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Differences between State-Owned and Private  
Enterprises**

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# **Employment Adjustment during the Global Crisis: Differences between State-Owned and Private Enterprises**

Álmos Telegdy

## Abstract

This paper analyses the employment adjustment of state- and privately-owned companies before and during the global crisis. Using Hungarian data, it finds that the net job creation rate is similar across the two ownership types before the crisis, but during the crisis state-owned companies have a net job creation rate larger by 7 percentage points than private enterprises. The effect is caused both by a larger gross job creation rate and by a drop in job destruction associated with state ownership.

Keywords: Net job creation, Global crisis, State ownership, Hungary

JEL classification: F23, L25, L32

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# **Állami- és magánvállalatok munkapiaci alkalmazkodása a globális válság idején**

Telegdy Álmos

## Összefoglaló

A tanulmány a magyarországi állami- és magánvállalatok munkapiaci alkalmazkodását elemzi a globális válság előtt és közben. A nettó munkahelyteremtési ráták hasonlóak 2007-ban és 2008-ban, azonban a válság kitörése után az állami vállalatok esetében ez a ráta 7 százalékpontal magasabb, mint a magánvállalatoknál. Ezt a hatást az eredményezi, hogy az állami vállalatok bruttó munkahelyteremtési rátája magasabb, bruttó munkahelyrombolási rátája pedig alacsonyabb a válság alatt, mint a magánvállalatok rátái.

Tárgyszavak: munkahelyteremtés, globális válság, állami tulajdon, Magyarország

JEL kódok: F23, L25, L32

## **1. INTRODUCTION**

The global crisis brought about large declines in the demand for commodities and services around the world, and many firms reacted to this shock by adjusting their employment to the new conditions. It is not clear, however, how this process varies by firm attributes. The purpose of this paper is to analyze one firm characteristic – state versus private ownership – which may affect employment adjustment. Indeed, there are reasons to expect that firms under state ownership behave differently in the crisis. State-owned enterprises (SOEs) may be more sluggish to decrease costs as a reaction to the new demand conditions (Hart et al., 1997) or politicians may simply use them to cushion the overall negative employment effects of the demand shock (Boycko et al., 1996). On the other hand, the need to ease the burden on the state budget created by lack of tax revenues and increased social spending may force decision makers to lay off the redundant workers of SOEs to save costs.

In particular, I analyze how net job creation varies by ownership before and during the global crisis, and I also decompose it into gross job creation and destruction to shed light on the mechanisms behind labor adjustment. As SOEs and privately-owned firms differ in many respects which can affect net job creation, I perform a simple matching by industry, size and firm age to create a common support of the two groups of firms.

In the next section I present the data, followed by Section 3 with the methodology and results. The last section concludes.

## **2. DATA AND DESCRIPTIVE STATISTICS**

The host of the data used in this paper is the National Tax and Customs Administration of Hungary. These data are available annually for all firms engaged in double-entry bookkeeping, comprising almost all limited liability companies and about 80 percent of partnerships. In this paper I use the waves between 2006 and 2010. The variables used are average employment, year of foundation, 2-digit industry classification and the share capital owned by private firms and individuals, the central government and local administrations.<sup>1</sup> As there are only few small SOEs, the sample is restricted

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<sup>1</sup> I use year of foundation to construct an age variable of the firm. If the firm underwent a boundary change (which is indicated in the data for the years between 1995 and 2005), the age of the firm is based on the founding date of the oldest predecessor firm. If the firm was ever state-owned, the foundation date is set to 1989 as there have been practically no newly established SOEs after the fall of the socialist regime.

to enterprises which had an employment size over 10 on average in the studied years. The resulting data includes about 30,000 firms each year totaling approximately 1.75 million jobs.<sup>2</sup>

I classify a firm as private if the state controls only a minority of its share capital; otherwise it is state-owned. As a result of privatizations, some firms changed ownership during the studied period, but this happened in only 34 companies, with total employment less than 3000. I use contemporaneous ownership and allow firms to from one ownership-type to another.

Table 1 shows the total number of firms included in the analysis, as well as their total and average employment by the two ownership types. SOEs are small in number (909), but quite large in size, with an average employment of 238. The state, therefore, is still an important owner of Hungarian corporations, employing almost 220 thousand workers or 12 percent of all employees in the sample. Private firms make up 97 percent of the firm sample and 87 percent of employment. Their average employment is 51.

Following Davis and Haltiwanger (1999), I define the firm-level net job creation rate for year  $t$  ( $g_{it}$ ) as the change in employment from one year to the next, divided by the average employment size between the two years. The rate of gross job creation ( $jc_{it}$ ) is identical with  $g_{it}$  if the firm is growing from one year to the next, and zero otherwise. The rate of gross job destruction ( $jd_{it}$ ) is equal to  $-g_{it}$  for shrinking firms and zero otherwise (in the following we suppress the indexes  $it$ ). Table 2 presents the three rates for each year in the analysis (the figures are weighted by average employment). In the two years before the crisis (2007 and 2008),  $g$  was 0 and -0.027 for the whole sample, respectively.<sup>3</sup> In 2009 it dropped by 9.2 percent, leveling somewhat by the following year, but corporate employment was still declining at a rate of almost 4 percent.

