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Firms during the Transition to a Market Economy***

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DEFENSIVE AND STRATEGIC RESTRUCTURING OF FIRMS DURING THE TRANSITION TO A MARKET ECONOMY¹

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ABSTRACT

We develop a theoretical framework and provide empirical estimates of the extent of several forms of restructuring in 130 privatized firms in a model transition economy (Slovenia) during the 1996-1998 period. In view of the institutional developments in the transition economies, we divide restructuring into defensive (related to short-term cutting costs) and strategic (focused on increasing revenues through investment). Using predictions from the theoretical framework, we estimate a firm-level labor demand equation to test defensive restructuring and an augmented investment equation to assess strategic restructuring. The labor demand estimates point to relatively slow defensive restructuring, while the investment model estimates indicate the presence of credit rationing and bargaining in most types of soft investment. We do not find support for the hypothesis that firms treat expenditures on employee training as investment, but there is evidence that they behave similarly as those from developed countries in that they display features of profit maximizing behavior.

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1. INTRODUCTION

What has been the extent, speed and nature of corporate restructuring during the transition to a market economy? While restructuring of firms is one of the most important aspects of the transition process, no study has addressed these issues in a systematic conceptual framework, using recent (post-privatization) data and a number of restructuring indicators.² Yet, the performance of most transition economies has fallen short of expectations, studies based on early transition data provide only tentative answers and there is a major debate about restructuring and performance of transition firms.³

In this study, we provide an answer to the above question by using analyzing a panel of annual 1996-98 firm-level data from Slovenia – one of the most successful and economically most advanced transition economies. We start in this section with a brief overview of the Slovenian institutional and policy setting. In Section 2, we present the theoretical framework of defensive and strategic restructuring and the corresponding estimating equations, while in Section 3 we describe the data and variables that we use. In

² Earlier studies are reviewed for instance in Megginson and Netter (2001) and Djankov and Murrell (2002).

³ Because of an economic decline in the first several years of the transition, the countries of the former Soviet bloc and former Yugoslavia have performed poorly relative to both expectations and advanced economies (Svejnar, 2002). Surveys of privatization in the transition economies vary from finding no systematic effect (Bevan, Estrin and Schaffer, 1999) to noting that a weak positive effect probably dominates (Megginson and Netter, 2001), to concluding that the overall effect is positive (Djankov, Murrell, 2000; Carlin et al., 2000, and Shirley and Walsh, 2000). Given that better performing firms tend to be privatized first (Gupta, Ham and Svejnar, 2001), it is likely that the positive effect of privatization is often overestimated. Stiglitz (1999) argues that the main reason for relatively poor performance is that successful privatisation requires effective institutional infrastructure. Svejnar (2002) points out that virtually all the transition economies in Central and East Europe (CEE) and the Commonwealth of Independent States (CIS) rapidly carried out Type I reforms (macroeconomic stabilization, price liberalization, break-ups of SOEs and monobank system, small scale privatization, and reduction of direct state subsidies). However, the CIS countries, Bulgaria, Czech Republic and Romania, were less successful in carrying out Type II reforms (large-scale privatization, establishment of a market-oriented legal system and accompanying institutions, and further development of commercial banking and financial system) and also performed worse than the CEE countries that carried out both types of reforms. Finally, Estrin (2002) notes that reform policies have been applied more consistently and effectively in the Visegrad countries, the Baltic States and Slovenia than elsewhere, especially in the rest of the former Soviet Union.

the fourth section, we present the results of our empirical tests and in Section 5 we draw our conclusions.

