

***Employment and Wages in Enterprises Under Communism and in
Transition: Evidence From Central Europe and Russia***

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William Davidson Working Paper Number 440
June 2000

**EMPLOYMENT AND WAGES IN ENTERPRISES
UNDER COMMUNISM AND IN TRANSITION:
EVIDENCE FROM CENTRAL EUROPE AND RUSSIA**

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In undertaking the research for this paper, Saul Estrin and Jan Svejnar were in part supported by World Bank research grants on Enterprises in Transition and Labor Markets in Transition, respectively, and by ACE PHARE grant No. P96-6095-R. Svejnar in part also benefited from NSF grants Nos. SBR 951-2001 and SES-921-3310. The authors would like to thank Olivier Blanchard, Tito Boeri, Simon Commander, George Johnson, and participants of seminars at Princeton University, the London Business School, University of Pittsburgh, and the 1996 and 1999 Davidson Institute Annual Workshops on Transition Economics for valuable comments. They are also indebted to Lubomir Lizal, Miroslav Singer, Lina Takla, and Chris Walters for valuable computer assistance.

Abstract

This paper presents a comparative analysis of employment and wage behavior of firms in the Czech Republic, Slovakia, Poland, Hungary and Russia during the late 1980s to the early 1990s. The four main findings are: 1) There is evidence of some (not excessive) labor hoarding before the transition and it disappeared shortly thereafter; 2) The estimated elasticities of demand grew over the transition, starting from zero in Russia, the Czech Republic and Slovakia and from sizeable levels in Hungary and Poland. By the end of the period, the elasticities for the four East European countries were quite similar and those for Russia had not changed significantly; 3) Once other factors are controlled for, there is no significant difference in the employment behavior among firms by ownership or legal status. However, Czech, Slovak and Polish private firms did pay higher wages than state-owned firms immediately after the start of the transition; 4) A closer examination in the Czech Republic of state-owned enterprises (SOEs) and newly established firms indicates that SOEs had lower elasticities of employment and allowed less rent sharing than the newly established firms.

Keywords: Russia, Central Europe, Employment, Wages

1. Introduction

In this paper we present a comparative analysis of the employment and wage behavior of firms as they moved from the communist economic system of the late 1980s into the transition to a market economy in the early 1990s. In carrying out this analysis, we use large panels of annual data on industrial enterprises in the Czech Republic, Slovakia, Poland, and Hungary, as well as a smaller (but best available) data set on industrial firms in Russia. We are thus able to demonstrate how the employment and wage setting behavior of firms varied with the change in the economic system as well as specific changes in enterprise ownership and legal status before and during the transition.

In our analysis, we address five important questions that have arisen in the debate about the nature of the centrally planned system and the subsequent transition to a market economy. The first issue concerns the extent to which important inter-country differences existed in the behavior of firms under the communist system in the late 1980s and the extent to which these differences disappeared as the transition was launched in the 1990s. An influential school of thought has argued, but not proved with micro data, that the behavior of firms in Hungary and to a lesser extent Poland reflected major reforms, while firms in the Czech Republic, Slovakia and Russia operated under a classical communist system of central planning before the transition was launched. Our findings, based on estimates of firm-level employment elasticities with respect to sales, suggest that firms in Hungary indeed started substantially reformed (having significant elasticities with the expected signs) and advanced further as the transition proceeded. Firms in Poland were somewhat less reformed (displaying smaller elasticities) but advanced fast, while firms in the Czech and Slovak republics started from what could be termed a stereotypical planned mode (having zero elasticities) but caught up very fast with Hungary and Poland. Finally, our results indicate that as late as 1993-94, firms Russia displayed virtually no sign of a transition to a market-like behavior (i.e., we find zero elasticities).

The second set of interrelated issues that we investigate is whether and to what extent firms in the Czech Republic, Hungary, Poland and Slovakia (a) hoarded labor, (b) allocated labor efficiently from a private or social standpoint, and (c) placed emphasis on wages versus employment.¹ In terms of the existing western literature, we investigate whether firms in these economies operated on the labor demand curve or on a more labor-intensive contract curve and whether their behavior changed systematically as they moved from central planning into the transition period. In terms of the economics of transition, we provide first systematic evidence on the widely maintained assumption that under communism firms hoarded labor and thus entered the transition with excess employment. Many theoretical models of the transition for instance assume that communist firms enter the transition with excess labor and that enterprise restructuring should initially hence consist of labor shedding.² Our striking finding is that when wages and output are taken into account, excess labor was an exception rather than the rule. In particular, the only instance when we detect excess employment (firms being to the right of the demand curve of labor) is in the case of Czech firms during the “big bang” year when the transition was launched. Moreover, taking into account the opportunity cost of labor in the Czech economy, the level of employment during the big bang year was actually not excessive from the standpoint of GDP maximization. The behavior of the Polish and Slovak firms during the big bang year is consistent with being on the labor demand curve,³ as is the behavior of firms in all four economies after the start of the transition. Labor hoarding hence appears to have been much less prevalent at the end of communism than is widely believed, and it is not detectable after the start of the transition.

The third issue that we explore is whether workers shared in firm-specific rents and losses

1 We do not have all the data needed to answer these questions with respect to Russia.

2 See e.g., Aghion, Blanchard and Burgess (1994), Blanchard and Kremer (1997) and Roland and Verdier (1999).

3 We do not have some of the data needed for providing estimates on Hungary during the first year of the transition.

under communism and during the transition. This question is of interest because wages were set relatively rigidly across firms under central planning, but this lack of a relationship between a firm's performance and its workers' earnings was presumably waning as communism collapsed. Indeed, the issue of power of worker-insiders and firm-specific wage setting has arisen in many policy discussions since the start of the transition. Our analysis suggests that wages varied with enterprise performance at the end of the communist period in Poland (where the Solidarity trade union was an important force) and to a lesser extent also in Slovakia. However, the phenomenon was undetectable in the Czech Republic and Hungary. Yet, within a year after the launching of the transition, we find that worker incomes started to vary significantly with enterprise performance in all four Central European countries that we study, but not in Russia. In this context, we have also tested for the presence of a "wage curve" - variation of wages with local unemployment (Blanchflower and Oswald, 1994). Interestingly, with the exception of Slovakia, we do not find a significant association between local unemployment and wages. This lack of support for the wage curve hypothesis is interesting in view of the wide variation in the local unemployment rate across districts and over time.

