

CHANNELS OF RESTRUCTURING IN PRIVATIZED CZECH COMPANIES^{*}

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Abstract: Wide variety of restructuring activities in the former state-owned enterprises has been documented in the literature. The present paper provides an analysis of channels of restructuring in a panel of 483 Czech companies privatized by the voucher method. The fixed-effects model with observations between 1993 and 1997 is used for this purpose. The results indicate that asset sale, labor shedding, employee incentives, sales growth, and inventory management serve as channels through which performance of the privatized companies measured by sale efficiency is improved. On the other hand, investment is not found to be a significant determinant of enterprise performance. Furthermore, the analysis suggests that the companies still face a soft budget constraint.

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1 Introduction

The ultimate objective of economic reforms is to put in place a functional market system, to increase production efficiency and to improve living standards. One of the principal areas of the reforms has been enterprise restructuring. That is, the process that transforms the unviable, loss making planned economy enterprises into vigorous, competitive entities. This complex process encompasses several issues such as the forms and determinants of restructuring, sequencing with respect to privatization, the role of ownership structure and implementation of effective corporate governance.

Experience with privatization projects in the Western Europe showed quite convincingly that private enterprises perform better than state owned enterprises (Hutchinson, 1991, Megginson et al, 1994, Shleifer and Vishny, 1994). This evidence motivated the advocates of a big bang approach (Lipton and Sachs, 1990, Blanchard et al., 1991), who argued that only private ownership would put in place proper incentives for enterprises to restructure. Therefore, they stressed the importance of speedy privatization. On the other hand, the supporters of a gradual reform (Roland, 1994, among others) insisted that privatization per se is not the remedy for the problems of the state-owned enterprises (henceforth SOEs). Accordingly, while privatization is important, a healthy financial system imposing hard budget constraints on the enterprises is a necessary prerequisite of enterprise restructuring.

Several studies focused on the strategies that SOEs followed in order to survive and become competitive (see, for example, Grosfeld and Roland, 1995, Carlin and Landesmann, 1997). Early case studies documented that even SOEs before privatization were engaged in some activities to cope with the existing situation (Carlin et al., 1995, Barberis, 1996, Aghion et al., 1994). The evidence indicates that managers of these enterprises undertook measures to reduce costs. However, arguments were raised that this was just an adjustment¹ instead of forward-looking 'real' restructuring (Blanchard, 1997). The latter type of restructuring, also called strategic or deep restructuring, entailing activities based on a "thoughtful business strategy leading to a profound redeployment of assets" (Grosfeld and Roland, 1995) was found only in companies privatized by a foreign investor (Carlin and Aghion, 1996).

Frydman et al. (1999) analyzing the effect of privatization in three Central European economies (the Czech Republic, Hungary, and Poland) argue that what matters is not only privatization as such, but also the type of owner to whom it gives control. In particular, when the effect of privatization in general is measured, one comes to a misleading conclusion that privatization in itself is good for the enterprises. However, distinguishing particular types of owners reveals that only foreign investors and private domestic financial firms perform better than state. On the other hand, insiders do not perform better than the state.

The literature dealing with the activities of firms after privatization focuses almost exclusively on the relationship between restructuring or improved performance on the one hand and ownership structure on the other hand (Claessens, 1997, Earle, 1998,

¹ These activities are also referred to as defensive or reactive restructuring (Grosfeld and Roland, 1995 and Carlin and Aghion, 1996, respectively).

among others). The general conclusion of the studies is again that privatization per se is not enough in order to secure restructuring. Foreign ownership proved to consistently outperform the other privatizing investors.

The common approach of these papers was that they regressed some measure of performance on ownership or ownership-concentration dummies. To my knowledge, none of the studies, however, tried to analyze the restructuring activities in firms after privatization and in particular to show which of the activities induced improved performance of the firms.² Nevertheless, the need to explore the sources of restructuring was stressed, for example, by Earle and Estrin (1998).

This paper analyzes the channels of restructuring in a panel of 483 former SOEs privatized in the Czech voucher privatization. It identifies the activities, which have had a positive effect on performance of the former SOEs since 1993, the year of the transfer of ownership rights after the first wave of the voucher privatization, until 1997.

The main findings of the present analysis are fourfold. First, asset sale, labor shedding, employee incentives, sales growth, and inventory management are associated with improvements in enterprise performance measured by sale efficiency (real sales per employee). Second, investment activities of the SOEs have an ambiguous effect on performance. Third, there is some indication of soft budget constraint imposed on the companies. Finally, the two measures of enterprise performance used in the present paper – sale efficiency and profitability – appear to be negatively correlated. This is a surprising finding because these two measures are often used interchangeably in the transition literature as proxies for enterprise performance and restructuring.

The paper is organized as follows. In the following section, the aggregate developments with respect to restructuring in the Czech Republic are reviewed. The hypotheses about potential restructuring channels are discussed in the third section. The data set, methodology used and main results are described in section 4. Section 5 summarizes the main results and outlines suggestions for further research.

2 Aggregate Developments in the Czech Republic

The transfer of ownership from state to private hands together with increased competition and hardening of the budget constraint have long been regarded as the major determinants of enterprise performance and efficiency. The disciplining role of these three mechanisms was acknowledged not only for market economies, but even more so for transition economies (Earle and Estrin, 1998). Therefore, the reforms were designed as to accomplish the liberalization of prices and trade, the reduction of state subsidies and bailouts and also privatization of SOEs.

In the Czech Republic, price and trade liberalization was introduced early in the transition process. According to the EBRD Transition Report 1998, the Czech

² Zemplerova, Lastovicka, and Marcincin (1995) studied restructuring activities of firms in their sample. However, majority of the firms studied were SOEs preparing for the voucher privatization.

Republic, along with Hungary, have progressed furthest in term of overall liberalization, reaching an average liberalization index of 3.63.³

Privatization policy also reflected the government's commitment to the reforms. The fast privatization program resulted in a swift transfer of property rights.⁴ In the period from 1990 till 1993, a centralized economy with 96.7% of output produced by SOEs was transformed into an economy with 67% of output produced by 'private' firms.⁵ However, many doubts have been expressed about the ability of new owners to improve performance of the former SOEs. The voucher privatization⁶ delivered a rather peculiar ownership pattern. The fears that it would result in dispersed ownership did not materialize, instead, investment privatization funds (IPFs hereafter) arose as the most important players. The IPFs captured more than 50% of shares in 334 companies out of 842 companies where more than 50% was privatization by means of vouchers (Lastovicka et al., 1994). Claessens et al. (1997) reports that in their sample of 706 firms privatized via the voucher privatization, the IPFs hold an average stake of around 23% compared to 2.4% and 0.1% average stakes held by state and domestic strategic owners, respectively. The average stake of foreign direct investors was less than 0.05%.⁷

As Coffee (1996) points out, highly dispersed ownership together with insufficiently transparent and illiquid financial market could not operate as a direct mechanism of corporate governance. Moreover, many of the most important IPFs acquired a stake in the main Czech banks, which in turn controlled the IPFs. This phenomenon resulted in a strange and non-transparent system of cross-ownership between the major banks and the IPFs. Furthermore, the IPFs were regarded as neither the optimal nor final owners because of their lack of access to finance for restructuring and inadequate expertise (Carlin and Aghion, 1996), and therefore additional reshuffling of ownership was said to be desirable.

The implementation of the hard budget constraint is ambiguous. On the one hand, state subsidies were abolished early in the transition process. However, the government's policy toward bankruptcies and bank-bailouts was rather 'soft.' First, the incidence of bankruptcies in the Czech Republic has been very low compared to Hungary or Poland. The government evidently protected insolvent firms against bankruptcy. Second, the problems of large state banks with high ratio of classified

³ The EBRD assesses progress in eight areas: large-scale and small-scale privatization, governance/enterprise restructuring, price liberalization, trade and foreign exchange liberalization, competition policy, banking reform and securities markets. The indicators take values from 1 (little progress) to 4+ (comparable to developed industrial economies). The figure reported above was computed as simple mean of the EBRD progress-in-transition indicators, ranging from 1 to 4+, with 4+ replaced by 5 for the computation of the means.