Our study is of interest for five principal reasons. First, the conceptual framework of defensive and strategic restructuring that we operationalize below is relevant for analyzing all types firms that are forced to react to external shocks, and in this sense our analytical framework has broad applicability. Second, our empirical estimation covers several restructuring activities, thus giving our results broader validity than is usual in studies of emerging market economies. Third, the sample that we use contains firms that differ markedly in the extent to which they carried out restructuring. Our data hence contain sizeable variation in the values of the key variables and thus lend themselves to detecting systematic effects. Fourth, in addition to being able to examine systematically the effect on restructuring of different types of privatization and subsequent ownership, we analyze the effect of employee representation on the Supervisory Boards of firms. The latter is an institutional feature of a number of key countries in the European Union (EU) and it has been adopted by several of the ten incoming EU members. The impact of this feature of corporate governance is not yet fully understood and we provide a test of its effects on a number of key restructuring variables.⁴ Finally, we are able to assess whether a firm's exposure to foreign versus domestic market affects the extent of post-privatization restructuring. If the barriers between domestic and export markets are low, the relationship between export orientation and restructuring should be weak or nonexistent because both types of firms are exposed to world competition. With the fall of the communist regime, the Central European transition countries moved virtually overnight into the ranks of the most open economies in the world, thus defying the widely accepted infant industry thesis that firms in emerging market economies require a long

period of protection before being able to face world-wide competition.⁵ The transition economy context hence provides an interesting setting in which to test the hypothesis that firms oriented toward the domestic market behave differently than those oriented to the export market.

1.1 The Institutional and Policy Setting

During the 1990s, Slovenia has pursued a gradual transition approach, with the most important reforms being macro stabilization, liberalization of trade and increase of product market competition. Price stabilization was achieved through restrictive monetary and fiscal policies that brought down inflation from 21.5 percent per month in October 1991, when Slovenia launched its own currency, to an annual rate of 6-7 percent in the late 1990s. Slovenia also pursued a policy of managed flexible exchange rate and low import duties. This, together with an aggressive development of small and medium sized firms and government hardening of the budget constraints of the large socially-owned firms, has led to greater competition on the domestic market and improved competitive position on the western markets (Prašnikar et al., 2001). Foreign capital has not played a significant part.

Compared to the aggressive pursuit of consistent macro policies, the government has placed relatively less emphasis on the development of efficient labor and capital markets. The financial system as a whole has remained underdeveloped and it represents a minute part of corporate financing, despite the extensive restructuring of banks and the founding of a stock exchange (Ribnikar, 1999, and Gregorič et al, 2000). Privatization of firms to insiders or outsiders took place in the early to mid 1990s, relying on a combination of voucher and manager-worker buy-out methods, and resulting in primarily

⁴ For earlier studies see Cable and FitzRoy (1980), Clegg (1983), Crouch (1983) and Svejnar (1982).

insider (internal) or outsider (external) ownership.⁶ The varying degrees of ownership of firms by investment privatization funds, state funds, other non-financial enterprises, employees, former employees, retirees, and other small shareholders makes Slovenia be an interesting laboratory for examining the effects of different forms of privatization and resulting patterns of ownership on restructuring and performance of firms.

A potentially important aspect of corporate governance is the German-style 1993 Law on Workers' Co-Determination that gives employees in companies with 500 to 1,000 (more than 1000) employees at least one-third (one-half) of seats on the Supervisory Boards of their firms. Since the Supervisory Board elects company management and also has other channels of influence, the employee-insiders potentially play an important role in the firms' decision making process (Prašnikar and Gregorič, 2002). Employee influence is also reflected in collective bargaining, which has permitted wages to vary across firms and defied government attempts to reign in real wage growth.

2. THE THEORETICAL FRAMEWORK AND ESTIMATING MODELS

Building on Grosfeld and Roland (1997), Aghion, Blanchard and Carlin (1997) and Frydman, Gray, Hessel, and Rapaczynski (1999), we conceptually divide restructuring of firms into defensive or reactive (primarily related to short-term measures, such as cost cutting) and strategic (focused on increasing revenues and profits in the medium- to long-

⁵ Most Latin American countries, India and many other Asian economies, and most African countries followed the infant industry prescription in maintaining for decades sizable tariff and non-tariff protection.

