efficiency, and net income efficiency, sales and net income data are deflated using the consumer price index in respective countries. For these variables we compute an index normalized to unity for year 0 (the year of privatization). Other years (year -2, year -1, year +1, and year +2) are expressed relative to unity.

To test whether the changes in financial and operating performance are significant, we run a t-test for significant changes in means and a Wilcoxon signed-rank test for significant changes in medians. In addition, a proportion test is used to determine whether

proportion (p) of companies that have experienced changes in a given direction is greater than the proportion of the companies expected by chance. [10]

Polish, Hungarian, and Czech markets are relatively small and dominated by privatized companies. We are therefore not able to match our sample companies by size and industry as suggested in Barber and Lyon (1996).[11] However, we are able to compare the performance of privatized firms with the performance of a sample of 78 private sector initial public offerings (IPOs; 63 from Poland and 15 from Hungary). In order to control for changes in the general economic performance (during the investigation period), we calculate the average industrial production in the pre and post privatization period for each sample firm in the three transition economies.[12] We than calculated for the sample firms mean (median) values of the cross-section of changes (post- minus pre-privatization) in industrial production.

5. Empirical Results

In this section we report and discuss the empirical results for the whole sample of 154 privatized companies. In addition, we partition the whole sample into several subsamples. First, we determine whether the effect of privatization varies according to the type of privatization. Hence, we partition the full sample into case-by-case versus mass privatization firms. In case-by-case privatizations a government sells one SOE after the other to local as well as foreign private investors. The method used to sell shares to the public is more or less the same as used for private sector IPOs. In contrast, in a mass privatization program a government distributes, for a small fee, vouchers to the local adult citizens. They have the opportunity to convert the vouchers into shares of enterprises that entered the mass privatization program. The starting position of firms privat-

[10] Typically we test whether, $p = 0.5$.

[11] This lack of matching firms is most obvious in the Czech Republic where all firms have been privatised in two waves (1993 and 1995) and no other firms went public during the period of our analysis. Other studies in this area seem to be facing similar problems with the matching and none of the following recent studies reported results based on the matching: Harper (2001; 2002), Wei et al. (2003), Sun and Tong (2002; 2003), and Boubakri and Cosset (1988).

[12] The calculations were based on Reuters 3000 Xtra industrial production data from 1988 to 2003.

ized through a case-by-case and a mass privatization program is therefore different, which might lead to differences in the financial and operating performance.

Second, in addition to SOEs, in Poland and Hungary many private sector companies went public in the period 1990 to 1998. This provides the opportunity to test whether these two groups of firms differ in their financial and operating performance. Jain and Kini (1994) document a significant operating performance decline after going public for US IPOs. From the evidence in the literature we expect that privatizations experience a better operating performance than their private sector counterparts. Our aim is to determine whether this is also the case in Central and Eastern European economies in transition. We therefore compare our case-by-case privatization subsample with a sample of 78 private sector IPOs.

Third, to determine whether the post-privatization performance varies by industry, we split our sample of privatized firms into manufacturing and non-manufacturing firms. Industries that belong to the non-manufacturing group are transport, telecommunication, tourism, trading, and various services industries. We expect that manufacturing firms have higher fixed costs and operating leverage, and, therefore, experience more difficulties with restructuring.

Fourth, we contrast the pre and post-privatization performance of small and large privatized firms. Transition economies often inherited few big, politically important, firms. These firms are bound to be more difficult to restructure. Smaller firms should be able to respond faster to changes in the economic environment. Hence, we expect that they experience a faster restructuring, resulting in a better past divestiture performance than their larger counterparts. SOEs are defined as small when their real average sale (in the pre- and post-privatization period) is below the median real average sale of the full sample.

In the following sub-sections we present and discuss our empirical results for the whole sample of all privatized enterprises, as well as for the four subsamples. The full sample results are shown in Table 2, and those for the subsamples are presented in Tables 3 to 6.

5.1 Profitability

MNR, BC and DM collectively examine 211 privatized companies from 42 countries and document highly significant improvements in profitability. This is in line with the theoretical expectation that in companies that move from public to private ownership private managers should show a greater interest in profits and efficiency compared with governments (see Boycko et al., 1996). To measure profitability we use several proxies: return on sales (ROS, net income to sales), return on assets (ROA, net income to total assets) and return on equity (ROE, net income to total equity).

In contrast to the evidence reported by MNR, BC and DM, the results for our sample of privatizations in three transition economies do not suggest significant improvements in profitability after divestiture. According to ROS, ROA and ROE, 55 percent of all firms experience a decline in profitability after privatization (see Table 2 and Figure 2). Although the mean ROS increased from 5.1 to 6.4 percent, the median ROS declined from 5.0 to 4.4 percent (see Figure 1). Both changes are not significantly different from zero. For a sample of 78 privatized firms from 21 developing countries (Central and Eastern European Transition Economies are not included) BC document a median ROS increase from 4.6 to 8 percent, while DM report a median ROS increase from 5 to 8 percent for a sample of 85 privatizations from 28 industrialized countries.[13]

Insert Table 2 about here

Insert Figures 1 and 2 about here

This evidence shows that privatizations in industrialized, developing and transition economies seem to start before privatization with a comparable median ROS-level of around 5 percent. But in the post-privatization period privatized firms in transition economies are not able to increase profitability whereas privatized firms in industrialized and developing economies are able to increase profitability, resulting in a nearly

[13] Only 3 Polish companies were included in their sample.

100 percent higher median ROS-level (8 percent compared to 4.4 percent). One reason for this observation might be that privatized firms in our three transition economies do not have the economic environment to restructure as fast as SOEs in other parts of the world, where in most cases economies have been market oriented for a longer time than in transition economies.

The results for the subsamples (Tables 3 to 6) reveal some interesting results. First, Table 3 shows that firms privatized through a mass privatization program perform much worse than case-by-case privatizations do. For example, the average (median) ROS for mass privatization firms declined from 4.6 (4.3) to 4.2 (3.2) percent, whereas the average (median) ROS of case-by-case privatization firms increased from 5.6 (5.7) to 9.1 (6.3) percent. A higher ROS was found in 55 percent of all case-by-case privatizations, whereas a significant portion of nearly 67 percent of the mass privatization firms records a decline in ROS. According to the ROA results, both subsamples experience a significant different median performance change: The median decrease in ROA of 0.7 percentage points (from 4.0 to 3.3 percent) for mass privatization firms contrasts to the median increase in ROA of 1.9 percentage points (from 5.2 to 7.1 percent) for case-by-case privatization firms.

Insert Table 3 about here

Our result of a decline in profitability after divestiture for mass privatizations firms is in line with the evidence provided in Harper (2001). For a sample of companies privatized in the first wave of voucher privatization in the Czech Republic he documents a significant drop in mean return on sales and mean return on assets.

