OWNERSHIP, FIRM SIZE AND RENT SHARING IN BULGARIA

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ABSTRACT

Using a unique 3-digit firm-level data set of all medium and large manufacturing enterprises in Bulgaria covering the years 1997-1998, we investigate how wages are affected by ownership status, firm size and rent sharing. Our pooled OLS, panel and first-difference TSLS estimates clearly point to ownership structure as an important determinant of both the wage level (for given productivity) and the degree of rent sharing. Rent sharing is very pronounced in state-owned firms but far less pronounced in private domestic and foreign firms. The results strongly confirm the existence of a multinational wage premium. In addition, we find weak evidence of a positive firm size-wage effect and a positive effect of firm size on the degree of rent sharing. If these effects exist, they are often more pronounced in private domestic firms.

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1. INTRODUCTION

This paper focuses on wage determination in Bulgaria and contributes to three topics in the empirical labour economics literature. The first topic concerns rent sharing. In a prominent attack on traditional analysis, Sumner Slichter (1950) showed that wages in the US manufacturing sector appeared to be positively correlated with various measures of firms' ability-to-pay. In the spirit of Slichter, labour economists have devoted much effort to test for imperfect competition in labour markets in the US and Canada[1] and in Western Europe.[2] The few related firm-level studies for post-communist Europe compare mainly rent-sharing behaviour before and during the transition period (Basu et al., 1997a [Poland, Hungary, the Czech and Slovak Republic]; Basu et al., 1997b [Poland]; Grosfeld and Nivet, 1997 [Poland]). These studies indicate that, except in Poland and to a lesser extent in the Slovak Republic, wages were set relatively independently of firms' performance under communism. During the transition period, however, wages started to vary with sales per worker, suggesting the presence of rent sharing. Commander and Dhar (1998) and Köllö (1997) investigate respectively for Poland and Hungary whether rent-sharing behaviour differs between firms with increasing and decreasing real sales.

Besides adding Bulgaria to the list of country studies,[3] we contribute to this literature by allowing the rent-sharing coefficient to vary across firms. More specifically, we investigate whether labour market imperfections differ between (1) state, private domestic and foreign companies and (2) small and large firms. In contrast to Grosfeld and Nivet, 1999 [Poland] and Luke and Schaffer, 1999 [Russia], our analysis draws upon a unique representative panel of firms in manufacturing with detailed information on output and input factors and on firm ownership for the period 1997-1998.

The positive relationship between wages and firm size is another well-documented empirical regularity. In their seminal paper, Brown and Medoff (1989) found a significant positive firm size-wage effect in the US. This effect has also shown up in more recent studies in the US (see Oi and Idson, 1999 for a review of the literature) as well as in other (mostly West European) countries.[4] Testing the firm size-wage hypothesis in post-communist countries has remained a largely unexplored field. Post-communist countries provide, however, certain advantages since firm size

[1] Among them are Abowd and Lemieux, 1993; Blanchflower et al., 1996; Budd and Slaughter, 2003; Christofides et al., 1992; Currie and McConnell, 1992.
[2] e.g. Abowd and Allain, 1996 [France]; Abowd et al., 1999 [France]; Blanchflower et al., 1989 [UK]; Budd et al., 2003 [West and East European Countries]; Goos and Konings, 2001 [Belgium]; Hildreth and Oswald, 1997 [UK]; Lever and Marquering, 1996 [the Netherlands]; Margolis and Salvanes, 2001 [France and Norway]; Nickell and Kong, 1992 [UK]; Nickell and Wadhwani, 1990 [UK]; Piekkola and Kauhanen, 2003 [Finland]; Teulings and Hartog, 1998 [the Nordic countries and Germany].
[3] Note that Jones and Kato (1996) provide evidence that the compensation of chief executives in Bulgarian not fully state-owned firms is positively related to labour productivity.
[4] e.g. Australia (Meagher and Wilson, 2000), Austria (Oosterbeek and van Praag, 1995), Canada (Morrisette, 1993), France (Abowd et al., 1999), Germany (Criscuolo, 2000; Schmidt and Zimmerman, 1991; Winter-Ebmer, 1995), Italy (Loveman and Sengenberger, 1991), Japan (Idson and Ishii, 1993; Rebick, 1993), Sweden (Edin and Zetterberg, 1992), UK (Main and Reilly, 1993).

can be considered largely exogenous to productivity in these countries (Svejnar, 1999). The reason is that at the onset of transition firm size was mostly politically determined by the central planners. To our knowledge, only one study investigates explicitly the firm size-wage effect in a post-communist country, Russia (Idson, 2000). Our analysis goes one step further as we test additionally whether the firm size-wage effect depends on the ownership structure of the firm.

A third empirical issue is the impact of foreign ownership on the firm's wage policy. In the literature on multinational enterprises, it is a stylised fact that foreign firms pay on average higher wages than their domestic counterparts, even controlling for a wide range of worker and/or firm characteristics.[5] In transition countries, newly established private firms pay higher wages than other firms (Svejnar, 1999). Previous studies investigating ownership effects on wages in these countries had to rely on ownership dummy variables (Earle et al., 1995 [Russia], Grosfeld and Nivet, 1999 [Poland], Jones and Kato, 1996 [Bulgaria] and Luke and Schaffer, 1999 [Russia]). Having data on the fraction of shares held by state, private domestic and foreign owners, we can investigate the ownership-wage effect in more detail.

In the remainder, we first discuss the institutional context of wage determination in Bulgaria during the transition period. In section 3 we set out the theoretical framework. Section 4 describes the empirical setting whereas section 5 presents the data set. Section 6 confronts the hypotheses with Bulgarian firm-level data and reports some robustness checks. Section 7 summarises and interprets the results. Our main conclusions are that rent sharing is very pronounced in state-owned firms but far less pronounced in private domestic and foreign firms. The results strongly confirm the existence of a multinational wage premium. In addition, we find weak evidence of a positive firm size-wage effect and a positive effect of firm size on the degree of rent sharing. If these effects exist, they are often more pronounced in private domestic firms.

2. INSTITUTIONAL BACKGROUND

Under central planning, collective bargaining was absent and wage levels and structures were determined by central planning authorities without union input. Trade unions acted merely as workplace representatives of the Communist Party in state-owned enterprises (Flanagan, 1998).

