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Selection of Firms into Privatization or Long-Term State Ownership in Romania [*]

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Abstract
We model and test empirically what objectives did politicians pursue in privatization programs: the efficiency enhancement of firms or preservation of employment? In the model privatization has two effects on firm behavior: changes in the owner's objectives from employment and efficiency to pure efficiency and an increase of managerial performance. The model links pre-privatization firm characteristics – the information available to politicians at the time of selection of firms into privatization programs – and post-privatization firm behavior. Taking advantage of a unique institutional feature of the early Romanian privatization setup, when a group of firms was explicitly barred from any privatization program, we estimate probit regressions on comprehensive firm-level data to test the predictions of the model. The results show that employment concerns played the key role in selecting firms for privatization, while efficiency increase was only of secondary importance.

JEL classification: L33, P26
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1. Introduction

How do politicians choose which firms to privatize? Economic theory recommends privatization as a tool to depoliticize state owned enterprises (SOEs) and to provide incentives to restructure them (Kay and Thompson, 1986), but the designers of privatization programs may have different objectives, among them the welfare of workers. Socially sensitive politicians may be more concerned about the current employment of the firm than its future efficiency, especially if they share the widespread belief that privatization results in layoffs.[1] To create political support, self-interested politicians may also keep excess employment in firms they control and hamper the privatization of those firms in which subsequent restructuring will result in loss of jobs (Shleifer and Vishny, 1994).

In this paper we model and test empirically how politicians value two objectives: post-privatization efficiency enhancement and the level of employment in privatized firms.[2] The purpose of the model is to feed the empirical work with testable hypotheses on the relation between pre-privatization firm characteristics – the information known to politicians at the time when decisions are made about the selection of firms into long-term state ownership or privatization – and the likely effects of privatization on firm-level productivity and employment. With the help of Romanian comprehensive firm-level data we test the model empirically, taking advantage of an institutional feature of the privatization process which permits us to distinguish firms slated for privatization from those which were sheltered from any ownership change. In 1990-91, before the privatization process actually started, the Romanian government explicitly prohibited the privatization of a group of firms, and the ban was lifted only seven years later at the end of 1997, after the party being in government between 1990 and 1996 lost the elections. This institutional feature allows us to distinguish privatizable firms from those kept in long-term state ownership, even if the privatizable firms had not yet been privatized. This empirical setting presents a clear advantage to the situation when the intentions of the decision makers are tested by comparing privatized and not privatized firms, as the not privatized group may contain firms that the government intended to privatize, but for some reason the transfer of ownership did not happen. Indeed, in our data only 30 percent of the privatizable firms had been actually privatized by 1996, the end of the

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[1] While a large body of literature demonstrates the superiority of restructuring potential of private owners over the state (summarized in Megginson and Netter, 2001 and Djankov and Murrell, 2002), evidence about the effects of privatization on employment is less well established. Theoretical papers indicate that employment is likely to fall after privatization (e.g., Boycko et al, 1996), but the body of empirical analysis provides ambiguous results (e.g., Brown et al., forthcoming).

first political cycle. Another advantage of the Romanian institutional setting is that the law regulating this process was rather vague, leaving the decision makers unconstrained when they selected firms into long-term state ownership.[3]

Efficiency and employment considerations are arguably among the most important political objectives in a privatization program. Higher firm efficiency is beneficial for politicians for several reasons. Perhaps the most important is that it increases the chance of survival of the firms, which is a prerequisite for a healthy economy. Higher profits also result in higher tax revenues. The level of employment is also important for politicians for several reasons: privatization may result in layoffs, and politicians care about unemployment as it has both a social and a private political cost for the incumbent government: the more workers lose their jobs, the less probable is the reelection of the government. Anecdotal evidence also suggests that politicians were indeed concerned about mass layoffs after privatization. In Sri Lanka, for example, a presidential decree was issued stating that workers in privatized companies should not lose their jobs (Knight-John and Athukorala, 2005). Megginson (2005) states more generally that "(all) governments fear lay-offs resulting from privatization" (p. 389).