Interesting is also the evidence for private sector IPOs. They perform even worse than firms privatized through a mass privatization program. In all three profitability measures private sector IPOs experience a significant decrease: Mean (median) ROS drops from 5.8 (5.6) to 0.6 (3.0) percent, mean (median) ROA drops from 8.1 (8.3) to 2.0 (4.7) percent, and mean (median) ROE drops from 15.2 (12.5) to 2.6 (8.5) percent. In ROS, ROA, and ROE, case-by-case privatizations perform significant better than their private sector counterparts (see Table 4). About three-quarters of all IPOs experience a decline

in profitability. This evidence is in line with our expectations and the existing evidence of negative operating performance changes in private sector IPOs documented for developed countries (see e.g. Jain and Kini, 1994).

Insert Table 4 about here

Privatized firms in non-manufacturing industries experience better changes in profitability than firms in manufacturing industries. All three profitability measures increased for the non-manufacturing firm subsample (median ROS: +5.0 percentage points, median ROA: + 2.2 percentage points, and median ROE: +4.3 percentage points), whereas for privatized firms in manufacturing industries the profitability dropped (median ROS: -0.9 percentage points, median ROA: -0.3 percentage points, and median ROE: -0.4 percentage points). The worse profitability performance of manufacturing firms is in line with our expectations.

Insert Table 5 about here

Our final set of subsamples compares small and large privatized firms. The aim is to analyze whether firm size, measured by real total sales, matters for the speed of restructuring in transition economies. Although privatized firms in the small firm sample are, on average, more than 7 times smaller than their counterparts in the large firm sample, both subsamples do not behave significantly different with regard to their profitability (pre- versus post-privatization period). This indicates that firm size has no influence on profitability changes for our total sample of privatized enterprises.

Insert Table 6 about here

5.2 Operating Efficiency

We measure operating efficiency with two ratios: Sales efficiency (SALEFF, inflation-adjusted sales per employee) and net income efficiency (NIEFF, inflation-adjusted net

income per employee). Both ratios are computed as an index, defined to be one for year 0 (the year of privatization), with other years being expressed relative to unity. One often mentioned objective of governments to privatize SEOs is the greater stress to generate profits. Privatized firms therefore should try to employ their resources more efficiently.

The results for the full sample reveal that this is not the case in transition economies (see Table 2). The sales efficiency shows a significant mean as well as median decrease after privatization (see also Figure 1). A significant portion of 72 percent of the sample firms achieved this decrease (see also Figure 2). Sales per employ decreases from an average (median) of 119 percent (123 percent) of the year 0 level during the pre-privatization period to 93 percent (91 percent) of the year 0 level during the post-privatization period. The change in average net income per employee is also negative but not significant.

These findings are in clear contrast to the dramatic post-privatization efficiency gains documented by MNR and DM for industrialized countries and BC for developing countries. This indicates that firms privatized in economies which are in a transition from a planned to a market oriented system are not able to gain efficiency improvements during the first years after divestiture. One reason for this observation might be that a market oriented framework, which is necessary for successful privatizations, has not been readily available in selected countries.

The documented significant decrease in sales per employee is totally due to case-by-case privatizations (see Table 3). Mass privatization firms experience an insignificant average (median) increase in SALEFF of 17 (9) percentage points. In contrast, sales per employee for case-by-case privatization firms drops significantly from an average (median) 128 percent (127 percent) of the year 0 level to 87 percent (86 percent) of the year 0 level in the post-privatization period. More than 87 percent of all case-by-case privatization firms experience a declining sales efficiency. The sales efficiency changes are significant different between the two privatization methods. In contrast, for both subsamples the net income efficiency (NIEFF) changes are not significant different from zero, although the average NIEFF decreases in the post-privatization period.

As for the full sample, for all other subsamples (manufacturing firms, non-manufacturing firms, large privatizations, small privatizations, and private sector IPOs) changes in sales per employee are significantly negative and changes in net income per employee are not significantly different from zero. Our results for the mass privatization sample are similar with those reported by Harper (2001) for Czech companies included in the first privatization wave.

5.3 Capital Investment Spending

It can be argued that privatized firms have more incentives to invest in growth and expansion opportunities and therefore will have more incentives to increase the level of capital investment spending (see e.g. MNR). To calculate the degree of capital investment spending we use two proxies: Capital expenditures divided by sales (CES) and Capital expenditures divided by total assets (CETA).

In contrast to MNR and BC but in line with the results for industrialized countries provided by DM, our results show no significant changes in capital investment spending after privatization. For example, the average (median) capital expenditures to total assets ratio increased (decreased) for the total sample from 17.6 percent (13.3 percent) to 20.6 percent (12.5 percent). The proportion of firms with higher (lower) capital investment spending in the post divestiture period is not significantly different from 50 percent (see Table 2 and Figure 2).

All subsamples provide similar results of no significant changes in CES and CETA. The only exception are IPOs. They experienced a significant mean as well as median decline in capital expenditure divided by total assets. In addition, the performance of case-by-case privatizations is significantly better than for private sector IPOs with respect to CETA (see Table 4). It is worth mentioning that large privatizations experienced an insignificant mean and median increase in capital investment spending whereas small privatizations experienced an insignificant decline.

5.4 Output

Successful privatizations are typically characterized not only by increased profitability, efficiency and investment spending but also by new growth and higher output. As a proxy for output we use inflation adjusted sales levels for the pre- and post privatization period, normalized to unity for the year of privatization (year 0).

In dramatic contrast to the empirical evidence for industrialized countries (MNR, DM) and developing countries (BC), all tests (parametric, Wilcoxon signed rank and proportion tests) reveal a significant decline in output for our full sample of privatizations (see Table 2). Real sales changed from an average (median) of 116 percent (118 percent) during the pre-privatization period to 100 percent (89 percent) during the post-privatization period (see Figure 1). A significant portion of 73 percent of the sample firms experienced decline in output (see Figure 2). It is important to note that this huge and significant decline in output is the main reason for the significant decrease in sales efficiency.

Boycko et al. (1996) state that privatization can lead to a reduction in output since the government can no longer force the management to maintain inefficiently high output levels. Our result of a significant decline in output is consistent with this interpretation. SEOs in transition economies are much more connected to the government than in other parts of the world, resulting in an inefficiently high output level. The higher the "unnecessary" high output in the pre-divestiture period is, the larger the drop to a more "efficient" output level after privatization should be.

The results in Table 3 reveal that the decline in output is only due to case-by-case privatizations, but not due to mass privatization firms. For our case-by-case privatization firms the average (median) real sales are 29 percent (21 percent) higher in the pre divestiture period than in the year 0 and are 16 percent (19 percent) lower than in the post-privatization period compared to the year of privatization. 91 percent of the case-by-case privatization firms experience a decline in real sales. Mass and case-by-case privatization firms significantly differ from each other in output performance changes.

This evidence is surprising, as both subsamples consist of firms privatized in transition economies. There are two possible explanations for this observation: First, mass privatization firms do not have inefficiently high output levels prior to privatization but case-by-case privatizations do. In our case this would mean that "unnecessary" real sales levels are prior to divestiture much higher in Poland and Hungary than in the Czech Republic. Alternatively, firms privatized through a case-by-case privatization program are faster in adjusting their output level to more efficient levels than companies privatized through a mass privatization program.

