Political Selection of Firms into Privatization Programs.

Evidence from Romanian Comprehensive Data[*]

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Abstract
Exploiting a unique institutional feature of the early Romanian privatization setup, when a group of firms was explicitly barred from any privatization, we test how politicians select firms into privatization programs. Using a comprehensive dataset that includes all firms inherited from socialism, we estimate the relation between pre-privatization firm characteristics – the information known to politicians at the time of decision making – and the effect of privatization on employment, efficiency and wages. With the help of the estimated coefficients we simulate the effect of privatization on non-privatizable and privatizable firms separately, including in the latter group both actually privatized and not privatized enterprises. The simulations show that politicians expected that privatization would reduce the employment size of the non-privatizable group more than 8 percent. On the contrary, employment in the privatizable group was likely to grow several percentage points. We do not find such discrepancies in the expected change in firm efficiency; the simulated efficiency effect of privatization is large and positive for both groups of firms and it is close to 40 percent. The analysis does not support the hypothesis that wages played an important role in privatization decisions. These results do not change qualitatively if the privatizable group is disaggregated into privatized and not privatized groups. Our study suggests that employment concerns played the key role in selecting firms for privatization, even if efficiency gains had to be sacrificed.

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1. Introduction

The effects of privatization on firm behavior have stimulated a large amount of research (Megginson and Netter; 2001; Djankov and Murrell, 2002), but the selection of state owned enterprises (SOEs) into privatization programs, which is the precondition of privatization, has received much less attention. Nevertheless, in the recent years there have been a small, but growing number of studies focusing on the motivations of politicians and bureaucrats materialized in decisions about allowing or banning firms to become private, or of sequencing of privatization.[1] This paper contributes to this literature by analyzing Romanian firm-level data to assess the relative importance of three factors that most likely played a crucial role in selecting firms into privatization programs: efficiency enhancement of the old socialist production sector and two factors directly influencing workers' well being, employment and wages.

A peculiar institutional feature of the Romanian privatization program permits us to distinguish between SOEs that were slated to or banned from becoming private. In 1990, in advance of launching any privatization program, the Romanian government selected about 370 SOEs and prohibited their transfer to private owners; this ban was lifted more than seven years later, after the left-wing party governing between 1990 and 1996 lost the elections.[2] This feature permits the unambiguous separation of firms slated for privatization from those that the government decided to keep in long term ownership, even if the privatizable firms were not actually privatized. Indeed, our data reveal how important the ex-ante separation of privatizable and non-privatizable companies is: only one-quarter of the privatizable group was actually privatized by the end of the political cycle we study.[3]

To assess politicians' objectives, we propose an alternative method to those papers that have analyzed this question with the help of microeconomic data (De Fraja and Roberts, 2008; Dinc and Gupta, 2007; Guo and Yao, 2005; Gupta et al., 2008; Liu and Woo, 2007). Instead of estimating the effects of pre-privatization characteristics on the probability of being selected into the privatizable group (or on sequencing of privatization), we use

[1] Bortolotti et al. (2003) provide a cross-country analysis of the factors that influence privatization decisions. Gupta et al. (2008) test sequencing in Czech privatization, Huyghebaert and Quan (forthcoming) analyze sequencing of SIPs in China. Guo and Yao (2005), De Fraja and Roberts (2008), Dinc and Gupta (2005) and Liu and Woo (2007) analyze which factors influenced the selection of firms into privatization programs in China, Poland and India, respectively.

[2] During this period the government changed several times, but the leading party and its symbolic figure, President Iliescu, was in office throughout the whole period.

[3] We have to set the time span over which politicians were interested in the effects of privatization. The political cycle is a natural choice for this time period: as politicians are interested in reelection, they arguably want to maximize public welfare around the time of elections.

information on the effect of actual privatizations on firm behavior and simulate the relationship between pre-privatization firm characteristics and the effect of privatization on both privatizable and non-privatizable firms. First we estimate how the effect of privatization on employment, firm efficiency and wages varies in function of pre-privatization firm characteristics – the information known to politicians when they decided which firm could be transferred in private ownership. To describe the firms before privatization we use employment, efficiency, wages and overdue payments. Then we use the estimated partial effects to simulate the employment, efficiency and wage effects of privatization for the privatizable and non-privatizable firms separately (including in the first group both actually privatized and not yet privatized firms). The comparison of the simulated effects for the two groups of firms indicates that those firms which were expected to shed employment as a consequence of privatization were sheltered from privatization programs even though their expected efficiency increase was large. The simulated wage effects are very small and similar for the two groups, suggesting that wage effects of privatization were of secondary importance.

We believe that this method has several advantages over the ones used in earlier research, but it also has drawbacks. Its main benefit is that we do not have to make conjectures about the relation between pre-privatization characteristics and the effects of privatization, as we estimate these relations directly from the data. The method's main disadvantage is that it hinges upon the assumption that the effect of privatization has the same pattern across privatizable and non-privatizable firms, a common assumption in simulation exercises. Although we control for many pre-privatization characteristics and their interactions in the first-stage regressions, we still cannot be sure that this assumption holds. We also have to assume that politicians have rational expectations, foresee what would happen to SOEs conditional on their pre-privatization characteristics after privatization, and that they used only this information to assess the likely effects of privatization. These deficiencies notwithstanding, we believe that this method is a useful complement to those used so far.

Besides the new method, another difference between this paper and the ones written so far is the economic environment in which privatizations took place. The four countries studied so far – China, the Czech Republic, India and Poland – did not have massive employment declines when privatization decisions were made. Romania differs from these countries as employment fell by about ten percent between 1992 and 1996, the period of interest of this paper (Romanian Statistical Yearbook, 1997). It is likely that politicians faced

different constraints in such economic environment than in countries which did not experience large employment reductions.

A possible shortcoming of the analysis is that it focuses on only three objectives, while others, such as revenue maximizing, reputation concerns or bribe collection might also have played a role in privatization decisions. The potential importance of these factors notwithstanding, we argue that the design of the early Romanian privatization program was such that these objectives were of secondary importance, as we discuss in the next section in length. The institutional setting of early Romanian privatization therefore helps us to assess the importance of the expected effect of privatization on firm efficiency, employment and wages in the objectives of politicians, and the results are not contaminated by the exclusion of other objectives which we cannot, or at least cannot directly take into account because of lack of data on privatization prices or bribes.

