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Employment and Wages in Transition: Panel Evidence from Poland

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EMPLOYMENT AND WAGE ADJUSTMENTS IN A PANEL OF POLISH FIRMS (1994-1997)[1]

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New survey data for a panel of Polish firms is used to estimate employment and wage adjustments under various forms of ownership (insider vs. outsider) and asymmetric response to exogenous shocks. In contrast to earlier studies, dynamic panel data estimators (GMM) allow for endogeneity of observed variables and partial adjustment to shocks. Results differ from other findings in the transition literature: wages have little effect on dynamic labor demand and the firm-size wage effect is confirmed. Firms that expand employment have to pay significantly larger wage increases and rising sales add little to employment, suggesting labor hoarding. Declining sales, however, significantly reduce employment and privatization (or anticipation thereof) has the expected benefits.

JEL Classification: J23, J21, J31, P2, P3

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I. Introduction

This paper uses new survey data for a panel of Polish firms in the period 1994-1997 to study employment and wage adjustments at the enterprise level. In contrast to earlier work on wage behavior and employment in Poland by Commander and Dhar (1998) and Grosfeld and Nivet (1999), and by Basu, Estrin and Svejnar (1997) and Estrin and Svejnar (1998) for other Central European countries, we use the stability of ownership varieties achieved or anticipated by the beginning of our period to systematically employ dynamic panel estimation methods. In this way, we correct for the endogeneity of key explanatory variables by using Generalized Method of Moments (GMM) estimators following Arellano and Bond (1991) and Blundell and Bond (1998), among others. Those estimators are consistent and considerably more efficient in the context of dynamic panel data models than the others suggested earlier in the literature or used in the above studies. Thus, we can allow both for the partial adjustment of employment and wages to exogenous shocks and for the endogeneity of most of the variables by exploiting the full panel rather than using a succession of cross-sectional estimates as in earlier work. To further explore the effects of differing forms of ownership and privatization, we report panel estimates for subsamples.

Among the new results obtained, we find significant size-wage and employment-growth-wage effects. The former is well known in Western firm-level wage studies, but seems to have been hitherto neglected in the transition literature. We also find asymmetric response to demand shocks in growing and declining firms by various measures, and different responses to demand growth by ownership categories.

The plan of the paper is to outline the framework of analysis in Section 2 and to describe the institutional background in Section 3. Section 4 introduces the sample and the data. The estimation and results are presented and discussed in Section 5, followed by a concluding Section 6. The data appendix provides further details on the firms in our survey.

II. Theoretical Framework and Empirical Specification

To explore the effects of transition on employment and wages, it is convenient to start with the well-known constant-elasticity of substitution or CES production function. First-order conditions yield a demand-for-labour function that is log-linear in real wages and output. In first

differences our basic specification thus becomes

$$(1) \qquad \Delta n_{it} = \alpha_0 + \alpha_1 \Delta w_{it} + \alpha_2 \Delta Y_{it} + \alpha_3 P_{it} + \Delta \varepsilon_{it}$$

where n_{it} is the log of employment in firm i at time t, w_{it} is the log real wage, Y_{it} is log output proxied with sales adjusted for inflation, and P_{it} is a set of dummy variables indicating privatized or state-owned or other transitional forms of ownership observed in the Polish economy. This vector may contain other time-invariant firm characteristics available from our survey. $\Delta\varepsilon_{it}$ is a composite error term in first differences including firm-specific (individual) and time-specific effects. For estimation purposes we include industry and time dummies to account for unobserved aggregate effects that have influenced the economy or the firms in transition over time. We shall also estimate a version of (1) for state-owned and other sub-samples of firms. We thus have two different ways of identifying the effect of privatization and adjustment on the employment response to demand shifts, which in turn provides evidence on unobservable labour hoarding as the initial response to falling demand.

We do not have data for employee skills or capital stocks, so that our wage equation is necessarily incomplete. However, a common starting point is to estimate the wage level in terms of the lagged wage and other explanatory and institutional variables, as done by Basu, et. al. (1997). We find this to be relatively uninformative as the lagged wage, or in our short panel the initial 1994 wage, has the most explanatory power. Estimating wage growth or first differences is more likely to reveal the institutional and other influences that differ across firms, which suggests the following specification (2) and its natural generalization (2') below.

$$(2) \qquad \Delta w_{it} = \beta_0 + \beta_1 \Delta x_{it} + \beta_2 P_{it} + \beta_3 \Delta n_{it} + \Delta \xi_{it}$$

where (log) labour productivity is

$$(3) \qquad x_{it} = Y_{it} - n_{it}$$

and we use real sales as the output variable; $\Delta\xi_{it}$ is defined similarly as above.

We now expect productivity growth to be the main determinant of wage growth following standard models of rent sharing and bargaining (though the latter are usually in a static framework).[1] Empirically productivity growth is a key component in wage negotiations. Grosfeld and Nivet (1999) use a similar specification for their wage equation, with the

[1] It is worth pointing out the finding of Pinto, Belka, and Krajewski (1993, p. 219): "...[in late 1992] ...wage setting has come to resemble bargaining outcomes commonly seen in the West." Thus, given the later stages of transition captured by our sample of firms this, observation has come to motivate the approach to specifying our wage equation.

additional use of the industry wage and regional unemployment rate. They emphasize the importance of controlling for firm fixed effects, but their Hausman test rejects fixed effects in favour of the random-effects estimates which they report. Commander and Dhar (1998) also use unemployment rates in their wage equation; however, none of the specifications they present yields a significant (different from zero) coefficient (i.e., no effect of regional unemployment). Given our panel data it seems appropriate then to omit regional and industry variables that are not of central importance, and eliminate firm-specific (individual) effects by differencing. An obvious problem with the above which is not discussed by Grosfeld and Nivet (1999) is the endogeneity of regressors such as productivity. To address this issue, we report the first difference GMM estimates of equations (1') and (2') below.[2] We have also estimated the wage equation in levels for comparison purposes as discussed in Section 4.

$$(1') \qquad \Delta n_{it} = \alpha_0 + \alpha_1 \Delta n_{it-1} + \alpha_2 \Delta w_{it} + \alpha_3 \Delta Y_{it} + \alpha_4' P_{it} + (\Delta \varepsilon_{it})$$

$$(2') \qquad \Delta w_{it} = \beta_0 + \beta_1 \Delta w_{it-1} + \beta_2 \Delta x_{it} + \beta_3 \Delta x_{it-1} + \beta_4 \Delta n_{it} + \beta_5' P_{it} + (\Delta \xi_{it}).$$

III. Institutional Background

In 1998, when the survey was conducted, we obtained a panel of firms of diverse forms of ownership, which have undergone a variety of privatization methods. We consider, to a certain extent, that all of these have influenced the adjustment behavior of employment and wages at the enterprise level by driving a wedge between the motivations of different interest groups in the enterprise in the process (insiders vs. outsiders vs. the government, etc.).[3] The delay in privatization of large firms in Poland (the process began in 1991), on which we have focused in our survey, however does not mean that little change has occurred. Market-oriented responses after price and trade liberalization and the withdrawal of subsidies can be observed quite independently of ownership.[4]

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[2] The lag structure in (1') and (2') has been determined empirically with a 'general-to-specific' approach. Initially we allowed for one lag on all variables and have sequentially eliminated those with little explanatory power from the equations. See empirical tables for details.