Similar to case-by-case privatization firms, the output of private sector IPOs also significantly declines after going public (see Table 4). A comparison of these two subsamples shows that the mean (median) output change of -11 percentage points (-21 percentage points) for private sector IPOs is significantly less negative than the mean (median) output change of -45 percentage points (-40 percentage points) for case-by-case privatization firms.

Table 5 reveals that the industry type (manufacturing versus non-manufacturing) has no influence on the changes in output. The subsample comparison between large and small privatizations shows that the output decline is significantly (10 percent level) more pronounced for large than for small firms (see Table 6). This observation is consistent with the interpretation that governments tend to influence large firms more, as they have more employees. Large privatizations therefore experience higher inefficiencies in output, resulting in a stronger adjustment effect in the post-privatization period.

Finally, our results are robust after we control for changes in the general level of inflation adjusted industrial production after privatization. Between the pre- and post-privatization period the average change in the general output in each of the three countries is significantly positive (see Table 7). This indicates that the documented significant decline in real sales after privatization is not biased downward by a general output decline, but is rather the result of a not well developed economic environment in an economy in the process from a centrally planned to a market oriented system.

Insert Table 7 about here

5.5 Employment

Since one of the objectives of the public sector is to create as many employment opportunities as possible, most SEOs tend to be overstaffed. To insure efficiency gains it can, therefore, be expected that employment levels will decline following divestiture. To examine employment level changes we calculate the average level of employment for the pre- and the post privatization period.

Results of the parametric and the Wilcoxon test, for the full and all subsamples, show an insignificant mean and median decrease in employment. For example, the average (median) employment level for the full sample decreases by 475 employees (11 employees) after privatization. The proportion test shows that the vast majority (80 percent) of all firms reduced the employment level during the post-privatization period (see Table 2 and Figure 2). Measured by the proportion test, all of our privatization subsamples, with an exception of the subsample for private sector IPOs, show similar decreases in employment. In the subsample of private sector IPOs the portion of firms with a decrease in employment (58.3 percent) is not significantly different from 50 percent.

5.6 Leverage

SOEs often receive explicit or implicit government debt guarantees and are, therefore, able to borrow at relatively low costs. The removal of debt guarantees in post-privatization period should lead to higher borrowing costs. On the other hand, as MNR note, privatization firms will have more opportunities to access public equity markets. Therefore it can be expected that the switch from public to private ownership should lead to a decline in leverage. To examine changes in leverage we use the long-term debt to total assets (LTDTA) ratio.

Our results, for the full sample, document a non significant decrease in leverage (see Table 2 and Figures 1 and 2). This is in contrast to findings of a significant decline in leverage reported by MNR, DM, and BC. The subsample comparison reveals significantly different changes in leverage of mass and case-by-case privatization firms (see

Table 3). The average (median) LTDTA ratio increases for mass privatization firms from 9.0 percent (5.9 percent) to 11.2 percent (7.9 percent) after privatization, whereas the ratio drops for case-by-case privatizations from 6.4 percent (5.0 percent) to 5.0 percent (3.1 percent). A significant portion (70 percent) of firms in the case-by-case privatization sample experiences a decline in leverage. This suggests that firms privatized through a case-by-case privatization program behave as expected (decline in leverage), whereas mass privatization forms do not. The observed increase in leverage for mass privatization forms is consistent with the fact that in the Czech Republic voucher investment funds where (directly or indirectly) controlled by (state owned) banks. Therefore banks seem to have an incentive to provide additional loans to privatized firms, resulting in an increased leverage. The other subsamples show, like the full sample, no significant changes in leverage.

5.7 Dividend Payments

Different to governments, private investors are expected to demand dividends. Dividend payments should therefore increase after privatization (see e.g. MNR). To test for changes in dividend payments, we use two proxies: Cash dividend payment divided by sales (DIVSAL) and cash dividend payment divided by net income (PAYOUT).

For the full sample the results show an average increase in DIVSAL from 1.1 percent in the pre-privatization period to 1.4 percent in the post privatization period. The PAYOUT ratio, however, drops from 14.1 to 12.1 percent after privatization. Both changes are not significantly different from zero (see Table 2). Many of the privatized firms in our sample do not pay dividends before and after the year of privatization, yielding median values of zero for both ratios and for the pre- as well as the post-privatization period (see also Figure 1). A significant portion of about 69 percent of all privatized firms does not increase dividend payments after privatization (see Table 2 and Figure 2). This evidence of lack of a significant increase in dividend payments is in contrast to the evidence provided for industrialized and developing countries (see MNR, DM and BC), where dividend payments increased markedly during the post-privatization period.

The differences in DIVSAL and PAYOUT changes between the pre- and post-privatization period of mass versus case-by-case privatizations, private sector IPOs versus case-by-case privatizations, manufacturing versus non-manufacturing firms, and small versus large privatizations are not significantly different from zero.

6. Conclusion

Recent studies document significant changes in the financial and operating performance for firms privatized in both developed and developing countries. For example, significant increases in profitability, operating efficiency, output, capital investment spending and dividend payments as well as significant decreases in leverage have been reported (see e.g. D' Souza and Megginson, 1999, or Boubakri and Cosset, 1998). The aim of this study is to extent the existing literature by focusing on the financial and operating performance of three Central and Eastern European Transition Economies: Poland, Hungary and the Czech Republic. This gives us the opportunity to compare two different privatization regimes: Case-by-case privatization (used in Poland and Hungary) and mass (or voucher) privatization (used in the Czech Republic).

Our sample consists of 154 companies that were fully or partially privatized between January 1990 and December 1998: 43 Polish, 28 Hungarian and 82 Czech Republic state-owned enterprises. For comparison purposes we also use a sample of 78 private sector Initial Public Offerings (63 from Poland and 15 from Hungary). We follow standard methodologies suggested in the literature for pre- versus post-privatization comparisons and adopt the same ratios to measure the financial and operating performance as in Megginson et al. (1994).

Overall, our results show that the operating performance of privatized state-owned enterprises (SOEs) in Poland, Hungary, and Czech Republic seems to be different from the performance reported for firms privatized in developed and other developing countries. For example, privatized firms in our sample did not manage to increase profitability, and significantly reduced efficiency and output in the post-privatization period. These results are in sharp contrast to the evidence presented in studies on the performance of privatized firms in developed and developing countries. They are consistent

with the hypothesis that the functioning of private ownership as a means to improve firm performance depends on the effectiveness of the institutional environment, which is typically not fully in place in the transition process from a centrally planned to a market system (see e.g. Nellis, 1999).

In addition, enterprises privatized through mass privatization programs (Czech SOEs) achieved lower profitability in the post-privatization period compared to their counterparts privatized through case-by-case method. The decline in profitability for the sample of Czech companies is in line with the results reported in Harper (2001). On the other hand, the drop in output and operating efficiency is much more profound in Polish and Hungarian case-by-case privatizations. Czech companies have also maintained much higher bank borrowings after privatizations then their Polish and Hungarian counterparts. This indicates that firms privatized through a case-by-case privatization program are faster in adjusting their output level and capital structure to more efficient levels than firms privatized through a mass privatization program.