⁶ The 1992 Privatization Law allocated 20 percent of a firm's shares to insiders (workers), 20 percent to the Development Fund that auctioned the shares to investment funds, 10 percent to the National Pension Fund, and 10 percent to the Restitution Fund. In addition, in each enterprise the workers' council or board of directors (if one existed) was empowered to allocate the remaining 40 percent of company shares for sales to insiders (workers) or outsiders (through a public tender). Based on the decision on the allocation of this remaining 40 percent of shares, firms can be classified as being privatized to insiders (the internal method) or outsiders (the external method).

term).⁷ While defensive restructuring reflects immediate, shock-induced managerial decisions (e.g., layoffs and basic financial rehabilitation), the concept of strategic restructuring aims at capturing more deliberate investments in the development of firms' advantages, including changes in the composition of the labor force and investment in fixed capital as well as "soft" capital, such as research and development (R&D), marketing and training.

2.1 Labor Force Restructuring

In order to capture the defensive and strategic employment adjustments of firms when they are confronted with demand shocks, we start with a model in which the firm faces quadratic costs d and e in adjusting its labor L and capital K inputs, respectively, and minimizes the cost of production C_t :

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

subject to a production constraint

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

where E is the expectation operator, subscript t denotes time, r is the discount rate, c is the user cost of capital, W is the wage, $\Delta L_t = L_t - L_{t-1}$ and $\Delta K_t = K_t - K_{t-1}$ are the one-period (year) adjustments in the labor and capital inputs, respectively, and Q is the firm's output or revenue. The adjustment costs d may reflect explicit financial costs, such as severance payments, or implicit costs such as the perceived difficulty of re-hiring specialized workers that had been laid off.

Assuming further that the production function is of the Cobb-Douglas form, changes in employment from period to period are not very large, the exogenous variables

⁷ Grosfeld and Roland (1997) and Aghion et al. (1997) introduce the theoretical concepts, while Frydman et al. (1999) estimate the effects of ownership on changes in revenues and costs using balance sheet data. We

follow an autoregressive process of the second degree, and the institutional features discussed above may be important, one obtains a log-linear estimating equation of the form

$$\begin{aligned} \ln L_{it} = & \alpha_0 + \alpha_1 \ln Q_{it} + \alpha_2 \ln Q_{it-1} + \alpha_3 \ln W_{it} + \alpha_4 \ln W_{it-1} + \alpha_5 \ln L_{it-1} + \alpha_6 \text{EXTPRIV}_{it} + \\ & \alpha_7 \text{OWNERFUNDS}_{it} + \alpha_8 \text{OWNERFIRMS}_{it} + \alpha_9 \text{OWNEROTHER}_{it} + \alpha_{10} \text{EXTBOARD}_{it} + \\ & + \alpha_{11} \text{HOMEMKT}_{it} + \alpha_{12} (\text{YEAR}_t) + \alpha_{13} (\text{IND}_i) + \varepsilon_{it}. \end{aligned}$$

(1)

In equation (1), subscript i denotes firms, Q is the real revenue of the firm and EXTPRIV is a dummy variable coded 1 if the firm was privatized primarily to external owners and 0 if it was privatized primarily to insiders (managers and workers). Variables OWNERFUNDS , OWNERFIRMS and OWNEROTHER measure the percentage of a given firm's shares that are owned by the state and investment funds, other firms and other (miscellaneous) owners, respectively. The miscellaneous owner category does not include the percentage of shares owned by insiders (workers, managers and retired workers) because this share of ownership is treated as the base, captured in the regression constant, against which the effects of other forms of ownership are being estimated. EXTBOARD measures the percentage of non-employee representatives on the Supervisory Board and HOMEMKT is the share of total sales going to the home (domestic) market. Finally, YEAR and IND are annual and industry dummy variables that control for macroeconomic shocks and industry-specific conditions, respectively, while ε_{it} is the error term.