The fourth issue relates to the relative performance of the newly established (*de novo*) and existing state-owned firms. The establishment of new firms is widely viewed as a key ingredient of a successful transition process since, unlike the state-owned enterprises (SOEs), the *de novo* firms are considered to be more market-oriented and operate under hard budget constraints.⁴ Our Czech and Slovak data permit us to examine whether the SOEs that existed under communism and survived during the first few years of the transition behave differently than the *de novo* firms, with the latter category being composed of start-ups and spinoffs. We find that the surviving SOEs are more rigid in the Czech Republic but more responsive in Slovakia in terms of employment adjustment than the

new firms. Interestingly, in both republics the SOEs allow workers less rent-sharing through wages and fringe benefits than the new firms. The behavior of the Czech SOEs during the early transition hence reflects the stereotype of state ownership in terms of more rigid employment policies, but also in terms of more control on rent-sharing by worker-insiders. The Slovak SOEs also limit rent-sharing by worker-insiders but they exhibit greater employment adjustment, a finding that is consistent with a harder budget constraint under large macro shocks that we discuss below.

Finally, we examine whether employment and wage setting varied systematically with enterprise ownership and legal status. This is not a principal focus of our inquiry in that we include as regressors dummy variables capturing numerous ownership and legal status variables but we do not explore the determinants of ownership and legal status.⁵ Yet, our findings are provocative in view of the importance assigned to privatization and commercialization of firms as catalysts of change in enterprise behavior. Contrary to widely held views,⁶ we do not find legal status and ownership of the firm to be associated with systematically different employment and wage behavior. In particular, employment behavior does not vary systematically with firm's ownership and legal status, while private firms paid higher wages immediately after the start of the transition but this wage premium appears to have dissipated later on.

Our analysis is of interest for four reasons. The first reason is of a general and fundamental nature. Communism and its accompanying system of central planning constitute some of the most important economic phenomena of the twentieth century, having affected profoundly the lives of about one-third of the world's population. An analysis of how firms behaved under the communist system and during the transition process to a market economy is essential for an understanding of

4 See e.g., The World Bank (1996) and EBRD (1998 and 1999).

5 See Gupta, Ham and Svejnar (1999) and Brown and Earle (1999) for examples of studies that focus on the determinants of ownership.

6 See e.g., The World Bank (1996) and EBRD (1998 and 1999).

this phenomenon and of the functioning of the market system that we otherwise observe only in a mature steady state.

Second, by carrying out a comparative analysis, we are able to elucidate the different patterns of adjustment in the various Central and East European (CEE) economies during the first phase of the transition.⁷ In particular, there is still only limited understanding of why all the former Soviet bloc economies experienced a depression-like fall in output and employment in the first few years of the transition.⁸ As may be seen from Table 1, the four CEE economies that we study experienced similar (17.5-20.5 percent) cumulative declines in estimated GDP in the early 1990s, before they resumed economic growth.⁹ Yet, the four economies responded to this output decline very differently in terms of employment and wage adjustment. In the Czech Republic, employment declined by only 9 percent but real product wages fell by 24 percent in the 1990-92 period.¹⁰ In contrast, in Hungary employment declined by full 20.5 percent but real product wages actually increased by 17 percent. Poland took a middle way, with employment decreasing by 11 percent and wages by 0.5 percent. Finally, Slovakia, having experienced the most profound (20.5 percent) decline in GDP among these four economies, registered a substantial fall in both employment and wages (13.5 and 21 percent, respectively).

As may be seen from the data on direct enterprise subsidies in Table 1, all four CEE countries reduced these government subsidies to the range of 3-6 percent of GDP in the early 1990s. However, in 1989 Czechoslovakia started with a much higher level of subsidies (25 percent of GDP)

7 Because our data on Russia come from an enterprise survey carried out in one point in time, we cannot extend the full comparative analysis to Russia. Moreover, the transition path has been somewhat different in the former Soviet Union (see e.g., Estrin and Wright, 1999) and a full comparison the different paths is beyond the scope of the paper.

8 See e.g., Rodrik (1994), Li (1994), Kornai (1995), Blanchard and Kremer (1998), and Roland and Verdier (1999) for some of the hypotheses and evidence that have been advanced in this area.

9 We do not include Russia in Table 1 since our analysis of Russia is limited to firm-level data from the 1993-94 period. Moreover, the pattern of economic decline observed in Russia is more extended than that in CEE.

10 Real product wages are defined as nominal wages deflated by the producer price index.

than Hungary (12 percent) and Poland (10.6 percent). The more severe wage-employment adjustment in Czech and Slovak republics is in part the result of their more precipitous decline in enterprise subsidies during the early 1990s. Since Slovakia was receiving substantial cross-subsidies within Czechoslovakia, the fact that the most severe decline in employment and wages is observed in Slovakia reflects in part the major subsidy reduction in that republic. These findings are consistent with the unemployment data that show the unemployment rate rising from zero to double digits in Hungary, Poland and Slovakia, but remaining at or below 4 percent in the Czech Republic in the early 1990s (Table 1). The relatively greater rise in unemployment in Hungary and Poland could be expected since these countries, unlike the Czech Republic, opted for a more pronounced reduction in employment than wages. Slovakia, despite reducing wages dramatically, did not escape a major decline in employment and rise in unemployment (Table 1). Ham, Svejnar and Terrell's (1998, 1999) finding that higher unemployment in Slovakia than the Czech Republic was in this period driven in part by lower demand in Slovakia is also consistent with this "subsidy reduction" hypothesis.

The third reason for the need to understand better the employment and wage behavior of firms in the transition economies relates to the political economy of the reform. Countries with significant employment reduction and rapid rise of unemployment (Hungary, Poland and Slovakia) experienced a strong negative political response, with the first post-communist governments having been quickly rejected by voters and more socially-oriented (often reformed communist) governments having been voted into office in the early 1990s.¹¹ In contrast, the low unemployment rate and relatively modest employment decline in the Czech Republic coincided with that country's first post-communist leadership remaining solidly in power until 1996 and surviving in a weaker form until 1998. These different political outcomes suggest that voters in the transition economies are sensitive

to losses in job security and declines in living standards, and that an understanding of the wage and employment behavior of enterprises is important for the ability of policy makers to pursue successful transition policies.

Finally, because the economies of Central and East Europe were the first ones to enter the transition process and represent diverse cases in terms of initial conditions, policies and outcomes, our comparative analysis provides important information for the policy makers in these economies as well as those in all the other post-communist countries that launched their transitions later. Poland and Hungary for instance entered the transition with a significant private sector in agriculture and services, as well as relatively limited government subsidies to and control over enterprises. In contrast, the Czech, Slovak and Russian economies were highly centralized, almost completely state-owned and relying on cross-subsidization to maintain the SOE sector. Data from these economies hence capture the diverse origins and transition paths from a centrally planned to a market economy.

The format of the paper is as follows. We start in Section 2 by presenting our conceptual framework and the estimating equations. In Section 3 we describe the data and report the econometric estimates with respect to employment and wage elasticities. In section 4, we discuss our findings with respect to the effects of ownership and legal status. We conclude in Section 5.