In Bulgaria, the transformation of industrial relations started in 1989-1990. To establish industrial relations in line with the European standards, an institutional and legislative framework

[5] See e.g. Dale-Olsen, 2002 [Norway]; Doms and Jensen, 1998 [US]; Feliciano and Lipsey, 1999 [US]; Globerman et al., 1994 [Canada]; Howenstine and Zeile, 1994 [US]; Lipsey, 1994 [US] and Lipsey and Sjöholm, 2001 [Indonesia]. For a survey of the literature on foreign firms in Mexico, Venezuela and the US, see Aitken et al., 1996.

was laid down in the Labour Code in 1993. The Labour Code is based on two fundamental principles: tripartite dialogue among social partners, i.e. social dialogue among governments, reformed and alternative unions and employer organisations, and independence of the social actors (Beleva et al., 1999). In line with the requirements of the Labour Code, the National Council for Tripartite Cooperation emerged in Bulgaria at the beginning of 1993. Only those trade unions and employer organisations which passed the criteria of representation established by law could participate in the social dialogue (Iankova, 1998). Once recognised by the government, the representative status was automatically transferred to the lower organisational levels (see infra). Until 1998, four employer organisations and six trade unions participated in tripartite negotiations. On the employer side, the Bulgarian Industrial Association (BIA), the Chamber for Trade and Industry, the Union for Private Enterprising and the Union Revival covered the criteria for national representation. During the 1990s, the Bulgarian Industrial Association played the most important role in the social dialogue (Gradev, 2000). On the employee side, the most powerful syndicates were Prodkrepa Confederation of Labour and the Confederation of Independent Trade Unions (CITUB) (Beleva et al., 1999). Although union membership declined sharply in all Central and East European Countries, union membership in Bulgaria is significantly higher than in most other CEE countries. Estimates of union membership amount to more than 70 percent of total employment in Bulgaria compared to only 20 percent in other CEE economies (IMF, 2001; Worldbank, 2001).

The development of tripartism has led to a multi-level bargaining structure in Bulgaria (Iankova, 1998). Negotiations are carried out on four independent levels: the national, branch, regional and enterprise level. The branch and regional levels are not well developed. Basic issues of working conditions, unemployment insurance and the minimum wage, as well as the initial level of average wages in the public sector, are negotiated at the national level. Similar issues with local importance are subject to agreements at branch and regional levels. All specific parameters concerning wages, employment, job evaluation and the level of additional payments are bargained at the enterprise level (Beleva et al., 1999).

In many countries union influence at the enterprise level is limited. Wages are generally determined unilaterally by management. As mentioned above, union power is relatively large and wage determination occurs through bargaining in Bulgaria (Martin and Cristescu-Martin, 1999). This institutional feature motivates our choice of Bulgaria for analysing wage determination at the firm level.

3. THEORETICAL FRAMEWORK

In accordance with the wage determination system applicable to Bulgaria, wages are considered to be the result of bargaining between the union[6] and the firm represented by its manager. To this end, we rely on the Right-To-Manage model (Nickell and Andrews, 1983). Under the assumption that union members are risk neutral and -given our short-run focus- that employment is not an argument in the union's utility function, the real wage w is assumed to result from the maximisation of the following Nash-bargaining maximand:

$$\Phi = \{w\text{-}A\}^{\phi} \{Y\text{-}wN\}^{1-\phi} \tag{1}$$

with A the workers' outside option expressed in real terms, Y real value added, N the employment level and $Y\text{-}wN = \pi$ real profits. The bargaining strength of employees, i.e. insider power, is represented by ϕ.

Maximisation of this function with respect to the wage rate gives the following first-order condition:

$$w = A + \frac{\phi}{1-\phi}\frac{\pi}{N} \tag{2}$$

According to this model, real firm-level wages are affected by both internal conditions (represented by profits per employee) and external factors (taken up by the outside option or the alternative wage) and the bargaining power of employees.

In the empirical part, we use value added to capture the firm's ability-to-pay. Our motivation is that although profits per worker have the advantage that they control for all costs, they have the disadvantage that they are negatively related to wages by construction, hence creating a severe endogeneity bias. Switching to value added per employee eliminates the direct endogeneity problem.[7]

[6] Although worker influence on enterprise policies may occur through trade unions, works councils and employee ownership, in Bulgaria worker participation is largely exercised through trade unions (Flanagan, 1998).

[7] This does not imply, however, that endogeneity is not an issue anymore. For example, wage shocks affecting productivity may cause endogeneity problems when using real value added per employee.

By adding the term $\frac{\phi}{1-\phi}w$ to both sides of equation (2), we obtain an expression for the optimum wage as a function of real value added per worker:[8]

$$w=(1-\phi)\,A+\phi\frac{Y}{N} \tag{3}$$

Although a well-developed theory of the determinants of bargaining power is lacking, some authors have made ϕ heterogeneous. Bughin (1991), Svejnar (1986) and Veugelers (1989) link the firm-level or sectoral bargaining power parameter to meso- or macroeconomic variables like the consumer price index, sectoral unemployment rates and proxies for product market concentration. Others consider firm-specific variables like the elasticity of labour supply at the level of the firm, firm size, risk of bankruptcy and technology level as important determinants of rent sharing (e.g. Piekkola and Kauhanen, 2003). The focus in this paper is on the potential influence of ownership status and firm size on the employees' bargaining power and the degree of rent sharing. Depending on these structural variables, we presume that different relative weights will be given to the workers' interests and to profitability considerations. We adopt a straightforward specification:

$$\phi=\gamma_0+\gamma_{own}OWN+\gamma_N N+\gamma_{own*N}OWN*N \tag{4}$$

In this equation OWN refers to the ownership status of the firm: state-owned, private domestic or foreign. Firm size is measured by the firm's employment level (N).

Substituting (4) into (3), we obtain the following basic equation for bargained real wages:

$$w=A+\gamma_0\left[\frac{Y}{N}-A\right]+\gamma_{own}OWN\left[\frac{Y}{N}-A\right]+\gamma_N N\left[\frac{Y}{N}-A\right]+\gamma_{own*N}OWN*N\left[\frac{Y}{N}-A\right] \tag{5}$$

[8] In the empirical section, all real variables are deflated by the (exogenous) producer price (P_p). The real wage w will be the real product wage. It could be argued that workers bargain over different wages. Workers' utility is affected by wages deflated by the (exogenous) consumer price index (P_c). Algebraically, equation (1) would be $\Phi'=\{w\kappa-A\kappa\}^{\phi}\{Y-wN\}^{1-\phi}$ with w the real product wage and $\kappa=\frac{P_p}{P_c}$. Since the effect of κ on the maximand is multiplicative, the bargained real wage (w) in equation (3) is unaffected. Assuming risk-averse workers does not change that result for a large range of utility functions.

4. EMPIRICAL FRAMEWORK AND TESTABLE HYPOTHESES

4.1. Empirical Framework

In this section we test the model described by equation (5) using panel data for 1514 Bulgarian firms during the period 1997-1998. Equation (6) reflects this panel data set-up. Note that in this equation we explicitly model the effect of the three possible ownership categories mentioned before. Furthermore, for generality and in line with the literature, we have extended equation (5) by allowing for an intercept term (α) that can also differ according to ownership status and firm size.[9] A final element of flexibility is the coefficient on A (as a separate variable). Rather than imposing 1, we estimate this coefficient freely (δ). We justify this choice below.

$$\begin{aligned} w_{it} = {} & \alpha_0 + \alpha_{privd} PRIVD_{it} + \alpha_{for} FOR_{it} + \alpha_N N_{it} + \alpha_{privd*N} PRIVD_{it} N_{it} + \alpha_{for*N} FOR_{it} N_{it} + \delta A_t + \\ & \gamma_0 \left[valad\_N_{it} - A_t \right] + \gamma_{privd} PRIVD_{it} \left[valad\_N_{it} - A_t \right] + \gamma_{for} FOR_{it} \left[valad\_N_{it} - A_t \right] + \\ & \gamma_N N_{it} \left[valad\_N_{it} - A_t \right] + \gamma_{privd*N} PRIVD_{it} N_{it} \left[valad\_N_{it} - A_t \right] + \gamma_{for*N} FOR_{it} N_{it} \left[valad\_N_{it} - A_t \right] + \alpha_i + D97 + \varepsilon_{it} \end{aligned} \quad (6)$$

where subscript i is used to index observations on individual firms and t represents year.