In the next section we discuss politicians' objectives in privatization programs and their relevance in the Romanian context. Section 3 presents the data and the institutional setting of the early Romanian privatization. The simulation method is discussed in Section 4, followed by the results in Section 5. The last section concludes.

2. Political Objectives in Privatization Programs

How do politicians choose which firms to privatize? While economists have frequently recommended privatization as a tool for firm restructuring and depolitization, the designers of privatization programs act in response to a much broader set of political objectives and face a number of constraints.

An expected advantage of privatization is the efficiency improvement of SOEs, which has been modeled (e.g., Sappington and Stiglitz, 1987; Schmidt, 1996) and tested empirically (e.g., Megginson et al., 1994; Brown et al., 2006). This effect may come about through several channels, such as hardening the budget constraint of privatized firms and boosting the direct interest of the new owners in profits (Asaftei et al., 2008; Boycko et al., 1996). Politicians assess the efficiency improvement of firms positively for several reasons. First and perhaps most important, only efficient firms are viable, especially if privatization is accompanied by deregulation of markets and therefore an increase in the competitive pressure on firms (as happened in many developed countries, and also in the early years of transition). Second, efficiency improvement may result in increased revenues for the state budget through increased corporate taxes, or sales taxes if the firm grows and boosts up revenues. Hard budget constraints - the reduction of state transfer to loss making SOEs – also decrease

the burden on the state budget.[4] The increased tax revenues are useful for politicians as they can be used to pursue social or political objectives, including tax reductions, support of the welfare system or investments in infrastructure, all having positive effects on chances of reelection.

Employment and wages, two variables that have a direct effect on voter well-being, may also be choice variables for politicians, either for equity reasons or vote maximization (as these two are observationally equivalent, we do not distinguish between them). If privatization results in layoffs and declining real wages, it will have a negative effect on worker welfare (at least in the short run) and also on the number of votes that can be collected by the governing parties in the following election. Empirical studies do not support the idea of massive employment and wage reductions after privatization (e.g., Brown et al., forthcoming; Megginson et al., 1994), but the ex ante expectations of researchers and policy makers seem to have been quite negative. Theoretical papers suggest that employment and wages are likely to fall after privatization (Boycko et al., 1996; Haskel and Szymanski, 1993), and politicians might well be inclined to believe this opinion. Megginson (2005, p. 389), for example, notes that "all governments fear lay-offs resulting privatization." As in this paper we are not interested in the actual effect of privatization on employment and wages, but on the perceptions of politicians, it is likely that loss of jobs and wages was a serious concern which could shape privatization policies. The reluctance to privatize firms with high chances of employment or wage declines can be exacerbated by incumbent employees' reactions, who may resist privatization for fearing the loss of their job (Druk Gal and Yaari, 2006). This fear need not be realistic – it is enough if workers expect this to be the result of privatization (Lipton and Sachs, 1990). If the economy is in recession – as it was in Romania in the studied period – the political cost of employment reduction may be large. Ceteris paribus, the reduction of employment or the wage bill also has a negative effect on fiscal stance, because of lower income and payroll tax revenues and higher social transfers associated with unemployment.

Other political objectives influencing privatization decisions include revenues resulting from the sale of enterprises, another income for the state budget (Bortolotti et al., 2003). Politicians may also use firms to bestow political patronage (López-de-Silanes et al., 1997). Instead of maximizing the state budget, they may maximize their own wealth by

[4] Bortolotti et al. (2003) establish the relation between privatization and high public debt and fiscal deficit. Gehlbach (2007) shows how the need of tax revenues alters the government's attitude towards the new economic sector, if the ability to collect taxes differs between this and the old socialist sector.

collecting bribes (Shleifer, 1998). The need to make reforms attractive to investors and the population might also play a role in delaying or banning certain types of firms from becoming private: if the government predicts that the privatization of certain firms would involve large costs, it might be a good strategy to delay or explicitly forbid their transfer to private hands in order not to undermine support for reforms.[5]

In this paper we focus only on efficiency, employment and wage considerations of politicians. In the Romanian context, however, the limited number of objectives does not seem to us to be a large drawback. First, these objectives are among the most important ones that induced governments to privatize or keep firms in state ownership not only in Romania but all over the world, although other factors discussed above also influence privatization decisions. It is possible that these factors also played a role in the Romanian case, but we argue that they were of secondary importance in the early privatization process and not taking them into account may bias the results only to a small extent. Out of all privatizations involving firms with at least 10 employees, about 90 percent of privatizations completed between 1992 and 1996 were management-employee buyouts (MEBOs).[6] In this privatization program the shares of the SOEs were sold to their employees at highly subsidized prices, usually involving a loan from a state-owned bank at negative real interest rates (Earle and Telegdy, 2002). Most privatizations, therefore, did not bring any revenues to the government. Bribes might have played a role, as investors could make side payments for lower share prices, and the management of the company might also paid politicians not to let the company be sold to outside investors, in which case the management would have faced the threat of being replaced by the new owners. It is unlikely, however, that bribes played a dominant role in the case of a MEBO privatization where the role of outside investors was small. It is also unlikely that reputation concerns played an important role in the Romanian case, as only a small fraction, about 30 percent of the privatizable firms ended up in private hands by 1996, the end of the first political cycle. To study revenue and bribe considerations of politicians directly, we would need to measure privatization prices and bribes, which we do not. To test reputation concerns, information on the privatization price is also necessary as both the quality of the company and the price asked for it determine the likeliness of privatization. The fact that factors that we cannot measure – revenue considerations, bribes

[5] See Dewatripont and Roland (1995). Earle and Gehlbach (2003) analyze how participation in the Czech Mass Privatization Program affected the support of the population for the reformist government. Huyghebaert and Quan (forthcoming) show that reputation concerns were important determinants in the selection of SOEs to Chinese SIPs.

and reputation concerns – are unlikely to have played an important role during the period we study, makes it less likely that our estimates are contaminated with omitted variable bias.