⁴ For a detailed description of the Czech privatization program see Kotrba (1994).

⁵ However, the transfer of ownership rights after the first wave of the voucher privatization was executed only by mid 1993. Furthermore, the ownership structures resulting from the voucher privatization were rather ambiguous, because of cross-ownership by state-controlled banks and bank-controlled privatization funds. See Turnovec (1999).

⁶ Out of 949 firms privatized in the first wave of privatization, in 842 firms a stake of 50% and more of shares was offered through vouchers.

⁷ These are numbers concerning the first wave. The results of the second wave were slightly more favorable towards the latter three types of owners. However, the discrepancy in average sizes of stakes remained the same.

loans were solved by state bailouts rather than by bank privatization. Hence, the credit policies of major banks did not harden the budget constraint of the SOEs, rather the opposite was the case.

In contrast to Poland and Hungary, no particular restructuring program was implemented. It was generally expected that changes in ownership together with increasingly competitive environment would evoke changes towards the efficiency frontier. Consequently, two natural questions arise. First, how has the Czech economy performed relative to the other leading transition economies in Europe? Second, has privatization alone been sufficient in achieving effective ownership structures leading to deep restructuring in the Czech Republic? In the present study, the latter question is addressed. Nevertheless, although the former question is not the subject of this paper, it is informative to look at the development of some aggregate economic indicators in the Czech Republic, and compare it to the development in Hungary and Poland.

Figure 1 shows the evolution of real GDP in the three countries. In order to get the correct perspective, time was measured as the number of years since the beginning of reforms. For Poland and Hungary, 1990 is considered to be the first year of transition, whereas 1991 is the starting point for the Czech Republic (cf. Blanchard, 1997). During the first years of transition, the Czech economy was performing relatively well. GDP did not drop as low as in the other two countries, and started to recover in the third year, in 1993. However, GDP growth has deteriorated in the more recent years, in particular since 1996. Moreover, it became negative in 1998. In contrast, the Polish economy has experienced more dynamic growth.

Figure 2, giving the evolution of aggregate labor productivity,⁸ might indicate the reason for low dynamics of Czech GDP growth. Czech aggregate labor productivity performance was poor when compared to Poland and Hungary. This suggests that firms across the Czech Republic have not been as flexible in terms of labor shedding as firms in the two other countries. The poor labor productivity growth in the Czech Republic perhaps reflects soft governmental policy towards bankruptcies and bank bailouts as well as low bank discipline.

Also, the development of fixed capital formation has not been as dramatic in the Czech Republic as in Hungary or Poland. This might suggest low long-term orientation, and hence low level of restructuring in the Czech Republic.

3 Enterprise Restructuring: Hypotheses and Previous Evidence

The aggregate data discussed in the previous section suggest that the Czech economy encountered some problems, which led to a slow down of its aggregate output and labor productivity growth since mid 1994. Many observers believe that one of the main reasons behind the slow down of transformation is slow microeconomic restructuring (Dlouhy, 1999). In order to provide more profound conclusion about the extent of restructuring at the micro level, it is necessary to examine firm level data.

Earle and Estrin (1998, p. 14) point out that, “[t]he impact of competition, ownership, and budget constraints on labor productivity may [...] work through several channels,

⁸ Aggregate labor productivity was computed as GDP in constant prices divided by the number of employed people in the economy.

including actions to enhance efficiency by reducing input waste, to increase sales [...], and to augment the quantity and quality of the capital stock and improve the technology through new investment.” To identify these channels in the privatized Czech SOEs is the main aim of the present paper. In particular, I investigate what are the restructuring activities that significantly improve enterprise performance.⁹ The underlying framework used here is captured by the following equation:

$$\text{Performance} = f(\text{restructuring activities, control variables}).$$

Studies on enterprise restructuring in transition (e.g. Carlin et al., 1995, Grosfeld and Roland, 1995, and Pohl et al., 1997) document that companies have been engaged in a wide variety of restructuring activities before as well as after privatization. In order to simplify the analysis and to generalize the findings, Carlin et al. (1995) handles restructuring as actions taken along the following four dimensions: (i) internal organization (e.g. unbundling, shedding social assets); (ii) employment (e.g. labor shedding, wage differentiation); (iii) output (e.g. marketing, product mix); and (iv) investment (e.g. in wholesale network, capital equipment). The strategy of categorizing restructuring activities into several groups proves useful also in Kang and Shivdasanyi (1997), a study on restructuring in underperforming Japanese corporations. The latter study uses seven categories of restructuring activities,¹⁰ however, most of them correspond to the categories used in the former study.

In the present analysis, a categorization gained by a combination of the two above-mentioned categorizations is used. The set of restructuring groups used here consists of five categories. They include all four dimensions used in Carlin et al. (1995), which correspond to the first four groups of Kang and Shivdasanyi (1997), plus a category reflecting changes in control (the fifth category in the latter study).¹¹ The five categories used here are labeled according to Kang and Shivdasanyi (1997). Each of the following subsections is devoted to one of the dimensions and contains a discussion of the expected effect of the corresponding dimension on company performance.

3.1 Asset contraction policies

This dimension of restructuring activities refers to the sale of assets, spin-offs of units, and plant closures. For a large socialist type of state owned enterprise, all of these activities may be an important source of performance improvement since it is desirable for such a company to downsize, in order to become efficient and focused on one or several most profitable products (Grosfeld and Roland, 1995). All of these activities are also used in market economies by companies in need for restructuring. In particular, Kang and Shivdasanyi (1997) report that 23% of the Japanese and 49%

⁹ Further in the paper, the terms of ‘channels of restructuring’ and ‘restructuring activities’ are used interchangeably.

¹⁰ The categories used are the following: (i) asset contraction policies; (ii) changes in employment policies; (iii) expansion policies; (iv) internal reorganizations; (v) changes in control; (vi) external takeover activity; and (vii) miscellaneous actions.

¹¹ The remaining two categories of the latter study are not covered here. The ‘miscellaneous actions’ category is too heterogeneous, and I believe the activities covered there play only a minor role in the total effect of restructuring. On the other hand, the ‘external control activity’ category, including for example block purchases, is perhaps quite important also in the Czech context. Unfortunately, our data set does not cover this kind of information.

of the American companies in their sample¹² used an activity along this restructuring dimension. The main reason why a Japanese or U.S. company may decide to adopt an asset contracting policy is that some of the firm's operations could have become economically unviable. However, many of the former planned economy SOEs' assets are by definition unviable or unprofitable. Social assets (e.g. day care centers, recreational facilities) may serve as an example. Hence the need to use this kind of restructuring and its positive effect on performance is even more profound in the case of former state owned enterprise facing a new, changed environment.

The privatization policy adopted in the Czech Republic had a special effect concerning restrictions on assets sales, which deserves to be mentioned here. In particular, because privatization was regarded to be of higher priority and importance than restructuring, and the threat of unfair dealings of managers was present, the Czech government decided to forbid asset sales in the companies until after the privatization (Grosfeld and Roland, 1995). On the other hand, the program explicitly encouraged split-ups, which was reflected in remarkable increase in the number of enterprises just before approval of privatization projects.¹³ This has an obvious consequence for the analysis along this dimension. Since so many split-ups and hardly any asset sales occurred prior to the privatization, one can, without a substantial loss of information, focus only on asset sales when analyzing the restructuring activities in the companies after their privatization.

3.2 Changes in Employment Policies

Changes in employment policies include employee layoffs, wage differentiation or changes in incentive (compensation) schemes, and other actions that significantly affect the composition or compensation of the firm's employees.