The dependent variable is the annual real wage per worker. Among the explanatory variables, $valad\_N$ stands for real value added per worker and N for employment. To check robustness, we will later use real profits per worker as a proxy for internal conditions. The variables $PRIVD$ and FOR are ownership categories. They refer to the fraction of shares held by private domestic and foreign owners. The ownership category that is left out is the state, which refers to the fraction of shares in the firm held by the state, municipalities or Treasury.

To stick as close as possible to the theory, the workers' outside option (A) is proxied by its expected value: the regional probability of employment times the real average regional wage.[10] Controlling for region-specific variables is in the context of Bulgaria particularly important as there are considerable disparities between the regions in which the firms are located (UNDP, 2000). Obviously, assuming our proxy to equal the theoretical A is rather strong. Allowing some flexibility in the coefficient on A_t (δ) is therefore justified.[11] ε represents a white noise error term.

[9] Note that excluding firm size in the intercept term of the wage equation would bias the estimate of the rent sharing effect.

[10] Ideally, the proxy for A would be: (regional probability of unemployment * unemployment benefits) + (regional probability of employment * real average regional wage). Since the level of unemployment benefits is determined at the national level (IMF, 2001), however, there is no variation between firms. Therefore, we proxy A by regional probability of employment * real average regional wage.

[11] Note however that we do not allow flexibility in the variable ($valad\_N$-A). The reason is that we can not impose proportional restrictions in STATA. From the estimates, it follows that the coefficient on A is 0.7 on average. As a test, we have therefore created the variable ($valad\_N - 0.7*A$) and re-estimated the model. The results were broadly similar to those reported in the paper.

All specifications include a year dummy ($D97$) to capture possible unobservable aggregate shocks in 1997. Finally, we control for unobserved firm heterogeneity by including a firm-level fixed effect (α_i), even within the separate ownership groups.

The heterogeneity that we have introduced in the wage intercept and the rent sharing parameter affects the interpretation of the coefficients in equation (6). $\alpha_0 + \alpha_N N$ is the wage intercept in state-owned firms whereas $\alpha_0 + \alpha_N N + \alpha_{privd} + \alpha_{privd*N} N$ and $\alpha_0 + \alpha_N N + \alpha_{for} + \alpha_{for*N} N$ indicate the wage intercept in private domestic and foreign firms respectively. Likewise, $\gamma_0 + \gamma_N N$ reflects the degree of rent sharing in state firms while $\gamma_0 + \gamma_N N + \gamma_{privd} + \gamma_{privd*N} N$ and $\gamma_0 + \gamma_N N + \gamma_{for} + \gamma_{for*N} N$ indicate the degree of rent sharing in private domestic and foreign firms respectively.

We specify the variables in equation (6) in levels rather than logs for two reasons. First, the levels-levels specification is the most consistent with the theoretical model (equations (2) and (3)). Second, given the presence of loss-making firms in our data, the use of logs would have necessitated discarding observations from poorly performing firms. This would possibly introduce problems of selection bias.

4.2. Testable Hypotheses

In the literature, various explanations have been put forward for the wage differential between foreign-owned and domestically-owned firms. Strand (2002) refers to the fact that foreign firms try to attract a higher quality work force and to differences in labour turnover costs. Jensen and Meckling (1976) point to efficiency wage mechanisms. Other authors explain the wage differential by differences in firm size and technological superiority (Aitken and Harrison, 1999; Djankov and Hoekman, 1998). A very recent explanation for the multinational wage premium is international rent sharing (Budd and Slaughter, 2003; Budd et al., 2003). The idea is that profits within multinational firms are shared across borders. Our data do not allow an explicit test of these explanations. However, we believe that technological superiority and international rent sharing are two potential explanations for finding a multinational wage differential in Bulgaria. Therefore we expect $\alpha_{for} > \alpha_{privd}$.

Explanations for the positive relationship between firm size and wages build on different aspects of wage formation: labour quality (Hammermesh, 1980; Kremer, 1993; Weiss and Landau, 1984), compensating differentials (Masters, 1969), efficiency wages (Oi, 1983; Garen, 1985) or more generally firm-specific compensation policies (Bullow and Summers, 1976), internal labour

markets (Doeringer and Piore, 1971), union avoidance and union demand (Weiss, 1966), job seniority (Schmidt and Zimmerman, 1991) and rent sharing. Based on the literature, we expect α_N to be significantly positive. We also investigate whether the firm size-wage effect differs according to ownership status. A priori, no clear prediction can be made about the magnitude of the firm size effect in the different ownership categories ($\alpha_{privd*N}$ and α_{for*N}), however.

In the labour literature, the standard explanation for rent sharing is insurance, i.e. implicit risk sharing between firms and workers. Hence, we anticipate an upward responsiveness of real firm-level wages to rents per worker. At the same time, we expect the insider effect to be determined by ownership form and/or firm size. Intuitively, we expect to find a strong rent-sharing effect in state firms and a small one in foreign firms. The idea is that foreign firms, being much more efficient than state firms, are concentrated in sectors with high value added. In contrast, value added in state-owned firms is much lower. Therefore, workers in state firms need to capture a large part of the rents to secure an acceptable wage while the opposite is true for workers in foreign firms. Moreover, employees in foreign firms are able to appropriate some portion of the rents from their parent firms (international rent sharing) which is translated into a higher inside wage level. Therefore, we expect $\gamma_{for} < \gamma_{privd} < 0$. In addition, the bargaining strength of the employees is expected to be positively correlated with firm size, i.e. γ_N is expected to be positive. Whether this effect is different in private domestic and foreign firms than in state-owned firms ($\gamma_{privd*N}$ and γ_{for*N}) is ex ante unclear, however.

5. DATA AND SUMMARY STATISTICS

We use a panel of 1514 manufacturing firms from the 28 Bulgarian regions ('oblasti'). To be included in the data set at least one of the following conditions has to be satisfied. Either total assets or total sales exceed 8 and 16 million USD respectively, or the number of employees is larger than 100.

All variables are taken from published annual company accounts which are collected by "Bureau Van Dyck" and marketed as the Amadeus data set. Nominal variables are expressed in millions of leva.[12] Although the data cover the period 1994-1998, we will focus the analysis on the period 1997-1998 as only for these two years detailed information on the ownership structure of the firms is available.