Equation (1) permits us to estimate separately the short-term effects that correspond to defensive restructuring, as well as the long-term effects that capture more

present theoretical models that develop and apply the concepts defensive and strategic restructuring, and we test the predictions using a wide variety of performance indicators.

the strategic managerial behavior. For example, the short-term elasticity of employment with respect to revenue is given by α_1 , while the corresponding long-term elasticity is given by the ratio $(\alpha_1 + \alpha_2)/(1 - \alpha_5)$.⁸ The short and long-term employment elasticities with respect to wages and the other variables are defined analogously.

In terms of our conceptual framework, equation (1) contains the following hypotheses about the extent and speed of firm restructuring during the transition:

H1: Firms adjust employment in response to changes in the relevant exogenous variables ($\alpha_1 \neq 0$ and/or $\alpha_2 \neq 0$ and/or $\alpha_3 \neq 0$ and/or $\alpha_4 \neq 0$).

H2a: Firms adjust employment rapidly, with the adjustment being completed within one year of a given change in the relevant exogenous variable (complete adjustment model: $\alpha_2 = \alpha_4 = \alpha_5 = 0$).

H2b: Firms adjust employment gradually over time (dynamic model: $\alpha_2 \neq 0$ and/or $\alpha_4 \neq 0$ and/or $\alpha_5 \neq 0$).

Hypothesis 1 enables us to assess if the adjustment in employment is significant or whether firms resist adjusting employment and thus resemble the traditional (stodgy), socially-owned enterprises (Basu, Estrin and Svejnar, 1997). Hypothesis 2a states that employment adjustment is completely in the form of short-term, defensive restructuring, while hypothesis 2b reflects employment adjustment that is in the form of long-term, strategic restructuring.

Equation (1) also permits us to test specific hypotheses about the employment effects of the institutional characteristics of firms' privatization and corporate governance. In particular, there has been a major debate about whether employee

⁸ The short-term elasticity measures the contemporaneous percentage effect on employment of a one-percent increase in firm's real revenue in a given year, while the long-term elasticity measures the estimated percentage effect on employment over time of a one percent increase in the revenue in a given year.

ownership and control are associated with excessive use of labor or labor hoarding (e.g., Hinds, 1990 and Brada, 1994), no employment effect (e.g., Prasnikar, Svejnar, Mihaljek, and Prasnikar, 1994), or whether employee insiders actually restrict employment so as to increase their own wages (e.g., Bonin, Jones and Putterman, 1993.). We have rich data in this area and can test these propositions with three sets of variables: whether the firm was privatized primarily to external vs. internal owners (EXTPRIV), extent of external vs. internal ownership in any given year (*OWNERFUNDS*, *OWNERFIRMS* and *OWNEROTHER*) and the percentage of non-employee representatives on the firm's Supervisory Board (EXTBOARD). The corresponding *ceteris paribus* hypotheses are:

H3: Firms privatized primarily to external owners operate with

a) fewer employees ($\alpha_6 < 0$),

b) same number of employees ($\alpha_6 = 0$), or

c) more employees ($\alpha_6 > 0$).

H4: Firms owned more by outsiders (investment funds, other firms and/or miscellaneous other owners) than employee insiders operate with

a) fewer employees ($\alpha_7 < 0$ and/or $\alpha_8 < 0$ and/or $\alpha_9 < 0$),

b) same number of employees ($\alpha_7 = \alpha_8 = \alpha_9 = 0$), or

c) more employees ($\alpha_7 > 0$ and/or $\alpha_8 > 0$ and/or $\alpha_9 > 0$).

H5: Firms with a greater percentage of external (non-employee) members of the supervisory boards operate with

a) fewer employees ($\alpha_{10} < 0$),

b) same number of employees ($\alpha_{10} = 0$), or

c) more employees ($\alpha_{10} > 0$).