3. Data and Institutional Background

3.1 Data construction

In this paper we use data from two years, 1992 and 1996. The year of 1992 is the first year when firm-level data are available. Privatization barely started in this year, so the data can be considered pre-privatization for most of the firms. In our sample only 12 firms were privatized, most of them in the last two months of the year, showing that the data from the first year of the analysis is contaminated by privatization effects to a very small extent.[7] 1996 is the end of the first political cycle, and it is thus a natural choice for the end of the period we study. Non-privatizable SOEs were assigned a special legal form (called *Regii Autonome* in Romanian), and we use this variable to distinguish privatizable and non-privatizable firms.

Our data come from several sources. The value of sales, employment, the value of overdue payments, net income, the wage bill and the value of tangible assets were drawn from the Ministry of Finance dataset, which provides information for most of the firms inherited from the communist regime in 1992, and for all Romanian enterprises for 1996. Industry classification and legal form of firms were drawn from the Romanian Enterprise Registry, a comprehensive database of all Romanian enterprises. Employment and sales were also available in these data, and we used the two sources to clean these variables by comparing their values across sources and their evolution in time. Other cleaning procedures involved the removal of spurious changes in the industry code and legal form. As with any large panel data, these also suffer from spurious entry and exit of firms, as well as reregistrations without firm boundary changes (in which case the firm appears in the data as a new entity). We improved the longitudinal links by looking for possible connections for each entering and exiting firm with at least 50 employees. For this procedure, we used firm name, industry, region and size. Many of the firms, however, were reorganized during the four years we study, which resulted in split-ups and other boundary changes. We are not able to follow these firms across time and therefore we cannot include them in the analysis. Sales and net income were deflated by two-digit implicit deflators to reflect the price changes faced

[6] Firms that were sold directly to outside investors were small, the employment size of the median firm being only 36 in 1992.

[7] If the managers of the SOEs foresaw privatization, there may be a pre-privatization effect already in 1992 which may bias the results (Aghion et al., 1994; Roland and Sekkat, 2000).

by firms, while wages by the consumer price index to filter out price changes affecting workers' welfare.

The main source of ownership data is the State Ownership Fund (SOF) Transactions Database, which has information on the year of transaction, percent of shares ownership transferred and type of buyer for each privatization transaction of about 6,000 SOEs for the period of 1992-1996. Some of these firms were inherited directly from the socialist period while others were created by using the assets of these firms. Those firms from the SOF portfolio that had no privatization transactions were identified with the help of another database, which contains the ownership structure of the firms in 1996. For those firms which were not part of the SOF portfolio, we used the ownership information from the Romanian Enterprise Registry, which indicates whether the firm was 100 percent, majority or minority state-owned, or totally private. Using all this information on the ownership structure of the firms, we constructed a dummy variable for each year indicating whether the firm was majority private or majority state-owned.

From the resulting dataset we selected those firms which existed in both 1992 and 1996 and had any indication of state ownership (either existed in the SOF portfolio or the ownership dummy from the Romanian Enterprise Registry indicated state ownership). In order to compare privatizable and non-privatizable firms which are as similar as possible, we kept in the analysis only those 2-digit industries by the NACE classification which contain at least one non-privatizable and one privatized firm.[8] We also dropped those firms with employment less than ten and more than 36,000, as the non-privatizable set does not have firms smaller than 10 and the largest employment size of the privatizable firms is 35,655. This procedure resulted in the deletion of 123 and 2 observations, respectively. We also removed those firms for which the data indicated that their labor productivity or wages increased (decreased) 10 times between 92 and 96 (45 observations). The final dataset contains 2,796 firms. In some robustness checks we replace labor productivity with return on assets (net income over the value of tangible assets) and in this case the sample size is 2,310. We also check whether our results are sensitive to the sample construction.

[8] The NACE codes of these industries are 22, 24, 36, 40, 41, 45, 51, 52, 55, 60, 63, 64, 70, 73, 74, 90, and 92. Agriculture contained 5 non-privatizable firms, but their share in the industry did not reach 0.05 percent, and hence we did not include this industry in the analysis.

3.2 Selection of Firms into the Privatization Program

Similarly to other countries from the region, the reorganization of SOEs in Romania started with their corporatization. Already in 1991, before launching any privatization program, about 8,300 SOEs were reorganized as joint-stock companies; the shares of about 6,000 were transferred in a 70-30 percent ratio to the portfolios of the organizations that were responsible for their privatization: the State Ownership Fund (SOF) and one of the five Private Ownership Funds.[9] About 2,300 SOEs remained under the supervision of branch ministries. These firms were mostly small (in our data their median employment size is only 22 in 1992), but some large firms were also left in this group. The privatization of the firms in this second group started quite early and many of them became private. We do not include them in a separate category, but group them together with the firms in the SOF portfolio and consider them all privatizable (but we check whether our results change if we exclude them from the analysis).

A number of companies were not corporatized, and transfer of their ownership to private owners was explicitly prohibited. These firms, called *Regii Autonome*, remained under the supervision of the relevant branch ministries. The declared criteria upon which firms were selected into the non-privatizable group are rather vague: according to Law 15 on State Enterprise Reorganization (1990), "(*Regii Autonome*) are organized and operate within the economy's strategic branches…as well as in other fields of activity established by the Government" (Art 2). The law did not specify what "other reasons" might be, therefore it gave discretion to politicians and state bureaucrats to decide which firms to render privatizable and which not. This is crucial for our analysis, as we draw conclusions about politicians' objectives by comparing the *Regii* with the privatizable enterprises.

The non-privatizable group was not numerous, but the companies included were large on average. In 1992, in the comprehensive data there are 365 such firms with average employment size over 3,000. The number of employees working in these firms was over one million, which makes up 20 percent of total SOE employment. The share of the non-privatizable firms in the total sales of SOEs was also 20 percent, while their share in the total state-owned assets was much larger: their total capital made up as much as 41 percent of the capital of all SOEs in 1992.

[9] The Private Ownership Funds were founded by the government and they were responsible for transferring the shares of the companies from their portfolio directly to the population in a voucher privatization program. In practice they were quite passive, as they did not have any real decision making power since they possessed only a minority of the shares of the companies in their portfolios. For this reason, consider the POF shares as state owned. For a discussion of the POFs, see Earle and Telegdy (1998).