This unique data set allows us to make at least two major contributions. First, until now the scarce existing empirical work in this field typically had to rely on small samples of firms collected

[12] In 1997 the exchange rate (annual average) was 1.674 leva per USD (EBRD, 2000).

through surveys. In contrast, our sample contains virtually the entire population of medium and large firms in manufacturing. Comparing the employment and sales coverage of our data with total employment and sales in manufacturing reported in the statistical yearbooks, reveals that our data cover 82% of total sales and 66% of total employment in manufacturing.[13] Furthermore, the Amadeus data set is collected from company accounts at the three-digit level of sectoral disaggregation. To our knowledge, this kind of detailed firm-level data for a transition country has not been used before for this purpose.

A second strength of the data set is that it offers detailed information on the ownership structure of firms for two consecutive years. In particular, we know the fraction of shares held by the state and by private investors and can observe their evolution over time. Next, we are able to make a distinction between private domestic investors and foreign investors. Earlier studies for Central and Eastern Europe had to rely on ownership dummies to investigate the crucial question of how wage formation is related to form of ownership (Earle et al., 1995, Grosfeld and Nivet, 1999, Jones and Kato, 1996 and Luke and Schaffer, 1999). Detailed information on the shareholding structure also enables us to perform some additional robustness checks. Table 1 shows the distribution of ownership on average.

Table 1 Distribution of Ownership

	1997	**1998**
	Mean (St.Dev.)	**Mean (St.Dev.)**
Fraction of shares held by the state (STATE)	0.34 (0.38)	0.27 (0.35)
Fraction of STATE firms in total number of firms[a]	0.70	0.66
Fraction of STATE in all STATE firms	0.49 (0.36)	0.40 (0.35)
Fraction of shares held by private domestic owners (PRIVD)	0.62 (0.39)	0.68 (0.37)
Fraction of PRIVD firms in total number of firms[b]	0.79	0.83
Fraction of PRIVD in all PRIVD firms	0.78 (0.26)	0.82 (0.23)
Fraction of shares held by foreign owners (FOR)	0.04 (0.17)	0.05 (0.19)
Fraction of FOR firms in total number of firms[c]	0.06	0.08
Fraction of FOR in all FOR firms	0.68 (0.23)	0.63 (0.29)
Number of majority state firms	332	269
Number of majority private domestic firms	897	1150
Number of majority foreign firms	63	83

Source: Amadeus Database

a: STATE firms are firms for which STATE > 0.
b: PRIVD firms are firms for which PRIVD > 0.
c: FOR firms are firms for which FOR > 0.

In 1997 the fraction of shares held by foreign owners was only 4% on average, meaning that only a relatively small fraction of firms had some foreign participation. However, if we look at shareholding in foreign firms only, i.e. firms with at least some shares held by foreign owners, we

[13] Sales coverage ratio = total sales of firms in Amadeus in 1998 divided by total national sales as reported by the National Statistical Offices. Idem for employment.

can see that the low average share of foreign ownership hides the fact that foreign investors were concentrated in a few firms. For example, in 1998 119 firms had a foreign owner who held an average share of 63%. In 83 firms foreign owners were holding more than 50% of the shares. Hence, in most cases foreign investors owned a majority share. Looking at shareholding in private domestic firms only reveals that private domestic investors held on average 80% of total shares. Finally, we can observe that the fraction of private domestic and foreign firms in the total number of firms increased over time.[14] During the 1990s, the inflow of foreign direct investment rose rapidly. By 1998 inward FDI was almost 10 times higher than in 1991 (EBRD, 2000). The rising total number of firms reflects a better coverage in the latest year and indicates that our analysis draws upon an unbalanced panel.

The regional variable A_t (at the NUTS3-regional level) is collected from the National Statistical Institute (NSI, 1998; 1999) and the United Nations Development Program (UNDP, 2000). Table 2 reports summary statistics for the main variables used in the regression analysis.

Table 2 Summary Statistics

VARIABLES	1997			1998			1997-1998		
	# Obs.	Mean	St. Dev.	# Obs.	Mean	St. Dev.	# Obs.	Mean	St. Dev.
Employment (N)	1306	374.12	759.47	1381	348.03	693.74	2687	360.71	726.41
Average wage (w)	1043	98.62	101.86	1109	112.22	76.55	2152	105.63	89.95
Alternative wage (A)	1514	83.22	18.32	1514	93.92	16.77	3028	88.57	18.35
Profits per employee (prof_N)	1038	178.08	601.59	1106	303.45	3277.26	2144	242.75	2391.06
N * prof_N	1038	81070.1	453430.5	1112	59549.7	352974.7	2150	69939.5	404647.2
Value added per employee (valad_N)	1038	277.09	663.89	1108	415.98	3279.45	2146	348.80	2401.73
valad_N - A	1038	192.95	661.23	1108	321.51	3278.29	2146	259.33	2400.41
N * (valad_N - A)	1038	99075.6	537981.3	1108	80076.9	431478.2	2146	89266.4	485894.2

Source: Amadeus Database, NSI (1998, 1999), UNDP (1999)

Wages are constructed as the reported wage bill divided by the average number of employees, which is standard for corporate data in the rent sharing literature (e.g. Hildreth and Oswald, 1997). The wage bill includes wage and salary payments to employees as well as mandated employer contributions to government social insurance funds.[15] Annual wages are expressed as real wages per worker, i.e. nominal wages deflated by a three-digit producer price index, normalised to 1 in 1995. This price index is obtained from the central statistical offices. 'A' represents the conditions on the labour market, measured as the regional probability of employment times the real average regional wage. Profits and value added per worker are also expressed in real terms. They are constructed in the standard way. Value added is calculated as sales minus material

[14] Note that the sum of the fractions of respectively state, private domestic and foreign firms in the total number of firms does not add up to 1 as each firm can have multiple owners.

[15] The wage measure hence refers to paid wages. Wage arrears could bias the rent sharing effect. To our knowledge, however, the problem of wage arrears is a very important issue in Russia and Ukraine but less severe in Bulgaria (Alfandari and Schaffer, 1996; Earle and Sabirianova, 2001; Ivanova and Wyplosz, 1999; Lehmann et al., 1999).

costs and profits as value added minus the wage bill (see e.g. Blanchflower et al., 1996). Our profit measure hence corresponds to the economic concept of rents available for sharing with workers. Variables per worker are constructed by dividing by the average number of employees in each firm for each year respectively. Employment ranges from 6 to 16280 employees. Its average level is 361. From Table 2, it is clear that profits as well as value added vary much more than wages.

Table A.1 in Appendix presents summary statistics by ownership category. In this table firms are classified according to majority shareholding. The average employment level is the highest in majority foreign firms (652), followed by majority state firms (441) and the lowest in majority private domestic firms (331) (see lower part of Table A.1). Workers in majority foreign firms get the highest wages (mean wage of 153). Wages in majority state and majority private domestic companies are much lower (mean wage of 100 and 106 respectively).