The importance of efficiency and employment considerations notwithstanding, other considerations also play a role in the selection of firms into privatization programs. Many of SOEs are loss-makers and if privatization hardens the budget constraint of the firms, the state budget will not need to subsidize loss-making SOEs. In addition, privatization revenues also have a positive effect on the state budget and a more balanced state budget can be used to provide goods and services to the large public, or the overall tax rate can be lowered, resulting in increased political support for the government. If the government's objective is to get rid of the loss-making firms which need to be subsidized, it should privatize the large, inefficient firms, while if privatization revenues are important, it should sell already efficient firms. Politicians may also maximize bribes, and political support which they receive from investors in exchange of a low price of the privatizable companies (López-de-Silanes et al., 1997; Shleifer, 1998). Bribe maximization would probably facilitate the sale of efficient firms, although even a loss-making firm may be worth paying a bribe for, if the price is low enough. The need to attract investors and keep the support of the public for future reforms may also be

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[2] Studies using firm-level data to test the selection of firms into privatization programs are Guo and Yao (2005) and Liu et al. (2007) in China and Dinc and Gupta (2005) in India. De Fraja and Roberts (2008) and Gupta et al. (2008) study the factors that explain sequencing of privatization in the Czech Republic and Poland, respectively.

a factor among the objectives of politicians, and this would also result in the privatization of efficient companies, and the delay of those privatization which are likely to have painful, involving large social costs, such as employment reduction (Dewatripont and Roland, 1995; Gupta et al, 2008). While we agree that these factors are important in general, we argue that in the Romanian early privatization they played only a secondary role. In the first five years of the transition the main privatization method of medium and large companies used in Romania was management-employee buyout (MEBOs).[4] In this program the employees of the firms could buy the shares of the company they worked for, and he purchase was financed with the help of a loan from a state-owned bank, usually involving a negative interest rate. (Earle and Telegdy, 2002). Therefore, the MEBO privatization did not bring any revenues to the government. Bribes are also unlikely to have played an important role in MEBO privatizations. The Romanian privatization in the early years went on at a very slow pace and thus it is unlikely that politicians were very concerned about the popularization of reform with successful privatizations. To summarize, the Romanian institutional setting was such that it lets us conclude that the factors we are unable to account for are unlikely to have played an important role in the selection of firms into long-term state ownership.[5]

In the next section we develop the model. In Section 3 we present the data and test it empirically. The last section concludes.

2. The Model

The purpose of this model is to provide empirically testable hypotheses on the relation of firm characteristics and privatization outcomes. We model the effect of pre-privatization firm characteristics on post-privatization profits and employment, the former being the information available to politicians at the time of decisions about privatization, and the latter the effects of privatization on firm behavior, which affects the utility of the decision makers.

2.1 Assumptions of the Model

In this model privatization has two effects on firm behavior: it alters the objectives of the owner and it increases managerial effort. When the politician has the ownership rights, he maximizes a weighted average of the profits and the employment level of the firm, while the

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[3] "…(non-privatizable firms) are organized and operate within the economy's strategic branches…as well as in other fields of activity established by the Government" (Law 15/1990 on State Enterprise Reorganization, Art. 2).
[4] In the data 85 percent of the SOEs with employment size larger than 20 were privatized by the MEBO method.

private owner is interested solely in the profits.[6] In a world of incomplete contracts where perfect regulation is not feasible, differences in owners' objectives will imply different behavior of public and private firms.

If the only effect of privatization were the change in the objective function of the owner, politicians would never decide to privatize a firm as there is nothing to offset the disutility from changed objectives. Our second assumption is that politicians can benefit from privatization because private owners are able to provide high-powered incentives to the managers, while the state cannot.[7] Accordingly, managers work harder under private than under state ownership, which has a positive effect on firm productivity, and by the scale effect, it may also increase production and the level of employment.[8]

The politician decides upon privatizing a firm by assessing the effect of altered objectives and improved managerial performance on firm behavior, using all available information, including the pre-privatization characteristics of the firm.

Formally, consider a firm with two inputs, labor, $L \geq 0$, and managerial effort, $e \geq 0$:

$$q(L,e) = f(e)L,$$

where $f(.)$ reflects the firm's technology. The marginal product of labor depends only on e, hence we assume away any shift in the firm's technology as a result of the ownership change. Let $f(e)$ be positive, increasing in e, continuously differentiable and concave. Assume further that the firm faces a linear inverse demand function,

$$p(q) = A - q,$$

where $A > 0$ is the size of the market. The firm's profit is equal to

$$\pi(L,e) = p(q)q - TC(q) = [A - f(e)L]f(e)L - wL, \tag{1}$$

Let the owner's objective function be

$$U(L,e) = \pi(L,e) + \lambda L, \tag{2}$$

$\lambda \in [0,1]$ being the constant marginal political benefit of employment and w its constant marginal cost of, including wages and the variable costs of additional capital needed for a

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[5] As well as other studies, we do not have data on privatization prices, which would be necessary for taking directly into account the effect of bribes and privatization revenues.