We further document that private sector IPOs underperform their privatization counterparts in terms of profitability, efficiency, capital investments and output. This evidence for transition economies is consistent with the evidence revealed for developed countries. Finally, firms' size does not seem to influence key performance measures in selected countries. In majority of companies in our sample governments have continued to own a significant percentage of shares long after privatizations. Nevertheless, partially privatized enterprises in our sample have outperformed privately owned companies. Our results are, therefore, consistent with Djankov and Murrell (2002) who report surprising effectiveness of state ownership within partially privatized firms in transition economies. Future research in this area should examine reasons for the greater efficiency of enterprises with mixed ownership in selected countries and determine whether this is a permanent or a transitory feature in transition economies.

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Table 1

Sample Characteristics

This table presents main sample characteristics for our full sample of privatized firms and for each of the three countries included in the full sample. Panel A provides the number of privatizations by calendar year. Panel B shows descriptive statistics of important operating performance measures in USD.

Panel A: Number of Privatizations by Calendar Year

Year of Privatization	Total Sample	Poland	Hungary	Czech Republic
1990	1	0	1	0
1991	13	9	4	0
1992	6	4	2	0
1993	51	3	4	43
1994	13	7	6	0
1995	48	5	4	39
1996	6	3	3	0
1997	15	12	3	0
1998	1	0	1	0
Total	154	43	28	82

Panel B: Descriptive Statistics

Sample		Average Net Income in th USD [(a), (b)]	Average Sales in th USD [(a), (b)]	Average Total Assets in th USD [(a), (b)]	Average Total Equity in th USD [(a), (b)]	Average Long Term Dept in th USD [(a), (b)]	Average No of Employees
Total Sample	Mean	11,412.5	229,715.6	303,336.1	158,622.8	26,612.6	3,863.8
	Std. Dev.	36,272.3	418,854.4	661,044.4	334,115.1	93,162.0	6,021.7
	Median	3,292.8	106,652.9	109,113.2	63,044.9	4,890.3	1,477.0
	No of Firms	134	144	148	143	102	46
Poland	Mean	7,010.9	161,336.5	155,252.8	89,930.1	6,932.7	4,245.7
	Std. Dev.	14,418.2	199,598.5	263,166.4	184,692.1	8,964.4	6,929.5
	Median	3,195.7	90,247.9	86,302.2	44,471.9	3,760.8	1,837.6
	No of Firms	41	42	41	41	33	16
Hungary	Mean	23,875.0	306,395.2	334,966.7	214,661.6	53,391.0	3,187.8
	Std. Dev.	49,400.6	782,385.1	827,480.8	484,700.9	182,486.9	4,793.1
	Median	4,790.3	75,995.2	63,690.2	39,311.0	1,629.9	1,182.0
	No of Firms	20	22	23	20	21	23
Czech Republic	Mean	10,470.2	244,527.8	366,954.2	179,301.1	28,427.1	10,211.6
	Std. Dev.	36,868.4	359,280.2	729,091.0	338,811.2	59,245.0	42,885.5
	Median	2,939.4	126,346.4	152,011.8	76,796.9	7,404.1	31,523.0
	No of Firms	73	80	82	82	48	7

[(a)] Thousands of USD, average exchange rate in the year of going public.
[(b)] Local inflation adjusted real values; the year of going public is used as base year to adjusted for inflation.

Table 2
Summary Results for the Sample of all Privatized Firms

This table presents summary results for the sample of all privatization firms. For each performance measure the mean and the median values for the two-year period before and after privatization, the changes in mean and median values, the number of observations, and the proportion of firms that increased the performance measure after privatization are provided. We employ a parametric test for the differences in mean, the Wilcoxon signed rank test for the differences in median, and a test whether the proportion of firms that increased the performance measure is significant different from 50 percent. The following variables are used to measure changes in operating performance: (a) Profitability: Return on Sales (ROS), Return on Total Assets (ROA), Return on Total Equity (ROE); (b) Operating Efficiency: Real Sales per Employee normalized (SALEFF), Real Net Income per Employee normalized (NIEFF); (c) Capital investment spending: Capital Expenditure to Sales (CES), Capital Expenditure to Total Assets (CETA); (d) Output: Real Sales normalized (RSAL); (e) Employment: Total Number of Employees (EMPL); (f) Leverage: Long Term Dept to Total Assets (LTDTA); (g) Dividends: Dividends to Sales (DIVSAL), Payout ratio (PAYOUT).

		Mean				Median				Proportion Test	
Variable	No of firms	Before	After	Difference	t-statistics for Differences in Mean (after - before)	Before	After	Difference	Wilcoxson Z-statistics for Differences in Median (after - before)	Proportion of firms: After > Before (%)	Z-Statistic for Significance of Proportion Change
Profitability											
ROS (%)	123	5.09	6.42	1.33	0.78	4.99	4.39	-0.60	-0.51	45.5	-0.99
ROA (%)	121	5.24	5.12	-0.12	-0.13	4.18	4.47	0.29	0.18	45.4	-1.00
ROE (%)	119	8.63	1.54	-7.08	-1.29	6.81	7.16	0.35	0.03	45.4	-1.01
Efficiency											
SALEFF	32	1.19	0.93	-0.26	-4.59***	1.23	0.91	-0.32	-4.46***	28.1	-2.47**
NIEFF	36	1.26	0.54	-0.72	-1.34	0.98	0.98	0.00	0.12	55.6	0.67
Capital Investment											
CES (%)	17	17.58	20.56	2.98	0.53	13.28	12.50	-0.78	-0.26	47.1	-0.24
CETA(%)	15	21.36	23.30	1.94	0.32	20.00	18.63	-1.37	-0.35	60.0	0.78
Output											
RSAL	144	1.16	1.00	-0.16	-3.43***	1.18	0.89	-0.29	-7.26***	27.1	-5.50***
Employment											
EMPL	46	4,101	3,626	-475	-0.38	1,483	1,472	-11	-0.45	19.6	-4.13***
Leverage											
LTDTA (%)	81	7.71	8.12	0.41	0.27	5.13	4.71	-0.42	-0.10	42.0	-1.44
Dividends											
DIVSAL (%)	115	1.11	1.39	0.27	0.87	0.00	0.00	0.00	0.73	30.4	-4.20***
PAYOUT (%)	111	14.12	12.14	-1.98	-0.72	0.00	0.00	0.00	0.56	31.5	-3.89***

***, **, * Significant at the 1, 5 and 10 percent level, respectively.

Table 3
Panel A: Summary Results for Mass Privatization versus Case-by-Case Privatization

This table presents summary results for the subsample mass privatization firms (Mass) and case-by-case privatization firms (Case). For each performance measure the mean and the median values for the two-year period before and after privatization, the changes in mean and median values, the number of observations, and the proportion of firma that increased the performance measure after privatization are provided. We employ a parametric test for the differences in mean, the Wilcoxon signed rank test for the differences in median, and a test whether the proportion of firms that increased the performance measure is significant different from 50 percent. The following variables are used to measure changes in operating performance: (a) Profitability: Return on Sales (ROS), Return on Total Assets (ROA), Return on Total Equity (ROE); (b) Operating Efficiency: Real Sales per Employee normalized (SALEFF), Real Net Income per Employee normalized (NIEFF); (c) Capital investment spending: Capital Expenditure to Sales (CES), Capital Expenditure to Total Assets (CETA); (d) Output: Real Sales normalized (RSAL); (e) Employment: Total Number of Employees (EMPL); (f) Leverage: Long Term Dept to Total Assets (LTDTA); (g) Dividends: Dividends to Sales (DIVSAL), Payout ratio (PAYOUT).