[3] A growing body of literature has studied these issues in detail, see for example Schleifer and Vishny (1994); Aghion, Blanchard, and Burgess (1994); Boycko, Schleifer, and Vishny (1996); Blanchard and Aghion (1996), among others. For an overview of the Polish experience, see Pinto, Belka, Krajwski (1993); Ipsen and Puntillo (1998) and Bornstein (1999) for a comparative analysis and contrast to Czech Republic and Hungary.

[4] See Aghion et. al (1994) and Aghion and Carlin (1997). For more on the privatization effects in pre-privatization firms, see Estrin, Gelb, and Singh (1995). The conclusion is that long-term adjustment strategies at the enterprise level are "intimately related to privatization" procedures. In this context, see also Roland (1996) on the sequencing of restructuring and privatization.

The process of 'reactive' restructuring (mainly adjustment of wages and employment) has started long before privatization. Pinto, Belka and Krajewski (1993, p. 219) point out that in anticipation, even before any change in corporate governance has taken place, managers raise their expectations and envisage their performance being rewarded once privatization occurs.

In Poland "commercialization" was viewed as a first step in the privatization process. As transition unfolded, these *Commercialized Joint-Stock Enterprises* (CJSE), created (rather easily) as only transitional legal entities, have come to be of a more 'permanent' form of enterprise organization than earlier expected. In our study these include 25 one-person State Treasury firms, three with majority state-owned shares and 23 other with the state having only a minority stake. As evidenced by our results, CJSE undergo substantial restructuring in anticipation of final privatization. *National Investment Fund enterprises* (NIFE) were organized as a result of the 1995 *Mass Privatization Program* (MPP). Owned by fifteen NIFs, enterprises in this category have not yet established a clear governance structure. One of the major disadvantages experienced with this type of enterprises is the dispersed structure of ownership (only few of our privatized (PRI) enterprises were mass privatized) and lack of power in corporate decision making (see Havrylyshyn and McGettigan, 1999, p. 6-9).

Management/Employee Buy-Out enterprises (MEBO) are mostly companies formed through liquidation of SOEs and then privatized by company leasing (i.e., all firms in our sample of firms are of this "liquidation-leasing" category, as shares of the enterprise are 'given' or sold to a group of managers and employees). In our sample of Polish firms, though having obtained the controlling influence in the enterprise, management/employees own on average 18%, with only one firm reporting 100% ownership. The advantage of this insider-dominated privatization is the possibility of close cooperation between management and employees, with little difference in motivation and goals. However, the potential inherent disadvantage becomes apparent if insider interests bring about increased costs and poor management decisions through excessive wage increases, labor hoarding, insufficient 'deep' restructuring (in the form of new product lines, new investments, etc.).[5] Two additional procedures of privatization (not dissimilar in essence) in our survey are direct sale and capital privatization. Most of the firms in these categories were sold to outside investors, who are expected to "infuse fresh blood" in the enterprise by bringing in better management, new knowledge and expertise and capital. This

would in due course induce wage and employment adjustment more in line with Western competitors. Firms privatized in Poland's "capital privatization" program underwent some pre-privatization restructuring, as evidenced from our survey, in the belief that better performing enterprises would be privatized first (as 52 % of our CJSE had indicated). Our sample of firms presents us also with seven new emerging private firms. The quite extraordinary growth rates of employment and sales relative to the other ownership categories are shown on tables 1 and 2a-2b. We shall use this institutional background of privatization and ownership to shed some light on our empirical results.

IV. Data and Sample

We use a panel of 178 firms in Poland for the period 1994-1997. The adjustment of employment and wages at the enterprise level has crucially depended on the involvement of firms in the ongoing privatization process. Our sample of firms was selected to investigate patterns of firms' restructuring in the process of transition and a survey was prepared to address some of these issues (for more on the structure and results of the survey see data appendix). Answers were obtained from enterprises of different size and industry at various stages of transition and privatization. The sample includes relatively large, mostly manufacturing firms (81.9%) with average employment in the beginning (end) of the period: 753 (664). In estimation we use a balanced panel of 171 firms taking into account the incomplete answers and missing first two years of a few firms and in one case the apparent non-reliability of the data.

Summary statistics are presented in Tables 1-3 and distinct patterns of growth rates of sales, wages, employment and labor productivity according to ownership categories are illustrated in Fig. 1. Not unlike earlier studies, notably Pinto, Belka and Krajewski (1993), Commander and Dhar (1998) and Grosfeld and Nivet (1999) on Polish firms, and Estrin and Svejnar (1998) and Aghion and Carlin (1997) summarizing evidence on several other Central and East European countries, we observe certain stylized facts at the enterprise level which our empirical results corroborate later on. First, privatized firms (PRI) and new private firms (NEW) are more likely to create jobs than state-owned enterprises (SOE) (see especially Fig.1 and Fig.2). Second, firms with increasing sales tend to increase real wages twice as fast as firms with decreasing sales. In this regard, in our panel we observe an unambiguous rise in real product wages (wages

[5] For more see Havrylyshyn and McGetting (1999) and Bornstein (1999, p. 63). It could also be that insider-owned firms may not be uniformly poor performers: (for discussion and evidence on this point see Carlin, Fries, Schaffer and Seabright (1999).

deflated by $PPI_{1993=100}$) and a substantial decline in employment, with decreasing sales firms decreasing employment by more (Table 3). This however may not be the case with different ownership categories on year to year observations as shown in Table 2a-2b, in particular for *National Investment Fund enterprises* (NIFE) and *Management/Employee Buy-Out* firms (MEBO). Interestingly, we discover that while in 1995 MEBOs' labor productivity has grown faster on average, by 1997 this is the only category with negative labor productivity growth. Yet these insider-owned enterprises have increased the growth rate of wages by half a percentage point over the time period. Tables 2a-2b additionally reveal NIFEs to be the only type of firms that have increased employment at the beginning of the period and shed most labor at the end of the period. Third, specific to our panel, we also notice that positive labor productivity growth is associated with larger employment declines but higher wage growth as well.

V. Empirical Methodology and Results

The panel structure of our sample of Polish firms allows us to study the dynamics of partial adjustment in the transition period, with the inclusion of a lagged dependent variable among the other regressors in the model. It is accepted that in such dynamic models with relatively large cross-sections over a short time period (here T=4), the fixed effects model yields inconsistent estimates (the problem with incidental parameters). Thus, as pointed out above, we specify an error components model (random effects) with $\varepsilon_{it}=\lambda_t+\eta_i+\nu_{it}$. In the presence of lagged dependent variables, this raises well-known additional problems. Earlier work has used maximum likelihood estimators (MLE) and a simple instrumental variable (IV) approach (Bhargava and Sargan, 1983 and Anderson and Hsiao, 1981) to address the issues (endogeneity and inconsistency). The relatively strong assumptions on the distributions of the individual effects and the initial conditions necessary to implement the MLE approach, and the lack of efficiency of the IV, has encouraged the use of the Generalized Method of Moments (GMM) (Hansen, 1982) estimation in recent studies of dynamic panel regressions.[6]

[6] For background and a detailed discussion see Baltagi (1995, Ch.8). For an overview and excellent treatment in the context and contrasted to the large N and large T case with the relevant asymptotic theory, see Phillips and Moon (1999a) and Phillips and Moon (1999b).