Since labor hoarding was endemic in companies in planned economies, at the beginning of transformation, the need for labor shedding in SOEs was obvious at the beginning of reforms (Pohl et al., 1997, Grosfeld and Roland, 1995). It was even strengthened by severe demand and price shocks resulting in significant fall in sales. It is documented that SOEs across the region (even before privatization) indeed responded to the fall of their sales by lowering output, and consequently by considerable decrease of their labor levels (Carlin et al., 1995). Pursuing this line of argumentation, a negative relationship between employment change and performance can be expected in the companies where labor hoarding is still prevalent.

This relationship can be expected also in the present analysis only under the condition that the privatized Czech companies experience excess employment even in the period since 1993, hence, at least two years after the first transition changes. I argue that labor hoarding is indeed still a problem in most of the privatized Czech SOEs. Primarily, one might question the extent of labor shedding in the Czech companies

¹² Their sample consists of 92 Japanese manufacturing firms listed on the Tokyo Stock Exchange and 114 U.S. manufacturing firms listed on the New York American Stock Exchanges during 1986 to 1990. Sample firms had a ratio of pretax operating income to assets that exceeds the industry median in a given year and experience a decline of at least 50% in operating income in the subsequent year.

¹³ The actual numbers of enterprises prior to and after the approval of privatization projects is 1179 and 3293, respectively (source: Ministry of Privatization, February 1994, quoted by Grosfeld and Roland, 1995).

before the privatization. Low unemployment levels¹⁴ indicate that the companies laid only as little employees as was necessitated by the fall of sales and output, but did not go any further in order to improve labor productivity. Consequently, after the sales of companies started to rise again, employment levels increased again proportionately. Of course, it might be argued that the low (on Central European standards) unemployment was a result of faster job creation in the private sector. However, the recent problems in the Czech Republic and revelation of existence of soft budget constraints faced by the privatized companies rather suggest the first explanation (Dlouhy, 1999). Hence, I conclude that a negative effect of employment change on enterprise performance can be expected.

The only evidence so far on the policies concerning changes in employee incentive schemes are case studies (Carlin et al., 1995) documenting many examples where managers try to introduce some kind of wage differentiation. Furthermore, the case study evidence also documents pressure for higher wages from the side of private sector forcing the SOEs not willing to lose skilled labor to increase wages. From these findings a positive relationship between labor costs and performance can be conjectured. The argumentation is as follows. First, it is obvious that the main goal behind an introduction of widened wage differentials is performance improvement. At the same time I assume that wage differentiation is associated with total labor cost increase, since good workers having the opportunity to switch to private sector require quite substantial wage increase. Second, the pressure from the private sector causes general wage increase in companies willing to keep skill workforce. A further argument in favor of this conjecture is the low unemployment level in the Czech Republic showing that it was generally not difficult to switch jobs. Hence, a positive relationship between wages and enterprise performance is hypothesized in the present analysis.

3.3 Expansion Policies

Actions along the expansion policy category enhance the scope or scale of operations. Such actions include construction of new plants, increased output or capital expenditures.

The need for new investment (modernization of equipment or construction of new lines of production) in former SOEs in transition countries was expressed in many studies (e.g., Blanchard, 1997, Grosfeld and Roland, 1995, and Carlin and Aghion, 1996). This fact is also supported by the very high obsolescence of the companies' fixed assets, which is in turn illustrated by very high values of the ratio of accumulated depreciation to total fixed assets. The average value of this ratio for the Czech non-financial enterprises with 25 and more employees was 44,2% in 1993¹⁵. Since equipment of new firms is by definition relatively less obsolete and there has been considerable growth in the number of new firms in the Czech Republic since 1991, the equipment obsolescence of SOEs seems to be remarkable. At the same time, there is evidence (Carlin et al., 1996, and Zemplerova et al., 1995) that before 1993, the Czech SOEs undertook almost no major investment projects. Consequently, the need for investment in the privatized Czech SOEs is straightforward. Furthermore, it

¹⁴ Unemployment in the Czech Republic has not exceeded 5% till 1997. On the contrary, it has been constantly higher than 10% in the other Visegrad countries.

¹⁵ The number was computed based on sectional statistics published by the National statistical office.

is quite intuitive to assume that the higher the level of investment, the better the performance of the company.

However, the literature so far does not support this positive relationship for the Czech economy. Carlin and Landesmann (1997) point out that the high economy wide ratio of investment to value added failed to translate into rapid productivity growth in the Czech Republic. The relatively high levels of investments in the Czech economy puzzled also Blanchard (1997). Carlin and Landesmann (1997) argue that a very large initial devaluation of the national currency provided protection for all companies and thus enabled spreading of investment across all firms instead of its concentration in the most promising enterprises. On the other hand, Dlouhy (1999) argues that, in the Czech Republic, the amount of the 'productive investment' was relatively low, since total domestic investment was dominated by infrastructure and ecological investment (very often of mandatory nature). This fact then explains that the direct effect of investment on productivity could have been very weak (or not present). Nevertheless, it is expected in the present analysis that modernization of equipment has positive effect on enterprise performance.

Another activity fitting under the heading of expansion policies is output increase. This concerns activities aiming at finding markets for the firm's products and adapting new product ranges. The importance of this kind of activities is underlined by the loss of CMEA¹⁶ markets and collapse of the traditional wholesale networks (Carlin et al., 1995). The ability to adjust product ranges and find new customers should be reflected in increased sales. Furthermore, if sales are measured in constant prices, increase in value of sales encompasses also enhanced quality of products reflected in higher prices. Hence, positive relationship between sales growth and performance is expected.

3.4 Changes in Control

(to be included to the regressions later)

The issue of changes in the top management and their association with improved performance is quite elaborated in the literature for developed economies (for an overview see Jensen and Zimmermann, 1985). In general, the findings support a positive relationship between changes in the top management and corporate performance or market valuation. However, in transition economies, the situation on the market for managers, development of remuneration motivation of managers, and also general competitiveness among managers are not completely comparable to those of the developed economies. In developed countries, properly working market for managers and at the same time properly designed remuneration schemes motivate the incumbent managers to perform well. However, these incentive mechanisms are not developed well in transition countries. In particular, the market for managers is underdeveloped and quality of managerial skills of the available managers is quite low (Carlin et al., 1995, Claessens and Djankov, 1999). A survey of managerial positions conducted by Aspect kilcullen s. r. o.¹⁷ may serve as an illustration of the situation in the Czech Republic. According to this study, almost all incumbent managers (in 1995) were native Czechs. Only 5% of them had foreign university

¹⁶ Council for Mutual Economic Assistance.

¹⁷ Adamek, Milan, 1995, 'Kdo jsou?', (Who they are?) Průvodce českým trhem s cennými papíry (Czech capital market guide), Aspect kilcullen, p. 21.

education, and less than 10% had some type of managerial education. Furthermore, majority of the managers (around 90%) were placed in the position in the pre-privatization period, and survived also the change of ownership. Furthermore, the literature provides a limited support for the hypothesis that bringing in new human capital is important in improving enterprise performance rather than improving incentives for the incumbent (Barberis et al., 1996).¹⁸ This evidence about the situation in the transition countries supports, however, even stronger positive relationship between turnover of top managers and performance of their companies.

3.5 Changes in Internal Organization

Internal reorganizations involve a restructuring without downsizing or enhancement of scale of the firms operations (Kang and Shivdasanyi, 1997). Examples of such activities include cost-cutting efforts, incorporating technological advances, changing production methods, or lowering of inventory levels. Since many activities along this category are difficult to measure, I focus only on inventory management. As mentioned already in the sections above, resource wastage was endemic for the planned economy enterprises (Carlin et al., 1995). Thus, a better inventory management should be one of the restructuring activities bring up better company performance.

4 Empirical Analysis

4.1 Data

The data used in the analysis were purchased from Aspect kilcullen s r.o., a consulting firm specializing in collecting accounting and trading data of firms traded at the Czech capital market. The database contains information on 1748 Czech non-financial firms. However, because of missing observations, only 503 firms had full data availability since 1993 till 1997. Further five firms were excluded because they were not privatized through the voucher method and, hence, have not been traded at the stock market. Finally, 15 firms were eliminated as outliers.¹⁹ Hence, I ended up with a panel of 483 Czech firms privatized through the voucher method over the period from 1993 till 1997.