Finally, the extent to which firms economize on inputs, including labor, may or may not be systematically related to whether they produce more for the domestic or export markets. Alternatively, if the barriers between domestic and export markets are not sufficiently low, then exporting firms face more competitive conditions and may be expected to use less labor, given output, wages and other conditions. The relevant *ceteris paribus* hypotheses to be tested hence are:

H6: Firms that sell a larger proportion of their output on the domestic (home) market use

a) the same amount of labor as firms that sell more output on the foreign market ($\alpha_{11} = 0$) or

b) more labor than firms that sell more output on the foreign market ($\alpha_{11} > 0$).

2.2. Restructuring through Investment

While defensive restructuring enables firms to adjust in the short run and survive, strategic restructuring through investment in fixed and soft capital permits firms to achieve greater competitiveness on the domestic and foreign markets. The importance of investment in fixed capital has been amply documented in the business and economics literatures. The literature on investment in soft capital, such as R&D, marketing and training/education is more recent but equally important. R&D expenses may for instance be included in the framework of the production function if output is a homothetic function of physical capital and technology acquired through R&D (Mairesse, Sassenou, 1991) and one may replace output by sales revenue in the production function since part

of R&D expenses represents the development of new products (Griliches, 1986).⁹ Chandler (1993) puts emphasis on investment in new markets, with firms shifting sales from declining to expanding markets and carrying out greater investments in market research, development of new market routes, promotion (designing trademarks), and sales. Batra (1997) in turn stresses the investment aspect of marketing expenditures in firms that operate in transition countries, pointing to the importance of competitiveness in both the domestic and foreign markets.¹⁰ Finally, Milkovich and Bloom (1998) consider investments made by firms in employee training an important source of competitive advantage for the firms in the world of global competition. This is especially important for firms operating in transition countries because they often need to carry out radical reorganization of their human resources (Carlin et al., 1994).

In order to capture these aspects of strategic restructuring empirically, we estimate an investment equation that incorporates firm's output demand (demand side), internal funds (supply side) and the bargaining about -- tradeoff between -- investment and wages (Fazzari et al. 1988 and Prasnikař and Svejnar, 2000). As in the preceding subsection, we first outline the theoretical framework that underlies our estimating equations.

One possible starting point is a neoclassical model, in which the firm is assumed to maximize profit

$$\pi_t = Q_t - W_t L_t - c_t K_t$$

⁹ Many Slovenian firms introduced transactional management in the period of early transition that led to lower R&D expenses and the closing down of R&D departments. After firms were privatized, R&D expenditures increased, especially to exchange "old-fashioned" products with new ones and to improve technology.

¹⁰ Slovenian firms were forced to reorient their business activities in the transition period from the 'undemanded' ex-Yugoslav market to the 'demanded' European market where they compete for a market share with competitors from all over the world. On the other hand, with the liberalization of the foreign trade, the competition on the domestic markets increased, too.

where Q is revenue, W is the wage (labor cost per employee) and c is the user cost of capital. With a Cobb-Douglas production function, the model yields a gross investment equation of the form

$$I_t = \sum_k \alpha (1/c)_{t-k} Q_{t-k} + \delta K_{t-1} + e_t \quad k=0,1,2,\dots,m, \quad (2)$$

where I is the gross investment of the firm and α and δ are parameters (Lizal and Svejnar, 2002). Equation (2) may also be derived from an accelerator model of investment and it is usually operationalized by relating the firm's investment/capital ratio to a polynomial of its revenue/capital ratio:¹¹

$$\frac{I_{it}}{K_{i,t-1}} = \alpha + \sum_{k=1}^m \gamma_k \left(\frac{Q_{i,t-k}}{K_{i,t-1}} \right) + \varepsilon_t, \quad (3)$$

where m is the number of lagged terms used in estimation.

Equation (3) implicitly assumes that the firm operates in a perfect capital market in that it may obtain as much external capital as it wants at the same rate as that at which it can lend its internal funds. However, the underdeveloped nature of the capital markets in the transition economies and the existence of informational asymmetries between banks and firms suggest that firms may face constraints on external financing (Bole, 1999, Meyendorff and Thakor, 2002). If this is the case, the amount of any given firm's investment will vary positively with the amount of funds that it can generate internally.¹² It is customary to test for this phenomenon by augmenting equation (3) with a proxy for these internal funds, such as profits (e.g., Lizal and Svejnar, 2002).