Privatisation is clearly associated with better firm performance. Majority private firms outperform majority state firms. Furthermore, majority foreign firms outperform majority state firms as well as majority private domestic firms. Using the same data set, recent empirical research by Estrin et al. (2001) confirms these findings. Strikingly, 18% of majority state companies (87 out of 476) are classified as loss-making firms, reporting negative profits per employee over the sample period.

6. RESULTS AND ROBUSTNESS CHECKS

6.1. Estimation Method

Our estimation strategy consists of three parts. First, in order to get some grip on the more long-term relationships of the model, the Pooled Ordinary Least Squares estimator is used as a benchmark for cross-sectional time-series estimates. Second, the Panel Data Estimation Method allows us to control for firm-specific heterogeneity which may capture various unobservables, such as the quality of capital and labour. In the last part, we check the robustness of the fixed-effects estimator. In addition, we try to deal with two problems that have not been addressed so far. First, simultaneity may obscure the true relationship between wages and the variables reflecting internal conditions. Moreover, firm size will be endogenous in that any effect from size to wages will induce the firm to economise on labour. Second, the level of employment entering both the definition of the wage and the measure of rents per worker, raises the standard problem that measurement error may induce spurious correlation between these two key variables. To circumvent these problems, we use the First-difference Instrumental Variables Method suggested for dynamic fixed-effects models by Anderson and Hsiao (1982). Under the assumption that

endogeneity is constant across years, these results are expected to be in line with those obtained by the fixed-effects estimator.

6.2. Results

We use the pooled OLS, panel and first-difference TSLS method to estimate four alternative specifications of equation (6). Gradually, we loosen a number of restrictions. In the first specification it is imposed that only ownership status matters for the wage intercept and the degree of rent sharing. Firm size does not, i.e. $\alpha_N = \alpha_{privd*N} = \alpha_{for*N} = 0 = \gamma_N = \gamma_{privd*N} = \gamma_{for*N}$. The second specification relaxes the restriction that $\alpha_N = \gamma_N = \gamma_{privd*N} = \gamma_{for*N} = 0$ whereas in the third specification we drop the restriction that $\alpha_N = \alpha_{privd*N} = \alpha_{for*N} = \gamma_N = 0.$ In the final specification all coefficients are freely estimated. As noted above, the benchmark ownership type is state-owned firms.

The pooled OLS results using real value added per worker to capture the firm's good fortune are reported in the left part of Table 3. Consider first ownership-, size- and cross-effects on the wage intercept, i.e. the effects on inside wages for given rent sharing. Even after controlling for differences in firm size, private domestic and foreign ownership exerts a significantly positive effect on the wage intercept in all specifications. In accordance with the MNE-literature and our first hypothesis, foreign firms pay the highest wages ($\alpha_{for} > \alpha_{privd} > 0$). Furthermore, we find a significantly positive relationship between firm size and wages in specification 2 ($\alpha_N > 0$), confirming our second hypothesis and the findings of Idson (2000) for Russia. There is also evidence that the firm size-wage effect differs according to ownership structure. From specification 3, it follows that the combined effect of private domestic as well as foreign ownership and firm size is significantly positive. Concentrating on privately-owned firms the larger the firm, the higher the wages. Once the positive combined effect of private ownership and firm size on rent sharing is also taken into account, however, the effects on the wage intercept are less clear.

Focusing on the degree of rent sharing, the results clearly indicate that ownership status is a crucial determinant of insider power. Each of the four specifications shows that workers in state-owned firms succeed in appropriating a significant part of the rents (γ_0 is about 0.12). In contrast, the employees' capacity to capture productivity gains is very low in both private domestic ($\gamma_0 + \gamma_{privd}$) and foreign firms ($\gamma_0 + \gamma_{for}$). These results confirm our third hypothesis. Moreover, the results regarding state-owned and private domestic firms are in line with the existing empirical research for Poland (period 1992-1994) and Russia (1996-1997) in this field (Grosfeld and Nivet,

1999; Luke and Schaffer, 1999). Both these studies use ownership dummies to discriminate between state, privatised and commercialised enterprises and find that the share of rents taken by workers in privatised companies is significantly less than the share taken by employees in state-owned firms. From specification 3, it is clear that workers' bargaining power is positively correlated with firm size ($\gamma_N > 0$). This effect is highly pronounced in private domestic and foreign firms as indicated by the significantly positive combined effect of private domestic and foreign ownership and firm size. Finally, the estimates show that outside forces play an important role in the wage determination process (δ is about 0.65).

Table 3 Wage Equation 1997-1998, dependent variable $wage_{it}$ - Pooled OLS

Constant	22.869*** (11.168)	28.734*** (10.599)	28.653*** (10.878)	0.054 (14.422)	**Constant**	23.810** (11.430)	26.940*** (10.968)	27.202*** (11.187)	26.458** (11.013)
PRIVD	20.400*** (5.315)	12.663*** (5.070)	8.693* (5.551)	17.906*** (5.504)	**PRIVD**	16.914*** (5.445)	11.085** (5.257)	6.054 (5.739)	11.259** (5.689)
FOR	74.432*** (11.458)	60.705*** (11.346)	50.439*** (14.835)	60.435*** (14.601)	**FOR**	73.489*** (11.662)	64.097*** (11.547)	49.997*** (15.227)	55.473*** (15.087)
N		0.009*** (0.003)	-0.011*** (0.004)	0.019*** (0.005)	**N**		0.016*** (0.003)	-0.004 (0.004)	0.016*** (0.005)
PRIVD * N			0.033*** (0.007)	-0.020*** (0.008)	**PRIVD * N**			0.034*** (0.007)	-0.001 (0.008)
FOR * N			0.030** (0.015)	-0.004 (0.018)	**FOR * N**			0.030** (0.015)	0.015 (0.018)
A	0.705*** (0.108)	0.620*** (0.103)	0.670*** (0.105)	0.615*** (0.103)	**A**	0.738*** (0.111)	0.653*** (0.106)	0.703*** (0.108)	0.658*** (0.107)
valad_N - A	0.128*** (0.010)	0.126*** (0.010)	0.105*** (0.010)	0.129*** (0.010)	**prof_N**	0.098*** (0.011)	0.099*** (0.011)	0.079*** (0.011)	0.099*** (0.011)
PRIVD * (valad_N - A)	-0.124*** (0.010)	-0.124*** (0.010)	-0.102*** (0.010)	-0.126*** (0.010)	**PRIVD * prof_N**	-0.095*** (0.011)	-0.098*** (0.011)	-0.077*** (0.011)	-0.098*** (0.011)
FOR * (valad_N - A)	-0.118*** (0.011)	-0.120*** (0.011)	-0.100*** (0.011)	-0.123*** (0.012)	**FOR * prof_N**	-0.092*** (0.013)	-0.093*** (0.013)	-0.076*** (0.012)	-0.091*** (0.013)
N * (valad_N - A)		-0.00003*** (0.00001)	0.00004*** (0.00001)	-0.00004*** (0.00001)	**N * prof_N**		-0.00004*** (0.00001)	0.00003*** (0.00001)	-0.00004*** (0.00001)
PRIVD * N * (valad_N - A)		0.0001*** (0.00001)		0.0002*** (0.00002)	**PRIVD * N * prof_N**		0.0001*** (0.00001)		0.0001*** (0.00002)
FOR * N * (valad_N - A)		0.0001*** (0.00002)		0.0001*** (0.00002)	**FOR * N * prof_N**		0.00004** (0.00002)		0.00003 (0.00003)
Year 1997	-1.841 (3.971)	-2.505 (3.752)	-2.758 (3.839)	-2.638 (3.754)	**Year 1997**	-1.408 (4.064)	-2.463 (3.885)	-2.481 (3.951)	-2.283 (3.893)
# Obs.	2040	2040	2040	2040	**# Obs.**	2040	2040	2040	2040
R^2	0.132	0.229	0.193	0.231	R^2	0.091	0.173	0.146	0.174