The disaggregation of  $g$  by ownership-type reveals that private firms did not change their employment levels in 2007 and were shedding labor already in 2008 at a rate of 2.1 percent. When the crisis hit Hungary, private firms reacted to the new conditions with a massive labor drop of 10.4 percent, which was followed by a further drop of 4.1 percent in 2010. Before the crisis, SOEs shed more labor in proportional terms than private companies: the rate of net job creation is negative and as high as 3 and 7 percent in the two pre-crisis years. These firms, however, kept their employment remarkably stable during the crisis:  $g$  equals of -0.009 in 2009 and -0.018 next year. These values are small not only when compared to the substantial drop of employment happening

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<sup>2</sup> The total number of Hungarian corporate employees was around 1.933 million in 2007 (Hungarian Statistical Office).

<sup>3</sup> The Hungarian economy was close to recession already at the beginning of the studied period (GDP growth was only 0.1 percent in 2007 and 0.9 percent in 2008), but the global crisis hit companies next year, when GDP contracted by 6.8 percent, followed by a 1.3 percent recovery in the last year of the analysis (Hungarian Statistical Office).

in private firms in the same period, but also relative to the rate of labor shedding of SOEs before the crisis. The negative pre-crisis growth rates may be explained by the unfavorable economic situation in Hungary when the government introduced an austerity package to balance its budget, which could have forced SOEs to shed labor. The difference between the net job creation rates of SOEs and private enterprises during the crisis, however, is hard to explain in the framework of simple profit-maximizing behavior, and suggests that political factors – such as preserving employment during hard times – could well contribute to this behavior.

To understand what processes lie behind these adjustment patterns, we also present  $jc$  and  $jd$  in Table 2. Private firms decrease  $jc$  and boost  $jd$  in the first crisis year by 3 and 5 percentage points, respectively. In the last year of the analysis  $jd$  falls to its pre-crisis level and  $jc$  also increases somewhat. SOEs also decrease  $jc$  by about 1 percentage point (which was already quite low before the crisis) but they simultaneously decrease  $jd$  by 7.5 percentage points, which is lower by almost 12 percentage points than the same figure of private companies. In the last year of the analysis, the  $jc$  of SOEs does not change while  $jd$  increases by one percentage point.

### 3. EMPIRICAL METHODOLOGY AND RESULTS

I follow the methodology developed by Davis and Haltiwanger (1999) and run regressions where the dependent variable is  $g$ ,  $jc$  and  $jd$ , and the explanatory variables include a state ownership dummy, the interaction term of this variable with a crisis dummy (which equals 1 for 2009 and 2010), and the crisis dummy itself.<sup>4</sup> The regressions control for export status, 2-digit industry effects, 9 employment size controls, and 11 age controls, as the dependent variables are likely to be correlated with these firm characteristics (Haltiwanger et al., 2010; Neumark et al., 2011):<sup>5</sup>

$$y_{it} = \alpha_0 + \alpha_s State_{it} + \alpha_c Crisis_{it} + \delta_s State_{it} Crisis_t + \alpha_2 Export_{it} + Size_{it} + Industry_i + Age_{it} + \varepsilon_{it}.$$

In this equation  $i$  indexes firms,  $t$  indexes time,  $\varepsilon_{it}$  is the error term and the regression is weighted by average employment.  $\alpha_s$  measures the conditional mean difference in the dependent variable by ownership type before the crisis,  $\alpha_c$  measures the effect of the crisis on private companies, and  $\delta_s$  indicates the difference between employment adjustment of SOEs and private firms during the crisis.

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<sup>4</sup> When I replace the crisis dummy with a full set of controls for years, the results do not change at all.

<sup>5</sup> A firm is an exporter if it exports at least 5 percent of its output in a given year. The employment categories are the following: 1-4, 5-9, 10-19, 20-49, 50-99, 100-249, 250-499, 500-999, more than 1000. The age controls are dummies for each year by the age of 10 and an aggregate category for older firms.

Despite the presence of firm-level control variables, these regressions may be biased, as firms under the control of state and private entities have very diverse industrial composition, employment size and age. If there are differences between employment adjustment of firms along these variables, the results may be biased because the lack of a common support of these variables across ownership. To estimate the differences in employment adjustment between SOEs and private companies more precisely, I create a control group that is similar to SOEs and run the regression on this restricted sample. As SOEs are much less likely to enter and exit the data than private companies, I keep only those firms which are in the sample for the whole period. In addition, I keep only those private firms which are older than 10 years, those which belong to an industry where there is at least one SOE and which have identical employment with the state-owned company in the given industry. If there is no private firm which satisfies the last condition, I include firms whose employment size is in a caliper of 10 percent around the SOE's size. If no private firm satisfies these conditions, the SOE is dropped from the analysis.<sup>6</sup> The resulting dataset has 573 SOEs which are matched to 2,118 private controls.