Average values of basic indicators characterizing the firms over the whole time span and separately for each of the years are presented in Table 1 and Table 2, respectively. Table 3 lists the definitions of the variables used in the previous tables. The basic indicators reveal wide variation among the firms. The book value of assets of an average firm over the studied period was slightly more than 2 billion Czech crowns (CZK), which is approximately 70 million USD.²⁰ The average sales were 1,3 billion CZK and the average employment was approximately 1,200 people. Hence, one employee was on average able to produce 1.6 million CZK worth of sales (sale

¹⁸ Barberis et al. confirm this hypothesis on a sample of privatized Russian shops. Since the entities studied are not representative for the whole population of enterprises, generalization of the findings may not be possible.

¹⁹ The criterion for identifying outliers was increase in employment or sales per employee exceeding 500% in any of the years.

²⁰ Average exchange rate over the period was around 28,8 CZK per one USD.

efficiency in constant prices of 1993) and was on average paid 130 thousand CZK per year (labor costs per employee). On average, the firms were left with 28% of sales after paying for materials and energy. After further paying to their employees, the firms were able to retain 17% of the total value of sales.²¹ This indicates a quite low profitability level of the firms in the sample.

In order to extract more detailed information on profitability of the SOEs, I considered the stages of profitability (cf. Pohl et. al, 1997).²² First, after subtracting all operating expenses, on average only 12% of the total revenue remained in the firm. Second, after paying all net financial obligations, the average firm retained 7,2% of the total value of sales. Furthermore, its net operating income before and after taxes was negative. Additional information is obtained by inspecting the number of firms with positive result at each stage of profitability. Over the period 1993–1997, roughly 91% of the firms were able to pay all operating expenses out of their revenues, 85% of firms were also able to pay their net debt service. Around 70% of the firms had positive base for computing their income tax from operating activities, and 68% of them still remained in black after paying the taxes. Quite alarming is the development of these numbers over the years. Whereas in 1993, 76% of firms were able to retain some profit after paying taxes, in 1997, there were only 58% of such firms. The decrease was continuous over years.

The development of basic indicators is captured by Figure 3. Though in decreasing rate, labor productivity grew steadily and faster than sales, primarily because of falling employment. However, even though employment dropped, labor related costs were growing as fast as labor productivity. Consequently, no resources were left over to improve the profitability position of the average firm. Furthermore, the development of costs of sales as a fraction of the total sales also indicates that even though the firms were able to increase sales on average, their cost efficiency deteriorated. They had to devote more and more resources to produce one monetary unit worth of sales. This fact might suggest that the firms were not concerned with profitability, instead they focused on increasing their sales. Another possible explanation might be that prices of their inputs grew faster than prices of their final products.²³

When compared to the aggregate figures for the whole Czech Republic, the improvement of the SOEs was on average considerably better. Their sales increased faster, and in contrast to growing aggregate employment the employment of SOEs was declining. Thus, their sale efficiency grew faster than sales while sale efficiency grew slower than output at the country level.

The analysis above suggests that despite some improvement, the privatized SOEs had considerable problems with profitability during the period 1993–1997. This might indicate poor restructuring. In order to see whether this pattern was general across all the firms, I divided the sample into quartiles according to their initial level of sale and cost efficiency, and computed means of several variables across firms and time within the individual quartiles. To be sure that the industry bias was excluded, the measures

²¹ Not reported in Table 1.

²² Not reported.

²³ Even though I corrected for inflation, I used just one price deflator for both output as well as inputs.

were adjusted by respective industry means. In particular, the industry adjusted sale efficiency measure was computed as follows:

$$serel_i = (se_i - seind_i)/seind_i$$

Where se_i represents sale efficiency of a firm i in 1993, and $seind_i$ indicates average sale efficiency of the respective industry (a similar measure was used by Claessens and Djankov, 1999). Similarly, I constructed an industry adjusted measure of cost efficiency. In addition, the F-test was used to see when there was enough evidence to reject the hypothesis of equality of the quartile means. The results are given in Tables 4 and 5.

Table 4 shows the characteristics of the quartiles according to the industry adjusted sale efficiency in 1993. Values for the average sale efficiency over the whole time period are ordered in the same direction as the quartiles. This suggests that the influence of industry affiliation is not significant. Since employment is not different across the four groups, it is obvious that higher sales were the source of higher labor productivity across the quartiles. The striking fact is that the average costs efficiency goes significantly in the opposite direction to sale efficiency; the quartile with the highest labor productivity has the lowest cost efficiency. However, all the measures of profitability are not significantly different across the groups.²⁴ This suggests that even though firms had higher sales, and hence higher sale efficiency, they were not able to be more profitable because of high operating costs.

On the other hand, the analysis of growth variables in the same table reveals that the firms in the lowest quartile increased their sales and sale efficiency the most, hence some convergence was present. Cost efficiency has on average deteriorated across all the groups.

In Table 5, firms are divided into quartiles according to their industry-adjusted costs of sales ratio in 1993. Similarly to the previous table, no industry bias is present because the distribution of the average cost efficiency corresponds to the quartiles. The strange fact that the most cost inefficient firms are the most sale efficient ones is again present here. Thus, the most productive firms are not the most profitable ones and vice versa. What is the source of this confusion? Obviously, the firms with the highest sale efficiency were able to maintain the highest sales while employment remained relatively low. On the contrary, their costs were very high, which explains their low profitability.

4.2 Methodology

The inefficiency of firms under the centrally planned economic system was documented in many studies (for a classic summary see Kornai, 1992). The way socialist firms operated was totally different from the practices usual in competitive capitalist firms (Earle and Estrin, 1998). Consequently, it is obvious that the former SOEs needed substantial adjustment after the introduction of a competitive market environment. Besides, the general situation at the beginning of the transition period was quite unfavorable for the SOEs. They had to deal with severe demand and price shocks, the collapse of CMEA, increased competition from international companies entering the markets and severe recession in the region. Hence, improvements in

²⁴ Not reported.

productivity as well as profitability became crucial and may serve as measures of improvement in companies.

A wide variety of measures of performance improvement in companies in transition countries have been used in the relevant literature. The prevalently used measure is the labor productivity, defined as real sales per employee (Earle and Estrin, 1998, Pohl et al., 1997, Frydman et al., 1998, and Linz and Krueger, 1998, among others). Usually, productivity change is used. Only studies on Russia and former Soviet republics prefer to use labor productivity level instead of change, arguing that because of hyperinflation and massive changes in relative prices, productivity growth is hard to measure (Earle and Estrin, 1998).

Frydman et al. (1998) highlights the importance of the revenue side of profit statements as the one with a much more direct relation to the entrepreneurial ability of managers to maneuver in a new environment. Moreover, Frydman et al. (1998) argues further that cost relations are more predictable for company insiders, and are often only a matter of will and standard procedures, especially if large inefficiencies are obvious. Hence, distinguishing between revenues and costs of sales, the two sides of profitability can offer more information. Therefore, sale efficiency (defined as total sales in constant prices per employee)²⁵ and profitability (profit margin²⁶ over total sales) are used in the present analysis to measure company performance. In addition, cost efficiency (total sales over costs of sales) is used next to profitability in order to detect the different development of sales and cost of sales across the companies, which was indicated in the data section.

It could be argued that total factor productivity change, often used in studies about developed countries, is a better measure, since it measures the success of a firm in increasing the productivity of all factors of production: labor, material inputs, and capital (Pohl et al., 1997). However, the quality of this measure highly depends on the proper accounting of fixed assets and inventories, and thus might be questioned in transition countries (Djankov, 1999).

Table 6 provides a short summary of the various channels of restructuring discussed in the hypothesis section. At the same time, variables serving as proxies for the individual restructuring channels, their expected effects on the dependent variables, and control variables are included as well.