				Mean (Median)					Proportion of Firms	
Variable			N	Before	After	Change	t-statistics: Change in Mean (after - before)	Z-statistics: Change in Median (after - before)	After > Before (%)	Z-Statistic
Profitability	ROS	Mass	57	4.63 (4.30)	4.16 (3.24)	-0.47 (-1.06)	-0.30	-1.06	37.3	-2.08**
	(%)	Case	56	5.64 (5.70)	9.14 (6.25)	3.50 (0.55)	1.08	0.55	55.4	0.80
		Diff				3.97 (1.61)	1.07	1.51		
	ROA	Mass	69	3.91 (4.06)	3.03 (3.33)	-0.88 (-0.73)	-1.04	-0.73	36.2	-2.29**
	(%)	Case	52	6.99 (5.20)	7.89 (7.11)	0.90 (1.91)	0.54	1.30	57.7	1.11
		Diff				1.78 (2.64)	1.19	2.05*		
	ROE	Mass	69	5.66 (5.40)	-3.19 (5.80)	-8.85 (0.40)	-0.97	0.59	42.0	-1.32
	(%)	Case	50	12.72 (10.06)	8.07 (11.25)	-4.65 (1.19)	-1.25	0.48	50.0	0.00
		Diff				4.20 (0.79)	0.44	0.10		
Efficiency	SALEFF	Mass	8	0,95 (0.93)	1.12 (1.02)	0.17 (0.09)	1.43	1.37	75.0	1.41
		Case	24	1.28 (1.27)	0.87 (0.86)	-0.41 (-0.41)	-7.98***	-5.28***	12.5	-3.67***
		Diff				-0.58 (-0.50)	-5.14***	-3.61***		
	NIEFF	Mass	7	0.90 (0.98)	0.33 (0.95)	-0.57 (-0.03)	-0.87	-0.58	57.1	0.38
		Case	29	1.35 (0.97)	0.60 (1.01)	-0.75 (0.04)	-1.16	0.40	55.2	0.56
		Diff				-0.22 (0.07)	-0.14	0.42		
Capital Investments	CES	Mass		n.a.	n.a.	n.a.				
	(%)	Case		16.70 (12.55)	20.66 (12.22)	3.96 (-0.33)	0.66	-0.38	50.0	0.00
		Diff				n.a.				
	CETA	Mass		n.a.	n.a.	n.a.				
	(%)	Case		21.46 (17.76)	24.18 (21.02)	2.72 (3.26)	0.42	0.55	64.3	1.07
		Diff				n.a.				
Output	RSAL	Mass	80	1.05 (1.08)	1.12 (1.00)	0.07 (-0.08)	1.14	-1.18	41.3	-1.57
		Case	64	1.29 (1.21)	0.84 (0.81)	-0.45 (-0.40)	-7.68***	-8.44***	9.4	-6.50***
		Diff				-0.52 (-0.32)	-6.22***	-7.69***		
Employment	EMPL	Mass	7	5571 (1523)	4652 (1523)	-1119 (0)	-0.79	-0.13	14.3	-1.89*
		Case	39	3801 (1382)	3442 (1243)	-359 (-139)	-0.28	-0.52	20.5	-3.69***
		Diff				-760 (139)	-0.74	0.54		
Leverage	LTDTA	Mass	41	8.99 (5.91)	11.21 (7.90)	2.22 (1.99)	0.87	1.99*	53.7	0.47
	(%)	Case	40	6.41 (4.97)	4.97 (3.12)	-1.44 (-1.75)	-1.00	-1.09	30.0	-2.53**
		Diff				-3.87 (-3.74)	-1.71*	-2.05**		
Dividends	DIVSAL	Mass	66	1.10 (0.00)	1.14 (0.00)	0.04 (0.00)	0.10	-0.25	25.7	-3.94***
	(%)	Case	49	1.13 (0.00)	1.73 (0.00)	0.60 (0.00)	1.05	1.20	36.7	-1.86*
		Diff				0.56 (0.00)	1.09	-1.48		
	PAYOUT	Mass	60	16.43 (0.00)	12.02 (0.00)	-4.41 (0.00)	-1.09	-0.54	25.0	-3.87***
	(%)	Case	51	11.40 (8.86)	12.28 (0.00)	0.88 (-8.86)	0.24	1.48	39.2	-1.54
		Diff				5.29 (-8.86)	1.14	-1.54		

***, **, * Significant at the 1, 5 and 10 percent level, respectively.

Table 4
Summary Results for Private Sector IPOs versus Case-by-Case Privatization

This table presents summary results for the subsamples private sector initial public offerings (IPO) and case-by-case privatization firms (Case). For each performance measure the mean and the median values for the two-year period before and after privatization, the changes in mean and median values, the number of observations, and the proportion of firma that increased the performance measure after privatization are provided. We employ a parametric test for the differences in mean, the Wilcoxon signed rank test for the differences in median, and a test whether the proportion of firms that increased the performance measure is significant different from 50 percent. The following variables are used to measure changes in operating performance: (a) Profitability: Return on Sales (ROS), Return on Total Assets (ROA), Return on Total Equity (ROE); (b) Operating Efficiency: Real Sales per Employee normalized (SALEFF), Real Net Income per Employee normalized (NIEFF); (c) Capital investment spending: Capital Expenditure to Sales (CES), Capital Expenditure to Total Assets (CETA); (d) Output: Real Sales normalized (RSAL); (e) Employment: Total Number of Employees (EMPL); (f) Leverage: Long Term Dept to Total Assets (LTDTA); (g) Dividends: Dividends to Sales (DIVSAL), Payout ratio (PAYOUT).