As discussed in the previous section, there were many reorganizations taking place between 1992 and 1996, and many of the firms – among them non-privatizable – exit the data. We can follow between 1992 and 1996 in our sample 169 non-privatizable and 2,627 privatizable firms, as Table 1 shows. Non-privatizable firms were indeed concentrated in branches that are often considered "strategic" – energy and water distribution, transportation, and utilities – but they were also in other sectors of the economy, such as in manufacturing, construction and services. Industry itself does not explain the selection of firms into privatizable and non- privatizable groups, as in each of these industries there are also a number of privatizable firms.

In 1992, the first year in the data, the average employment size of the non-privatizable firms from our sample is 1,402, while that of privatizable firms is 457. The mean difference is significant at the one-percent level. Measured by labor productivity (defined as the ratio of value of sales to average employment), privatizable firms were about twice as productive, but the mean difference is significant only at the ten-percent level. Average wages (the firm's total wage bill divided by the number of employees) were very similar in the two groups of firms. Return on assets (the ratio between net income and the value of assets) is 1.7 percent for non-privatizable and 4.7 percent for the privatizable group on average (the mean difference being highly significant). The ratio of payments overdue to the value of sales is over 10 percent in the non-privatizable firms, and 7 percent in the privatizable ones.[10] The unconditional mean comparison of pre-privatization performance and employment size suggests that pre-privatization employment, efficiency and payments overdue played a role in the selection of firms into privatization programs, while wages did not. It is also important to mention that despite the large differences in the mean values of employment and firm performance variables, the distributions of employment and productivity overlap across the two groups of firms.[11]

To take the effect of all variables into account at the same time, we estimate a probit specification similar to those used in other studies (De Fraja and Roberts, 2008; Gupta et al., 2008; Liu et al., 2007). The dependent variable indicates whether the firm is privatizable or not, and the regressors are firm characteristics in 1992 (employment, labor productivity,

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[10] This variable exists only in 1993, and it includes overdue payments to suppliers and creditors, as well as overdue tax payments.

[11] The 75th percentile of the employment distribution of privatizable firms is larger than the employment size of the median non-privatizable firm, and the 25th percentile of the non-privatizable employment distribution is smaller than the median privatizable firm's employment. The same applies to the distribution of labor productivity.

wage, the ratio of payments overdue to sales and industry dummies). The hypothesis that the estimated coefficients of employment, efficiency, wages and payments overdue are jointly equal to zero is rejected by the Wald test at any level of significance, providing support that these variables indeed played a role in the selection of firms into privatization. Table 2 shows that employment size had a negative effect on the probability of being in the privatizable group: the estimated coefficient is negative and highly significant. This means that the firm at the 10th percentile of the employment distribution has a 1.6 percent chance to be in the non-privatizable group, while this is 5.9 percent of the firm situated at the 90th percentile (the other variables being set at their means). More productive firms, on the other hand, had a higher chance to become privatizable. The firm which occupies the 10th percentile in the pre-privatization efficiency distribution has a chance 4.5 percent to be in the non-privatizable group; this proportion is only 2 percent for the firm situated at the 90th percentile. Compared to the mean of the dependent variable (in the sample 94 percent of the firms are privatizable), these variations in the probability of being in one group or another are quite sizable. Wages and overdue payments do not seem to have played a role in the selection of firms into privatization, as the estimated coefficients are small and insignificant. Controlling for size, efficiency and the wage level, construction and service firms had a higher chance of being privatizable than industrial firms, despite the fact that the latter group includes energy production and water distribution, two industries classified as of strategic importance. The probit regression shows, therefore, that relatively small and productive firms are more likely to be selected into the Romanian privatization program.[12] The efficiency result is similar to the finding of Gupta et al. (2008) and Dinc and Gupta (2007), but Dinc and Gupta (2007) find that larger firms are more likely to be privatized in India. The result that wages are not a determinant of the selection of firms into privatization is also at odds with Dinc and Gupta (2007) and Liu et al. (2007).

The privatization process started quite late in Romania. Although the Law of Privatization was passed in mid-1991, privatization of enterprises gained speed only in 1993-94. The overwhelming majority of privatizations by 1996 were MEBOs – in the sample used in this study over 90 percent of the firms were sold by this method. We consider a firm as being privatized by 1996 if it became majority private in 1995 or before, to permit privatization to take its effect on firm behavior. By this criterion, 683 firms from the sample were privatized, which makes up 26 percent of the privatizable firms.

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[12] We ran this specification replacing labor productivity with ROA, and the results do not change qualitatively.

4. Empirical Method

We use information on privatization outcomes to simulate the effect of privatization on the privatizable and non-privatizable firms separately. First we establish the relation between the effect of privatization and the 1992 characteristics of the firms – the information known to policy makers when deciding which firm to become privatizable and which not. The identifying assumption is that the decision makers used only observable pre-privatization characteristics of SOEs to infer the effects of privatization on firm behavior. This seems to us a realistic assumption: given the large number of firms to decide about, it is unlikely that decision makers had more information on firms than what was shown in firms' books. In accordance with this assumption, we estimate the first step regression by ordinary least squares (OLS), which, unlike a fixed effect regression, does not take out the effect of unobservable firm characteristics. The OLS also has the advantage that we can estimate the effect of privatization on variables of political interest between the first and last year of the political cycle, as it is likely that politicians want to maximize voter well-being around the time of the elections.[13] Having obtained the estimated effects of the pre-privatization firm-level variables on post-privatization outcomes, we construct the counterfactual of the effect of privatization for each firm by multiplying pre-privatization characteristics with the estimated effects, and compare the average hypothetical privatization effect between non-privatizable and privatizable firms (including in the latter group both the actually privatized and the not privatized ones).