In the present study, I estimate the impact of explanatory variables on performance of companies by fixed effects panel regressions. This method of estimation provides better estimators than simple OLS when the explanatory variables are correlated with the error term. It is quite straightforward to argue that there is probably significant correlation between unobservable individual characteristics of the firms (which are captured by the error term of the OLS regression), and some of the explanatory variables. For example, a good manager (individual effect) could be more able to increase sales (explanatory variable). Therefore, if OLS were used, coefficient estimates would be biased. In particular, in the case of the correlation between sales and managerial abilities, the effect of sales on firm performance would be overestimated. Using a fixed-effects model can solve the problem of correlation. In

²⁵ The term labor productivity is usually used in the transition literature. Sale efficiency was used for example in Megginson et al.

²⁶ Profit margin is defined as total sales minus cost of sales.

the fixed effects model, the differences across firms are captured by the differences in constant term (see Greene, 1993, pp. 444-485 as a general reference on panel data regressions). Hence, the part of the error term causing correlation with the explanatory variables is taken out and included in the regression as a set of individual dummy variables.

4.3 Results

A general investigation of basic characteristics in the data section revealed a negative relationship between sale efficiency and profitability across the enterprises. Usually, these two variables are used as proxies for the same phenomenon, namely corporate performance or enterprise restructuring. This implies that positive correlation between sale efficiency and profitability is uniformly assumed. If, however, the correlation is negative, it is important to investigate the problem closer. This section presents the results of panel regressions with sale efficiency, profitability as well as cost efficiency as dependent variables. The results are expected to indicate what are the factors behind high sale or cost efficiency improvements – the channels of restructuring. At the same time they might shed some light on the relationship between these two measures of performance.

Table 7 summarizes the regression estimates. OLS as well as fixed-effects estimates are reported. The corresponding coefficients for the two methods are in many cases significantly different. Also, the Hausman test for dependence between individual effects and explanatory variables is highly significant for all three specifications. This implies that using OLS without explicitly including fixed individual effects to explain firm performance would lead to inconsistent estimates. Using the fixed-effect model solves this problem.

4.3.1 Sale Efficiency

The second column of Table 7 reveals the sources behind increase of sale efficiency. Most of the results go in line with what was expected. Asset sale is positively associated with sale efficiency, higher wages lead to higher sale efficiency, and increase in sales means in general also improvement of sale efficiency. Also as expected is the effect of inventory level, the higher are inventories, the lower is efficiency. Employment affects sale efficiency negatively indicating that labor shedding has positive influence on this performance measure.²⁷

However, capital expenditures do not affect sale efficiency significantly, what is not in line with the expectation. This result suggests that investment in the companies does not lead to improved sale efficiency. This in fact confirms the conjecture of Carlin and Landesmann (1997) that investment in the Czech companies was not distributed among companies in order to improve performance but rather scattered across all the firms without any effect on performance. However, one has to be careful not to draw very strong conclusions since just the effect of investment in a given year is measured in the regression. Usually, given investment influences the firm's productivity over a longer time period.

²⁷ Employment is not included to the first two regressions in Table 7 because of identification problems (sale efficiency = sale / employment). An equation with employment as a regressor was also estimated, though it is not reported in Table 7.

The control variable for bank loans reveals an interesting result. The corresponding coefficient is negative documenting that the more bank loans a firm has, the less efficient it gets. This finding is a confirmation of a widely spread opinion that the privatized Czech companies do not face hard budget constraint. This result documents that banks do not partition their resources according to efficiency requirements, they rather provide funds to inefficient firms long standing in their portfolio. It is also worth to mention that on average, bigger firms are less efficient.

4.3.2 Profitability and Cost Efficiency

Contrary to the first regression, the effects of the restructuring activities on profitability and cost efficiency are not performing according to the expectation. The only result where the expectation was confirmed is the negative effect of inventory level meaning that higher inventory levels are associated with poorer profitability and cost efficiency.

Opposite to the expectation is the negative effect of asset sales suggesting that the more a firm gets rid of unproductive assets, the less profitable it remains. This might point to the fact that firms do not reorganize their assets till they are in a quite unfavorable financial situation. Then, asset sales do not help to improve the situation any more. Also, the effect of labor costs is, contrary to the expectation, negative. While the relationship between sales produced by one employee (sale efficiency) and wage per employee is positive (the first regression), the relationship between profit margin per one unit of sales and wage per employee is negative. Hence, higher labor expenses help to improve sales, but have deteriorating effect on the profit margin. This leads to a conclusion that firms do not watch costs, they rather focus on increasing sales. The marginally significant, negative coefficient of total sales in the cost-efficiency regression leads to a similar conjecture. This coefficient indicates that increasing sales induce decreasing profit margin per one unit of cost (cost efficiency) implying that costs grow faster than sales.

Labor shedding was expected to have positive effect on performance. Hence, negative coefficient of the employment variable was expected. However, the coefficient is insignificant in the profitability/cost-efficiency equations. Hence, employment policy does not have any effect on profitability. Taking into consideration that most of the former SOEs still have excess labor force, this result witnesses insufficient labor shedding in the companies.

From the sale-efficiency regression, it was induced that there is insignificant relationship between capital expenditures and sale efficiency. The effect of capital expenditures remains without any significant effect also in the profitability/cost efficiency equations.

When the control variables are concerned, the soft budget constraint is confirmed also in these regressions. Hence, more bank loans available to a company are not used to improve firm performance. On the contrary, the scarce resources are wasted in such a way that they are used to produce less and less profit. Quite surprising is also the result that profitability does not depend on firm size or amount of fixed assets used by one employee. This indicates that profitable as well as unprofitable firms are scattered all over the country and do not have any size or technology (industry) affiliation.

4.3.3 Sale Versus Cost Efficiency

In the regressions in Table 7, the forces behind improved performance of privatized SOEs are analyzed. The results discussed in the two sections above suggest that there

are notable differences in the way the activities within the companies influence company performance. In particular, the regression results suggest that the activities within the companies are more concentrated on increasing sales, but do not lead to higher profit margin. This conjecture is implied by the estimated coefficients in the profitability/cost-efficiency regressions with signs opposite to expectation. This evidence indicates that positive sale efficiency growth in the Czech SOEs is associated with excessively high costs. In accordance with the argument of Frydman et al. (1998), costs should be relatively predictable. Therefore, costs reduction should be only a question of the will of managers. Is this not the case in the Czech Republic? Or are the Czech managers not forced to reduce costs? If the latter is the case, than the SOEs are still facing a soft budget constraint. In fact, the hypothesis of soft budget constraint is also supported by the negative effect of available bank loans on the performance measures.

5 Conclusions

In Summary, the results of the present study are fourfold. First, the study identifies the restructuring activities with positive effect on performance measured by sale efficiency, which are asset sale, labor shedding, efficiency-wage motivation, sale increase, and inventory management.

Second, it is argued that these restructuring activities do not have the same effect on profitability as they do on sale efficiency. In fact, the coefficients, with the exception of inventory management, have opposite signs for the two specifications. This finding points to an important conclusion that attention should be paid to these particular variables when measuring firm performance. Because even though firms are engaged in improving sale efficiency, they do not manage to increase profitability. Hence, one should be aware that different conclusions could be induced from these two performance measures. An analysis relying only on labor productivity as a measure of performance and restructuring might lead to only a partial picture of the situation in the analyzed firms. It is evenly important to look at cost reducing activities of the studied firms.

Third, capital expenditures are not found to have significant effect on performance. This finding might support the conjecture of Carlin and Landesmann (1997) that investment in the Czech economy was dispersed among all firms and did not concentrate only in the best firms with the highest returns.

Forth, the main policy implication that can be drawn from the present study concerns the soft budget constraint faced by the SOEs. The results indicate that credit-allocating policies of banks are not oriented towards good performing companies. Also, investment activities are not undertaken in order to increase performance. Finally, costs spent to produce revenues are not kept low perhaps because companies are not forced to do so. Consequently, hardening the budget constraint should be one of the primary goals of the Czech government. Privatization of the banking sector and thorough enforcement of bankruptcies are examples of state policies in the right direction.