2. The Conceptual Framework and Estimating Equations

In examining the wage and employment outcomes before and during the transition, we use the conceptual framework depicted in Figure 1. For any given firm, the competitive labor market outcome is given by employment L^* at point A, with the marginal revenue product of labor R_L equaling the competitive (market clearing) wage W_c . Since planners kept wages low and sought to

11 By the late 1990s the electoral cycle brought the reformers back to power in some countries.

maintain full employment when the communist system was intact, an efficient centrally planned system with full employment may be conceptualized precisely as one that induces firms to operate at point A. At this point, the workers are paid the minimum acceptable wage and the planners appropriate the maximum profit, as depicted by the iso-profit curve $\Pi = \text{Max}$.

Since in countries such as Hungary and Poland, the communist system was reformed in the 1980s as a result of pressure from workers and managers, a more realistic way to conceptualize the workings of the labor market in these economies is to portray it as bargaining between the planners, managers and workers. Depending on the preferences and relative power of these three parties, the wage-employment outcome could lie anywhere in the area AB'F' in Figure 1.¹² Points B' and F' lie on the zero profit ($\Pi = 0$) iso-profit curve and reflect the maximization of income per worker and employment, respectively, subject to profit being zero and the wage being at least W_c . The contract curve ABB', which corresponds to the short run labor demand curve of a profit maximizing firm, reflects outcomes with varying emphasis on wages and profit (no emphasis on employment), while the horizontal contract curve AFF' corresponds to varying degrees of joint employment and profit maximization (no emphasis on wages above W_c). The outcomes C', D' and E' on the $\Pi = 0$ iso-profit curve reflect varying degrees of emphasis on wages and employment (subject to zero profit). A set of intermediate outcomes where the planners appropriate a given level of profit are depicted by the iso-profit curve $\Pi = \alpha \text{Max}$ and the corresponding points B, C, D, E, and F.

The socially efficient set of outcomes, corresponding to $R_L = W_c$ and various wage-profit combinations, lies on the vertical contract curve ADD'. These outcomes are also important from an empirical standpoint because they correspond to a situation where the firm does not adjust employment in response to changes in the wage, *ceteris paribus*. Backward bending contract curves

12 See e.g., McDonald and Solow (1981) and Svejnar (1982,1986) for the underlying model.

(e.g., ACC' and ABB' in Figure 1) imply that the firm reduces employment in response to a wage increase, while forward sloping contract curves (e.g., AEE') imply that wages and employment move in the same direction.¹³

Finally, it should be noted that the framework of Figure 1 can capture the widely discussed phenomenon of soft budget constraints under communism, whereby planners cross-subsidized loss making firms from the surplus of profitable firms. In Figure 1, this scenario is captured by the loss making firms operating above and the profitable firms below the $\Pi = 0$ curve. Firms operating at point F'' receive a subsidy for hoarding extra labor, while paying the minimum acceptable wage W_c . Firms at E'' use part of the subsidy to pay a wage above the reservation level. Hardening of the budget constraint, be it through elimination of subsidies, privatization or other means, is reflected in a leftward move from points such as F'' and E'' to the $\Pi = 0$ curve or even further to points such as A, B or B' on labor's marginal revenue product curve.

As our discussion indicates, firms in different countries are likely to have started the transition from different wage-employment-profit combinations. Moreover, they probably exhibited different original distribution of power among the planners, managers and workers. Finally, depending on the form of macro stabilization, enterprise commercialization and privatization, the hardening of budget constraints, and redistribution of power among the government, managers and workers, the behavior of firms is likely to have evolved differently in different countries. In view of all these possible changes, it would be necessary to invoke very strong assumptions if one tried to identify the preferences of the government, managers and workers and their possible changes over time. Moreover, for our purposes this is unnecessary since our goal is to assess if enterprise behavior observed during the pre-transition and transition periods reflected outcomes consistent with being on

¹³ Prasnikař et al. (1994) for instance found that firms in former Yugoslavia operated along a curve such as ACC' in Figure 1.

the labor demand or another contract curve and if the behavior changed systematically as a result of the transition.

Our empirical strategy is to proceed in three steps. We first derive and estimate a dynamic labor demand equation and obtain elasticity estimates under the assumption that wages are either set exogenously (by the planners or the market) or that they are set by the employer or through bargaining, with the management setting employment in a cost minimizing way. We next derive and estimate an employment equation that includes a proxy for the reservation (alternative) wage of workers and hence permits us to interpret the estimated coefficients as indicating whether the outcome deviates from the labor demand curve and hence reflects bargaining over both wages and employment. Our third set of estimates comes from a wage equation that we estimate simultaneously with an employment equation.

In estimating the labor demand equation, we use the following specification:

$$L = L(W/P, Q, X), \tag{1}$$

where L = number of employees, W = the nominal wage, P = the product price index, Q = the sales or output of the firm, and X = a vector of ownership, legal status, and industry dummy variables that may affect the firm's demand for labor. The specification in equation (1) corresponds to a labor demand function of an enterprise characterized by cost minimization subject to an exogenously given level of output. This approach has been used frequently in the studies of western economies and it is useful to adopt it as a starting point in our analysis.¹⁴ In fact, the assumption of exogenously set output is more realistic in our setting than in the West

¹⁴ For examples of western analyses using this framework see e.g., Hamermesh (1986, 1993) and Quandt and Rosen (1992).

since firms in Eastern Europe and Russia were arguably output constrained as a result of the dramatic output fall that resulted from the collapse of the Soviet market in 1990 and the following years, the imposition of restrictive macroeconomic policies in the late 1980s and 1990s, and the disbanding of the common trading area of the Soviet bloc (CMEA) in 1991.

Assuming that wages were set exogenously to the firm by the planners and later by the market and government wage controls, one could estimate equation (1) by ordinary least squares. We err on the conservative side and treat the wage as endogenous since enterprises had some latitude in setting wages. We also test whether the negative output shock imposed an exogenous output (sales) constraint on firms. In the employment equation we therefore instrument wages and test whether sales are to be treated as exogenous by the Hausman test for exogeneity.¹⁵ The instrumental variables that we use are district dummy variables, two digit industry dummy variables, preceding year value of enterprise assets interacted with industry dummy variables, firm ownership, and the current and lagged average values of sales, wages, and employment of firms in the neighboring three digit industry, as well as the average value of lagged assets of firms in the neighboring three digit industry. The district-level dummy variables are used as instruments because wages and changes in wages varied across districts in response to changes in the cost of living and other compensating differentials, while technology is likely to be invariant across districts.¹⁶ The industry and regional dummy variables are also used as instruments to capture factors such as the technical and managerial error components of the underlying production function (Zellner, Kmenta and Dreze, 1966). Finally, by using as instruments the average values of variables from firms in the nearest three-digit industry within the same two-

15 Endogenous output would imply that equation (1) is a structural expression, corresponding for instance to profit maximization, rather than a reduced form equation.