				Mean (Median)					Proportion of Firms	
Variable			N	Before	After	Change	t-statistics: Change in Mean (after - before)	Z-statistics: Change in Median (after - before)	After > Before (%)	Z-Statistic
Profitability	ROS	IPO	71	5.75 (5.61)	0.57 (3.04)	-5,18 (-2.57)	-1.95**	-3.57***	22.5	-4.63***
	(%)	Case	56	5.64 (5.70)	9.14 (6.25)	3.50 (0.55)	1.08	0.55	55.4	0.80
		Diff				8.67 (3.12)	2.22**	3.38***		
	ROA	IPO	64	8.10 (8.34)	1.97 (4.68)	-6.13 (-3.66)	-3.80***	-3.66***	25.0	-4.00*
	(%)	Case	52	6.99 (5.20)	7.89 (7.11)	0.90 (1.91)	0.54	1.30	57.7	1.11
		Diff				7.03 (5.57)	4.02***	3.89***		
	ROE	IPO	57	15,23 (12.53)	2.62 (8.54)	-12.61 (-3.99)	-4.06***	-3.42***	24.6	-3.84*
	(%)	Case	50	12.72 (10.06)	8.07 (11.25)	-4.65 (1.19)	-1.25	0.48	50.0	0.00
		Diff				7.96 (5.18)	1.84*	2.73***		
Efficiency	SALEFF	IPO	16	1.14 (1.19)	0.89 (0.84)	-0.25 (-0.35)	-2.52**	-2.79**	25.0	-2.00**
		Case	24	1.28 (1.27)	0.87 (0.86)	-0.41 (-0.41)	-7.98***	-5.28***	12.5	-3.67***
		Diff				-0.16 (-0.06)	-1.23	-0.80		
	NIEFF	IPO	16	3.77 (1.42)	-1.97 (0.80)	-5.74 (-0.62)	-1.48	-1.64	33.3	-1.29
		Case	29	1.35 (0.97)	0.60 (1.01)	-0.75 (0.04)	-1.16	0.40	55.2	0.56
		Diff				4.99 (0.76)	0.90	1.47		
Capital Investments	CES	IPO		n.a.	n.a.	n.a.				
	(%)	Case	16	16.70 (12.55)	20.66 (12.22)	3.96 (-0.33)	0.66	-0.38	50.0	0.00
		Diff				n.a.				
	CETA	IPO	5	15.39 (13.27)	9.50 (10.29)	-5.89 (2.98)	-2.79**	-2.61***	0.0	-2.24**
	(%)	Case	14	21.46 (17.76)	24.18 (21.02)	2.72 (3.26)	0.42	0.55	64.3	1.07
		Diff				8.61 (6.24)	1.83*	2.04**		
Output	RSAL	IPO	71	1.09 (1.14)	0.98 (0.93)	-0.11 (-0.21)	-2.02**	-3.81***	32.4	-2.97***
		Case	64	1.29 (1.21)	0.84 (0.81)	-0.45 (-0.40)	-7.68***	-8.44***	9.4	-6.50***
		Diff				-0.34 (-0.19)	-3.99***	-4.40***		
Employment	EMPL	IPO	24	1069 (804)	1051 (724)	-18 (-80)	-0.08	-0.41	41.7	-0.82
		Case	39	3801 (1382)	3442 (1243)	-359 (-139)	-0.28	-0.52	20.5	-3.69***
		Diff				-342 (-59)	-1.61	-1.26		
Leverage	LTDTA	IPO	40	9.67 (4.04)	8.19 (4.58)	-1.48 (0.54)	-0.45	0.33	50.0	0.00
	(%)	Case	40	6.41 (4.97)	4.97 (3.12)	-1.44 (-1.75)	-1.00	-1.09	30.0	-2.53**
		Diff				0.04 (2.29)	0.01	1.73*		
Dividends	DIVSAL	IPO	66	1.86 (0.00)	1.08 (0.00)	-0.78 (0.00)	-0.73	-0.73	21.2	-4.68***
	(%)	Case	49	1.13 (0.00)	1.73 (0.00)	0.60 (0.00)	1.05	1.20	36.7	-1.86***
		Diff				-0.18 (0.00)	1.74*	0.90		
	PAYOUT	IPO	69	12,84 (0.00)	10.91 (0.00)	-1.93 (0.00)	-0.51	-0.01	30.4	-3.25***
	(%)	Case	51	11.40 (8.86)	12.28 (0.00)	0.88 (-8.86)	0.24	1.48	39.2	-1.54
		Diff				2.81 (-8.86)	0.65	-0.86		

***, **, * Significant at the 1, 5 and 10 percent level, respectively.

Table 5
Summary Results for Privatized Firms in Manufacturing versus Non-Manufacturing Industries

This table presents summary results for the subsamples of privatized firms in manufacturing (M) and non-manufacturing industries (NoM). For each performance measure the mean and the median values for the two-year period before and after privatization, the changes in mean and median values, the number of observations, and the proportion of firma that increased the performance measure after privatization are provided. We employ a parametric test for the differences in mean, the Wilcoxon signed rank test for the differences in median, and a test whether the proportion of firms that increased the performance measure is significant different from 50 percent. The following variables are used to measure changes in operating performance: (a) Profitability: Return on Sales (ROS), Return on Total Assets (ROA), Return on Total Equity (ROE); (b) Operating Efficiency: Real Sales per Employee normalized (SALEFF), Real Net Income per Employee normalized (NIEFF); (c) Capital investment spending: Capital Expenditure to Sales (CES), Capital Expenditure to Total Assets (CETA); (d) Output: Real Sales normalized (RSAL); (e) Employment: Total Number of Employees (EMPL); (f) Leverage: Long Term Dept to Total Assets (LTDTA); (g) Dividends: Dividends to Sales (DIVSAL), Payout ratio (PAYOUT).