Another implication of the analysis is that the ownership structures are probably not efficient in delivering deep restructuring. However, based on the results of the present study, it is not possible to make clear and definitive conclusion concerning the corporate governance structures employed by the companies. Further research is

desirable to shed some light on the relationship between ownership patterns and channels of restructuring leading to better performance.

Further suggestion for future research is to include more countries (for example, all Visegrad countries) in a similar analysis. Such an exercise might indicate how different policies in terms of privatization, liberalization, and enforcement of the budget constraint affect the extent and speed of restructuring.

References

- Aghion, Philippe, Olivier Blanchard, and Robin Burgess, 1994, 'The Behaviour of State Firms in Eastern Europe, Pre-Privatisation,' *European Economic Review* 38, pp. 1327-1349.
- Barberis N., M. Boycko, A. Shleifer, and N. Tsukanova, 1996, 'How Does Privatization Work? Evidence from Russian Shops,' *Journal of Political Economy* 104, pp.764-790.
- Blanchard, Olivier, 1997, 'The Economics of Post-Communist Transition,' Oxford University Press, New York.
- Carlin, Wendy and Philippe Aghion (1996), 'Restructuring Outcomes and the Evolution of Ownership Patterns in Central and Eastern Europe,' *Economics of Transition* 4, pp. 371-388.
- Carlin, Wendy and Michael Landesmann (1997), 'From Theory into Practice? Restructuring and Dynamism in Transition Economies,' *Oxford Review of Economic Policy*, vol. 13 (2), pp. 77-105.
- Carlin, Wendy, John v. Reenen, and Toby Wolfe (1995), 'Enterprise Restructuring in Early Transition: the Case Study Evidence from Central and Eastern Europe,' *Economics of Transition*, vol. 3, pp. 427-458.
- Claessens, Stijn, 1997, 'Corporate Governance and Equity Prices: Evidence from the Czech and Slovak Republics,' *Journal of Finance* 52, pp. 1641-1658.
- Claessens, Stijn, and Simeon Djankov, 1999, 'Enterprise Performance and Management Turnover in the Czech Republic,' *European Economic Review* 43, pp. 1115-1124.
- Claessens, Stijn, Simeon Djankov, and Gerhard Pohl, 1997, 'Ownership and Corporate Governance: Evidence from the Czech Republic,' *World Bank Working Paper No. 1737*.
- Coffee, John C., 1996, 'Institutional Investors in Transitional Economies: Lessons from the Czech Republic,' *In: Frydman, R. et al., ed., Corporate Governance in Central and Russia*, Vol. 1, CEU Press, Budapest.
- Djankov, Simeon, 1999, 'Restructuring of Insider Dominated Firms: A Comparative Analysis,' *Economics of Transition* 7, pp.467-479.
- Dlouhy, Vladimir, 1999, 'The Economic Reforms in Central Europe: Ten Years after,' Katholieke Universiteit Leuven, paper prepared for the Licos research seminar on transition.
- Earle, John, 1998, 'Post-Privatization Ownership Structure and Productivity in Russian Industrial Enterprises,' *SITE Working Paper No. 127*.
- Earle, John S., and Saul Estrin, 1998, 'Privatization, Competition, and Budget Constraints: Disciplining Enterprises in Russia,' mimeo.
- Ernst, Maurice et al., 1996, 'Transforming the Core,' Boulder CO: Westview Press.

- Frydman, Roman, Cheryl Gray, Marek Hessel, and Andrzej Rapaczynski, 1998, 'Private ownership and Corporate Performance: Evidence from the Transition Economies,' mimeo.
- Frydman, Roman, Cheryl Gray, Marek Hessel, and Andrzej Rapaczynski, 1999, 'When Does Privatization Work? The Impact of Private Ownership on Corporate Performance in the Transition Economies,' *Quarterly Journal of Economics* CIV, pp. 1153-1191.
- Frydman, Roman, Marek Hessel, and Andrzej Rapaczynski, 1998, 'Why Ownership Matters?: Politicization and Entrepreneurship in the Restructuring of Enterprises in Central Europe,' C.V. Starr Center for Applied Economics Research Report #98-14.
- Greene, William H., 1993, 'Econometric Analysis,' Prentice Hall, Englewood Cliffs, NJ.
- Grosfeld, Irena, and Gerard Roland (1995), 'Defensive and Strategic Restructuring in Central European Enterprises,' CEPR Discussion Paper No. 1135.
- Hutchinson, Gladstone, 1991, 'Efficiency Gains through Privatization of UK Industries,' *In: Ott, A. F. and K. Hartley, ed., Privatization and Economic Efficiency, A Comparative Analysis of Developed and Developing Countries*, Edward Elgar.
- Kornai, Janos, 1992, 'The Socialist System: the Political Economy of Communism,' Clarendon press, Oxford.
- Kotrba, Josef, 1994, 'Czech Privatization: Players and Winners,' CERGE Working Paper No. 58.
- Lastovicka, Radek, Anton Marcincin, and Michal Mejstrik, 1994, 'Privatization and Opening the Capital Markets in the Czech and Slovak Republics,' CERGE Working Paper No. 54.
- Linz, Susan J., and Gary Krueger, 1998, 'Enterprise Restructuring in Russia's Transition Economy: Formal and Informal Mechanisms,' *Comparative Economic Studies* 40, pp. 5-52.
- Lipton, David, and Jeffrey Sachs, 1990, 'Creating a Market Economy in Eastern Europe: The Case of Poland,' *Brookings Papers of Economic Activity*, pp. 75-147.
- Lizal, Lubomir, Miroslav Singer, and Jan Svejnar, 1997, 'Enterprise Breakups and Performance During the Transition,' CERGE Working Paper No. 116.
- Marcincin, Anton, and Sweder van Wijnbergen, 1997, 'The Impact of Czech Privatization Methods on Enterprise Performance Incorporating Initial Selection-Bias Correction,' *Economics of Transition* 5, pp. 289-304.
- Megginson, William L., Robert C. Nash, and Matthias van Randenborgh, 1994, 'The Financial and Operating Performance of Newly Privatized Firms: An International Empirical Analysis,' *The Journal of Finance* 49, pp. 403-452.
- Pohl, Gerhard, Robert E. Anderson, Stijn Claessens, and Simeon Djankov, 1997, 'Privatization and Restructuring in Central and Eastern Europe,' *World Bank Technical Paper* No. 368.
- Roland, Gerard, 1994, 'On the Speed and Sequencing of Privatization and Restructuring,' *The Economic Journal* 104, pp. 1158-1168.
- Schleifer, Andrei and Robert W. Vishny, 1994, 'Politicians and Firms,' *Quarterly Journal of Economics* 108, pp. 599-618.
- Turnovec, Frantisek, 1999, 'Privatization, Ownership Structure, and Transparency: How to Measure the True Involvement of the State,' *European Journal of Political Economy* 15.
- Zemplerova, Alena, Radek Lastovicka, and Anton Marcincin, 1995, 'Restructuring of Czech Manufacturing Enterprises: An Empirical Study,' CERGE Working Paper No. 83.

Table 1: Basic Statistics for the Whole Time Span

	units	# of obs.	mean	median	st. dev.	min	max
sale efficiency ¹	mill. CZK	2415	1.631	0.582	13.547	0.004	470.294
profitability		2415	0.284	0.292	0.220	-4.675	0.899
cost efficiency							
asset sale		2415	0.063	0.014	0.464	-0.015	18.975
employment		2415	1,249	576	2,713	11	49,701
labor cost ¹	th. CZK	2415	125.7	116.9	56.0	2.9	1080.2
capital expenditures		2415	0.043	0.007	0.180	0.000	4.925
sales ¹	bill. CZK	2415	1.271	0.370	3.486	0.000	48.407
inventories		2415	0.256	0.179	0.562	0.000	19.884
total assets ¹	bill. CZK	2415	2.041	0.532	8.206	0.015	171.810
bank		2415	0.170	0.153	0.141	-0.002	1.842
technology mix ¹	mill. CZK	2415	0.733	0.390	1.021	0.001	13.411
sale eff. growth		1932	0.100	0.050	0.411	-0.991	4.101
profitability growth		1932	0.026	-0.023	3.002	-53.461	65.605
cost efficiency growth							
employment change		1932	-0.029	0.000	0.134	-0.919	1.957
labor cost growth		1932	0.103	0.082	0.388	-0.937	8.681
sale growth		1932	0.057	0.018	0.388	-0.995	4.367

Notes: Definitions of the variables are listed in Table 3. Growth variables defined as follows:
 $growth = (var_t - var_{t-1}) / var_{t-1}$.