¹¹ Note that the usual assumption on the form of heteroskedasticity of ε_t leads to scaling with the reciprocal of capital. We hence use ε_t to denote the transformed error terms.

¹² An alternative interpretation of the case when the firm's level of investment varies positively with internal funds – one that is consistent with perfectly functioning capital markets -- is that the firms can borrow investment funds at a constant market rate but that this rate exceeds the rate at which the firms can lend because of transaction costs (e.g., Fazzari et al. (1988), Kaplan and Zingales (1997) and Almeida and Campello (2002)).

In a transition economy setting, it is also important to assess the extent to which employee ownership and/or control affect the firm's investment. The literature on participatory and labor-managed firms has for a long time debated the existence and seriousness of the so called "under-investment problem," allegedly brought about by the short time horizon of individual workers in these firms. The basic argument is that worker-insiders, unlike diversified capital owners (outsiders), prefer to distribute enterprise surplus as current labor income and fringe benefits rather than reinvesting it in the firm for future growth (e.g., Furubotn and Pejovich, 1970, and Vanek, 1970). More recently, Blanchard and Aghion (1995) have followed this thesis by arguing in the transition context that insider-dominated firms may not generate resources needed for restructuring activities such as investment.¹³ We hence use explanatory variables that permit us to assess the extent to which (a) there is bargaining over the internally generated funds that the firm could use for investment versus expenditures on wages, salaries and bonus payments and (b) employee ownership and/or control affect negatively the firm's investment.

To tackle the issue of bargaining, let profit π be defined as revenues Q minus labor costs WL and all non-labor costs H : $\pi = Q - WL - H$. Moreover, let $WL - W^aL$ be the difference between the actual and reservation level of wage bill (labor cost), where W^a is the reservation (best alternative) wage.¹⁴ The extent to which employee-insiders earn more than their reservation income ($WL - W^aL > 0$) reflects their ability to appropriate what would otherwise be the firm's surplus. $WL - W^aL$ is hence an outcome of bargaining over the firm's internally generated funds. Since we analyze strategic decisions over labor

¹³ In the context of the transition to a market economy, the investment-wage issue is especially important. The lifting of central controls and insider privatization gave workers significant powers in enterprises in countries such as Russia, Ukraine and some other newly independent states (NIS). Moreover, with the inability of many firms in these economies to pay wages, the tradeoff between using the firm's value added for financing investment versus paying wages and fringe benefits has become particularly acute.

¹⁴ The reservation wage is defined as the wage below which employees would be unwilling to work in the firm.

cost as well as investment in several areas, we include expenditures on research and development I_{RD} , expenditures on marketing I_M and expenditures on training I_T in the internal funds that are subject to bargaining.¹⁵ The measure of internal funds that we use is therefore given by

$$\pi^a = \pi + (WL - W^aL) + (I_{RD} + I_M + I_T) = Q - W^aL - H + I_{RD} + I_M + I_T$$

We include π^a as a proxy for the internal funds variable in an augmented form of equation (3) and interpret the estimated coefficient on π^a as a measure of the extent to which firms with more internal funds invest more than others, *ceteris paribus*. We also include $WL - W^aL$ as an explanatory variable in the augmented equation (3) in order to assess if worker earnings over and above the reservation level result in a lower level of investment, controlling for π^a and the other regressors. The estimated coefficient on $WL - W^aL$ hence gives us the magnitude of the bargaining tradeoff between extra labor cost and investment.

To answer the second question, namely whether employee ownership and control have a negative effect on firm's investment, we include as explanatory variables a dummy variable indicating whether the firm was privatized primarily to external owners (EXTPRIV), variables measuring the percentage of a given firm's shares that are owned by the investment funds (OWNERFUNDS), other firms (OWNERFIRMS) and other external owners (OWNEROTHER), respectively, and a variable measuring the percentage of non-employee representatives on the Supervisory Board (EXTBOARD).