The regression results for the full sample are shown in the top panel of Table 3, and document that before the crisis, SOEs and private companies had identical  $g$ ,  $jc$  and  $jd$  conditional on size, age and industry. The crisis decreased domestic firms'  $g$  by 5.5, and increased it for SOEs by 3 percentage points. These results underline the behavior of SOEs documented with the unconditional rates: relative to private companies, SOEs create 8.4 percent more jobs in the crisis on the net.<sup>7</sup>

The table also presents the same regression but with  $jc$  and  $jd$  as dependent variables. These rates are identical across ownership types before the crisis. As expected, the burst of the crisis decreases  $jc$  in private firms (by 2.6 percent) and it also increases  $jd$  (by 2.9 percent). SOEs'  $jc$  is not different from private companies', but  $jd$  is lower by more than 8 percentage points. The relative increase of net job creation associated with state ownership is therefore the result of a massive decline in job destruction in state-owned enterprises.

The regression results for the restricted sample are presented in the lower panel of Table 3 and are quite similar to those for the full sample. In this sample, SOEs and private firms have somewhat different adjustment patterns before the crisis: the coefficients of state ownership are different from zero but they are rather small and insignificant. The crisis reduces  $g$  of private firms only by 2

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<sup>6</sup> This procedure generally results in having one or few control firms for large SOEs and many for the small ones.

<sup>7</sup> Konings (1997) finds that SOEs have lower  $g$  in Romania, Bulgaria and Hungary than private firms. Brown and Earle (2003, 2006) find that new firms have higher growth rates than state-owned and privatized firms in Russia, but they do not find any differences between state and private firms in Ukraine.

percentage points, which is mostly due to a decline in  $jc$ . The divergent behavior of state ownership, however, is found in this sample as well:  $g$  is almost 7 percent larger in SOEs than in private firms during the crisis. This difference is caused equally by a larger  $jc$  and a lower  $jd$  each of a magnitude of around 3.5 percent.<sup>8</sup>

#### **4. CONCLUSIONS**

This paper has studied the employment adjustment of state- and privately-owned enterprises during the global crisis, finding that before the crisis the two ownership types do not differ in their adjustment patterns; however, after its outbreak, state ownership is associated with higher job creation and lower job destruction than private ownership, resulting in a difference in the net job creation rate of 7-8.5 percentage points. The cause of the divergent behavior of SOEs and private companies may be a longer reaction time in the case of SOEs, or that the government, being aware of the mounting unemployment rate, fought this through the enterprises it directly controlled; unlike private corporations, state firms did not shed labor and thus cushioned the effects of the drop in global demand on employment.

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<sup>8</sup> The matching was also performed by using only firms which are older than 16 years. The regression coefficients do not change, but their significance drops.

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**TABLES**

*Table 1*

**Characteristics of the Sample, 2007**

	State	Private	Total
<b>Firms</b>			
N	909	29374	30283
Percent	(3.0)	(97.0)	(100.0)
<b>Employment</b>			
N	216.5	1501.9	1718.4
Percent	(12.6)	(87.4)	(100.0)
Mean employment	238	51	57
	(1743.9)	(231.1)	(379.5)

Note: "N" refers to number of firms/total employment, "Percent" refers to percent of firms/proportion of employment. Standard deviation in parenthesis. Employment measured in thousands.

*Table 2*

**Job Flow Rates by Ownership**

	Net Job Creation	Job Creation	Job Destruction
<b>Total</b>			
2007	0.000	0.105	0.105
2008	-0.027	0.079	0.106
2009	-0.092	0.046	0.139
2010	-0.038	0.060	0.098
<b>Private</b>			
2007	0.004	0.113	0.108
2008	-0.021	0.083	0.105
2009	-0.104	0.049	0.153
2010	-0.041	0.065	0.106
<b>State</b>			
2007	-0.028	0.056	0.084
2008	-0.071	0.042	0.113
2009	-0.009	0.029	0.037
2010	-0.018	0.029	0.046

Note: N = 113,850. The rates are weighted by average employment.

Table 3

**Variation of Job Flows by State and  
Private Ownership Before and During the Crisis**

	Net Job Creation	Job Creation	Job Destruction
<b>Full Sample</b>			
State	0.001 (0.035)	0.001 (0.019)	-0.000 (0.025)
Crisis	-0.055** (0.007)	-0.026** (0.003)	0.029** (0.006)
State*Crisis	0.084* (0.039)	0.003 (0.020)	-0.081** (0.030)
R <sup>2</sup>	0.111	0.278	0.073
<b>Matched Sample</b>			
State	-0.024 (0.019)	0.009 (0.014)	-0.018 (0.011)
Crisis	-0.020 (0.011)	-0.014* (0.006)	0.006 (0.008)
State*Crisis	0.068** (0.020)	0.035** (0.013)	-0.032* (0.014)
R <sup>2</sup>	0.084	0.035	0.108

Notes: N = 113,850 (full sample); 10,804 (matched sample). Regressions weighted by average employment. Controls include export status, 2-digit industries, 9 employment size categories and 11 age categories. Standard errors (adjusted for clustering of firms) in parenthesis. \*\* = significant at 0.01; \* = significant at 0.05.