¹ values are in CZK. Logarithmic transformation used in the regressions.

Table 2: Basic Statistics: Overview by Years

	units	1993	1994	1995	1996	1997
sale efficiency ¹	mill. CZK	2.479 (24.655)	1.877 (14.238)	1.443 (9.538)	1.143 (2.518)	1.211 (3.153)
profitability		0.293 (0.223)	0.306 (0.167)	0.282 (0.195)	0.267 (0.207)	0.271 (0.289)
asset sale		0.027 (0.114)	0.040 (0.158)	0.057 (0.163)	0.069 (0.283)	0.124 (0.964)
employment		1,409 (3,300)	1,290 (2,732)	1,233 (2,596)	1,179 (2,492)	1,135 (2,350)
labor cost ¹	th. CZK	108.74 (63.94)	116.96 (48.90)	124.13 (46.17)	135.69 (50.06)	142.83 (61.68)
capital expenditures		0.043 (0.215)	0.041 (0.239)	0.043 (0.115)	0.043 (0.116)	0.046 (0.178)
sales ¹	bill. CZK	1.337 (4.072)	1.283 (3.482)	1.271 (3.386)	1.212 (3.180)	1.252 (3.252)
inventories		0.287 (0.387)	0.250 (0.312)	0.263 (0.925)	0.254 (0.583)	0.228 (0.374)
total assets ¹	bill. CZK	1.733 (5.841)	1.831 (6.671)	2.051 (8.328)	2.209 (9.218)	2.383 (10.19)
bank		0.148 (0.120)	0.151 (0.120)	0.166 (0.133)	0.185 (0.145)	0.198 (0.174)
technology mix ¹	mill. CZK	0.599 (0.797)	0.658 (0.892)	0.731 (0.959)	0.812 (1.118)	0.863 (1.256)
sale eff. growth			0.1834 (0.5508)	0.0956 (0.3858)	0.0764 (0.3450)	0.0453 (0.3063)
profitability growth			0.1872 (2.4497)	-0.0942 (2.8249)	-0.0330 (3.7983)	0.0435 (2.7663)
empl. change			-0.0413 (0.1744)	-0.0289 (0.1294)	-0.0265 (0.0965)	-0.0207 (0.1249)
labor cost growth			0.1781 (0.6162)	0.0806 (0.2146)	0.0968 (0.1971)	0.0546 (0.3585)
sale growth			0.1171 (0.5224)	0.0517 (0.3518)	0.0396 (0.3293)	0.0197 (0.3033)

Notes: Number of observations for each year:483. Standard deviation in brackets. Definitions of the variables are listed in Table 3. Growth variables defined as follows: $growth = (var_t - var_{t-1}) / var_{t-1}$.

¹ values are in CZK. Logarithmic transformation used in the regressions.

Table 3: Variable Definitions

Variable	Description
sale efficiency	total sales in const. prices / # of employees (log)
profitability	(total sales – cost of sales) / total sales
cost efficiency	total sales / cost of sales
asset sale	book value of fixed assets sold / total sales
employment	number of employees (log)
labor cost	wages and wage taxes / # of employees (log)
capital expenditures	book value of unfinished fixed assets / total sales
sales	total sales in constant prices (log)
inventories	book value of inventory level / total sales
total assets	book value of total assets in constant prices (log)
bank	book value of bank loans / total assets
technology mix	total assets in constant prices / # of employees (log)

Table 4: Quartiles According to Industry Adjusted Sale Efficiency

Variable:	1 st quartile	2 nd quartile	3 rd quartile	4 th quartile	F-ratio	
ind. adjusted sale efficiency	-0.127	-0.031	0.021	0.137	25.53	***
sale efficiency	5.983	6.297	6.549	7.274	50.93	***
cost efficiency	1.543	1.443	1.330	1.295	2.37	*
employment	6.240	6.480	6.379	6.385	1.01	
labor cost	4.566	4.730	4.778	4.904	6.53	***
sales	12.223	12.777	12.927	13.660	32.16	***
inventories	0.259	0.254	0.314	0.198	0.70	
sale efficiency growth	0.204	0.073	0.077	0.047	3.30	**
cost efficiency growth	-0.025	-0.040	-0.014	-0.025	0.16	
employment change	-0.039	-0.030	-0.035	-0.013	0.22	
labor cost growth	0.164	0.084	0.073	0.088	1.31	
sale growth	0.142	0.031	0.033	0.022	2.13	*
total assets	12.741	13.203	13.179	13.980	23.89	***
bank	0.160	0.180	0.180	0.157	0.15	
technology mix	5.794	5.965	5.960	6.678	22.63	***

Notes: Number of observations: 2415 or 1934. Definitions of all the variables are listed in Table 3. Significance level is denoted as follows: *** means significance at 1% level; ** means significance at 5% level; and * means significance at 10% level.

*industry adjusted sale efficiency*_{*i*} = $(se_i - seind_i)/seind_i$; for firm *i*; where *se_i* denotes the level of sale efficiency for a firm *i*; *seind_i* denotes the respective industry average of sale efficiency.

Table 5: Quartiles According to Industry Adjusted Cost Efficiency

Variable:	1 st quartile	2 nd quartile	3 rd quartile	4 th quartile	F-ratio
ind. adjusted cost efficiency	-0.234	-0.037	0.072	0.381	55.31 ***
sale efficiency	6.716	6.726	6.439	6.224	8.36 ***
cost efficiency	1.220	1.299	1.433	1.730	9.50 ***
employment	6.512	6.418	6.380	6.174	2.11
labor cost	4.785	4.788	4.654	4.751	1.23
sales	13.228	13.144	12.820	12.397	12.45 ***
inventories	0.366	0.221	0.208	0.231	1.78
sale efficiency growth	0.129	0.074	0.092	0.107	0.34
cost efficiency growth	-0.005	-0.012	-0.021	-0.067	1.18
employment change	-0.030	-0.038	-0.035	-0.015	0.18
labor cost growth	0.115	0.109	0.101	0.086	0.11
sale growth	0.090	0.021	0.034	0.082	0.74
total assets	13.619	13.434	13.130	12.921	8.41 ***
bank	0.178	0.184	0.168	0.148	0.25
technology mix	6.224	6.134	6.018	6.023	1.32

Notes: Number of observations: 2415 or 1934. Definitions of all the variables are listed in Table 3. Significance level is denoted as follows: *** means significance at 1% level; ** means significance at 5% level; and * means significance at 10% level.

*industry adjusted cost efficiency*_{*i*} = $(ce_i - ceind_i)/ceind_i$; for firm *i*; where *ce_i* denotes the level of cost efficiency for a firm *i*; *ceind_i* denotes the respective industry average of cost efficiency.