In the following we use the asymptotically efficient (one-step) GMM advocated by Arellano and Bover (1995) and more recently by Blundell and Bond (1998).[7] This type of GMM estimators usually exploits a different number of instruments in each time period. Under weak assumptions the additional orthogonality conditions that become available here have not been previously used with IV estimators. Therefore, we should use transformations of the data that allow lagged endogenous or predetermined variables as instruments in the transformed equations, where the transformed error term does not contain η_i and orthogonality among the errors is preserved (the original errors may be heteroskedastic but not autocorrelated and we treat all variables in our models as endogenous). An alternative to first differences used here is the orthogonal deviations transformation (forward demeaning), which applied to our data yielded similar results.[8]

To ensure consistency, we check for serial correlation in the errors. If ε_{it} are serially uncorrelated, then $\Delta\varepsilon_{it}=\Delta\lambda_t+\Delta\nu_{it}$ may be moving average errors but should not be second-order serially correlated to assure the reliability of our results.[9] However, Arellano and Bond (1991, p.83) note that for T<5 the test for MA(2) second-order serial correlation may not be well defined, and only Sargan's over-indentification test is available from the two-step GMM estimation which is heteroskedasticity-consistent. In our sample, it is evident that there are no first-difference residuals two periods apart. Sargan's test is a test of over-indentifying restrictions, which is a chi-square under the null of no significance or instrument validity (note the degrees of freedom (number of restriction) given in parenthesis in the empirical tables). For a simple AR(1) model and T=4, Sargan's test verifies the following three restrictions: $E[(\varepsilon_{i3}-\varepsilon_{i2})y_{i1}]=E[(\varepsilon_{i4}-\varepsilon_{i3})y_{i1}]=E[(\varepsilon_{i4}-\varepsilon_{i3})y_{i2}]=0$, which in effect implies the errors are not second-order serially correlated. The addition of regressors is done in a similar fashion; thus, we use MA(1) and Sargan jointly to determine the validity of our instruments and the correctness of our assumptions.

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[7] Earlier work by Arellano and Bond (1991) proposed the use of IV in the GMM framework , which employed the lagged levels of the series as instruments to the first differences. Ahn and Schmidt (1995) and Ahn and Schmidt (1997) discover additional (nonlinear in the parameters) moment conditions and show the efficiency gained in estimation. Hahn (1999), using a similar approach, derives the sources of efficiency gains in the estimation method of Blundell and Bond (1998). The conclusion is that these can be substantial. In this connection, it is worth mentioning that Blundell and Bond (1998) use simulations to suggest that in typical sample sizes the asymptotic standard errors for the one-step GMM estimators may be more reliable for inference. We report these in our empirical tables.

[8] See also Arellano and Bover (1995, p. 41-42) for more on other transformations with similar properties.

[9] When $\Delta\varepsilon_{it}$ are the first-differences of serially uncorrelated errors, then it is evident $E[\Delta\varepsilon_{it}\Delta\varepsilon_{it-1}]$ may not be zero; yet for consistency GMM estimators require that $E[\Delta\varepsilon_{it}\Delta\varepsilon_{it-2}]=0$ hold (for more see Arrelano and Bond (1991, p.280-83).

Our estimates may be seen as an extension and improvement over Basu, et. al. (1997) and Commander and Dhar's (1998) results in two important ways. First, our estimates are in first differences over a panel of four consecutive years, and include a lagged dependent variable to capture the partial adjustment of endogenous variables at the firm level. Second, we employ the GMM estimators described above which correct for both endogeneity (inherent in the properties of the explanatory variables) and also take into account the serial correlation properties of the residuals. For comparison, we have also estimated the wage equation in levels, following Basu, et.al. (1997) (see Table 10). Employment is included to capture the well-known firm-size wage effect. We shall contrast our findings below and explain our preference for the difference specification, which has also been used, though in different specifications, by Commander and Dhar (1998) and Estrin and Svejnar (1998). The estimates of employment and wage equations based on our sample of Polish firms are reported in Tables 4-10.

5.1 Employment

The first employment estimates in Table 4 show the importance of allowing for partial adjustment, with significant coefficients of about 0.6 on lagged employment growth. The change in contemporaneous sales has a comparable effect, but in specification (2) of Table 4 we see that sales increases have less than half the effect of sales declines. This is an interesting result which suggests that labor hoarding was initially widespread, so firms can raise output with little additional labor (see also Estrin and Svejnar, 1998, for a similar finding in a earlier sample of Polish firms). However, declining sales do prompt to substantial downsizing.

Further insight is provided by Table 5, where sales growth is interacted with ownership. Surprisingly perhaps, NIF firms show the largest response, followed by the NEW firms. In Table 9 we report separate estimates for the various ownership categories, which confirm the sales results, but also show no sales growth effect on employment growth in MEBOs and PRI (privatized) firms. In both tables (5 and 9), however, we see that SOEs have responded to sales changes by adjusting employment (note particularly the similarity in the size of the elasticity effect). The result also does suggest the earlier finding of initial widespread labor hoarding in SOEs.

In the case of MEBOs, none of the estimates seem to provide evidence of delayed adjustment to employment which is in accordance with the well-documented observed behavior of this type of firms. The only significant coefficient appears in front of 'change in management' and indicates a relative "slowdown" in employment change, other things equal. Surely, this is not

uncharacteristic for insider-owned firms reluctant to decrease employment. While the lagged dependent variable has a non-trivial effect in both SOEs and CJSE firms, the size of the coefficients suggest that state-owned firms adjust employment more slowly than CJSE; note that at the end of the period commercialized firms reduce employment by more (Table 2b). In adjusting employment, CJSEs however do not seem to respond to sales growth in contrast to especially NIFE and NEW (which however are probably doing so for different reasons).

All else the same, change in corporate governance appears to exert a significant influence on employment growth in our sample of Polish firms. While in privatized firms this has had little influence on the growth rate of employment, it has a significant negative effect in NIFE. Owned by fifteen NIFs, these firms have not yet established a corporate governance structure, which is also implied by our results (in general management resists or alleviates change; while employment grew by 1.2% in 1994-1995, by 1997 NIFE had the largest reduction in employment). Some earlier studies do confirm that comprehensive restructuring is stalled in some mass privatization programs due to ownership uncertainty (concentration or lack thereof) (Aghion and Carlin, 1997, p 251).

The only two significant coefficients of privatization dummies in Table 8 suggest that in those cases not only the ownership type but also the way the firm is privatized matters. Among privatized firms, those that undertook the direct sale approach have tended to increase employment growth relative to those not privatized or mass-privatized, other things equal. Among CJSE those that participate in the MPP were relatively more inclined to reduce employment growth. We also find more rapid adjustment in firms with increasing sales and the strongest sales growth response (elasticity) of employment in NIFE and PRI firms, with a surprisingly positive wage coefficient in the former. The lack of any significant negative wage effect may be understood in light of our wage equation estimates to which we turn next.

Diagnostics show that neither the robust Sargan nor MA(1) test provide evidence to suggest that the assumption of serially uncorrelated errors (second-order) is unrealistic; according to these tests the choice of the instruments used also seems to be appropriate.

5.2 Wages

The wage estimates in levels in Table 10 show how the lagged wage obscures the size-wage effect, which is significant in specification (1) and reduces the productivity influence (effect) in (2) and (3). In contrast, turning to the wage growth estimates in Tables 6-8, it is interesting to

observe that the lagged dependent variable becomes insignificantly different from zero, suggesting that wage changes are not autocorrelated but rather driven primarily by productivity growth. Interestingly, positive employment changes have a much larger effect on wage growth than employment declines (note rows six and seven of Table 7). This indicates that the size-wage effect should be mainly due to wage increases that are required to attract new employees to growing firms in a dynamic monopsony situation; while at the same time there appears to be resistance to any reversal of this effect or even slowdown of wage growth below the rate of productivity growth when employment falls.