***Significant at 1%; **Significant at 5%; *Significant at 10%. Standard errors in parentheses.

The panel estimates are reported in the left part of Table 4. We control for firm heterogeneity for each individual firm, even within the different ownership categories. In all specifications, the Hausman test indicates that we should rely on the fixed-effects model.[16]

Since unobserved fixed effects, of which the unobserved quality of workers is probably an important one, are likely to be positively correlated with private ownership, we are implicitly controlling for one of the potential sources of endogeneity of ownership by using the fixed-effects estimator (Estrin et al., 2001). In line with the previous results, private ownership is positively correlated with the wage intercept although this effect is not always statistically significant for private domestic firms. Foreign firms pay the highest wages. The results also point to a significantly positive firm size-wage effect in private domestic firms, even after controlling for the cross-effect on rent sharing.

With respect to rent sharing, we find again that employees in state-owned firms manage to cream off a significantly larger share of the rents than workers in private domestic and foreign companies, although this share is smaller than in the pooled OLS estimates. Foreign-owned firms are in fact characterised by zero rent sharing. On average, the bargaining power of workers in large firms is higher than in small firms. Specification 2 suggests that this effect is only significant in private domestic firms. From specification 4, however, it follows that the cross-effect on rent sharing is not statistically significant. This would suggest that the positive effect of firm size on the degree of rent sharing does not differ according to ownership status. Again, external labour market conditions appear to be important for wage setting.

[16] A critique to the use of within-group estimation is that the assumption of non-zero correlation between the time-invariant fixed effect and the exogenous variables does not allow for doing out-of sample inference (Baltagi, 1995). Since we rely on a large and

Table 4 Wage Equation 1997-1998, dependent variable wage $_{it}$ - Panel (Fixed Effects)

Constant	23.123 (17.216)	27.691 (18.123)	30.107* (18.319)	31.641* (18.345)	**Constant**	27.345* (17.401)	26.923 (18.340)	25.808 (18.673)	28.594 (18.717)
PRIVD	19.259** (8.951)	17.279** (9.080)	10.789 (9.517)	11.681 (9.599)	**PRIVD**	20.754** (9.010)	17.606** (9.161)	16.127* (9.763)	15.561* (9.833)
FOR	63.980*** (14.398)	65.070*** (14.729)	65.546*** (17.500)	63.234*** (18.148)	**FOR**	68.921*** (13.999)	69.989*** (14.383)	75.542*** (17.415)	69.951*** (18.139)
N		-0.001 (0.011)	-0.011 (0.012)	-0.011 (0.013)	**N**		0.007 (0.010)	0.006 (0.013)	0.003 (0.013)
PRIVD * N			0.015*** (0.005)	0.012* (0.007)	**PRIVD * N**			0.004 (0.007)	0.005 (0.008)
FOR * N			0.003 (0.012)	0.008 (0.015)	**FOR * N**			-0.008 (0.012)	0.002 (0.016)
A	0.723*** (0.171)	0.692*** (0.172)	0.711*** (0.171)	0.696*** (0.172)	**A**	0.754*** (0.173)	0.750*** (0.174)	0.765*** (0.174)	0.750*** (0.174)
valad_N - A	0.050*** (0.010)	0.054*** (0.011)	0.045*** (0.011)	0.048*** (0.011)	**prof_N**	0.033*** (0.011)	0.040*** (0.011)	0.037*** (0.012)	0.038*** (0.012)
PRIVD * (valad_N - A)	-0.018 (0.012)	-0.031** (0.013)	-0.021* (0.012)	-0.027** (0.014)	**PRIVD * prof_N**	-0.035*** (0.014)	-0.043*** (0.014)	-0.037*** (0.014)	-0.042*** (0.014)
FOR * (valad_N - A)	-0.047*** (0.017)	-0.053*** (0.018)	-0.053*** (0.017)	-0.051*** (0.019)	**FOR * prof_N**	-0.075*** (0.017)	-0.072*** (0.019)	-0.079*** (0.018)	-0.072*** (0.020)
N * (valad_N - A)		0.000003 (0.00001)	0.00003*** (0.00001)	0.000029* (0.000015)	**N * prof_N**		-0.000016* (0.00001)	-0.00001 (0.00002)	-0.00001 (0.00002)
PRIVD * N * (valad_N - A)		0.00002*** (0.000007)		0.00001 (0.00001)	**PRIVD * N * prof_N**		0.000017* (0.00001)		0.00001 (0.00001)
FOR * N * (valad_N - A)		0.000001 (0.00001)		-0.00001 (0.00002)	**FOR * N * prof_N**		-0.00002 (0.00002)		-0.00002 (0.00002)
Year 1997	-8.186*** (2.460)	-8.542*** (2.468)	-8.591*** (2.462)	-8.619*** (2.470)	**Year 1997**	-7.721*** (2.498)	-7.635*** (2.504)	-7.735*** (2.504)	-7.690*** (2.511)
Hausman test	$\chi^2(7)$ =46	$\chi^2(11)$ =40	$\chi^2(11)$ =74	$\chi^2(13)$ =36	**Hausman test**	$\chi^2(7)$ =116	$\chi^2(11)$ =48	$\chi^2(11)$ =355	$\chi^2(13)$ =31
# Obs.	2040	2040	2040	2040	**# Obs.**	2040	2040	2040	2040
R^2	0.182	0.189	0.190	0.192	R^2	0.158	0.166	0.163	0.166

***Significant at 1%; **Significant at 5%; *Significant at 10%. Hausman test checks for orthogonality of individual effects and other regressors. Standard errors in parentheses. R^2 = R -sq within.

In Table 5, we calculate the size of the total impact of private ownership on firm-level wages (using the values of the variables from Table 2). The main conclusion is that ownership effects on wages differ consistently between ownership regimes. The first two rows refer to the pooled OLS and the panel estimates using value added as proxy for the firm's ability-to-pay. From the pooled OLS estimates, it follows that the strongly negative effect of private domestic ownership on rent sharing dominates the positive effect of private domestic ownership on the wage intercept, resulting in a negative total impact of private domestic ownership on wages. On average over all four specifications, a 1% increase in the fraction of shares held by private domestic owners decreases

representative sample of manufacturing firms, however, we argue that this critique does not apply to our results.

the average wage by 8 000 leva (in 1995 prices). In contrast, the total impact of foreign ownership on wages is positive and amounts to 38.784 on average. The multinational wage premium clearly compensates for the negative effect of foreign ownership on rent sharing. The fixed-effects estimates are more in line with our expectations: the total effect of private domestic as well as foreign ownership on wages is positive and highest in absolute value for foreign ownership (on average over all specifications 6.894 for private domestic ownership and 51.232 for foreign ownership).