The estimation equation used to obtain the effect of privatization as a function of pre-privatization firm characteristics is the following:

$$\Delta y_{92\text{-}96,i} = \beta_0 + \beta_1 X_{92,i} + \beta_2 PO_i X_{92,i} + \varepsilon_i, \qquad (1)$$

where i indexes firms, $\Delta y_{92\text{-}96}$ is the change between 1992 and 1996 of the variable of interest, which is log employment, efficiency (measured as labor productivity) and average wage. PO = 1 if the firm was majority privatized by the end of 1995, and zero otherwise, $X_{92,i}$ is a vector of the firm i's 1992 characteristics and ε_i is the residual. In particular, X_{92} includes log employment, efficiency, average wage, the share of payments overdue in the firm's total sales and industrial dummies. In order to have enough non-privatizable and privatized firms in each industry for estimation, we define four industry dummies: industry, construction,

[13] Fixed effects regression would provide estimates either of the average growth of the dependent variables over the years when the firm was already private (if the dependent variable is defined in levels) or the change in its growth rate (if it is defined as growth).

transportation and other services. The omitted category is industry, and we include interactions between *PO* and all four industrial dummies (and do not include *PO* alone). In order to allow a more flexible functional form between pre-privatization firm characteristics and the effect of privatization, we also include in X_{92} interactions between industry dummies and all the other variables, and interactions between the variables themselves (employment-efficiency, employment-wage, employment-overdue payments, wage-efficiency, wage-overdue payments, efficiency-overdue payments). As a robustness check, we also include squared terms of log employment, efficiency, wage and the share of overdue payments.

Using the estimated parameters from (1), we compute the simulated effect of privatization between 1992 and 1996 for each firm separately:

$$\Delta\hat{y}_i = \hat{\beta}_2 X_{92,i} \tag{2}$$

With the help of (2), we construct the average difference between non-privatizable and privatizable firms (the privatizable group including both privatized and not yet privatized companies):

$$\Delta^2\hat{y} = \Delta\bar{\hat{y}}^{NPRIV} - \Delta\bar{\hat{y}}^{PRIV}. \tag{3}$$

This statistic shows the difference in the hypothetical effects of privatization between the two groups, and we use it to assess the motivations of decision makers. This method permits us to analyze jointly the employment, efficiency and wage effects of privatization, which in turn allows us to draw conclusions on the relative importance of these variables in politicians' objectives. If, for example, $\Delta^2 emp < 0$ and $\Delta^2 eff > 0$, this would imply that politicians were more concerned about the employment effects of privatization than about efficiency gains, as they did not allow the privatization of firms that were expected to suffer declining employment levels after the ownership change, even if these firms would have gained efficiency as a consequence of privatization.

5. Results

Table 3 presents the estimated coefficients of the first-step results.[14] To start with the employment growth regression, initial employment size is inversely correlated with employment growth, and the effect in larger in magnitude for privatized firms (except in construction). Contrary to employment size, pre-privatization efficiency and wages have positive partial effects in all industries, and the effect is larger in privatized firms (the sole

[14] The regressions include industry controls and their interactions with privatization (not presented in the table).

exception being construction, where the initial level of wages is negatively correlated with employment growth in SOEs). The share of overdue payments to the value of sales has a positive marginal effect on employment growth in SOEs, and very large negative effect in privatized companies. The interaction of employment size and efficiency has a negative partial effect on SOEs' employment growth, but the effect on privatized firms is positive – ceteris paribus, large and efficient firms grow further if they are privatized. The employment-wage interaction has a positive estimated coefficient for SOEs and the effect is essentially zero for privatized firms (the coefficients with and without privatization interactions are very similar). Overdue payments have negative effects in large firms, but this effect declines after privatization. Wage-efficiency interactions have a negative partial effect on both SOEs and privatized firms. More efficient firms that had overdue payments grow more than less efficient ones, regardless of privatization. Finally, high wage firms with overdue payments experience a larger employment growth after privatization than SOEs. If our assumptions hold about the information set of politicians, they believed that the employment effect of privatization is negatively correlated with initial employment size (unless firms were relatively efficient) and positively with efficiency and wages, while overdue payments had negative effects on privatized firms' employment growth.

The second column of the table shows the determinants of productivity growth. Employment size has a positive effect on productivity growth of SOEs in all industries, but the partial effect is always negative for the privatized firms – it is more difficult to restructure larger firms. The initial levels of productivity and wages have negative effects in all industries, but the effects are smaller for privatized firms, ceteris paribus.[15] Payments overdue have negative partial effects on productivity growth in all industries for all firms, except for those privatized firms that belong to transportation and other services. Employment-efficiency and wage-efficiency interactions are very small, while the employment-overdue interaction term has a negative estimated coefficient. The efficiency-wage interaction term has a positive effect on all firms, but the effect is very small for privatized firms. Efficient firms which have overdue payments grow slower if they are privatized, but high-wage firms grow faster.

[15] This result is counterintuitive, as one would expect that low productivity firms have a larger growth potential than those already productive before privatization. It is possible, however, that the overall initial productivity effect is negative, but this is masked by the large number of interactions. To check for this possibility, we ran a regression where we took out all interaction terms which involved efficiency, and added a pure efficiency term and efficiency interacted with the privatization dummy. We found that the estimated coefficients on both variables are negative and significant.

Finally, the change of wages during the analyzed period is negatively correlated with initial employment size, but the magnitude of this effect is quite small. Initial efficiency has a negative effect on wage growth when the company is owned by the state, but this effect is attenuated for privatized firms. Initial wages and overdue payments also have negative partial effects on wage growth for privatized firms. The interaction terms between employment, efficiency, overdue payments and wages have small estimated effects on wage growth.

With the help of these estimated effects, we compute the expected effect of privatization for the non-privatizable and privatizable groups. The results, presented in Table 4 show that if our assumptions are valid, politicians believed that the privatization of all privatizable firms would have increased their employment by 3.2 percent while the non-privatizable firms would have suffered a loss of 8.3 percent. The diverse privatization effect on employment is further underlined by the high statistical significance of the mean difference between the two groups. Contrary to the diverse employment effect, the expected efficiency effect of privatization is positive and very similar in magnitude in the two groups of firms. The simulated efficiency increase for the non-privatizable firms is 38 percent, and for the privatizable ones 39.2 percent (the mean difference is not significant). The simulated effect of privatization on the growth rate of wages is zero in the non-privatizable group and 0.3 percent for privatizable firms. Although the difference is statistically significant, the magnitude of the simulated wage effect is so small that it is likely that wages did not play an important role in the privatization decisions of politicians. To summarize, the simulations show that politicians were more concerned with the negative effect of privatization on employment than with efficiency improvement, and they protected labor even if they had to sacrifice productivity gains. Wages do not seem to play an important role in the selection of firms into privatization programs.[16]