16 In the medium and long run firms would presumably adjust location in response to regional wage differentials but this phenomenon is absent in the short span of two consecutive years.

digit classification, we capture the effect of common external shocks to similar sub-industries within a given two-digit industry, while avoiding the correlation between the error term and regressors that may be brought about by the firm- and three-digit industry fixed effects (see also Kmenta, 1997, p. 360).¹⁷

In estimating equation (1), we use a dynamic specification and estimate on consecutive two-year panels of data. Using a dynamic specification is desirable since early transition was a very dynamic process and it would be unrealistic to assume complete adjustment of variables within a one-year period. Using consecutive two-year panels, and hence estimating a series of dynamic cross-section equations, is motivated primarily by the fact that the high frequency of enterprise entry, break-ups and exit would make us lose most Czech and Slovak observations and all observations on Russia if we used longer than two-year panels. Using the short panels also allows us to assess how the behavior of firms changed from the pre-transition period into the various phases of the early transition. As a result, for each country we use consecutive two-year panels of data and test for the stability of coefficients across the two-year periods.

We specify equation (1) in a loglinear form and introduce a general dynamic framework by allowing the left hand side variable and all the principal right hand side variables to enter in both current and one-year lagged form.¹⁸ Formally, this first-degree general distributed lag model is specified for equation (1) as

17 The Hausman test warranted the instrumenting of the sales variable in some but not all the reported regressions. In particular, Slovakia appears to have been the most output constrained of all the countries, as we cannot reject the hypothesis of exogeneity of sales in the employment equation. In Hungary, output appears exogeneously determined (constrained) in the pre-transition and early transition period, but not in the later periods. In Poland, we reject exogeneity of sales in almost all runs and in the Czech Republic literally in all runs. Interestingly, when we consider only the “balanced panel” of 266 SOE’s that existed before and survived the transition in the Czech Republic, the Hausman test suggests that these firms were output constrained before and at the start of the transition, but ceased to be so in the later years.

18 See e.g., Hendry and Mizon (1978), Nickell (1986) and Estrin and Svejnar (1993).

$$\ln L_t = \alpha_0 + \alpha_1 \ln(W/P)_t + \alpha_2 \ln(W/P)_{t-1} + \alpha_3 \ln Q_t + \alpha_4 \ln Q_{t-1} + \alpha_5 \ln X_t + \alpha_6 \ln X_{t-1} + \alpha_7 \ln L_{t-1}. \quad (1')$$

In equation (1'), the short-term elasticity of employment with respect to the wage is given by α_1 , while the corresponding long-term elasticity is given by the ratio of the two relevant polynomials in the lag operator $(\alpha_1 + \alpha_2)/(1 - \alpha_7)$. The short and long-term employment elasticities with respect to output and the other variables are defined analogously.¹⁹

While the flexible stochastic difference equation (1') may be viewed as an arbitrary flexible approximation to a dynamic adjustment, it may also be derived formally from an underlying cost minimization behavior of the firm (see e.g., Nickell, 1986 and Bresson et al., 1992). In particular, suppose firms face exogenous output constraints and quadratic costs d and e in adjusting their labor L and capital K inputs, respectively. Furthermore, assume that the firms determine their employment paths by minimizing input costs C_t :

$$C_t = E_t \sum_{\tau=0}^{\infty} \left(\frac{1}{1+r} \right)^{\tau} [c_{t+\tau} K_{t+\tau} + W_{t+\tau} L_{t+\tau} + d(\Delta L_{t+\tau})^2 + e(\Delta K_{t+\tau})^2] \quad \forall t$$

subject to a production constraint

$$Q(L_{t+\tau}, K_{t+\tau}) = Q_{t+\tau}, \quad \forall t,$$

where E is the expectation operator, c_t is the user cost of capital, d and e are the parameters of quadratic adjustment costs, $\Delta L_t = L_t - L_{t-1}$ and $\Delta K_t = K_t - K_{t-1}$, respectively. Assuming further that the production function is of the Cobb-Douglas form, changes in employment from period to period

¹⁹ Since we use two-digit industry dummy variables as intercepts and estimate on a two-year panel of annual data, a two digit producer price variable P would be collinear with the industry dummies. We therefore do not enter the price variable on the right hand side of equation (1').

are relatively small and the exogenous variables follow an autoregressive process of the second degree, one obtains a loglinear equation such as (1'), where the vector X_t includes c_t .

Equation (1') represents a relatively general model within which one can test if the appropriate specification is (a) a partial adjustment model $\alpha_2 = \alpha_4 = \alpha_6 = 0$, (b) a static model $\alpha_2 = \alpha_4 = \alpha_6 = \alpha_7 = 0$, or (c) a (first difference) fixed effects model $\alpha_2 = -\alpha_1$, $\alpha_4 = -\alpha_3$, $\alpha_6 = -\alpha_5$, and $\alpha_7 = 1$. In our empirical work we test and in most cases reject the above restrictions.

In the second step of our empirical investigation, we allow for bargaining over both wages and employment, with the contract curve deviating from the marginal product curve of labor in relation to the weight that the bargainers place on employment relative to wages. In particular, following the conceptual frameworks of Brown and Ashenfelter (1986) and Prasnikař et al. (1994), assume that worker preferences over wages and employment are given by a Stone-Geary function

$$U = k(W/P - W^a/P)^{\alpha} L^{(1-\alpha)},$$

where W^a is the alternative (reservation) wage, and that the management (and possibly government) is interested in profit

$$\pi = PQ - WL - H,$$

where H is fixed non-labor cost.²⁰ A Pareto-efficient contract that equates the marginal rate of substitution between wages and employment in these two objective functions (e.g., in a Nash bargaining context) yields the marginal revenue product condition

²⁰ The government may also be interested in employment generation, in which case its objective is congruent with that of workers (Prasnikař et al., 1994).

$$PQ_L = W - \gamma(W - W^a),$$

where $\gamma = (1 - \alpha)/\alpha$ is the weight that the firm places on employment relative to wages. In the context of a particular production technology (e.g., CES) one can derive an employment equation of the form

$$\ln L = \beta_0 + \beta_1 \ln Q + \beta_2 X - \sigma(1 - \gamma) \ln(W/P) - \sigma \gamma \ln(W^a/P), \quad (1'')$$

where σ is the constant elasticity of substitution between labor and capital in production or another non-negative parameter. As may be seen from this employment equation, when the firm places no weight on employment ($\gamma = 0$), the coefficient on the alternative wage is zero and the specification reduces to the standard labor demand equation. When the firm places equal weight on wages and employment ($\gamma = 1$), the coefficient on the own wage is zero and employment is driven by the alternative wage. This is the case corresponding to the (socially efficient) vertical contract curve ADD' in Figure 1. For $\gamma > 1$, one obtains forward sloping contract curves such as AEE' in Figure 1.