[6] The model is similar in this respect to the one developed by Boycko et al. (1996), but we do not allow for bargaining between the politician and the manager-owner.

[7] The same argument is made by Bartel and Harrison (2005). Higher managerial incentives may stem from various sources: it may be politically costly to provide incentive payments to a manager of a state-owned company (Sappington and Stiglitz, 1987) or noncontractible social objectives of politicians may mute public managers' optimal second best incentives (Baker, 1992; Schmidt, 1996). Our model does not endogenize the change in the managerial motivations. For endogenization see, e.g., Schmidt (1996).

higher level of production.[9] The difference in the private and public owner's objectives is captured by λ: $\lambda_{PRIV} = 0$ but $\lambda_{SOE} > 0$.

Regarding the allocation of decision rights, we assume that the owner can directly decide upon how many workers to employ. He does this by taking into account the firm's efficiency level, which depends on manager's effort. Meanwhile the manager, correctly anticipating the owner's employment decision rule, decides on how much effort to exert to improve the productive efficiency of the firm given her incentive scheme under the particular form of ownership.[10] We assume that $e^*_{SOE} < e^*_{PRIV}$, where e^*_{SOE} and e^*_{PRIV} are the equilibrium levels of managerial effort under state and private ownership, respectively.

2.2 The Privatization Effect

To determine the impact of privatization, first we examine the effect of the shift in the owner's objectives on the firm's equilibrium level of employment and profits (the variables in the utility function of the politician), keeping managerial effort constant at e^*_{SOE}. Second, we derive the impact of higher managerial effort on the private firm's operation.

The optimal employment and profit levels are the following:

$$L^*_\lambda\left(e^*_{SOE}\right) = \frac{Af\left(e^*_{SOE}\right) - (w - \lambda)}{2f\left(e^*_{SOE}\right)^2} \tag{3}$$

$$\pi^*_\lambda\left(e^*_{SOE}\right) = \frac{\left(Af\left(e^*_{SOE}\right) - w\right)^2 - \lambda^2}{4f\left(e^*_{SOE}\right)^2}, \tag{4}$$

where $w - \lambda$ is the net political cost of employment (the cost of employment reduced by the political benefit of employment). Privatization amounts to setting λ from some positive value to zero.[11]

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[8] If the high-powered incentives of the private firm's managers are extended to search for new markets, the scale effect would be even more powerful. While common sense would agree that managerial motivation includes search for new markets, we do not model this channel of employment expansion.

[9] We assume that λ is constant, but if it varies by country, region or industry, the model can be extended to describe differences in privatization outcomes in countries, regions or industries.

[10] The firm's politically optimal employment level may not be contractible in the manager's incentive contract, as the marginal benefit of employment may not be known in advance by the government, and the government is not able to specify exactly its employment goals in an enforceable contract (Sappington and Stiglitz, 1987).

[11] Note from (3) that, ceteris paribus, more efficient SOEs (with high $f\left(e^*_{SOE}\right)$) lay off fewer workers as a consequence of the change in the owner's objective function. It is also worth noting from (4) that SOEs may incur losses in equilibrium, which can happen if the SOE is inefficient ($f\left(e^*_{SOE}\right)$ is low), it operates in a small market (A is small) giving rise to low profits anyway, which is reduced sharply by high wages (w is high).

Turning to the impact of higher managerial effort on the private firm's operation we take the first-order linear approximation of (3) and (4) at e^*_{SOE}, with $\lambda_{PRIV} = 0$, and differentiate the corresponding expressions with respect to e, obtaining

$$\left.\frac{\Delta L^*_{\lambda=0}(e)}{\Delta e}\right|_{e=e^*_{SOE}} = \frac{f'(e)}{f(e)}\left[\frac{w}{2f(e)^2} - L^*_{\lambda=0}(e^*_{SOE})\right]\Delta e \gtrless 0 \tag{5}$$

and

$$\left.\frac{\Delta \pi^*_{\lambda=0}(e)}{\Delta e}\right|_{e=e^*_{SOE}} = \frac{f'(e)}{f(e)} w L^*_{\lambda=0}(e^*_{SOE})\Delta e > 0. \tag{6}$$