The resulting estimating equation is given by

¹⁵ I.e., we capture the fact that employees may try to appropriate as income some funds that could otherwise be used for expenditures on R&D, marketing and training. We also implicitly assume that the reservation level of these expenditures is zero, which is not unrealistic in the context of the transition economies.

$$I_{it}/K_{it-1} = \beta_0 + \beta_1(Q_{it}/K_{it-1}) + \beta_2(\pi_{it}^a/K_{it-1}) + \beta_3(WL - W^aL)_{it}/K_{it-1} + \beta_4EXTPRIV_{it} + \beta_5OWNERFUNDS_{it} + \beta_6OWNERFIRMS_{it} + \beta_7OWNEROTHER_{it} + \beta_8EXTBOARD_{it} + \beta_9HOMEMKT_{it} + \beta_{10}YEAR_t + \beta_{11}IND_i + \varepsilon_{it}, \quad (4)$$

As in the case of equation (1), equation (4) contains firm-specific variables related to the firm's orientation towards the domestic versus foreign market and controls for industry characteristics and annual macroeconomic shocks. The inclusion of the variable capturing the share of firm's sales on the domestic market reflects the hypothesis that exporting firms that face greater competition and hence need to invest more than their domestically oriented counterparts in order to succeed.

Equation (4) contains the following key hypotheses about strategic restructuring of firms in the transition economies, as reflected in their investment behavior:

H7: A firm's investment is positively related to its revenue ($\beta_1 > 0$).

H8: Firms face financial constraints and their investment depends positively on the level of internal funds ($\beta_2 > 0$).

H9: Employees are able to appropriate internal funds that would otherwise be used for investment ($\beta_3 < 0$).

H10: Firms privatized primarily to external as opposed to internal owners invest

a) more ($\beta_4 > 0$) or

b) the same ($\beta_4 = 0$).

H11: Firms owned more by outsiders (investment funds, other firms and/or other owners) than employee insiders invest

a) more ($\beta_5 > 0$ and/or $\beta_6 > 0$ and/or $\beta_7 > 0$) or

b) the same ($\beta_5 = \beta_6 = \beta_7 = 0$).

H12: Firms with a greater percentage of external (non-employee) members of the supervisory boards invest

a) more ($\beta_8 > 0$) or

b) the same ($\beta_8 = 0$).

H13: Firms oriented more towards the domestic market invest

a) less than export-oriented firms ($\beta_9 < 0$) or

b) the same as export-oriented firms ($\beta_9 = 0$).

2.3. Statistical Issues

In interpreting the coefficients of equations (1) and (4), it is important to remember that the constant term serves as the base that reflects certain characteristics against which we measure the other effects. In particular, the constant reflects the effect of firms that have been privatized primarily to insiders ($EXTPRIV = 0$), are completely insider-owned ($OWNERFUNDS = OWNERFIRMS = OWNEROTHER = 0$), do not have non-employee representatives on the supervisory board ($EXTBOARD = 0$), and export all of their output ($HOMEMKT = 0$).

It should also be noted that by using micro-level panel data we are able to eliminate bias introduced by using aggregate investment data (Abel and Blanchard, 1986), reduce measurement error and take into account heterogeneity across firms and over time (e.g., Bond and Meghir, 1994). Given that we have panel data, we employ the Hausman (1978) specification test to establish if the fixed or random effects specification is preferable.