Econometrically, equation (1'') represents a relatively straightforward extension of the basic labor demand model, with the alternative wage and possibly some other control variables added to the right hand side. Since we have accurate and highly varying district-level data (regional-level data in Poland) on local unemployment, we follow Brown and Ashenfelter (1986) and postulate that the alternative wage is an inverse linear function of local unemployment and industry dummy variables. In addition, in order to allow for the possibility that during the transition employment is influenced by the capital stock that planners allocated to firms under communism, we include one year lagged

capital assets of the firm as an explanatory variable in equation (1''). As with equation (1'), we estimate equation (1'') in the general distributed lag form.

In the third phase of estimation, we model explicitly the outcome of wage and employment determination and estimate jointly a wage and employment equation. We use equation (1'') and supplement it with a wage equation that allows for the possibility that worker-insiders appropriate some of the enterprise-specific rents as their wages. The wage equation that we estimate hence reflects the hypothesis that, in addition to exogenous factors, wages may depend on enterprise characteristics and policy variables:

$$W = W(Q/L, X, Z), \tag{2}$$

where Q/L = sales per employee, X = the ownership, legal status, and industry cum regional variables discussed above and Z = a vector of relevant structural and policy variables that may affect wages in a given firm. Ideally, we would like to include on the right hand side of equation (2) a variable such as net profit per worker (Svejnar, 1986), so as to reflect firm's rents that could potentially be appropriated by workers. Our data sets do not contain sufficient information to do so and we hence proxy firm's rents by two-digit industry dummy variables and firm's sales per employee (Q/L). The most important variable included in the Z vector is the local unemployment rate, which is included to test if it exerts a negative effect on the wage outcomes. This hypothesis has received considerable attention in the market economies under the heading of a "wage curve," and we check if it is supported by the firm-level data during the transition from plan to market.²¹

Like Q and L in equation (1), the Q/L variable in equation (2) is potentially endogenous. We

21 See e.g., Blanchflower and Oswald (1994).

hence test for its endogeneity by the Hausman test and instrument it using the same instrumental variables as in equation (1). We estimate equation (2) in a dynamic form, using a first degree distributed lag model that is analogous to that in employment equation (1').

Before presenting our empirical results, we briefly address three issues related to our data and methodology. First, like most large firm-level data sets, our data come in annual rather than quarterly or monthly frequency. The obvious disadvantage is that annual data contain aggregation over time that smoothes short term changes in variables. On the other hand, Singer's (1995) labor demand analysis using Czech monthly data produced very low output elasticities of labor demand, suggesting that employment and wage setting in CEE may reflect annual rather than shorter time intervals. Second, the need to use short panels of data prevents us from using more than one lag of variables in our specification. While the first-degree distributed lag specification may be limiting in some contexts,²² this is a shortcoming that we simply cannot overcome in view of the severe loss of observations that we would face if we were to use longer panels of data. In this context, it should also be noted that our distributed lag specification is more flexible than specifications used in other studies of the transition economies. Finally, there is a substantial literature dealing with the tradeoffs in estimating models in levels versus first differences of variables. As we have discussed above, we use a first-degree general distributed lag model that is quite flexible and dynamic, while also estimating and testing the merits of the static level and first difference specifications.

3. The Data and Econometric Estimates

3.a The Data and Summary Statistics

As mentioned in the introduction, we use annual data from industrial enterprises in four

²² Nickell (1986) for instance shows that if firms optimize over inputs that are aggregated in the data (e.g., skill categories of labor), it may be appropriate to include additional lags of the dependent variable in the employment

important transition economies: The Czech Republic, Slovakia, Poland, Hungary, and Russia. The data for the first four countries were collected from records that enterprises were legally required to submit to their country's Statistical Offices and Ministries of Finance. The Czech, Slovak and Polish data sets contain almost all industrial firms with twenty five or more workers. Except for the small firms, these three data sets provide an almost complete record of the transition of industrial firms in three key transition economies. The drawback is that it has been impossible to obtain these data for the later years as western-style protection of information took place. The Hungarian and Russian data are samples of industrial enterprises. The Hungarian data come from a 1988-91 panel of one thousand largest firms, of which about 400 are industrial firms. The latter are the firms we use in the present analysis. The Russian data come from a 1994 enterprise survey carried out by the World Bank.²³ The survey covered 394 firms that accounted for about 10% of Russian manufacturing output in 1991. The sample was drawn from the list of manufacturing firms in Russia, was stratified by industry and region, and the firms were sampled with replacement. However, the information available in the survey is not always consistent with that collected by the national statistical offices in the other countries that we analyze, preventing us from making comparisons with all 394 firms. As a result, we end up using a two-year (1993-94) panel on 229 of these Russian firms. Annual summary statistics for the firm-level as well as more aggregate variables used in the analysis are given in the appendix Table A1 for the Czech Republic, A2 for Slovakia, A3 for Poland and A4 for Hungary. The data cover the period 1989-93 for the Czech Republic, 1989-92 for Slovakia, 1988-91 for Poland, 1988-92 for Hungary, and 1993-94 for Russia. In Poland and Hungary, the transition was launched at the start of 1990,²⁴ while in the Czech and Slovak Republics it was on

equation.

23 See Commander, Fan and Schaeffer (1996).

24 In Hungary, the reform process dates as far back as 1968 and the transition changes that occurred at the end of the 1980s and early 1990s were hence less fundamental than those in the other countries (see e.g., Kornai, 1995).

January 1, 1991. Our data hence enable us to chronicle the evolution of behavior of the Czech, Slovak, Polish and Hungarian firms before and during the early transition. In Russia, the transition process was formally launched in 1992. The two-year (1993-94) panel of Russian firms hence relates to an early phase of the transition.

The summary statistics in Tables A1-A4 yield two insights that are relevant for our analysis: First, the average number of employees per firm held steady in Poland during the entire 1988-90 period and declined only one year after the big bang (i.e., in 1991). In the Czech and Slovak republics, as well as in Hungary, the average employment per firm started declining as soon as the transition took place and the decline continued as the transition proceeded. In the case of the Czech Republic and Slovakia, the pattern is influenced more strongly by a major wave of break-ups and spinoffs of firms that occurred at the end of 1990 and in 1991,²⁵ while in Hungary there was relatively more emphasis on layoffs. The steady employment level in the Polish data is in part accounted for by the fact that Poland did not create the same giant enterprises as did Czechoslovakia and Hungary in the 1980s. Second, the price liberalization associated with the end of the centrally planned system resulted in price jumps that the workers were able to transmit rapidly into corresponding nominal wage increases in the more reformed economies (Hungary and Poland) but not in the more traditional communist economies (Czech Republic and Slovakia). Indeed, in the latter countries it took several years for workers to overcome the major declines in real wages that occurred at the start of the transition.²⁶

25 See Lizal, Singer and Svejnar (1995 and 1996) for an analysis of these break-ups and spinoffs.

26 An interesting issue that is not the subject of the present paper is wage distribution. As may be seen from the summary statistics in Tables A1-A4, the inter-enterprise dispersion in average earnings rose during the early transition in the Czech and Slovak republics as well as in Hungary, but remained unchanged in Poland. In the Czech Republic, the coefficient of variation increased from 12 to 23 percent between 1989 and 1993, the corresponding Slovak coefficient of variation rose from 10 percent in 1989 to 25 percent in 1992 and the Hungarian coefficient jumped from an already high level of 29 percent in 1988 to 48 percent in 1991. The Polish coefficient of variation started relatively high at 27 percent in 1988, moved to 32 percent in 1990 and settled back to 27 percent in 1991. See also Garner, Lubyova and Terrell (1995).