Table 5 Ownership Effects on Wages

	Spec. 1		**Spec. 2**		**Spec. 3**		**Spec. 4**	
	$\partial w / \partial PRIVD$	$\partial w / \partial FOR$	$\partial w / \partial PRIVD$	$\partial w / \partial FOR$	$\partial w / \partial PRIVD$	$\partial w / \partial FOR$	$\partial w / \partial PRIVD$	$\partial w / \partial FOR$
OLS (valad_N)	-11.757	43.831	-10.567	38.512	-5.855	35.327	-4.131	37.464
FE (valad_N)	19.259	51.791	11.025	51.326	-0.035	51.802	-2.673	50.008
fd TSLS (valad_N)	-1.317	80.338	-6.617	118.218	-6.050	197.962	-16.438	127.810
OLS (prof_N)	-6.147	51.156	-5.711	44.319	-6.428	42.369	-5.537	33.383
FE (prof_N)	12.258	50.715	8.357	52.511	7.145	56.365	5.366	52.473

valad_N: $\partial w_{it} / \partial PRIVD_{it} = \alpha_{privd} + \alpha_{privd*N} N_{it} + \gamma_{privd} [valad\_N_{it} - A_t] + \gamma_{privd*N} N_{it} [valad\_N_{it} - A_t]$. Idem for FOR.

prof_N: $\partial w_{it} / \partial PRIVD_{it} = \alpha_{privd} + \alpha_{privd*N} N_{it} + \gamma_{privd} [prof\_N_{it}] + \gamma_{privd*N} N_{it} [prof\_N_{it}]$. Idem for FOR.

6.3. Robustness Checks

To test whether the estimation results are robust to the use of different variables and estimation techniques, two robustness checks are carried out.

The first one is related to the measurement of internal conditions and ownership status.[17] Following the empirical literature, we substitute profits per worker for value added per worker. Next, we define three slightly different samples to investigate whether our results are robust to the use of discrete instead of continuous shareholding variables.[18] More specifically, to test for jump effects we define the ownership dummies in three different ways. The first option is private domestic (foreign) ownership in the strictest sense: the dummy PRIVDDUM10 (FORDUM10) equals 1 if private domestic (foreign) ownership exceeds 10%. The 10% threshold is chosen since it is an internationally accepted standard (see e.g. Blomström and Sjöholm, 1999; Konings, 2001). Furthermore, it is the criterion used by the IMF to characterise foreign ownership. Second, we check for majority shareholding: the dummy PRIVDDUM50 (FORDUM50) equals 1 if private

[17] Note that for all specifications, the Hausman test rejects the random effects estimator.

[18] When we estimate the model using the continuous shareholding variables ranging between zero and one, we assume a linear relationship between the fraction of shares held by the different owners and the control over the firm. To get rid of this -arguably strong- assumption, we use dummies for shareholding to check the robustness of our findings. These results, which are not reported, are available upon request (for a discussion of the results, see p. 3.18).

domestic (foreign) ownership is higher than 50%. Third, we define fully-owned private domestic (foreign) firms as those owned for at least 95% by a private domestic (foreign) shareholder (dummy PRIVDDUM95 (FORDUM95)).

The second check refers to the estimation method. We check the robustness of the fixed-effects estimator by applying the first-difference instrumental variables approach.

Including profits per worker, the pooled OLS estimates (right part of Table 3) are very well in line with the earlier results, except for the last specification. This specification points to a positive firm size effect on the wage intercept (α_N) which is however independent of the firm's ownership status. Note that the rent-sharing estimate for state firms is lower than the estimate using value added. The direct endogeneity bias might be an explanation for this finding. The fixed-effects estimates using profits per worker are reported in the right part of Table 4. In contrast to the previous panel results, we find no significant firm size-wage effect. Remarkably, the rent-sharing coefficient in both private domestic and foreign firms is found to be negative and highest in absolute value for foreign firms. Table 5, however, shows that the size of the total impact of private ownership on wages using profits per worker to capture the firm's internal conditions accords very well to the one using value added per worker.

The pooled OLS results using discrete shareholding variables correspond strongly to those using continuous shareholding variables. From the results, it follows that no systematic differences in the estimates across the various ownership dummy categories can be detected. This suggests that the degree of private ownership does not affect the previous qualitative conclusions. The results of the panel estimates using majority shareholding as criterion are very similar to those using continuous shareholding variables. In contrast, when the 10% threshold is used both the firm size-wage effect and the negative correlation between private domestic ownership and rent sharing totally disappear. The estimates using the fully-owned ownership definition suggest that firm size has no effect on rent sharing.

To correct for possible simultaneity between value added and wages as well as between firm size and wages and to allow for firm-specific effects, we report the results of the first-difference instrumental variables procedure in Table 6. The various specifications include the first differences of all variables. As suggested by Arellano (1989), the instruments are in levels. The 3-period lagged value of value added combined with the 3-period lagged value of real wages at the firm level are used as instruments for value added. Firm size is instrumented by its 3-period lagged value. To check instrument validity, we present the probability values of a chi-square statistic testing overidentifying restrictions, the Hansen-Sargan test. It is clear that all specifications pass the

overidentification test. To check the usefulness of the instruments, we have performed F-tests. For all specifications, the nullity of the instruments in the first-stage regression is rejected.[19]

In line with the panel estimates, foreign firms pay very high inside wages, followed by private domestic firms. Specifications 2 and 3 point to a positive effect of firm size on the wage intercept. In contrast to the panel estimates, however, this effect does not differ across ownership structure. In line with the panel estimates, the results confirm the existence of crucial differences in the degree of rent sharing across the various ownership types. Comparing the fixed-effect estimates (left part of Table 4) with the first-difference TSLS estimates (Table 6) reveals that the extent of rent sharing in state-owned companies is underestimated using an OLS technique. A rather unexpected result is that the coefficients on rents in private firms are negative in all specifications.[20] No significant effect from firm size on rent sharing is found in specifications 2 and 3. Specification 4 suggests, however, that workers in large private domestic firms have more bargaining power than those in small firms. From Table 5, it follows that the first-difference TSLS estimates result in a negative total effect of private domestic ownership on wages and a strongly positive effect of foreign ownership on wages.

[19] For sake of brevity, these test statistics are not reported but are available upon request.

[20] A potential explanation for this result may be the limited forecasting power of our instruments. Due to data availability we are forced to use lags to instrument financial conditions. These instruments, however, are not capturing exogenous demand shocks hitting the industry. Therefore, this unexpected result might partly be due to weak instrument bias, yielding downward biased insider effects (for a recent discussion of the issue of weak instruments, see Stock and Yogo, 2002 and Chao and Swanson, 2003).