Combining (3) and (5), and (4) and (6), we obtain the total impact of privatization on the firm's employment and profit level:[12]

$$\Delta L = -\frac{\lambda}{2f(e^*_{SOE})} + \frac{f'(e)}{f(e)}\left[\frac{w+\lambda}{2f(e)^2} - L^*_{\lambda>0}(e^*_{SOE})\right]\Delta e \gtrless 0 \tag{7}$$

$$\Delta \pi = \frac{\lambda^2}{4f(e^*_{SOE})^2} + \frac{f'(e)}{f(e)} w\left[L^*_{\lambda>0}(e^*_{SOE}) - \frac{\lambda}{2f(e)^2}\right]\Delta e > 0. \tag{8}$$

Finally, plugging (7) and (8) into the politician's objective function (2), yields the total effect of privatization on the politician's utility level:

$$\Delta U = -\frac{\lambda^2}{4f(e)^2} + \frac{f'(e)}{f(e)}\left[(w-\lambda)L^*_{SOE} + \frac{\lambda^2}{2f(e)^2}\right]\Delta e \gtrless 0. \tag{9}$$

2.3 Testable implications

Formulae (7) and (8) link post-privatization employment and profit change to pre-privatization firm characteristics. With the use of comparative statics we derive empirically testable implications, summarized in Table 1. To start with employment, the firm's pre-privatization employment level is negatively correlated with the employment effect and positively with the efficiency effect. The reason is that larger firms save more on wages as a result of higher efficiency, but a part of these savings comes from higher layoffs, or at least from less extra employment.[13]

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[12] Here we used the relation between the optimal employment levels under the two ownership structures:

$$L^*_{\lambda>0}(e^*_{SOE}) = L^*_{\lambda=0}(e^*_{SOE}) + \frac{\lambda}{2f(e)^2}.$$

[13] On the net, (9) shows that the political benefit of privatization is increasing in firm size, since higher increase in profits outweighs the higher political costs of lower employment, if $\lambda < w$. While this is an artifact of the

Higher pre-privatization efficiency of SOEs decreases efficiency gains from higher managerial effort. First, more efficient firms lay off fewer workers due to the shift in the owner's objectives resulting in smaller profit increase and second, they save less from additional increases in firm efficiency. At the same time, the relationship between higher pre-privatization efficiency and the employment effect of privatization is ambiguous. On the one hand, more efficient firms lay off fewer employees as a result of the shift in the owner's objectives. On the other, more efficient firms adjust their employment level to a smaller extent as they become more efficient, which may be either good or bad from the politicians' viewpoint, depending on the sign of $\frac{\Delta L^*_{PRIV}(e)}{\Delta e}$. Hence, the net impact is determined by the relative strength of these two effects which, in turn, depends largely on λ.

Higher pre-privatization wage increases employment gains from privatization, since at high wages, increasing managerial effort triggers larger expansion of output. Hence, firms paying higher equilibrium wages, e.g. due to employing more qualified workers, are better candidates for privatization from the viewpoint of employment objectives. Moreover, for a given firm size (which is also affected by wages) wages also have a positive impact on efficiency gains. The reason for this is that higher managerial effort saves labor input, which is more valuable if wages are higher. Thus, high wage SOEs are better candidates for privatization.[14]

The model thus predicts that efficiency maximizing politicians will privatize large and inefficient firms, while politicians with salient employment concerns choose small firms for privatization with better growth opportunities as they become more efficient. Finally, high wage firms are, ceteris paribus, always better candidates for privatization.

3. Data Description and Results

The main data source is the Ministry of Finance balance sheet data, which provides information on the value of sales, net income, tangible assets, total cost, wage bill and the employment for all SOEs in 1992. As we do not have data from 1990 or 1991, the year when firms were selected into the privatization program, we use the 1992 values in the analysis.

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model, in the empirical test we concentrate on the effect of pre-privatization characteristics on the employment and productivity effect of privatization separately.

[14] This result is rather intuitive, as more qualified workers find new jobs more easily and thus the government do not have to care for high unemployment. If we relax our assumption that the political benefit from employment (λ) does not vary across different types of workers, then the government may attach more weight to the employment of less qualified workers, and may want to keep firms employing less qualified workforce in state ownership.

Privatizations barely started in 1992 (in our data there are only 10 firms that were privatized by the end of the year), so these are also pre-privatization data for most of the firms.[15] The data also have information on overdue payments and the value of bad loans for 1993, which we use as proxies for soft budget constraints. Industry code at the 3-digit level and legal form are drawn from the Romanian Enterprise Registry, which provides information on all Romanian firms. We use the legal form to distinguish privatizable and non-privatizable firms, as the latter were given a special legal form (they are called "*Regii Autonome*" in Romanian).