Turning to Table 8, the inclusion of productivity growth interactions with ownership dummies restores the lagged dependent variable and uncovers some distinct differences according to ownership categories. MEBO's paid themselves more than their productivity rises, whereas SOE's and NIFE's wage growth was unrelated to productivity. If one were to take these coefficients as a measure of insider power as suggested by Grosfeld and Nivet (1999), then clearly insider-owned firms such as MEBOs exhibit the highest productivity elasticity whereas firms without a well-defined corporate governance structure (or in a transitional form of ownership) show no effect. The NEW firms however increased the growth rate of wages in accordance with productivity growth in much the same way Western firms do. While privatized (PRI) firms and CJSE firms (in anticipation of privatization) have significantly responded to productivity growth in adjusting wages, they have done so by less than MEBOs (an indication of insider prevalence confirmed).

Two firm-specific variables have a non-trivial effect on wage growth. Not surprisingly, trade unions have a small positive influence, and manual workers (being paid relatively lower wages) have a negative impact on wage growth. Direct sale privatization (outsider-owned firms) has a significant positive effect on wage growth (Table 8).

VI. Conclusion

Conclusions can be drawn from various levels of the analysis. Starting with Fig.1-2 and the summary Tables 1-3, we see that PRI and NEW firms had the highest growth of employment and sales, as most observers would expect. MEBOs, however, paid themselves the highest wage increases, in spite of their dramatically declining productivity performance at the end of period. Sales declined by far the most in SOEs; all relatively unsurprising results as are those revealed in the sub-samples of summary statistics in Table 2a-2b.

Turning to the econometric results, our employment estimates exploit the panel data to find more rapid adjustment in firms with increasing sales, and the strongest sales growth in NIFE and NEW firms, with a positive wage coefficient in the former. The lack of any significant negative wage effect, perhaps surprising given Commander and Dhar's (1998) results, is however consistent with our wage equation estimates.

Starting with the wage results in levels in Table 10, we find the expected strong relationship with the lagged dependent variable and productivity. An interesting additional result, which has not been exploited in other work on transition economies, is the significant positive effect of firm size (employment). This firm size-wage relationship is a common empirical regularity in Western firm level data, so its neglect in transition enterprises is somewhat surprising. Estimates in differences again exploit the panel, removing firm specific effects, and now reveal a size-growth effect twice as large for growing (employment) firms compared to contracting (labor shedding) ones. This suggests that we have identified labor supply, with growing firms raising wages to attract workers in temporary dynamic monopsony situations.

The productivity growth interactions with ownership dummies confirm that insider-owned MEBOs have paid themselves more than their productivity rises, whereas SOEs and NIFEs' wage growth appears to be unrelated to productivity. Trade Unions have a small positive influence and the privatization method apart from direct sale has had a trivial effect on wage growth.

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Appendix: DATA and TABLES

1. Data source and definitions

(a) The survey:

The survey was completed early in 1998, with the support of EU-ACE Program and partner-institutions in Poland. Only operating, relatively large (in terms of employment) enterprises were selected from a variety of legal and ownership claims. Out of over 1800 enterprises and after a pre-test, questionnaires were sent to 370 of them. Finally we obtained 178 responses (not all enterprises completed all of the 75 questions) for analysis. In the process, detailed questionnaires were sent to the managers and interviews conducted with most of those enterprises. With these limitations in mind, however, in terms of size and region (all 49 voivodships) firms in our survey are relatively representative of the manufacturing sector (81.9%) and in part of the domestic economy. There are five ownership categories as detailed in Table A-1 according to employment size: State-Owned Enterprises, Commercialized Joint-Stock Enterprises, National Investment Fund Enterprises, Management/ Employee Buy-Out, and Privatized Enterprises.

The questionnaires are divided into four parts. The first part consists of questions concerning location and activities of the enterprise, description of the ownership type and its changes and, as far as possible, quantitative managerial data. The second part is about the employment structure and policy of the company. The third part deals with the influence of state subsidies and regulations on the enterprises' employment and investment decisions. The last part includes qualitative information on the voluntary and compulsory social benefits provided by the company. Hence, the survey data contain information on employment, wages and other firm characteristics for the period which we use to construct our panel. Tables A-1 and A-2 give an overview of ownership type and firm size in our sample and privatization method chosen by different enterprises according to percentage of trade union membership. Trade unions were active in most of the enterprises surveyed (88.7 %) with two or three different unions operating in some enterprises.

In 1998, 23.4 % of the firms identified themselves as still state-owned (SOE). Privatized enterprises (PRI) constituted 14.6 % of our sample, however these are not homogeneous: six are

emerging private (de novo) firms (new). The rest of the sample is in various forms of ownership at different stages of privatization. Our commercialized joint-stock companies (CJSE) include 25 State Treasury firms, three with majority state-owned shares and 23 other with the state having only a minority stake. We have decided to combine these for two reasons: first, separating them did not yield quantitatively different results, and second these were envisioned as only transitional legal entities (later it turned out this form of enterprise existence to be more permanent than expected). As evidenced by our results, these enterprises undergo substantial restructuring in anticipation of final privatization. National Investment Find firms (NIFE) were organized as a result of the long-delayed 1995 Mass Privatization Program (MPP). Management/Employee Buy-Out enterprises (MEBO) are mostly companies formed through liquidation of SOEs and were privatized by company leasing (all firms in this category). Management/employees own on average 18 %, with only one firm reporting 100 % ownership. Managers/employees become the rightful owners after a specific contract lease expires (usually within few years of privatization). 9.6 % of the enterprises have also reported foreign directed investment; of those 5.7 % have occurred in the last four years.

94.4 % of the firms in our survey were state-owned before 1990, and only three did not exist. While the process of privatization is still under way in 19.1 % of firms, 42.7 % have completed privatization (20.2 % of those in the last four years). In the process 52.8 % of employees in the sample (predominantly in company leased or NIF enterprises) have bought shares and only 9 % have resold their stake in the company within the year.

Positive profitability over the sample period was indicated by 77 % of our firms. Competition was viewed as strong in 58.4 %. 27 % of enterprises produce for the domestic market only. Change in management was observed in 40.4 %. As a sign of hardening budget constraints, 84.3 % received no subsidies from the state in 1994-1997. While only 13.5 % were allowed to keep tax arrears, no subsidies were procured by the state towards wages or social benefits paid out by the enterprise.

Finally, given the diversity of the sampled enterprises, manager's perceptions of the government's influence on employment and wages were captured in a sequence of qualitative questions, which required them to rank the influence from non-existent to strong. Concerning wages, 35.4 % considered the influence of the Tripartie Commission as strong; 46.1 % the pressure exerted by trade unions and employees; 73.6 % cost-effectiveness had a strong effect on wage setting. Regarding employment, 60.7 % perceived the government's influence as non-existent and 33.7 % evaluated its strength to have decreased since 1994.

(b) Variables:

The industries covered are: (1) Mining and quarrying, excluding gas, coal; (2) manufacture of: food products; (3) beverages; (4) textiles; (5) wearing apparel and furriery; (6) leather and leather products; (7) wood and wood products; (8) pulp and paper; (9) chemical and chemical products; (10) rubber and plastic products; (11) other non-metal mineral products; (12) basic metals; (13) products, excluding machinery; (14) not classified machinery and equipment; (15) not classified electrical machinery and apparatus; (16) radio, TV and communication equipment; (17) medical, optical and precision equipment; (18) motor vehicles and trailers; (19) furniture and other manufacturing; (19) electricity, gas, hot water supply; (20) construction (5.6%); (21) wholesale and retail trade (4.0%); (22) other land transport, excluding railways.