To test the robustness of our results, we compute the hypothetical effect of privatization for several different samples and specifications. The difference of the simulated effect of privatization between non-privatizable and privatizable firms for these robustness checks are shown in Table 5. As a first check, we replace labor productivity with return on

[16] It is likely that politicians were more concerned about job losses than wage declines as between 1992 and 1996 the number of employed persons fell by ten percent (from 10,458 thousand to 9,379 thousand), while average real wages did not change (Romanian Statistical Yearbook, 1997, p. 125 and 176). The employment reduction of the non-privatizable firms may not seem very large, but it is not negligible. The total employment of non-privatizable firms was over one million in 1992. If we apply the expected employment effect of privatization on the whole group, the number of jobs lost would have been 84,000, or 10.6 percent of the number of unemployed in 1996 (International Labour Organization Statistics and Databases).

assets (ROA). Corporate taxes, and therefore government revenues are tied to profits, so it is possible that profits were in the utility function of politicians and not labor productivity. Profits, however, are not very reliable, especially in early transition and for this reason our preferred variable is labor productivity (we prefer labor productivity also because profits are missing in a larger number of firms than labor productivity). Second, we exclude overdue payments from the first stage regression, as they are available only in 1993 and thus this variable might be contaminated with privatization effects. Third, to allow for more flexibility in the first-stage regression, we include squared employment, efficiency, wages and overdue payments both in levels and interacted with privatization.

We also test whether changes in the sample affect the results. First, we exclude firms that were under the subordination of the ministries and therefore their status regarding privatizability is unclear, as discussed in Section 3.2. Second, we drop those firms that were privatized already in 1992 and thus the first year of the study might be contaminated with privatization effects. Third, we add back firms to the sample which were removed because they were outliers in productivity or wages. As a forth check, very small and very large firms are also included in the sample. Finally, we add back outliers and the firms that were excluded because of size restrictions, to test whether our results hold for the largest possible sample. As Table 5 shows, the results do not change qualitatively: the expected employment effect is always smaller for the non-privatizable firms than for the privatizable ones, while the efficiency and wage effects are very similar. It is worth mentioning that in all these robustness checks the simulated employment effect is always negative for non-privatizable, and positive for the privatizable firms.

One possibility we have not studied so far is that the results are driven by selection of firms by the future private owners. It is possible that they picked firms with better prospects and thus privatized firms are different from privatizable, but not privatized firms. We have controlled for initial characteristics, so the bias has to arise through some omitted variable, for example the growth potential of the firm or the quality of labor not captured by higher average wages. For example, as most of the new owners in the privatized firms in Romania are the employees of the firm, it is possible that they bought up those firms in which maintaining the employment level was easy. In this case the difference in the simulated privatization effects may not arise between the privatizable and not-privatizable firms, but between the privatized and not privatized ones. We check for such possibilities by disaggregating the privatizable group into not privatized and privatized firms and redo the simulation for all three groups (non-privatizable, privatizable, but not privatized and

privatized). The results, shown in Table 6, are similar to our base results. The simulated privatization effects of the two privatizable groups are always employment enhancing and the efficiency effects always smaller than the effect measured for the non-privatizable group. The expected effects of two privatizable groups are very similar in terms of efficiency enhancement and wage growth, but privatized firms' employment effect is larger than that of the privatizable but not yet privatized group's.

6. Conclusions

Privatization has been one of the most important policies that shaped the economies of many countries in the last three decades. In this paper we analyze the prerequisite for privatization, the political selection of firms into privatization programs. We take advantage of comprehensive data and the fact that a group of state-owned firms was explicitly barred from privatization in Romania. We use simulation methods to estimate the expected employment, efficiency and wage effects of privatization on the political sorting of firms into privatization programs. Using information on actual privatizations, we first estimate the effect of privatization as a function of firm-level pre-privatization characteristics. With the estimated effects we simulate the privatization effect for privatizable and non-privatizable firms separately. The results show that that employment concerns were of primary importance, even if efficiency gains had to be sacrificed. The expected employment effect of privatization is negative and 8.3 percent on average for the non-privatizable group, and it is positive and 3.2 percent for the privatizable group. Efficiency increase, on the contrary, is around 38 percent in the case of both groups. Wages do not seem to have played a role in the political selection of firms into the privatization program, as the simulated effects are very small in both groups of firms. These results are robust to different specifications in the first step regression, to the use of different measures of firm efficiency, and to various samples of firms.

While our results are very robust, several factors may weaken them, which we list below. The crucial assumption in the simulation is that firms that have not become private would have behaved in the same way as privatized firms, had they been privatized. This is a common problem in any simulation study, and we tried to mitigate it by augmenting the regression with different cross-terms to control for observable characteristics as well as possible. Nevertheless, we cannot be sure that unmeasured characteristics of firms in the privatizable and non-privatizable groups are similar. When we disaggregate the privatizable group into privatized and not privatized, the main results hold, which provides some evidence

that this bias is probably not very large, at least it does not affect qualitatively the analysis of political selection of firms into privatization programs. We should also emphasize that our goal is not to measure the effects of privatization, but to estimate the expected effect of privatization on several key variables which are likely to be of political interest, with the help of the information available to the decision makers: the pre-privatization characteristics of SOEs. If politicians possessed the same information that we use, our results hold regardless of differences in unobserved characteristics of non-privatizable and privatizable firms.

Second, the privatizations are mainly MEBOs, and it is questionable how the results can be applied to other privatization methods, such as direct sales. It is indeed likely that firm behavior under the control of the management and employees is different from outsider ownership. In particular, it is possible that the employee-owners would sacrifice efficiency increase if it caused employment reduction, while this behavior is less likely to happen in an enterprise controlled by outside investors. On the other hand, if outside owners are more efficient in reducing the overall cost level of the firm, this may contribute to employment increase through the scale effect. Furthermore, if they are more entrepreneurial and expand the firm's markets, this may also increase the demand for labor. Therefore, it is unclear a priori what the effects of privatization are in the case of sales to outside owners and how they relate to MEBO privatizations.[17] But if decision makers foresaw that privatizations will mostly be MEBOs, our results hold and there is some evidence that the Romanian program was prepared to be mostly MEBO, at least in the early phase. In a pilot privatization program launched in 1992, out of the 22 companies finally privatized, 15 were exclusively and 4 partially MEBOs (Earle and Telegdy, 1998). Nevertheless, we cannot be sure that decision makers knew this already in 1991, when they selected firms into privatization programs.