From the population of SOEs we selected those 3-digit industries by the NACE classification which contain at least one non-privatizable firm. Table 2 shows that there are 47 such industries. Some of them are typically considered of strategic importance in many countries, and firms belonging to them were traditionally state owned in many countries. These include different mining activities, the railway, the post, and a radio communication firm that deals with the distribution of frequencies. These industries contain very few firms, many times only one, and these are not privatizable. Other industries can also be considered of strategic importance, such as the energy sector and water distribution, sewage, and land transportation. A part of the firms belonging to them are non-privatizable, but there is also a large number of privatizable firms in these industries. A third category consists of those industries in which state ownership does not seem to be important, at least not for strategic reasons. Examples can be brought from agriculture, cigarette manufacturing, constructions, retail, hotels, real estate and many others.

To perform the regression analysis, we restrict the sample to have more comparable firms across the two privatizable and non-privatizable groups. Agriculture is dropped from the analysis, as the number of non-privatizable firms is a very small proportion of all firms. We drop those industries in which only non-privatizable firms exist, and thus industry predicts entirely the status of the firm. The final sample consists of 2,019 firms, out of which 287 are non-privatizable and 1,732 privatizable.

Table 3 shows that non-privatizable firms were much larger than privatizable firms. The average employment size of the non-privatizable firms was 1,079 in 1992, while the privatizable firms' only 404. The mean difference is statistically significant, as shown in Column 3 of the table. For firm efficiency we use three measures: return on assets (ROA), return on sales (ROS) and the unit cost. ROA and ROS are defined as the net income over the

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[15] If managers anticipated that their company will be privatized soon, they might have changed their behavior accordingly (Aghion et al., 1994; Roland and Sekkat, 2000). While we are aware of this possible shortcoming, we cannot control for it.

value of tangible assets and sales, respectively. Unit cost is defined as the ratio between total costs and value of sales. All the three performance proxies show that on average, privatizable firms were more efficient than the non-privatizable ones, and the difference is always highly statistically significant. ROA is 1.1 percent for the average non-privatizable, and 4.5 percent for the privatizable firm. ROS is 0 for non-privatizable, and 4.5 for the privatizable firm, and the unit cost is slightly larger than 1 for the non-privatizable and 0.935 for the privatizable firms. The average wage in the company (defined as the ratio between the wage bill and the average number of employees) shows that workers in privatizable firms earned by 9 percent higher earnings than those working for the firms kept in long-term state ownership (the mean difference, however, is significant only at the 10-percent level). The comparison of means across the two types of firms therefore suggest that Romanian politicians were inclined to privatize relatively small and profitable firms, which pay high wages. In light of the predictions of the model developed in the previous section, this suggests that employment concerns were more important than productivity increase, as pre-privatization firm size is negatively correlated with post-privatization employment growth and positively with productivity growth, and initial productivity is negatively correlated with subsequent productivity growth.

The table contains two more variables, the proportion of overdue payments and the value of bad loans taken over by the government to the value of sales (they are available only for 1993).[16] We use these variables as indicators of soft budget constraints, and check whether the inclusion of these variables in the regression affects our results on initial employment size and productivity. The proportion of overdue payments to sales is larger in non-privatizable firms, where on average this amounted to almost 11 percent of the value of sales, while this proportion is 7 percent for the other group. Bad loans taken over by the government were, on the contrary, larger in proportion in the privatizable group (5.7 and 3.6, respectively).

To perform the multivariate analysis, we follow the literature and estimate probit regressions (Gupta et al., 2008, Liu et al., 2007), where the dependent variable equals 1 if the firm is kept in long-term state ownership and 0 if not, and the regressors include the key variables of the model: average employment, performance and wages (employment and wages are in logarithms). We control for the chance that selection was partially done on the basis of strategic industries in two ways. First, we include a dummy variable indicating that

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[16] Overdue payments include overdue payment to suppliers and creditors, as well as overdue tax payments.

the firm is from a strategic industry.[17] As the grouping of industries into strategic and not strategic is somewhat *ad hoc*, in a second specification we replace this dummy with a full set of 3-digit industry controls.