List of Variables:

Δn_{it}: growth rate of log employment of firm i at time t.

Δn_{it}^{+}: positive growth rate of employment of firm i at time t, 0 otherwise.

Δn_{it}^{-}: negative growth rate of employment of firm i at time t, 0 otherwise.

Δw_{it}: growth rate of log real product wages (the wage deflated by $PPI_{1993=100}$: 1994=125.3, 1995=157.1, 1996=176.6, 1997=198.2.)

ΔY_{it}: growth rate of log real sales / turnover of enterprise i at time t.

ΔY_{it}^{+}: positive growth rate of sales of firm i at time t, 0 otherwise.

ΔY_{it}^{-}: negative growth rate of sales of firm i at time t, 0 otherwise.

ΔY_{it}^{SOE}: interactive variable, growth rate of sales with SOE dummy.

ΔY_{it}^{CJSE}: interactive variable, growth rate of sales with CJSE dummy.

ΔY_{it}^{NIFE}: interactive variable, growth rate of sales with NIFE dummy.

ΔY_{it}^{MEBO}: interactive variable, growth rate of sales with MEBO dummy.

ΔY_{it}^{PRI}: interactive variable, growth rate of sales with PRI dummy.

Δx_{it}: growth rate of log labor productivity, defined as $x_{it} = Y_{it} - n_{it}$.

Δx_{it}^{+}: positive growth rate of productivity of firm i at time t, 0 otherwise.

Δx_{it}^{-}: negative growth rate of productivity of firm i at time t, 0 otherwise.

Δx_{it}^{SOE}: interactive variable, growth rate of productivity with SOE dummy.

Δx_{it}^{CJSE}: interactive variable, growth rate of productivity with CJSE dummy.

Δx_{it}^{NIFE}: interactive variable, growth rate of productivity with NIFE dummy.

Δx_{it}^{MEBO}: interactive variable, growth rate of productivity with MEBO dummy.

Δx_{it}^{PRI}: interactive variable, growth rate of productivity with PRI dummy.

% Trade Union Members: Average percentage of trade union membership 1994-1997 (Maximum 85%).

% Female Workers: Highest mean value over 1994-1997 41.5% of labor force in 1995; (Maximum 95%).

% Manual Workers: Highest mean value over 1994-1997 75% beginning of period; (Maximum 95%).

Indicated Profitability: Dummy Variable, 1 if firm indicted some profits in the period 1994-1997, 0 otherwise.

Change in Management: Dummy Variable, 1 if enterprise experienced change in management, 0 otherwise

SOE: Dummy Variable State-Owned Enterprises=1, 0 otherwise.

CJSE: Dummy Variable Commercialized Joint-Stock Enterprises =1, 0 otherwise.

NIFE: Dummy Variable National Investment Fund Enterprises =1 , 0 otherwise.

MEBO: Dummy Variable Management / Employee Buy-Out =1, 0 otherwise.

PRI: Dummy Variable Privatized Enterprises=1, 0 otherwise.

Direct Sale Privatization: Dummy Variable, 1 if firm privatized through direct sale, 0 otherwise.

Capital Privatization: Dummy Variable, 1 if firm privatized through capital privatization, 0 otherwise.

Company Leasing: Dummy Variable, 1 if firm leased, 0 otherwise

Mass Privatization: Dummy Variable, 1 if firm privatized through MPP, 0 otherwise.

Table A-1: Ownership and employment (in percent)

	ENTERPRISE OWNERSHIP (1998)						
EMPLOYMENT (1997)	SOE	CJSE	NIFE	MEBO	PRI	NEW	Total
Below 500 employees	59.4	37.0	13.3	65.4	52.6	57.1	48.3
501-1000 employees	24.6	33.3	53.3	30.8	31.6	42.9	33.1
Above 1000 employees	15.9	29.6	33.3	3.8	15.8		18.5
Total	38.8	15.2	16.9	14.6	10.7	3.9	100

SOE State-owned enterprise
CJSE Commercialized joint-stock enterprise
NIFE National Investment Fund enterprises
MEBO Management / Employee Buy-Out enterprise
PRI Privatized enterprise
NEW New (Emerging) Private enterprise

Table A-2: % Trade Union Members and Privatization Procedure

	Privatization Procedure (in percent)					
%°1994 (1997)	NP	DS	CP	CL	MP	Total
No Union	12.1 (10.6)	6.7 (6.7)	0.0 (0.0)	22.0 (24.4)	5.9 (5.9)	11.2 (11.2)
0-50 %	30.3 (33.3)	53.3 (66.7)	27.3 (36.4)	53.7 (58.5)	52.9 (50.0)	41.6 (45.5)
51-75 %	45.5 (45.5)	40.0 (20.0)	54.5 (50.0)	22.0 (14.6)	38.2 (41.2)	39.3 (36.0)
76-100 %	12.1 (10.6)	0.0 (6.7)	18.2 (13.6)	2.4 (2.4)	2.9 (2.9)	7.9 (7.3)
Total	37.1	8.4	12.4	23.0	19.1	100.0

NP Not Privatized enterprise
MP Mass Privatization (General Privatization) enterprise
CP Capital Privatization
CL Company Leased enterprise
DS Direct Sale

2. Summary statistics and Empirical Tables:

Table 1: Growth rates of sales, employment, and wages in a sample of Polish firms

	mean (standard deviation) median 1994-1997 (in percent)						
	SOE (N=68)	CJSE (N=25)	NIFE (N=30)	MEBO (N=26)	PRI (N=19)	NEW (N=7)	Total (N=175)
Growth rate of sales	-3.5 (0.47) -3.0	10.3 (0.36) 4.6	9.0 (0.27) 6.3	16.8 (0.44) 9.8	18.2 (0.22) 10.7	67.3 (0.46) 77.4	8.5 (0.42) 6.4
Growth rate of employment	-19.0 (0.21) -15.1	-21.1 (0.28) -16.4	-12.0 (0.19) -12.7	-6.5 (0.20) -5.5	6.2 (0.22) 0.0	62.2 (0.40) 71.1	-10.7 (0.27) -11.6
Growth rate of labor productivity	15.5 (0.44) 21.2	31.4 (0.39) 26.5	20.9 (0.22) 22.1	26.6 (0.37) 18.3	12.0 (0.17) 12.6	5.1 (0.39) 16.0	19.6 (0.30) 20.8
Growth rate of real wage	20.1 (0.14) 19.3	30.9 (0.16) 28.8	26.6 (0.20) 24.4	24.0 (0.33) 32.0	24.5 (0.10) 21.0	26.7 (0.23) 29.6	24.0 (0.19) 23.3

SOE State-owned enterprise
CJSE Commercialized joint-stock enterprise
NIFE National Investment Fund enterprises
MEBO Management / Employee Buy-Out enterprise
PRI Privatized enterprise
NEW New Private Enterprise

Figure 1: Growth Rates of Sales, Wages, Employment and Labor Productivity According to Ownership