Table 6: Channels of Restructuring and their Measurement

Channel of restructuring	Variable	Expected effect on performance
Asset contraction	Asset sale	positive
Labor shedding	Employment change	negative
Employee incentives	Labor costs growth	positive
Modernization of equipment	Capital expenditures	positive
Increased output	Sales growth	positive
Changes in control (to be added)	Change of CEO	positive
Inventory management	Inventory level	negative
Control variables		
Meaning	Variable	
Size	Total assets	?
Fund availability / soft budget constraint	Bank loans	?
Capital utilization	Technology mix	positive

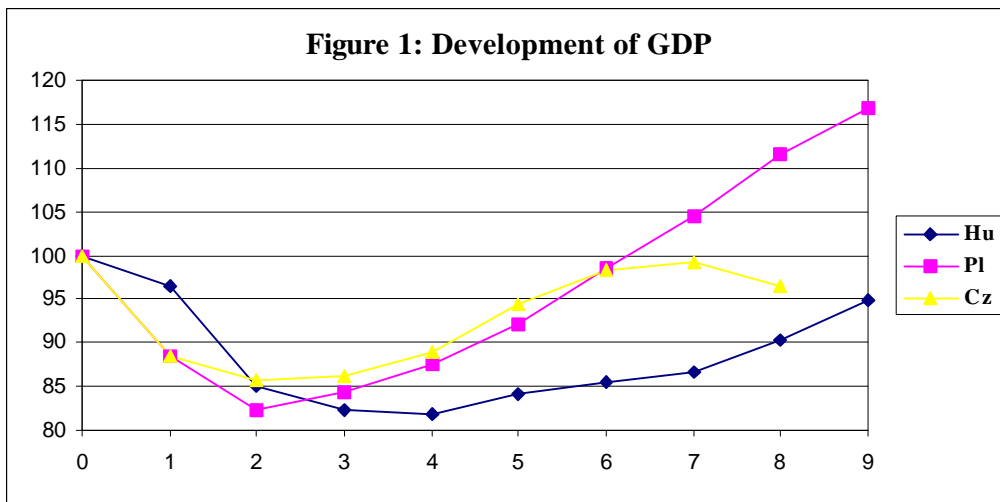
Notes: Definitions of all the variables are listed in Table 3. A question mark indicates that the relationship is ambiguous.

Table 7: Fixed Effects Estimates

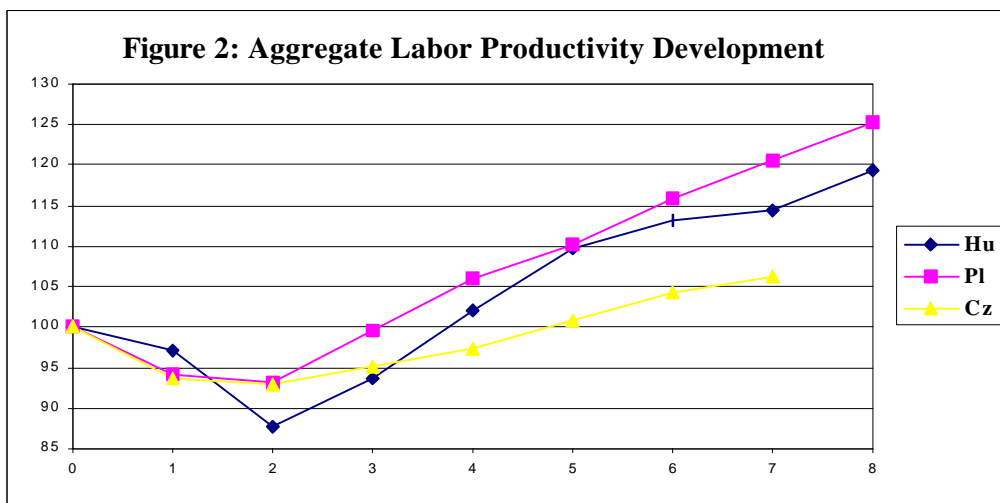
	sale efficiency		profitability		cost efficiency	
	ols	within	ols	within	ols	within
constant	-0.3770 *** (0.1260)		0.6011 *** (0.0433)		2.2009 *** (0.1098)	
asset sale	0.1425 *** (0.0224)	0.0998 *** (0.0072)	-0.2213 *** (0.0077)	-0.1957 *** (0.0075)	-0.1520 *** (0.0197)	-0.0984 *** (0.0183)
employment ^a			0.1486 *** (0.0070)	0.0064 (0.0225)	0.2831 *** (0.0177)	-0.0169 (0.0552)
labor cost	0.4404 *** (0.0252)	0.2751 *** (0.0128)	0.0876 *** (0.0092)	-0.0798 *** (0.0141)	0.2248 *** (0.0233)	-0.1266 *** (0.0346)
cap. expend.	-0.1206 ** (0.0593)	0.0234 (0.0207)	0.0334 (0.0203)	-0.0249 (0.0204)	0.1548 *** (0.0516)	-0.0325 (0.0500)
total sales	0.7507 *** (0.0176)	0.7706 *** (0.0097)	-0.1212 *** (0.0063)	0.0364 *** (0.0109)	-0.3190 *** (0.0160)	-0.0467 * (0.0268)
inventories	0.1207 *** (0.0185)	-0.0221 ** (0.0088)	-0.0883 *** (0.0064)	-0.0772 *** (0.0087)	-0.1253 *** (0.0163)	-0.1150 *** (0.0214)
total assets	-0.5933 *** (0.0187)	-0.0881 *** (0.0154)	-0.0281 *** (0.0076)	-0.0289 * (0.0153)	0.0154 (0.0193)	-0.0052 (0.0375)
bank loans	0.1338 * (0.0710)	-0.1492 *** (0.0385)	-0.1850 *** (0.0244)	-0.1174 *** (0.0382)	-0.4420 *** (0.0618)	-0.2854 *** (0.0936)
technol. mix	0.4837 *** (0.0137)	0.1515 *** (0.0097)	0.0531 *** (0.0058)	0.0177 * (0.0102)	0.0749 *** (0.0147)	0.0192 (0.0250)
R ²	0.733	0.9854	0.4395	0.7461	0.2552	0.6859
Hausman test	1901.40		328.82		364.32	

Notes: Number of observations: 2415 (483x5). Definitions of all the variables listed in Table 3. Standard errors presented in brackets. Significance level is denoted as follows: *** means significance at 1% level; ** means significance at 5% level; and * means significance at 10% level.

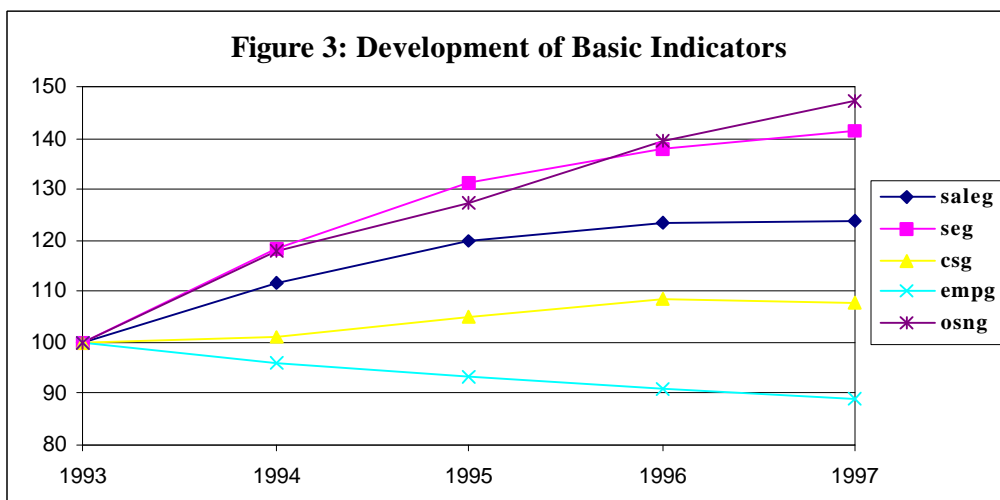
^a Employment is not included in first set of equations because of identification problems.



Notes: In constant prices. 1990 is considered to be the first year of transition in Poland and Hungary; 1991 in the Czech Republic. Correspondingly, GDP in 1989 = 100% in Poland and Hungary; GDP in 1990 = 100% in the Czech Republic.



Notes: In constant prices of 1990. 1990 is considered to be the first year of transition in Poland and Hungary; 1991 in the Czech Republic. Correspondingly, GDP per worker in 1989 = 100% in Poland and Hungary; GDP per worker in 1990 = 100% in the Czech Republic.



Notes: Number of observations in each year: 483.