The regression results, presented in Table 4, confirm the results obtained from the univariate analysis. The estimated marginal effects show that pre-privatization employment size has a positive effect on being in long-term state ownership, while efficiency – measured by ROA, ROE and unit cost – has a positive effect on the chance to be selected into the privatizable group. The estimated coefficients for employment do not vary across different controls for industries (strategic or a full set of 3-digit industry dummies). The efficiency effect, on the other hand is always smaller when industry dummies are controlled for. Higher wages have a negative effect and significant coefficient when a strategic dummy is included in the specification, but this effect vanishes when we control with a full set of industry dummies (the coefficient becomes very small and insignificant). The dummy variable indicating whether the company is in a strategic industry also has a positive, significant coefficient.

The estimated effects of pre-privatization characteristics on the probability of being slated for long-term state ownership are quite large. In Table 5 we present the predicted probability of being in the group of long-term state ownership of the firm situated at the 10th and the 90th percentile of the distribution of the variable of interest (the regression specifications are those from Table 4). To start with the employment effect, the probability of being in long-term state ownership of the firm with employment size at the 10th percentile of the employment distribution varies between 2.2 and 6.2 percent, depending on the specification. This probability is between 11.1 and 18 percent for the firm at the 90th percentile of the employment distribution, the difference between the two number being between 8.8 and 13 percentage points. The effects are much smaller for pre-privatization performance. The firm at the 10th percentile in the distribution of ROA has a chance of 11.2 or 6.1 percent to be in the non-privatizable group, while the firm at the 90th percentile has a chance of only 8.9 and 4.6 percent, the difference between the two estimated coefficients being 2.3 and 1.5 percentage points. We estimate similar effects for the other proxies of efficiency. These effects are not large, but neither negligible if compared to the observed probability of being in the non-privatizable group: for example, the difference in probability

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[17] We use a very broad definition of strategic industries, which include the following industries (by the NACE code): 101, 102, 111, 132, 145, 221, 401, 402, 403, 410, 601, 602, 632, 641, 643, 644, 731, 900, 921. By this definition half of all firms, and 83 percent of non-privatizable firms operate in strategic industries.

to be in long-term state ownership when ROS is the proxy for productivity is around two percentage points (or 15 percent of the observed probability) and for unit cost 1.6 and 0.7 percentage points (or 11 and 5 percent of the observed probability).

These results confirm that the key variables in our model – employment and profitability – did play a role in the selection of firms into privatization programs, and that Romanian decision makers selected relatively small and efficient firms to become private, while large, loss making SOEs were rather kept in long-term state ownership. In our model this corresponds to politicians being concerned with the employment loss of privatization, while productivity enhancement plays only a secondary role.

To test whether other factors alter the effect of pre-privatization employment and productivity on the probability to be in one group or another, we add to the regressions two variables that are likely to be correlated with soft budget constraints: the proportion of overdue payments and bad loans taken by the government to the value of sales in 1993. These variables are likely to be correlated with the values from 1992. If the government wants to minimize the subsidies given to SOEs to keep the state budget balanced, those firms that have large overdue payments and bad loans are likely to be in the privatizable group, ceteris paribus. Table 6 shows the estimated marginal effects of the regressions presented in Table 4, augmented with the two variables that proxy for soft budget constraints. Overdue payments have a positive and significant estimated marginal effect when we control for strategic industries, but this effect vanishes (and it becomes negative) when the strategic dummy is replaced with a full set of industry controls. Bad loans seem not to have any effect on the selection of firms into long-term state ownership. It is more important that the estimated marginal effects of employment and productivity are qualitatively the same as those presented in Table 4, when we did not control for soft budget constraints.

How do our results compare to findings from other studies? Gupta et al. (2008) and Dinc and Gupta (2007) find that in the Czech Republic and India profitable firms are more likely to be privatized than less efficient ones. The two studies using Chinese data, however, find small and insignificant effect of firm efficiency on privatization (Guo and Yao, 2005; Liu et al., 2007). Regarding the size of the firm, Dinc and Gupta (2007) find that large firms are more likely to be privatized in India, and they explain this by smaller informational asymmetries between the buyer and seller for large than for small firms. Gupta et al. (2008) test the employment concerns of politicians by including industry-level employment growth in the regressions and do not find any effect. The reason for this difference in their and our

result may be that Romanian was in a recession during the first part of the nineties which resulted in large drops in the labor force, while the Czech Republic was not.