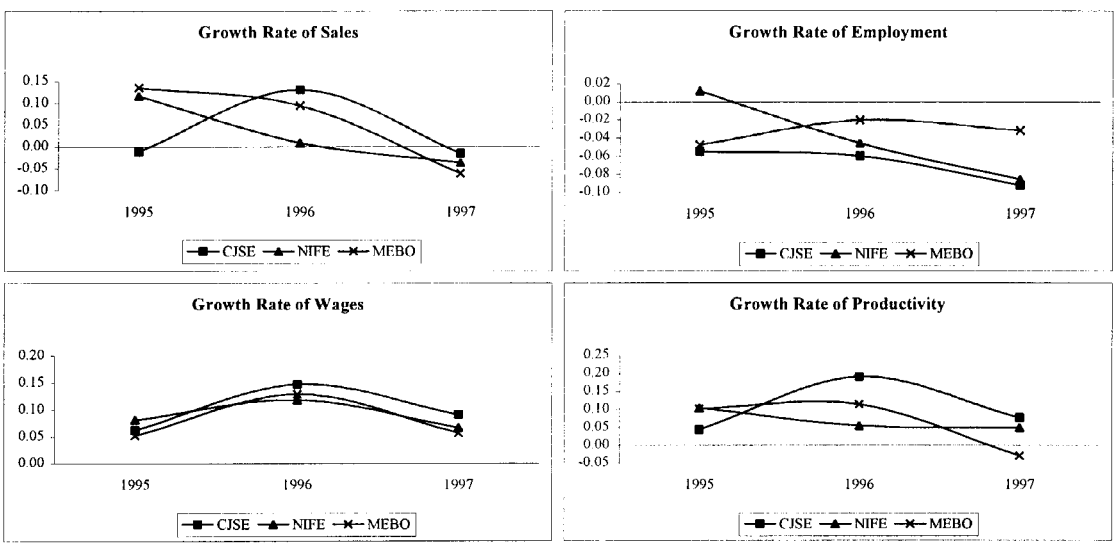

Figure 2: Growth Rates of Sales, Wages, Employment and Labor Productivity According to Ownership

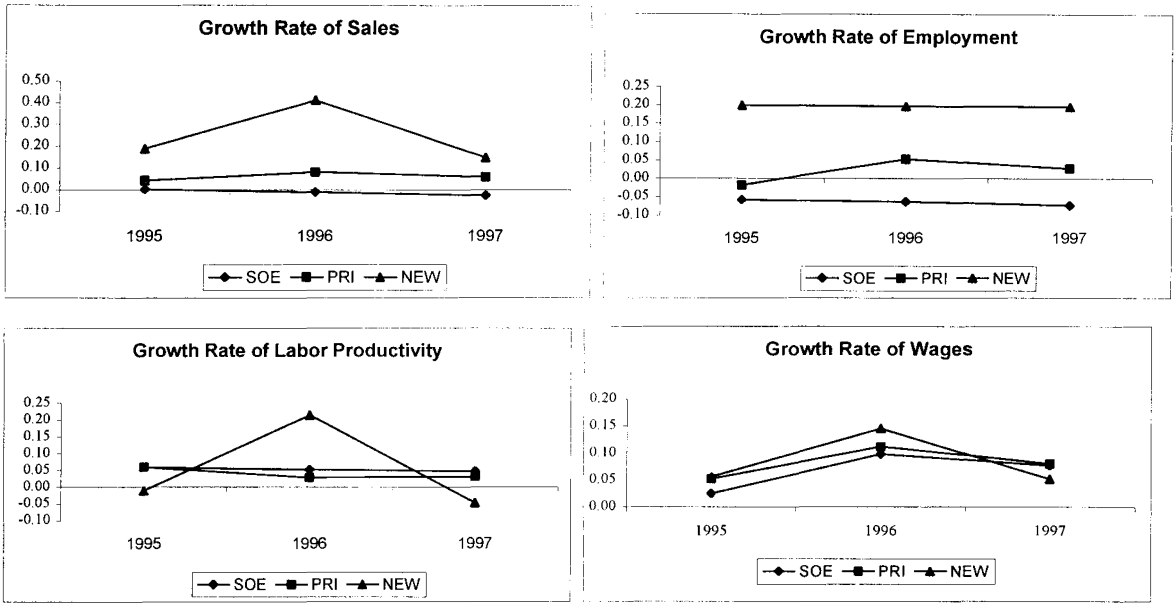

Table 2a: Growth rates of sales, employment, and wages in a sample of Polish firms

	mean (standard deviation), median						
	1995						
	SOE (N=68)	CJSE (N=25)	NIFE (N=30)	MEBO (N=26)	PRI (N=19)	NEW (N=6)	Total N=174
Growth rate of Sales	0.1 (0.39) 1.8	-1.1 (0.27) -1.0	11.7 (0.16) 11.3	13.5 (0.53) -1.1	4.2 (0.14) 4.5	18.8 (0.12) 22.8	5.0 (0.34) 3.7
Growth rate of employment	-5.8 (0.09) -4.0	-5.5 (0.11) -3.7	1.2 (0.08) 0.5	-4.8 (0.11) -2.0	-1.8 (0.18) 0.3	19.9 (0.12) 16.8	-3.1 (0.15) -2.1
Growth rate of labor productivity	6.0 (0.38) 5.5	4.4 (0.26) 5.3	10.5 (0.17) 9.5	10.2 (0.30) 4.8	6.0 (0.17) 3.7	-1.1 (0.17) -3.4	6.9 (0.30) 5.6
Growth rate of real wage	2.4 (0.09) 2.6	6.2 (0.12) 2.7	8.1 (0.17) 5.4	5.2 (0.09) 3.6	5.2 (0.06) 5.4	5.6 (0.05) 7.0	4.8 (0.11) 3.5

SOE	State-owned enterprise
CJSE	Commercialized joint-stock enterprise
NIFE	National Investment Fund enterprises
MEBO	Management / Employee Buy-Out enterprise
PRI	Privatized enterprise
NEW	New Private Enterprise

Table 2b: Growth rates of sales, employment, and wages in a sample of Polish firms

	mean (standard deviation), median						
	1997						
	SOE (N=69)	CJSE (N=26)	NIFE (N=30)	MEBO (N=26)	PRI (N=19)	NEW (N=7)	Total N=177
Growth rate of Sales	-2.6 (0.22) -3.9	-1.5 (0.22) 0.8	-3.6 (0.17) -2.2	-6.1 (0.55) 0.5	5.8 (0.15) 3.0	14.9 (0.36) 25.9	-1.5 (0.29) -0.1
Growth rate of employment	-7.3 (0.10) -5.6	-9.2 (0.15) -8.2	-8.6 (0.13) -6.1	-3.2 (0.11) -3.8	2.8 (0.09) 2.0	19.6 (0.44) 12.3	-5.1 (0.15) -4.6
Growth rate of labor productivity	4.7 (0.20) 3.1	7.7 (0.25) 9.5	5.0 (0.15) 5.0	-2.9 (0.50) -0.8	3.1 (0.10) 4.0	-4.7 (0.30) 5.5	3.6 (0.26) 4.1
Growth rate of real wage	7.7 (0.09) 6.3	9.1 (0.08) 7.9	6.7 (0.06) 6.4	5.7 (0.29) 9.9	8.1 (0.07) 8.6	5.2 (0.15) 6.8	7.4 (0.14) 7.2

SOE State-owned enterprise
CJSE Commercialized joint-stock enterprise
NIFE National Investment Fund enterprises
MEBO Management / Employee Buy-Out enterprise
PRI Privatized enterprise
NEW New Private Enterprise