Finally, we do not control for unobservable firm-specific effects in the first-stage regressions, and thus the estimated coefficients, which we use to simulate the effect of privatization, may be biased. We cannot rule this possibility out, but our interest is not estimating the privatization effect per se, but to try to use that information that was available to the decision makers. We argue that it is unlikely that politicians possessed a great deal of insider information on a large number of firms under state ownership at the beginning of the transition. Ideally we should use the information set that was available to the decision

[17] Earle and Telegdy (2002) find that the Romanian MEBO privatization enhanced the productivity of the firms compared to state ownership, but the effect is smaller than of outsider privatization. Frydman et al. (1999) conclude that insider privatization does not enhance productivity, while outside privatization does, and there is only weak evidence that the employment levels are different at the firms under the two ownership structures.

makers when they were deciding about the privatizability of firms. We do not know what this information set was, but we think the most important variables that can be taken from the firm's books are the best candidates.

The analysis, similar to previous research, provides evidence that privatization is a political process and that efficiency enhancement is only one of the factors which influence the decisions of politicians when they select firms into privatization programs. In Romania, where jobs were destroyed and employment fell in the whole country, politicians sensed the large political costs of further job destruction; their main concern was not the efficiency enhancement of firms but the preservation of employment at any price.

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Table 1: Non-Privatizable and Privatizable Firm Characteristics in 1992

	Non-privatizable	Privatizable	Mean difference
Employment	1,402	457	945***
	(288.9)	(17.9)	(101.6)
Labor productivity	2,092	4,066	-1,973*
	(318.3)	(283.0)	(1,118.9)
Wage	290	303	-13
	(10.8)	(3.3)	(13.2)
Return on Assets	0.017	0.047	-0.030***
	(0.005)	(0.002)	(0.009)
Payments overdue	0.103	0.070	0.033***
	(0.011)	(0.003)	(0.012)
Industry			Percent non-privatizable
Manufacturing	7	255	2.7
Energy	51	28	64.6
Water distribution	49	13	79.0
Construction	7	524	1.3
Transportation	25	506	4.7
Utilities	11	12	47.8
Other services	19	1,288	1.5
Total	169	2,627	6.0

Notes: return on assets is missing for 26 non-privatizable and 460 privatizable firms. Mean difference represents the difference between the average value of non-privatizable and privatizable firms. Labor productivity, wages and return on assets are measured in thousands of 1992 Lei. NACE codes included in industries: manufacturing (22, 24, 36); energy (40); water distribution (41); construction (45), transportation (60, 63, 64); utilities (90); other services (51, 52, 55, 70, 73, 74, 92). *** = significant at the 1-percent level; * significant at the 10-percent level.

Table 2: Selection of Firms into Privatization Programs

Variable	Coefficient
Employment 92	-0.014***
	(0.003)
Efficiency 92	0.010**
	(0.005)
Wage 92	-0.004
	(0.011)
Payments overdue	-0.006
	(0.021)
Construction	0.061***
	(0.006)
Transportation	0.045***
	(0.006)
Other services	0.093***
	(0.012)
Mean privatizable	0.940

Notes: N = 2,796. Probit estimates, the coefficients show marginal effects (robust standard errors in parenthesis). Pseudo $R^2 = 0.220$. Dependent variable = 1 if the firm is privatizable, = 0 if not. Excluded industrial dummy: industry. *** = significant at the 1-percent level; ** = significant at the 5-percent level.

Table 3: Effect of Pre-Privatization Characteristics on Privatization Outcomes

	Δ Employment	Δ Productivity	Δ Wage
Employment*Industry	-0.127	0.181	-0.037
	(0.354)	(0.399)	(0.024)
Employment* Industry *PO	-0.095	-0.596	-0.052
	(0.745)	(0.663)	(0.049)
Employment*Construction	-0.199	0.183	-0.037
	(0.352)	(0.401)	(0.025)
Employment* Construction *PO	0.043	-0.426	-0.039
	(0.759)	(0.676)	(0.052)
Employment* Transportation	-0.150	0.164	-0.028
	(0.355)	(0.398)	(0.025)
Employment* Transportation *PO	-0.100	-0.417	-0.048
	(0.763)	(0.665)	(0.050)
Employment* Otherserv.	-0.168	0.115	-0.033
	(0.348)	(0.393)	(0.024)
Employment* Otherserv.*PO	-0.218	-0.427	-0.041
	(0.753)	(0.664)	(0.049)
Efficiency* Industry	0.952**	-0.673**	-0.073***
	(0.377)	(0.340)	(0.023)
Efficiency* Industry *PO	0.516	0.018	0.018
	(0.722)	(0.532)	(0.049)
Efficiency* Construction	1.055***	-0.829**	-0.086***
	(0.374)	(0.337)	(0.023)
Efficiency* Construction *PO	0.541	0.261	0.022
	(0.741)	(0.541)	(0.053)
Efficiency* Transportation	0.788**	-0.806**	-0.086***
	(0.369)	(0.326)	(0.024)
Efficiency* Transportation *PO	0.862	0.410	0.046
	(0.726)	(0.525)	(0.050)
Efficiency* Otherserv.	0.656*	-0.720**	-0.108***
	(0.361)	(0.314)	(0.022)
Efficiency* Otherserv.*PO	0.786	0.360	0.048
	(0.709)	(0.504)	(0.049)
Wage* Industry	0.226	-0.326	-0.235***
	(0.443)	(0.461)	(0.026)
Wage* Industry *PO	1.487*	0.329	0.033
	(0.822)	(0.683)	(0.050)
Wage* Construction	-0.041	-0.514	-0.234***
	(0.393)	(0.424)	(0.025)
Wage* Construction *PO	1.500*	-0.016	-0.004
	(0.864)	(0.725)	(0.063)
Wage*Transportation	0.649*	-0.383	-0.224***
	(0.373)	(0.380)	(0.024)
Wage* Transportation *PO	1.485*	0.241	-0.041
	(0.867)	(0.695)	(0.060)
Wage*Otherserv.	0.964**	-0.772*	-0.204***
	(0.385)	(0.401)	(0.025)
Wage*Otherserv.*PO	1.088	0.105	0.004
	(0.878)	(0.677)	(0.059)