4. Conclusions

During the last two decades a great deal of analysis has been directed towards the effects of privatization on firm behavior. The prerequisite of privatization – the political decision whether to privatize a particular firm – has received much less attention, however. In this paper model the privatization decisions of politicians, concentrating on two key objectives: efficiency increase and employment preservation. In the empirical part we add Romania to the rather short list of countries where such analysis was performed – the Czech Republic, China, India and Poland – and argue that Romania is particularly suited to this type of investigation, as a group of SOEs was explicitly banned to become private, and the legislation left open the grouping of firms into privatizable and non-privatizable on the discretion of decision makers. Romania is also different from the other countries because the country experienced a severe recession during the first years of transition, and the protection of workers from the negative effects of privatization was probably of high importance.

We modeled the privatization decisions of politicians, assuming that privatization has two effects on firm behavior: switching the owner's objectives from employment and efficiency to pure efficiency maximization, and an increase in managerial effort, which increases productivity. The model links pre-privatization firm characteristics to the effect of privatization, and it predicts that politicians whose main interest is firm efficiency are likely to privatize large and inefficient firms, while if employment stability is their main concern, they will rather include small efficient firms in privatization programs. Probit estimates confirm that the main objective of the Romanian decision makers was to keep those firms under state ownership for which privatization would result in massive layoffs, even if this decision delayed the beneficial effects of privatization on firm productivity.

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Table 1: Model Predictions

Pre-privatization characteristic	Government objectives	
	Employment	Productivity
Profitability (e)	**?**	−
Wage level (w)	+	+
Firm size (L)	−	+

Table 2: Non-Privatizable and Privatizable Firm Characteristics

	Non-privatizable	Privatizable	Mean difference	Firms not privatizable	Firms privatizable
Employment	1,078.7 (225.2)	403.1 (22.4)	675.6*** (106.8)	287	1,732
ROA	0.011 (0.003)	0.053 (0.003)	-0.042*** (0.010)	248	1,593
ROS	-0.000 (0.016)	0.045 (0.002)	-0.045*** (0.009)	248	1,593
Unit cost	1.003 (0.021)	0.935 (0.004)	0.068*** (0.013)	287	1,732
Wage	288.3 (13.5)	316.0 (5.6)	-27.8* (14.8)	287	1,732
Payments overdue	0.107 (0.009)	0.071 (0.004)	0.036*** (0.010)	287	1,732
Bad loans	3.601 (0.050)	5.771 (2.257)	-2.164 (5.544)	287	1,732

Notes: Mean difference represents the difference between the average value of non-privatizable and privatizable firms. Standard errors in parentheses. The precise definition of variables is given in Section 3. *** = significant at the 1-percent level; ** = significant at the 5-percent level; * = significant at the 10-percent level.

Table 3: Determinants of Selection into Long Term State Ownership

Variable	1	2	3	4	5	6
Employment	0.029*** (0.006)	0.027*** (0.005)	0.031*** (0.006)	0.028*** (0.005)	0.040*** (0.005)	0.034*** (0.005)
ROA	-0.177*** (0.066)	-0.119*** (0.036)				
ROS			-0.187*** (0.067)	-0.165*** (0.069)		
Unit Cost					0.111*** (0.039)	0.049* (0.025)
Wage	-0.065*** (0.020)	-0.009 (0.014)	-0.063*** (0.021)	-0.006 (0.015)	-0.062*** (0.020)	-0.007 (0.014)
Strategic	0.151*** (0.015)		0.154*** (0.015)		0.178*** (0.014)	
Industry controls	No	Yes	No	Yes	No	Yes
Observed prob.	0.135	0.135	0.135	0.135	0.142	0.142
Pseudo R^2	0.113	0.439	0.116	0.446	0.140	0.451
N	1,841	1,841	1,841	1,841	2,019	2,019

Note: The coefficients are marginal effects from probit estimations (robust standard errors in parentheses). Employment and wages are in log form. Dependent variable = 1 if the firm is not privatizable. *** = significant at the 1-percent level; ** = significant at the 5-percent level; * = significant at the 10-percent level.

Table 4: Probability of Selection into Long-Term State Ownership

Variable	1	2	3	4	5	6
Employment						
10th percentile	0.062	0.022	0.060	0.022	0.051	0.019
90th percentile	0.155	0.110	0.159	0.115	0.180	0.131
Difference	0.093	0.088	0.099	0.093	0.129	0.112
Performance	ROA		ROS		Unit Cost	
10th percentile	0.112	0.061	0.111	0.063	0.094	0.053
90th percentile	0.089	0.046	0.090	0.044	0.110	0.060
Difference	-0.023	-0.015	-0.021	-0.019	0.016	0.007
Observed probability	0.135	0.135	0.135	0.135	0.142	0.142

Note: The coefficients represent the probability of being selected in long-term state ownership when the variable is set at value of the 10th or the 90th percentile of the distribution, and the other variables are set at their average value. The regression specifications are the same as in Table 4.