Table 3: Growth rates of wages and employment in a sample of Polish firms

REAL WAGES and EMPLOYMENT: mean (in percent)									
Growth Rate of WAGES	94-95	95-96	96-97	94-97	**Growth Rate of EMPLOYMENT**	94-95	95-96	96-97	94-97
$(Y_{i1997}-Y_{i1994})^{+}$ (N=105)	6.4	13.1	9.6	29.0	$(Y_{i1997}-Y_{i1994})^{+}$ (N=107)	-1.3	0.0	-1.8	-3.1
$(Y_{i1997}-Y_{i1994})^{-}$ (N=68)	2.3	9.5	4.1	16.1	$(Y_{i1997}-Y_{i1994})^{-}$ (N=70)	-6.0	-7.8	-10.1	-23.0
$(x_{i1997}-x_{i1994})^{+}$ (N=137)	4.4	12.0	9.4	25.8	$(x_{i1997}-x_{i1994})^{+}$ (N=137)	-3.3	-3.6	-5.5	-12.4
$(x_{i1997}-x_{i1994})^{-}$ (N=37)	2.8	10.6	0.6	14.1	$(x_{i1997}-x_{i1994})^{-}$ (N=40)	-2.1	-1.4	-3.6	-4.3

$^{+/-}$ indicates values for 1994 are less / higher than 1997: Increasing / Decreasing Sales / Labor Productivity over the specific time period

Table 4: Estimated EMPLOYMENT Equation: Dependent Variable Δn_{it}
(171 companies, Period 1994-1997, 342 Observations)

Independent Variables	All Firms (1)	All Firms (2)
Δn_{it-1}	0.622 (2.77)	0.586 (2.63)
Δw_{it}	-0.075 (-0.66)	-0.076 (-0.69)
ΔY_{it}	0.250 (3.44)	
ΔY_{it}^{+}		0.145 (1.70)
ΔY_{it}^{-}		0.371 (4.04)
Firm-Specific Variables:		
Change in Management	-0.032 (-2.22)	-0.032 (-2.25)
% Trade Union Members	0.001 (1.63)	0.001 (1.70)
% Manual Workers	0.001 (0.53)	0.001 (0.51)
Ownership dummies:		
Commercialized Firm	0.018 (0.48)	0.021 (0.61)
NIF Firm	0.010 (0.22)	-0.011 (0.25)
MEBO Firm	0.052 (1.45)	0.054 (1.51)
Privatized Firm	0.081 (1.73)	0.081 (1.70)
New Private Firm	0.041 (0.50)	0.075 (0.36)
Privatization dummies:		
Direct Sale Privatization	0.091 (1.94)	0.087 (1.80)
Capital Privatization	-0.057 (-1.95)	-0.057 (-1.96)
Company Leasing	-0.023 (-0.69)	-0.027 (-0.80)
Mass Privatization	-0.039 (-0.86)	-0.043 (-1.01)
Diagnostics:		
RSS	5.60	5.33
TSS	5.99	5.99
MA(1)	-2.849	-2.637
Sargan Test	4.01 (6)	4.76 (6)
Wald Test for dummies	15.59 (9)	18.51 (9)

Notes: 1) The equations are estimated by GMM in first differences. The t-statistic, reported in the parenthesis next to the point estimates, is corrected and robust to heteroskedasticity over industries and time. A constant and Time dummies are always included but not reported; where appropriate, we add Industry dummies and/or interactive Industry/Time dummies. The Wald test for the joint significance of those is reported in the last row of the table; the test is a chi-square under the null of no significance (degrees of freedom are in parenthesis). The Arellano and Bond (1991) MA(1) is a test of first-order serial correlation, based on the standardized first-difference residual autocovariances asymptotically distributed as N(0,1) under the null of no autocorrelation. Sargan's test is a test of over-indentifying restrictions, which is a chi-square under the null of no significance or instrument validity (degrees of freedom (number of restriction) given in parenthesis). We use MA(1) and Sargan jointly to determine the validity of our instruments and the correctness of our assumptions.
2) NIF: National Investment Funds Firms, established with the Law on Mass Privatization (1995). MEBO: Management / Employee Buy-Out Firms, mostly organized through liquidation of SOE and then leased for a given time period.

Table 5: Estimated EMPLOYMENT Equation: Dependent Variable Δn_{it}
(171 companies, Period 1994-1997, 342 Observations)

Independent Variables	(1)	(2)
Δn_{it-1}	0.765 (3.43)	0.757 (3.70)
Δw_{it}	-0.090 (-0.69)	-0.102 (-0.99)
ΔY_{it}^{SOE}	0.177 (2.69)	0.189 (2.77)
ΔY_{it}^{CJSE}		0.122 (1.59)
ΔY_{it}^{NIFE}		0.607 (2.67)
ΔY_{it}^{MEBO}		0.262 (1.43)
ΔY_{it}^{PRI}	0.153 (1.14)	0.190 (1.24)
ΔY_{it}^{NEW}	0.558 (3.87)	0.597 (4.46)
Firm-Specific Variables:		
Change in Management	-0.032 (-1.93)	-0.023 (-1.58)
% Trade Union Members	0.001 (1.08)	0.001 (1.67)
% Manual Workers	0.000 (0.09)	0.000 (0.18)
Privatization dummies:		
Direct Sale Privatization	0.123 (1.90)	0.138 (2.35)
Capital Privatization	-0.036 (-1.73)	-0.024 (-1.45)
Company Leasing	0.033 (1.39)	0.038 (1.82)
Mass Privatization	-0.029 (-1.89)	-0.025 (-1.62)
Diagnostics:		
RSS	6.95	6.32
TSS	5.99	5.99
MA(1)	-2.752	-2.821
Sargan Test	2.23 (6)	5.16 (6)
Wald Test for dummies	12.18 (9)	14.33 (9)

Notes: 1) See Table 4

Table 6: Estimated WAGE Equation: Dependent Variable Δw_{it}
(171 companies, Period 1994-1997, 342 Observations)

Independent Variables	All Firms
Δw_{it-1}	0.132 (0.68)
Δx_{it}	0.594 (4.18)
Δx_{it-1}	0.171 (2.09)
Δn_{it}	0.666 (3.04)
Firm-Specific Variables:	
Indicated Profitability	0.025 (0.57)
Change in Management	-0.055 (-1.06)
% Trade Union Members	0.002 (1.98)
% Female Workers	-0.002 (-1.41)
Ownership dummies:	
Commercialized Firm	0.208 (2.22)
NIF Firm	0.135 (0.93)
MEBO Firm	0.104 (1.07)
Privatized Firm	0.047 (0.55)
New Private Firm	0.021 (0.13)
Privatization Dummies:	
Direct Sale Privatization	0.127 (1.85)
Capital Privatization	-0.108 (-1.44)
Company Leasing	0.101 (0.97)
Mass Privatization	-0.116 (-0.81)
Diagnostics:	
RSS	54.23
TSS	71.01
MA(1)	-1.298
Sargan Test	12.13 (7)
Wald Test for dummies	38.51 (16)

Notes: 1) See Table 4

Table 7: Estimated WAGE Equation: Dependent Variable Δw_{it}
(171 Companies, Period 1994-1997, 342 Observations)