3.b Estimates of the Employment and Wage Equations

In interpreting the estimated coefficients, it is important to remember that the transition process started at different dates in different countries. For the Czech and Slovak data our estimates hence cover the pre-transition period of 1989-90, the start of the transition (big bang) in 1990-91, and the early transition (1991-92 for Slovakia and 1991-92 as well as 1992-93 for the Czech Republic). For Poland, the estimates cover the pre-transition period of 1988-89, the start of the transition in 1989-90 and the early transition in 1990-91. Hungary adopted many market oriented reforms already in the 1970s and 1980s. Nevertheless, it is generally assumed that the transition process accelerated in 1989 and 1990. Our estimates hence cover the pre-transition period of 1988-89, the launch of transition in 1989-90, and the early transition period of 1990-92. As mentioned earlier, the 1993-94 Russian data cover the period of early transition.

The principal estimated coefficients of the dynamic labor demand equation (1') are reported for the five countries in Tables 2 and 3. The complete sets of estimated coefficients of the underlying equations are reported in Appendix Tables A5 for the Czech Republic, A6 for Slovakia, A7 for Poland, and A8 for Hungary.²⁷ As may be seen from the Appendix tables, the estimated equations have good fits and the test results indicate that the restrictions implied by the first difference specification are usually rejected by the data. (Results of unreported tests indicate that parameter restrictions related to partial and complete adjustment models are usually also rejected, as is the hypothesis that parameter estimates do not differ across the consecutive two-year periods.) The results of the Hausman tests are mixed, suggesting that firms in the Czech Republic and Poland were relatively unconstrained in selecting the level of output, firms in Hungary were constrained in the

²⁷ Since for Russia we only have estimates for the 1993-94 period, most Russian coefficients turn out to be insignificant, and the number of appendix tables is already very large, we do not report the complete set of Russian

early but not later periods, and firms in Slovakia were constrained most of the time. The exogenous shocks at the start of the transition thus appear to have significantly constrained the sales of firms in Hungary and Slovakia.

As may be seen from Table 2, while the long term elasticity estimates are similar and close to unity in all four Central European economies, the short term elasticity estimates show a strikingly varied pattern. The Czech and Slovak firms registered very low (.0 to .1) short term labor demand elasticities with respect to sales before and at the very start of the transition. A zero elasticity estimate is also generated with the early transition data from Russia. In contrast, the .3 Polish and .6 Hungarian elasticity estimates indicate that firms in these more market oriented communist economies were responsive in their employment adjustment to changes in sales already in the 1988-89 pre-transition period.

The second major finding observed in Table 2 is the rise in the estimated short term labor demand-sales elasticities in all four Central European countries shortly after the start of the transition. In particular, the elasticity rose to .33 in Slovakia by 1991-92 (after a temporary decline to .06 during the big bang of 1990-91) and to .5 - .6 in the Czech Republic in the 1991-93 period. In Hungary and Poland one observes a temporary decline in the estimated elasticities to about .23 at the start of the transition but the estimates rise to .4 in Poland by 1990-91 and to .46 - .65 in Hungary by 1990-92. Hence, the greater pre-transition responsiveness of employment to sales in the more market oriented economies (Poland and Hungary) than the more traditional centrally planned economies (Czech and Slovak Republics) disappeared shortly after the prices were freed and enterprise subsidies phased out at the start of the transition.

The estimated labor demand elasticities with respect to wages are reported in Table 3. The

estimates in appendix tables. They may be obtained from the authors upon request.

short term elasticities suggest that in the pre-transition period the Czech and Slovak firms were equally or more responsive in adjusting employment to wages than their Polish and Hungarian counterparts. Indeed, the Czech and Slovak pre-transition elasticities are in the $-.33$ to $-.39$ range, while the Polish point estimate stands at $-.26$ and the Hungarian one is at $-.35$ but is not highly significant statistically. The Czech estimate becomes insignificant and the Slovak one temporarily reverses sign during the big bang of 1990-91, but both become significantly negative thereafter. As with the labor demand elasticity with respect to sales, one hence finds that shortly after the start of the transition the wage elasticities of labor demand were significantly negative in all four CEE economies. In this context, it is interesting to note that the Slovak estimate ($-.25$) is lower than those found in the other three CEE economies ($-.61$ to $-.96$).

The estimated short term wage elasticity of labor demand for Russia is statistically insignificant, indicating that market driven incentives were weak in Russia, with firms being unresponsive in adjusting their employment to changes in wages. The two sets of findings imply that the Czech and Slovak firms started adjusting much faster than their Russian counterparts.

Our findings with respect to the labor demand elasticities are interesting in the context of the double digit unemployment rate observed in Hungary, Poland and Slovakia, as compared to the 3-4% rate registered in the Czech Republic. With positive estimated elasticities of employment with respect to sales, employment clearly fell in all countries on account of the dramatic output fall. However, the negative estimated employment elasticity with respect to wages had a differential effect across the four countries. In the Czech and Slovak republics, where real wages fell, the negative employment-wage elasticity mitigated the output-driven decline in employment, with the mitigating effect being larger in the Czech Republic, where the estimated employment-wage elasticity is higher than in Slovakia. In Hungary, the rising wages contributed to the employment decline. Finally, in Poland, where real wages stayed about constant during this period, the wage

effect on employment was minimal. These effects are consistent with the macro data presented in Table 1 and explain the underlying employment-wage-output dynamics.

In Table 4 we report estimates of employment elasticities with respect to own wage and local unemployment rate. These estimates correspond to the dynamic employment equation (1''), with the local unemployment rate proxying for the tightness of the local labor market and hence the alternative (reservation) wage W^a .²⁸ As may be seen from Table 4, while the estimated own wage coefficients are by and large negative and statistically significant, the estimated coefficients on local unemployment are almost always insignificant. In fact, the unemployment coefficient is positive, large and significant only in the Czech Republic during its big bang year of 1990-91. During the 1989-90 big bang year in Poland, the unemployment coefficient is also statistically significant but its size is so miniscule as to make the effect be nil. In all other cases, the unemployment coefficient is statistically insignificant, occasionally displaying a negative sign. Our findings hence indicate that at the very start of the transition, only the Czech firms operated to the right of their labor demand curves, with the estimates corresponding to an outcome on the vertical contract curve (ADD' in Figure 1). However, in Poland and Slovakia during the big bang, and in all countries (including the Czech Republic and Hungary) during the subsequent years, the data generate estimates corresponding to an outcome on the demand curve for labor. In sum, our findings indicate that outcomes to the right of the demand curve were rare as the CEE countries moved from the pre-transition to the early transition period. Moreover, as soon as these economies started adjusting to the shock of price liberalization, reduction of subsidies and loss of markets, they started operating on the labor demand curves. In terms of theory, this finding indicates that defensive (reactive) restructuring of firms, defined in terms of labor adjustment, was virtually instantaneous and occurred

28 The full set of parameter estimates and the associated diagnostic statistics may be obtained from the authors upon request. Since we could not match local unemployment rate to the Russian firms, we have not estimated

long before privatization. In terms of econometric specification, this finding provides support for the labor demand specification of equation (1') during the transition period.