Table 3 continued

	Δ Employment	Δ Productivity	Δ Wage
Overdue*Industry	1.857	-3.029	0.184
	(3.357)	(3.331)	(0.177)
Overdue * Industry *PO	-11.668***	-0.892	-0.263
	(4.355)	(4.290)	(0.266)
Overdue * Construction	2.016	-2.806	0.219
	(3.539)	(3.317)	(0.173)
Overdue * Construction *PO	-13.286***	-0.567	-0.227
	(4.573)	(4.335)	(0.268)
Overdue *Transportation	1.673	-2.044	0.242
	(3.331)	(3.328)	(0.172)
Overdue * Transportation *PO	-12.154***	2.094	-0.244
	(4.490)	(4.443)	(0.286)
Overdue * Otherserv.	1.140	-3.081	0.233
	(3.360)	(3.221)	(0.168)
Overdue *Otherserv.*PO	-12.872***	0.114	-0.239
	(4.694)	(4.507)	(0.285)
Employment*Efficiency	-0.030*	-0.006	-0.004***
	(0.015)	(0.018)	(0.001)
Employment*Efficiency*PO	0.079***	0.009	-0.001
	(0.030)	(0.032)	(0.002)
Employment*Wage	0.047	-0.009	0.008**
	(0.045)	(0.052)	(0.003)
Employment*Wage*PO	-0.071	0.046	0.006
	(0.093)	(0.085)	(0.007)
Employment*Overdue	-0.312**	-0.112	-0.003
	(0.148)	(0.136)	(0.008)
Employment*Overdue*PO	0.160	0.008	-0.005
	(0.247)	(0.233)	(0.016)
Efficiency*Wage	-0.061	0.063*	0.015***
	(0.041)	(0.035)	(0.002)
Efficiency*Wage *PO	-0.132*	-0.050	-0.005
	(0.080)	(0.058)	(0.005)
Efficiency*Overdue	0.294*	0.080	0.007
	(0.161)	(0.163)	(0.009)
Efficiency *Overdue*PO	0.079	-0.280	-0.002
	(0.180)	(0.178)	(0.010)
Wage*Overdue	-0.307	0.329	-0.029
	(0.417)	(0.417)	(0.021)
Wage *Overdue*PO	1.265**	0.255	0.030
	(0.553)	(0.556)	(0.034)
R^2	0.159	0.337	0.308

Note: N = 2,796. The dependent variables are log differences between 1992 and 96. The regressions include industry controls and their interaction with privatization. Robust standard errors in parentheses. *** = significant at the 1-percent level, ** = significant at the 5-percent level; * = significant at the 10-percent level.

Table 4: Simulated Effect of Privatization on Employment, Firm Efficiency and Wages

Non-privatizable	Privatizable	Mean Difference
	Employment	
-0.083	0.032	-0.114***
(0.022)	(0.005)	(0.020)
	Efficiency	
0.380	0.392	-0.012
(0.021)	(0.004)	(0.016)
	Wage	
-0.000	0.003	-0.003***
(0.002)	(0.000)	(0.001)

Note: N = 169 for non-privatizable, 2,627 for privatizable firms. The table presents the average simulated effect of privatization (the hypothetical percentage change of the variable) for non-privatizable and privatizable firms. Mean difference = difference in the hypothetical privatization effect between non-privatizable and privatizable firms. *** = significant at the 1-percent level.

Table 5: Robustness Checks

	Mean difference in privatization effect			Number of firms	
	Employment	Efficiency	Wage	Non-privatizable	Privatizable
Efficiency measured by ROA.	-0.129***	0.003	0.006***	143	2,167
	(0.022)	(0.005)	(0.001)		
Payments overdue taken out from first-stage regression.	-0.104***	0.050***	0.000	169	2,628
	(0.015)	(0.013)	(0.001)		
Emp^2, Eff^2 and $Wage^2$ added to first stage regression.	-0.128***	-0.009	-0.003***	169	2,627
	(0.021)	(0.018)	(0.001)		
Firms with unclear privatization status taken out.	-0.144***	-0.012	-0.002***	169	2,422
	(0.021)	(0.014)	(0.001)		
Firms privatized in 1992 taken out.	-0.112***	0.011	-0.002**	169	2,615
	(0.019)	(0.015)	(0.001)		
Outliers added.	-0.117***	0.009	-0.005***	170	2,671
	(0.027)	(0.015)	(0.001)		
Very small and very large firms added.	-0.151***	-0.030**	-0.003***	171	2,735
	(0.020)	(0.015)	(0.001)		
All sample.	-0.133***	0.025	-0.003*	173	2,793
	(0.022)	(0.016)	(0.001)		

Note: The table presents the mean difference of the simulated privatization effect between non-privatizable and privatizable firms (standard errors in parenthesis). *** = significant at the 1-percent level; ** = significant at the 1-percent level; * = significant at the 10-percent level.

Table 6: Simulated Effect of Privatization for Non-privatizable, Privatizable and Not Privatized, and Privatized Firms

Non-privatizable (1)	Privatizable, not privatized (2)	Privatizable, privatized (3)	Mean Difference (1) – (2)	Mean Difference (1) – (3)
		Employment		
-0.083	0.005	0.108	-0.087***	-0.191***
(0.022)	(0.006)	(0.009)	(0.020)	(0.020)
		Efficiency		
0.380	0.405	0.355	-0.025	0.050***
(0.021)	(0.004)	(0.007)	(0.016)	(0.008)
		Wages		
-0.000	0.002	0.003	-0.003***	-0.004*
(0.002)	(0.000)	(0.000)	(0.001)	(0.001)

Note: N = 169 for non-privatizable, 1,944 for privatizable but not privatized and 683 for privatized firms. The table presents the average simulated effect of privatization (the hypothetical percentage change of the variable) for non-privatizable, privatizable and not privatized, and privatized firms. *** = significant at the 1-percent level.