Independent Variables	(1)	(2)
Δw_{it-1}	0.107 (0.57)	0.258 (1.52)
Δx_{it}	0.639 (4.28)	
Δx_{it-1}	0.155 (1.83)	
Δx_{it}^{+}		0.661 (2.93)
Δx_{it}^{-}		0.452 (2.12)
Δn_{it}^{+}	1.128 (2.03)	1.149 (2.04)
Δn_{it}^{-}	0.541 (2.47)	0.603 (2.41)
Firm-Specific Variables:		
Indicated Profitability	0.024 (0.58)	0.025 (0.55)
Change in Management	-0.054 (-1.08)	-0.029 (-0.58)
% Trade Union Members	0.003 (2.19)	0.003 (2.02)
% Manual Workers	-0.005 (-2.19)	-0.005 (-2.43)
% Female Workers	-0.002 (-1.15)	-0.002 (-1.18)
Ownership dummies:		
Commercialized Firm	0.197 (2.29)	0.165 (1.92)
NIF Firm	0.141 (1.01)	0.105 (0.73)
MEBO Firm	0.084 (0.83)	0.092 (0.97)
Privatized Firm	0.035 (0.39)	0.021 (0.25)
New Private Firm	-0.032 (-0.19)	-0.076 (-0.46)
Privatization Dummies:		
Direct Sale Privatization	0.159 (1.42)	0.161 (1.53)
Capital Privatization	-0.118 (-1.64)	-0.115 (-1.58)
Company Leasing	0.112 (1.07)	0.078 (0.79)
Mass Privatization	-0.122 (-0.87)	-0.098 (-0.68)
Diagnostics:		
RSS	54.78	57.90
TSS	71.01	71.01
MA(1)	-1.415	-2.327
Sargan Test	10.31 (7)	9.79 (7)
Wald Test for dummies	37.97 (9)	43.14 (9)

Notes: 1) See Table 4

Table 8: Estimated WAGE Equation: Dependent Variable Δw_{it}

(171 Companies, Period 1994-1997, 342 Observations)

Independent Variables	(3)
Δw_{it-1}	0.353 (2.25)
Δx_{it}^{SOE}	0.064 (0.41)
Δx_{it}^{CJSE}	0.734 (4.92)
Δx_{it}^{NIFE}	0.307 (0.64)
Δx_{it}^{MEBO}	1.548 (4.27)
Δx_{it}^{PRI}	0.751 (1.83)
Δx_{it}^{NEW}	1.415 (2.55)
Δn_{it}^{+}	1.077 (2.02)
Δn_{it}^{-}	0.527 (2.25)
Firm-Specific Variables:	
Indicated Profitability	0.004 (0.10)
Change in Management	-0.011 (-0.23)
% Trade Union Members	0.003 (2.86)
% Manual Workers	-0.006 (-2.78)
% Female Workers	-0.002 (-1.23)
Privatization Dummies:	
Direct Sale Privatization	0.209 (1.86)
Capital Privatization	-0.071 (-1.06)
Company Leasing	0.078 (1.32)
Mass Privatization	-0.013 (-0.26)
Diagnostics:	
RSS	56.02
TSS	71.01
MA(1)	-2.772
Sargan Test	12.29 (7)
Wald Test for dummies	61.05 (9)

Notes: 1) See Table 4

Table 9: Estimated EMPLOYMENT equation: Dependent Variable Δn_{it}
(According to categories of Ownership (1998) for 1994-1997)

Independent Variables	SOE (68 firms)	CJSE (25 firms)	NIFE (30 firms)	MEBO (25 firms)	PRI (18 firms)
Δn_{it-1}	0.367 (2.65)	0.915 (4.08)	-0.106 (-1.14)	0.155 (0.87)	-0.020 (-0.09)
Δw_{it}	0.037 (0.69)	-0.167 (-1.56)	0.127 (2.34)	-0.013 (-0.16)	0.050 (1.02)
ΔY_{it}	0.189 (1.90)	0.164 (1.47)	0.533 (4.12)	0.066 (0.49)	0.040 (0.34)
Firm-Specific Variables:					
Change in Management	-0.024 (-1.09)	-0.019 (-0.55)	-0.086 (-4.85)	-0.079 (-3.91)	0.010 (0.24)
%Trade Union Members	-0.000 (-0.14)	0.001 (0.65)	-0.000 (-0.04)	-0.001 (-0.91)	-0.000 (-0.50)
% Manual Workers	0.001 (0.86)	-0.001 (-0.50)	0.006 (2.42)	-0.002 (-0.76)	0.006 (2.87)
Privatization Dummies:					
Direct Sale Privatization		-0.012 (-0.23)			0.492 (3.52)
Capital Privatization		-0.076 (-2.03)			0.059 (2.18)
Company Leasing					0.030 (1.29)
Mass Privatization		-0.174 (-2.37)			
Diagnostics					
RSS	1.18	0.68	0.41	0.34	0.25
TSS	1.63	0.84	1.02	0.49	0.69
MA(1)	-1.725	-2.164	-0.971	-0.814	-1.197
Sargan's Test	11.33 (10)	11.54 (10)	13.72 (10)	4.28 (10)	8.36 (10)
Wald Test for dummies	34.35 (16)	2.10 (2)	73.43 (16)	23.83 (8)	6.30 (2)

Notes: 1) See Table 4
2) SOE: State-owned enterprise; CJSE: Commercialized Joint-Stock Enterprise; NIFE: National Investment Fund Enterprise; MEBO: Management / Employee Buy-Out Enterprise; PRI Privatized Enterprise

Table 10: Estimated WAGE equation: Dependent Variable w_{it}
(IV estimates: Period 1994-1997, 513 Observations)

Independent Variables	(1)	(2)	(3)
All Firms (171 firms)	IV estimates	system GMM	system GMM
w_{it-1}		0.834 (13.84)	0.863 (11.49)
x_{it}	0.718 (3.91)	0.594 (4.40)	0.372 (4.20)
x_{it-1}	0.448 (2.90)		-0.087 (-0.97)
n_{it}	0.249 (1.81)	-0.019 (-0.36)	0.025 (0.52)
Firm-Specific Variables:			
Indicated Profitability	0.198 (1.61)	-0.101 (-1.21)	0.027 (0.51)
Change in Management	-0.434 (-3.06)	-0.054 (-0.87)	-0.098 (-1.70)
%Trade Union Members	0.005 (1.33)	0.002 (1.45)	0.002 (1.44)
% Female Workers	-0.010 (-2.13)	-0.001 (-0.69)	-0.003 (-1.80)
Ownership dummies:			
Commercialized Firm	0.003 (0.01)	0.007 (0.07)	0.143 (2.17)
NIF Firm	-0.186 (-0.46)	0.004 (0.02)	0.099 (0.57)
MEBO Firm	-0.503 (-1.44)	0.037 (0.27)	0.013 (0.11)
Privatized Firm	0.015 (0.05)	-0.034 (-0.29)	0.028 (0.31)
New Private Firm	-0.102 (-0.33)	-0.054 (-0.34)	0.083 (0.72)
Privatization dummies:			
Direct Sale Privatization	-0.128 (-0.38)	0.024 (0.18)	0.061 (0.51)
Capital Privatization	0.013 (0.05)	0.034 (0.35)	0.002 (0.02)
Company Leasing	0.929 (3.15)	0.154 (1.10)	0.224 (1.87)
Mass Privatization	0.008 (0.02)	-0.008 (-0.04)	-0.064 (-0.41)
Diagnostics			
RSS		95.53	84.58
TSS		1017.64	1017.64
MA(1)		-4.364	-4.488
Sargan test		23.70 (19)	31.29 (19)
Wald test for dummies		128.73 (9)	127.40 (9)

Notes: 1) See Table 4

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