In Table 5 we present wage elasticities with respect to sales per worker (proxying for rent-sharing) and the local unemployment rate (reflecting the wage curve hypothesis). The elasticities correspond to the dynamic version of wage equation (2), which was estimated jointly with the employment equation (1'').²⁹ The estimates in Table 5 indicate that in the pre-transition Czech Republic and Hungary there was virtually no association between wages and sales per worker - suggesting that under communism Czech and Hungarian workers did not share in rents. In contrast, in Poland and Slovakia, one observes a positive association between wages and sales per worker in the last years of the communist regime. In the transition period, one finds a positive elasticity of wages with respect to sales in all four countries. To the extent that the instrumented sales per worker provide a good proxy for the firms' ability to pay when industry-specific effects are controlled for, the estimates in Table 5 provide evidence that (at least in the short run) workers' wages contained an element of firm-specific rent. The estimate for Russia is positive but statistically insignificant, suggesting that as late as 1993-94 rent-sharing was not a systematic phenomenon in Russian manufacturing firms.

The wage curve hypothesis is reflected in the expected negative coefficient on unemployment in the wage equation. The hypothesis receives support in Slovakia in 1991-92, but it is uniformly rejected in the Czech Republic and Hungary. In Poland, the coefficient is statistically significant and of the predicted sign, but it is too small to be economically significant. Hence, despite the significant variation in the local unemployment rate, the wage curve hypothesis receives

equation (1'') for Russia.

²⁹ The complete set of parameter estimates and diagnostic statistics related to this table may be obtained from the authors upon request. The joint estimation of the employment and wage equation yields similar estimates of the employment equation as IV estimation of the employment equation alone. We hence do not discuss the joint 3SLS estimates of the employment equation in the text but they may be obtained from the authors upon request.

virtually no support in our firm-level data.

3.c Old Versus New Firms

While the Polish and Hungarian data sets for the most part contain the same firms during the entire time period, the Czech and Slovak data reflect a significant turnover of firms. Since the latter data sets basically cover the entire population of existing firms, the turnover reflects the entry of new firms and the break-ups of existing firms.

The high turnover of firms in the Czech and Slovak republics enables us to test the hypothesis that the SOEs that existed before and survived into the transition behaved differently (i.e., were more rigid) than the population of industrial firms as a whole. In particular, in 1991 the surviving SOEs represented about one-quarter of the Czech and one-third of the Slovak firms. In Table 6 we report for these firms labor demand elasticities that correspond to employment equation (1').³⁰ As may be seen by comparing these results with those in Table 4, the old SOEs have lower labor demand elasticities than the entire population of firms in the Czech Republic but equal or higher ones than the rest of the firms in Slovakia. The wage elasticities for the old SOEs, reported in Table 7, are significantly smaller in both republics than those reported for all firms in the two countries, respectively, in Table 5. The Czech industrial SOEs are thus in all respects stodgier than the population of all industrial firms, while the Slovak SOEs appear to have adjusted employment more and held back more on rent sharing than the entire population of Slovak industrial firms. Put differently, the behavior of the Czech SOEs during the early transition reflects the stereotype of state ownership in terms of more rigid employment policies, but also in terms of more control on rent-sharing by worker-insiders. The finding that Slovak SOEs limit rent-sharing by worker-insiders but also exhibit greater employment adjustment is consistent with the observation in Table 1 that Slovak

³⁰ The complete sets of estimates and diagnostic statistics are reported in appendix tables A6 and B6.

SOEs were relatively more pressed financially than their Czech counterparts as a result of the tighter budget constraint brought about by the greater macro shocks and reduction of subsidies in Slovakia.

4. Ownership and Legal Status of Firms

While not being a principal focus of our study, our estimates of the effect of ownership and legal status of firms on employment and wages contribute to one of the most hotly debated issues in the context of the transition, namely the effect of ownership and commercialization on performance. The evidence to date has been mixed. At the macroeconomic level one observes some of the transition economies that engaged in massive and rapid privatization (e.g., the Czech Republic and Russia) registering low or negative rates of growth, while others (e.g., Lithuania and Slovakia) growing relatively fast in the mid-to-late 1990s. Similarly, among the transition economies that have proceeded slowly with privatizing SOEs, some have grown rapidly (e.g., Poland and Slovenia), while others have had a very mixed record (e.g., Bulgaria and Romania) in the 1990s.

Firm-level micro studies have also found mixed results. Barberis et al. (1996) for instance use data from 266 to 336 privatized and 38 state-owned shops to find that the effect of privatization on employment through layoffs is mostly insignificant or negative. Unlike in our study, Barberis et al. (1996) had only a small sample, did not have a quantitative measure of the change in employment associated with layoffs, and could not control for changes in output, sales, wages, prices, and other relevant variables. Bilsen and Konings (1998) estimate country-specific employment growth equations using data from 96 Bulgarian, 76 Hungarian and 85 Romanian firms to find that state-owned and privatized firms do not have significantly different rates of change of employment. Unlike Barberis et al. (1996), Bilsen and Konings (1998) have quantitative employment data and can control for a number of variables. Unlike our study, however, they have small sample sizes and do

not control for other relevant variables such as sales (output), wages and prices.³¹

The principal finding of our study is that ownership and legal status (commercialization) of firms do not have a systematic effect on employment and wages, *ceteris paribus*. As discussed in the context of equations (1) and (2), we have used large firm-level data sets and tested these effects by including a number of dummy variables for ownership and legal status in the regressions that we ran. As may be seen from appendix tables A5-A8, we have not detected major systematic effects of ownership and legal status on employment. Similarly, in the wage regressions that are not reported in the paper because of space limitations, we have not found any systematic effects of ownership and legal status on wages.