Table 6 Wage Equation 1997-1998, dependent variable $wage_{it}$ - First-difference TSLS

Constant	6.309* (3.413)	6.809** (3.495)	4.968 (4.188)	7.875** (3.759)
PRIVD	45.622*** (15.122)	36.432*** (14.779)	43.741*** (18.440)	29.047* (17.609)
FOR	160.73*** (28.213)	183.31*** (34.718)	291.58*** (91.314)	205.09*** (79.101)
N		0.066*** (0.026)	0.053* (0.030)	0.017 (0.030)
PRIVD * N			-0.004 (0.019)	0.023 (0.017)
FOR * N			-0.109 (0.083)	-0.007 (0.076)
A	0.845*** (0.221)	0.894*** (0.227)	0.960*** (0.246)	0.814*** (0.228)
valad_N - A	0.099*** (0.024)	0.105*** (0.025)	0.118*** (0.028)	0.096*** (0.027)
PRIVD * (valad_N - A)	-0.181*** (0.052)	-0.166*** (0.053)	-0.192*** (0.056)	-0.184*** (0.054)
FOR * (valad_N - A)	-0.310*** (0.065)	-0.251*** (0.066)	-0.361*** (0.075)	-0.298*** (0.078)
N * (valad_N - A)		-0.00003 (0.00002)	-0.00006 (0.00006)	0.00005 (0.00005)
PRIVD * N * (valad_N - A)		0.00002 (0.00002)		0.000025* (0.000015)
FOR * N * (valad_N - A)		-0.00007 (0.00005)		-0.00005 (0.00005)
Hansen-Sargan IV Test (p-value)	0.834	0.976	0.938	0.328
# Obs.	695	695	695	695
R^2	.	.	.	.

***Significant at 1%; **Significant at 5%; *Significant at 10%. Standard errors in parentheses. A full stop in the R^2 box indicates that the calculated R^2 was negative and hence is not reported. Hansen-Sargan Instrument Validity Test: test of correlation among instruments and residuals, asymptotically distributed as χ^2_{df}. The null hypothesis is that the instruments are valid. All variables are in first differences, the instruments are in levels.

7. CONCLUSION

To conclude, our results clearly show that ownership status is an important determinant of both the wage intercept and the degree of rent sharing. Rent sharing is very pronounced in state-owned firms but far less pronounced in private domestic and foreign firms. The results strongly confirm the existence of a multinational wage premium. In addition, we find weak evidence of a positive firm size-wage effect and a positive effect of firm size on the degree of rent sharing. If these effects exist, they are often more pronounced in private domestic firms.

In our view, the higher technology level of foreign firms and the presence of international rent sharing are two plausible explanations for the significant multinational wage premium in Bulgaria. The resulting high wage may prevent insiders in foreign firms from translating productivity gains into wage increases. This may partly explain the result that the share of rents taken by workers in foreign companies is considerably less than the part taken by state-owned employees. Another explanation is that foreign ownership seems to be concentrated in firms with high value added. Consequently, workers in these firms need to capture only a small fraction of the rents to secure an acceptable wage. A third possible explanation for the observed differences in rent-sharing behaviour across ownership categories is that firm mobility may curb insider power. If one thinks about a two-stage game in which the location decision of foreign firms occurs after firms and insiders bargain over wages, the 'threat of relocation' possibility of foreign firms vis-à-vis the insiders increases the relative bargaining power of the firm. If bargaining breaks down, the conflict payoff (or outside option for the firm) is positive as foreign firms can relocate activity to other countries. This may lead to a low responsiveness of real wages to productivity gains (Zhao, 1995).

The strong positive relationship between firms' ability-to-pay and wages in state-owned firms may partly be explained by the fact that insiders in these companies still play an important role. This is however not a sufficient explanation as increased product market competition (resulting for example from increased FDI) may prevent insiders from exploiting their power at the bargaining table. More plausible explanations are the relatively low inside wage level (for given rent sharing) and the low value-added profile in these firms which may induce (or necessitate) employees to cream off a considerable part of the rents to obtain an acceptable wage.

Finally, a caveat to our results is the possibility of residual selection bias. It could be that some categories of owners were able to obtain shares in better firms, in ways which are unobservable to the researcher but possibly observable to the buyers. This problem arises in all studies of privatisation and firm performance. In our analysis, we argue that the fixed-effects estimator controls for ownership endogeneity. This is valid if the unobservable quality is fixed for each firm. The effect may be dynamic, however, if for example the unobservable quality relates to potential for restructuring and improvements in productivity rather than being intertemporally fixed. We implicitly control for this dynamic effect by using the first-difference TSLS method. Nevertheless, the possibility of selection bias should be borne in mind in interpreting our findings.

APPENDIX A

Table A.1 Summary Statistics by Ownership Category

VARIABLES	# Obs.	Total Sample Mean (St. Dev.)	# Obs.	Maj. State Firms Mean (St. Dev.)	# Obs.	Maj. Priv. Dom. Firms Mean (St. Dev.)	# Obs.	Maj. Foreign Firms Mean (St. Dev.)
1997								
Employment	1163	400.4 (799.0)	303	528.6 (1398.4)	802	335.0 (390.4)	58	635.3 (553.3)
Average wage	933	101.7 (105.6)	265	98.2 (84.2)	620	100.3 (114.3)	48	137.9 (89.0)
Profits per employee	931	167.3 (595.5)	265	111.5 (396.3)	618	179.1 (667.2)	48	323.8 (495.2)
Value added per employee	931	269.1 (663.3)	265	209.7 (446.5)	618	279.6 (742.0)	48	461.7 (545.8)
1998								
Employment	1371	346.8 (695.0)	236	328.5 (609.3)	1058	327.8 (708.5)	77	664.1 (685.7)
Average wage	1102	112.2 (76.7)	211	102.0 (78.0)	828	110.8 (71.5)	63	164.7 (112.2)
Profits per employee	1099	303.4 (3287.5)	211	98.5 (271.5)	827	337.2 (3741.0)	61	553.9 (2153.0)
Value added per employee	1101	415.9 (3289.7)	211	200.6 (304.1)	828	447.6 (3743.2)	62	725.8 (2145.3)
1997-1998								
Employment	2534	371.4 (744.8)	539	441.0 (1126.8)	1860	330.9 (592.5)	135	651.7 (630.1)
Average wage	2035	107.4 (91.2)	476	99.9 (81.5)	1448	106.3 (92.4)	111	153.1 (103.2)
Profits per employee	2030	241.0 (2452.7)	476	105.7 (346.3)	1445	269.6 (2863.8)	109	452.6 (1641.7)
Value added per employee	2032	348.7 (2463.3)	476	205.6 (389.5)	1446	375.8 (2874.2)	110	610.5 (1649.7)

Source: Amadeus Database

Note: In Table A1, the sample is restricted to firms which are classified according to majority shareholding. By contrast, the sample in Table 2 also contains firms which have multiple owners. Consequently, the number of observations in Table A1 differs from the number in Table 2.

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