				Mean (Median)					Proportion of Firms	
Variable			N	Before	After	Change	t-statistics: Change in Mean (after - before)	Z-statistics: Change in Median (after - before)	After > Before (%)	Z-Statistic
Profitability	ROS	M	104	5.76 (4.94)	4.59 (4.05)	-1.17 (-0.89)	-1.01	-0.89	44.2	-1.18
	(%)	NoM	19	1.43 (5.62)	16.47 (10.61)	15.04 (4.99)	1.68*	1.27	52.6	0.23
		Diff				16.21 (5.98)	1.68*	1.29		
	ROA	M	103	5.60 (4.54)	5.00 (4.23)	-0.60 (-0.31)	0.61	-0.63	43.7	-1.28
	(%)	NoM	18	3.13 (3.83)	5.82 (6.05)	2.69 (2.22)	1.42	1.36	55.6	0.47
		Diff				3.29 (2.53)	1.60	1.38		
	ROE	M	101	9.13 (7.37)	0.16 (7.01)	-8.97 (-0.36)	-1.39	-0.16	44.5	-1.09
	(%)	NoM	18	5.79 (5.18)	9.32 (9.45)	3.53 (4.27)	1.09	1.14	50.0	0.00
		Diff				12.56 (4.63)	1.78*	1.22		
Efficiency	SALEFF	M	23	1.18 (1.21)	0.96 (0.90)	-0.24 (-0.31)	-3.25***	-3.55***	30.4	-1.88*
		NoM	9	1.24 (1.34)	0.85 (0.91)	-0.39 (-0.43)	-3.36***	-2.78**	22.2	1.67*
		Diff				-0.15 (-0.12)	-1.03	-0.90		
	NIEFF	M	26	0.93 (1.04)	0.84 (0.98)	-0.09 (-0.06)	-0.42	-0.13	57.7	0.78
		NoM	10	2.12 (0.98)	-0.22 (0.99)	-2.34 (0.01)	-1.26	0.30	50.0	0.00
		Diff				-2.25 (0.07)	-0.85	0.11		
Capital Investments	CES	M	16	15.26 (12.55)	19.35 (12.22)	4.09 (-0.33)	0.77	-0.26	50.0	0.00
	(%)	NoM		n.a.	n.a.	n.a.			n.a.	n.a.
		Diff								
	CETA	M	16	20.62 (15.16)	22.51 (17.02)	1.89 (1.86)	0.27	0.28	53.8	0.28
	(%)	NoM		n.a.	n.a.	n.a.			n.a.	n.a.
		Diff								
Output	RSAL	M	124	1.16 (1.18)	1.01 (0.89)	-0.15 (-0.29)	-2.77***	-6.61***	27.4	-5.02***
		NoM	20	1.16 (1.12)	0.91 (0.87)	-0.25 (-0.25)	-3.01***	-3.06***	25.0	-2.24**
		Diff				-0.10 (0.04)	-0.90	0.92		
Employment	EMPL	M	33	4486 (1958)	4043 (1854)	-443 (-104)	-0.29	-0.38	27.3	-2.61***
		NoM	13	3125 (821)	2569 (686)	-556 (-135)	-0.26	-0.67	0.00	-3.60***
		Diff				-113 (-31)	-0.25	-0.52		
Leverage	LTDTA	M	67	7.71 (5.67)	8.55 (4.71)	0.84 (-0.86)	0.49	-0.07	44.8	-0.86
	(%)	NoM	14	7.72 (4.62)	6.08 (4.86)	-1.64 (0.24)	-0.50	0.09	28.6	-1.60
		Diff				2.48 (1.10)	1.18	0.89		
Dividends	DIVSAL	M	98	1.17 (0.00)	1.29 (0.11)	0.12 (0.11)	0.41	0.55	31.6	-3.64***
	(%)	NoM	17	0.80 (0.00)	1.94 (0.00)	1.14 (0.00)	0.92	0.49	23.5	-2.18**
		Diff				1.02 (-0.11)	0.90	-0.06		
	PAYOUT	M	94	15.9 (0.00)	13.20 (2.86)	-2.65 (2.86)	-0.84	0.25	30.9	-3.71*
	(%)	NoM	17	4.55 (0.00)	6.28 (0.00)	1.73 (0.00)	0.46	0.91	35.3	-1.21
		Diff				4.38 (-2.86)	1.25	-0.91		

***, **, * Significant at the 1, 5 and 10 percent level, respectively.

Table 6
Summary Results for Privatized Firms: Small versus Large Companies

This table presents summary results for the subsamples small (S) and large (L) privatized firms. SOEs are defined as small when their real average sale (in the pre- and post-privatization period) is below the median real average sale of the full sample. For each performance measure the mean and the median values for the two-year period before and after privatization, the changes in mean and median values, the number of observations, and the proportion of firma that increased the performance measure after privatization are provided. We employ a parametric test for the differences in mean, the Wilcoxon signed rank test for the differences in median, and a test whether the proportion of firms that increased the performance measure is significant different from 50 percent. The following variables are used to measure changes in operating performance: (a) Profitability: Return on Sales (ROS), Return on Total Assets (ROA), Return on Total Equity (ROE); (b) Operating Efficiency: Real Sales per Employee normalized (SALEFF), Real Net Income per Employee normalized (NIEFF); (c) Capital investment spending: Capital Expenditure to Sales (CES), Capital Expenditure to Total Assets (CETA); (d) Output: Real Sales normalized (RSAL); (e) Employment: Total Number of Employees (EMPL); (f) Leverage: Long Term Dept to Total Assets (LTDTA); (g) Dividends: Dividends to Sales (DIVSAL), Payout ratio (PAYOUT).

				Mean (Median)					Proportion of Firms	
Variable			N	Before	After	Change	t-statistics: Change in Mean (after - before)	Z-statistics: Change in Median (after - before)	After > Before (%)	Z-Statistic
Profitability	ROS	S	55	4.38 (5.40)	7.48 (5.11)	3.10 (-0.28)	0.89	-0.12	44.1	-0.97
	(%)	L	68	5.66 (4.62)	5.57 (3.61)	-0.09 (-1.01)	-0.07	-0.61	47.3	-0.40
		Diff				-3.19 (-0.73)	-0.84	-0.29		
	ROA	S	53	4.76 (4.45)	4.50 (5.19)	-0.26 (0.74)	-0.19	0.28	43.7	-1.28
	(%)	L	68	5.61 (4.11)	5.60 (4.06)	-0.01 (-0.05)	-0.01	-0.38	55.5	0.47
		Diff				0.25 (-0.79)	0.17	-0.47		
	ROE	S	52	8.40 (5.82)	-6.60 (7.07)	-15.00 (1.25)	-1.22	0.01	44.8	-0.85
	(%)	L	67	8.80 (7.71)	7.87 (7.24)	-0.93 (-0.47)	-0.46	-0.05	46.1	-0.55
		Diff				14.07 (-1.72)	1.16	-0.39		
Efficiency	SALEFF	S	16	1.26 (1.26)	0.93 (0.90)	-0.33 (-0.36)	-3.71***	-3.58***	18.8	-2.50**
		L	16	1.13 (1.13)	0.94 (0.94)	-0.19 (-0.19)	-2.74**	-2.30**	37.5	-1.00
		Diff				0.14 (0.17)	1.04	1.39		
	NIEFF	S	18	1.67 (1.02)	0.28 (0.99)	-1.35 (-0.03)	-0.18	-0.38	50.0	0.00
		L	18	0.85 (0.79)	0.82 (0.98)	-0.03 (0.19)	-0.14	0.44	61.1	0.94
		Diff				1.32 (0.22)	0.91	0.43		
Capital Investments	CES	S	7	16.38 (10.00)	15.73 (8.92)	-0.65 (-1.08)	-0.10	-0.32	50.0	0.00
	(%)	L	10	18.42 (13.89)	23.95 (14.37)	5.51 (0.48)	0.65	0.38	42.9	-0.38
		Diff				6.18 (1.56)	0.89	0.68		
	CETA	S	7	25.42 (20.00)	21.75 (17.02)	-3.67 (-2.98)	-0.41	-0.19	53.8	0.27
	(%)	L	8	17.80 (17.76)	24.66 (21.02)	6.85 (3.25)	0.78	0.32	100.0	1.41
		Diff				10.53 (-6.23)	1.32	0.23		
Output	RSAL	S	75	1.11 (1.15)	1.04 (0.90)	-0.07 (-0.25)	-1.17	-4.70***	29.3	-3.58***
		L	75	1.20 (1.18)	0.95 (0.88)	-0.25 (-0.30)	-3.86***	-5.76***	24.6	-4.21***
		Diff				-0.18 (-0.05)	-1.81*	-1.90*		
Employment	EMPL	S	24	1204 (1031)	1085 (1003)	-111 (-28)	-0.51	-0.69	22.7	-2.56***
		L	22	7261 (4285)	6399 (3854)	-862 (-431)	-0.37	-0.35	16.7	-3.27***
		Diff				-751 (-403)	-1.76*	-0.97		
Leverage	LTDTA	S	39	8.36 (4.81)	9.48 (4.71)	1.12 (-0.10)	0.44	-0.19	38.1	-1.54
	(%)	L	42	7.12 (5.93)	6.86 (4.85)	-0.26 (-1.08)	-0.16	-0.36	46.2	-0.48
		Diff				-1.38 (-0.98)	-0.62	-0.66		
Dividends	DIVSAL	S	56	1.15 (0.00)	1.52 (0.00)	0.37 (0.00)	0.78	0.00	37.3	-1.95**
	(%)	L	59	1.08 (0.00)	1.26 (0.17)	0.18 (0.17)	0.44	1.03	23.2	-4.00***
		Diff				-0.19 (0.17)	-0.39	1.47		
	PAYOUT	S	50	12.95 (0.00)	12.57 (0.00)	-0.38 (0.00)	-0.10	0.00	32.8	-2.69***
	(%)	L	61	15.08 (0.00)	11.79 (4.06)	-3.29 (4.06)	-0.82	0.67	30.0	-2.83***
		Diff				-2.91 (4.06)	-0.63	0.34		