Table 5: Determinants of Selection into Long Term State Ownership, Controls for Soft Budget Constraints

Variable	1	2	3	4	5	6
Employment	0.030***	0.026***	0.031***	0.029***	0.031***	0.033***
	(0.006)	(0.005)	(0.006)	(0.005)	(0.009)	(0.005)
ROA	-0.132*	-0.177***				
	(0.078)	(0.049)				
ROS			-0.190***	-0.178**		
			(0.068)	(0.079)		
Unit Cost					0.081***	0.047*
					(0.036)	(0.025)
Wage	-0.070***	-0.009	-0.065***	-0.007	-0.049***	-0.007
	(0.020)	(0.014)	(0.020)	(0.015)	(0.018)	(0.014)
Strategic	0.154***		0.156***		0.140***	
	(0.015)		(0.015)		(0.034)	
Payments overdue	0.122**	-0.056	0.165***	-0.035	0.137***	-0.028
	(0.061)	(0.037)	(0.056)	(0.042)	(0.027)	(0.014)
Bad loans	-0.021	-0.003	-0.022	-0.004	-0.014	-0.001
	(0.018)	(0.004)	(0.018)	(0.004)	(0.009)	(0.003)
Industry controls	No	Yes	No	Yes	No	Yes
Observed prob.	0.135	0.135	0.135	0.135	0.142	0.142
Pseudo R^2	0.117	0.441	0.123	0.447	0.148	0.452
N	1,841	1,841	1,841	1,841	2,019	2,019

Note: The same as in Table 4.

**Appendix Table 1: Industrial Distribution of Non-Privatizable
and Privatizable State-Owned Enterprises**

NACE code	Description	Non-privat.	Privat.
11	Growing of crops; market gardening; horticulture	2	443
12	Farming of animals	1	191
13	Mixed farming	2	177
14	Agric. and animal husbandry service activities exc. vet. act. landscape gardening	1	547
21	Forestry and logging	1	1
22	Forestry and logging related service activities	1	6
101	Mining and agglomeration of hard coal	1	0
102	Mining and agglomeration of lignite	1	0
111	Extraction of crude petroleum and natural gas	1	0
132	Mining of non-ferrous metal ores, except uranium and thorium ores	2	0
144	Production of salt	1	0
145	Other mining and quarrying	1	5
160	Manufacture of tobacco products	1	0
201	Sawmilling and planing of wood; impregnation of wood	2	20
221	Publishing	1	56
222	Printing and service activities related to printing	5	26
244	Manuf. of pharmaceuticals, medicinal chemicals and botanical products	1	13
246	Manufacture of other chemical products	1	13
362	Manufacture of jewelry and related articles	1	1
401	Production and distribution of electricity	1	1
402	Manufacture of gas; distribution of gaseous fuels through mains	1	2
403	Steam and hot water supply	84	40
410	Collection, purification and distribution of water	90	29
452	Building of complete constructions or parts thereof; civil engineering	17	450
502	Maintenance and repair of motor vehicles	1	53
511	Wholesale on a fee or contract basis	1	259
512	Wholesale of agricultural raw materials and live animals	2	18
514	Wholesale of household goods	1	125
524	Other retail sale of new goods in specialized stores	1	236
526	Retail sale not in stores	3	17
551	Hotels	1	115
601	Transport via railways	1	0
602	Other land transport	45	532
632	Other supporting transport activities	6	9
641	Post and courier activities	1	0
643	Radio communications	2	5

Table 2 continued

NACE code	Description	Non-privat. firms	Privat. firms
644	Other radio communication related activity	1	0
701	Real estate activities with own property	2	6
702	Letting of own property	5	45
703	Real estate activities on a fee or contract basis	6	20
731	Research and exp. development on natural sciences and engineering	3	178
742	Archit. and engineering activities and related technical consultancy	1	133
743	Technical testing and analysis	2	5
747	Industrial cleaning	1	2
900	Sewage and refuse disposal, sanitation and similar activities	36	20
921	Motion picture and video activities	3	4
927	Other recreational activities	2	19
Total		**348**	**3,825**