In terms of our employment equation, in the Czech and Slovak samples we find that newly established firms do not set employment differently, *ceteris paribus*, from the state-owned and state registered firms that form the base against which we measure the effects of different types of ownership and legal status. Private firms are found to have an insignificant positive effect on employment in 1991, the effect becomes positive and significant in most specifications in 1992, but then it ceases being significant in 1993 in the Czech Republic.³² A virtually identical pattern is found for the joint venture ownership in the two republics except that even in 1992 there is no significant effect in Slovakia. In Poland, the first changes in ownership took place between 1990 and 1991, the last two years for which we have data. During this period we find that firms that moved from the dominant form of state ownership (basic units) into private or mixed ownership displayed 10-25

31 There are also a number of studies that seek to relate enterprise performance, typically measured by productivity or profitability, to ownership form (e.g., Earle, Estrin and Leschenko, 1996, Filatotchev et al., 1996, and Jones and Mygind, 1999). These studies explore not only the impact of state ownership vs. private owners as a group, but also of private ownership by insiders vs. that of outsiders. The shortcoming of these studies is that they use small enterprise surveys taken at one point in time, such as our Russian data set. Moreover, the sampling frame of these studies is not always reliable or adequate to the task. Note that even our Russian survey, which used western sampling methods, was unable to capture new firms because no listing of these firms was available.

32 We do not have 1993 data for Slovakia.

percent higher levels of employment, *ceteris paribus*, than firms that remained state owned as basic units. Interestingly, the positive effects that we find in 1991 in Poland and in 1992 in the Czech and Slovak Republics go counter to the general expectations that privatization would impose harder budget constraints and result in a reduction rather than increase in employment, *ceteris paribus*. Since our regressions control for previous year's level of employment, our findings suggest that, controlling for other factors, firms tended to add rather than shed labor immediately after privatization. We do not have data on private ownership in Hungary and find no significant effect of any other form of ownership there.

As with ownership, we find no systematic employment effects of different types of legal status of firms. In the Czech Republic firms registered as limited liability companies have employment levels about 15 percent above those of the state firms, *ceteris paribus*, while joint stock company status has no effect. Firms registered as cooperatives have employment that is about 30 percent below that of state firms but also display a positive effect of cooperative ownership that offsets the negative effect of cooperative legal status. We detect no significant employment effect of any legal status in Slovakia and Hungary.³³

In terms of wage setting, we find private ownership to be associated with higher wages in Poland and Slovakia during the later years for which we have data on transition in these economies (1990 and 1991 for Poland and 1992 for Slovakia) and in the middle year (1992) of our transition data period in the Czech Republic. However, we find no effect of private ownership on wages in the Czech Republic in 1991 and 1993. Our three-country evidence hence indicates that private firms paid higher wages after the "big bang" (1991 in Poland and 1992 in the Czech and Slovak Republics), but the Czech data suggest that this effect was temporary. Our findings are consistent

33 In Poland, we have information on ownership but not legal form in 1991. The indicator of whether the firm was a basic in 1988-90 reflects a degree of financial independence of a firm under communism.

with recent estimates of an insignificant wage effect of firm ownership within a human capital earnings function.³⁴

5. Conclusions

Using large firm-level data sets from the Czech Republic, Slovakia, Poland, Hungary, and Russia, we show that the employment and wage behavior of firms displayed dramatic changes as these economies abandoned central planning and launched their transitions to a market system. At the same time, we find that a number of effects that many analysts and policy makers expected to be present, were absent.

Our first finding, based on estimated elasticities of employment with respect to sales, is that Hungarian firms started the transition substantially reformed (changing employment in response to changes in sales) and advanced further as the transition proceeded. Poland's firms were somewhat less reformed (having smaller elasticities of employment to sales) but advanced fast, while firms in the Czech and Slovak republics started from what could be termed a stereotypical planned system (employment not varying with sales) but caught up remarkably fast with their counterparts in Hungary and Poland. In contrast, as late as 1993-94, Russian firms in our sample displayed virtually no sign of a transition to a market-like behavior (i.e., we find elasticities of employment to sales that are not significantly different from zero).

Our second finding is that contrary to accepted wisdom excess employment was a rare phenomenon at the start of the transition and became completely undetectable once the transition process started. In particular, when we control for wages and output of firms, the only instance when we find excess labor is in the Czech firms during the big bang year of 1990-91. Our evidence hence indicates that as the Central and East European countries entered the transition and wages,

34 See Munich, Svejnar and Terrell (1999).

employment and unemployment started adjusting to the dramatic output fall and reduction in subsidies (Table 1), firms had much less excess employment than is commonly assumed. Our results are important for understanding the behavior of firms during the planned and transition periods. They are also important for theoretical modeling since most theories of enterprise adjustment during the transition assume the existence of excess employment and focus on defensive (reactive) restructuring of firms in terms of labor shedding. Our estimates indicate that the problem of labor adjustment in firms has been given undue importance, with real problems of restructuring being elsewhere, such as in the functioning of the capital markets.

Third, we find evidence of worker sharing in their enterprise rents and losses at the end of the communist period in Poland (where the Solidarity trade union was an important force) and to a lesser extent also in Slovakia. However, the phenomenon is undetectable at the end of communism in the Czech Republic and Hungary. Yet, within a year after the launching of the transition, we find that worker incomes started to vary significantly with enterprise performance in all four Central European countries that we study, but not in Russia. We have also tested for the presence of a “wage curve” (variation of wages with local unemployment) and with the exception of Slovakia we do not find a significant association between local unemployment and wages. This lack of support for the wage curve hypothesis is particularly interesting in view of the wide variation in the local unemployment rate across districts and over time.

Fourth, the Czech and Slovak data enable us to examine whether the state-owned enterprises (SOEs) that existed under communism and survived during the transition behave differently than the newly created firms or firms that were spun off from the old SOEs. We find that in the Czech Republic the old SOEs are more rigid, while in Slovakia they are more responsive in terms of employment adjustment than other firms. In both republics the SOEs allow for less worker rent-

sharing than other firms. The behavior of the Czech SOEs reflects the stereotype of rigidity and limited worker power under effective state ownership. The greater employment adjustment in Slovak SOEs is in turn consistent with the government passing on to firms the larger negative shock experienced by Slovakia than the Czech Republic in the early 1990s. The important implication of our findings for theory and policy is that the extent of rigidity or responsiveness of the SOEs depends on the degree of shock and hardness of their budget constraint. Our findings suggest that the SOEs are relatively rigid when not faced with extreme shocks and hardening of the budget constraint (Czech SOEs), but they are relatively responsive when subject to sharp shocks and severe tightening of the budget constraint (Slovak SOEs).

Our final set of results relates to employment and wage effects of enterprise ownership and legal status. Enterprise restructuring has been seen as a key element of a successful transition, with commercialization (change of a firm's legal status) and privatization being the principal factors bringing about the needed restructuring. Contrary to expectations, once we control for other factors we do not find ownership or legal status of the firm to be associated with systematically different employment behavior. In terms of wages, we find that private firms in the Czech Republic, Slovakia and Poland paid higher wages immediately after the start of the transition, but the longer-period Czech micro-data suggest that this effect dissipated later on. The lack of detectable ownership effect points to the importance of examining the part played by complementary measures such as the introduction of effective corporate governance and competition.

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