***, **, * Significant at the 1, 5 and 10 percent level, respectively.

Table 7: Changes in industrial production

The table presents descriptive statistics of cross-section percent changes (post minus pre privatization) in general industrial production in Hungary, Poland, and the Czech Republic. The calculations were based on Reuters 3000 Xtra industrial production data from 1988 to 2003.

	Sample	Hungary	Poland	Czech Republic	Case-by-case method	IPOs
Mean	16.50	11.27	22.33	15.24	17.97	17.85
Median	16.56	9.08	16.82	12.82	16.82	16.82
St. dev.	12.02	17.68	9.64	9.51	14.35	10.22
Min	-15.73	-15.73	13.09	-5.26	-15.73	-15.73
Max	40.45	40.45	38.73	25.18	40.45	40.45
N	154	28	43	83	71	78

Figure 1

Percent change in median operating performance (sample of all privatized firms)

This figure presents for the sample of all privatized firms the percent change in median operating performance between the pre- and post privatization period. The following variables are used to measure changes in operating performance: (a) Profitability: Return on Sales (ROS), Return on Total Assets (ROA), Return on Total Equity (ROE); (b) Operating Efficiency: Real Sales per Employee normalized (SALEFF), Real Net Income per Employee normalized (NIEFF); (c) Capital investment spending: Capital Expenditure to Sales (CES), Capital Expenditure to Total Assets (CETA); (d) Output: Real Sales normalized (RSAL); (e) Employment: Total Number of Employees (EMPL); (f) Leverage: Long Term Dept to Total Assets (LTDTA); (g) Dividends: Dividends to Sales (DIVSAL), Payout ratio (PAYOUT). A Wilcoxon signed rank test is used to test whether the median performance changes are significantly different from zero. ***, **, and * indicate the 1, 5 and 10 percent significance level, respectively.

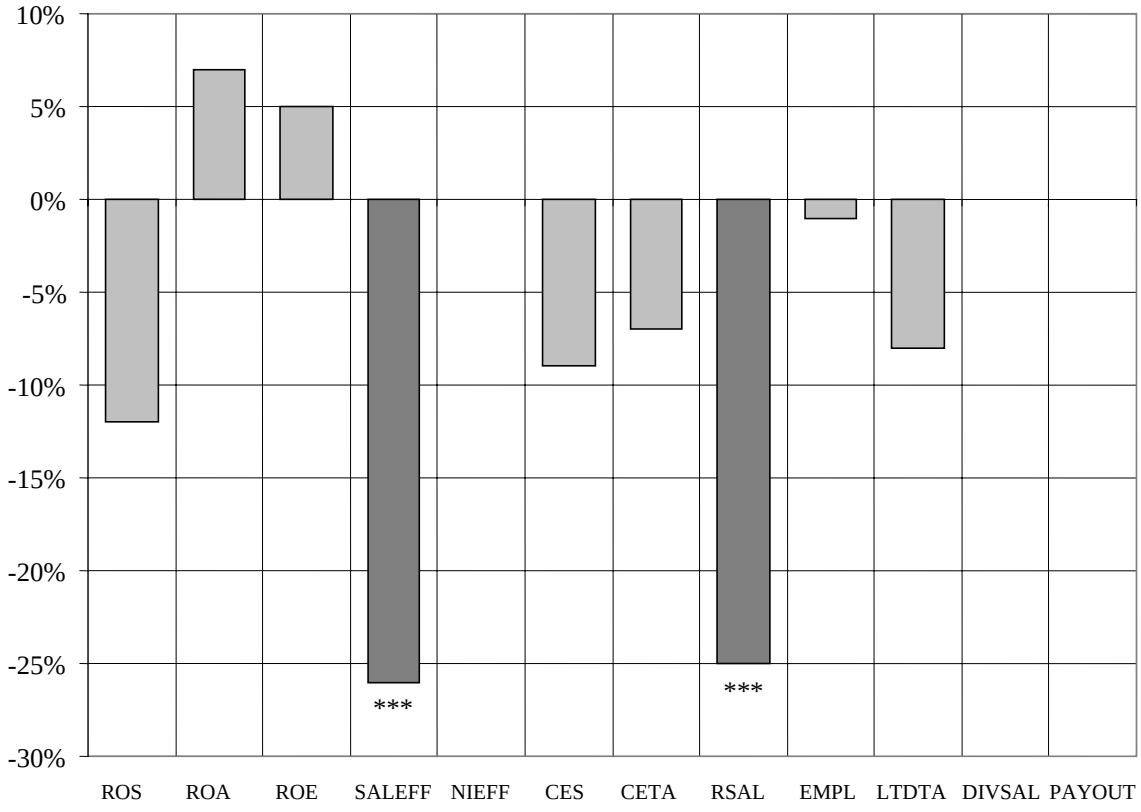

Figure 2

Proportion of firms with increased operating performance (sample of all privatized firms)

This figure presents for the sample of all privatized firms the proportion of firms that experienced an increase in the corresponding performance measure between the pre-and the post-privatization period. The following variables are used to measure changes in operating performance: (a) Profitability: Return on Sales (ROS), Return on Total Assets (ROA), Return on Total Equity (ROE); (b) Operating Efficiency: Real Sales per Employee normalized (SALEFF), Real Net Income per Employee normalized (NIEFF); (c) Capital investment spending: Capital Expenditure to Sales (CES), Capital Expenditure to Total Assets (CETA); (d) Output: Real Sales normalized (RSAL); (e) Employment: Total Number of Employees (EMPL); (f) Leverage: Long Term Dept to Total Assets (LTDTA); (g) Dividends: Dividends to Sales (DIVSAL), Payout ratio (PAYOUT). A proportion test is used to test whether the proportion of firms that increased the performance measure is significantly different from 50 percent. ***, **, and * indicate the 1, 5 and 10 percent significance level, respectively.