Another statistical issue that needs to be considered is the possibility of endogeneity, either because some regressors are jointly determined with the dependent variable or because they are influenced by unobserved characteristics of firms. In order to

assess the sensitivity of our results to this problem, we have carried out estimations using several methods. First, depending on the results of the Hausmann test, we present estimates based on fixed or random effects specifications that eliminate the firm-specific component in the error term as a possible cause of the endogeneity problem. The shortcoming of this approach is that it does not eliminate other sources of endogeneity and it may magnify the effect of errors in measurement of variables. We hence also report instrumental variable (IV) estimates, in which we instrument the potentially endogenous regressors.¹⁶ The advantage of this approach is that with an appropriate choice of instrumental variables, one eliminates all components of endogeneity, including the firm-specific component in the error term.¹⁷ We use lagged levels of regressors as instruments and find that the explanatory power of the first-stage regression is satisfactory, with R^2 ranging from 0.5 to 0.7. We are fortunate that our firm-level data come from two sources -- questionnaires that we administered to firms and the Slovenian Statistical Office. The questionnaire data relate to 1996-98, but the Statistical Office data cover earlier years as well. We use the Statistical Office data for the lagged values of variables that we use as instruments and thus avoid the substantial loss of degrees of freedom that we would incur if we had to use 1996 data as instruments for 1997 values of variables.

¹⁶ In the employment adjustment equation, we instrument the logarithm of sales, wage and lagged employment. In the investment equation, we instrument sales revenue per lagged capital, internal funds per lagged capital and actual less reservation labor costs per lagged capital. In principle, a maximum-likelihood estimation (MLE) is more efficient, but in our model it requires numerical integration and is sensitive to misspecification. Since MLE is a large sample estimator and our sample contains at most 130 observations per year, we use the more robust IV approach.

¹⁷ We find that in the investment equations there is indeed correlation between the explanatory variables and firm-specific individual effects in the residuals in OLS.

For equation (1) we also report ordinary least squares (OLS) estimates because Kiviet's (1995) Monte Carlo studies find OLS superior to the IV method in estimating dynamic panel data equations, especially when the time dimension is low.¹⁸

Finally, note that depending on the estimation technique, EXTPRIV may also serve as a control variable for selectivity in privatization. For instance, if insiders acquire firms that display certain behavioral features (e.g., higher investment in R&D) and this effect is not adequately controlled for by the estimation technique or the other explanatory variables, the coefficient on EXTPRIV will reflect this feature. In general, fixed and random effect estimators control for the above problem, as does appropriate selection of instrumental variables.

3. DESCRIPTION OF DATA AND VARIABLES

The sample contains 1996-98 annual data on 130 largest Slovenian firms that were privatized in the 1993-1995 period.¹⁹ We hence observe the firms in the immediate post-privatization period when they could carry out defensive and strategic restructuring. Most these firms are registered as joint stock companies and in 1998 they generated 15 percent of total income and employed 16 percent of all employees among the firms registered in Slovenia. The data set is unique in that it provides information on a number of key variables, namely investment in R&D, marketing and training that are usually not available in balance sheets and income statements.

As may be seen from the summary statistics in Table 1, the variables display reasonable mean values and considerable variances. The average firm in the sample

¹⁸ One can also estimate a first-difference IV model, but this approach both magnifies the error in measurement of variables and reduces significantly the number of available observations. Since we only have a short panel, we do not employ this method.

employs 573 workers, achieves a ratio of sales to tangible capital of 2.8 and sells 60.5 percent of the value of its products on the domestic market. Gross investment in fixed capital and marketing expenditures are each equivalent to about 15 percent of tangible capital, while investment in R&D and externally provided training equal to 8 and 1 percent of tangible capital, respectively.²⁰ Over 80 percent of the marketing expenditures are geared toward the domestic market. Slightly more than one-half of the firms were privatized primarily to insiders, and the average share ownership is 37 percent by each insiders and investment funds, 14 percent by other firms and 12 percent by other owners. Finally, the average share of non-employee representatives on the supervisory boards of firms is only 43 percent, confirming that employees have a significant representation on these boards.

The average intertemporal adjustments, not reported in a tabular form, include a decline in net employment of 5 percent in both 1996 and 1997 and a 3 percent decline in 1998, a reduction in the relative differential between actual and reservation wages from 37 percent in 1996 to 17 percent in 1998,²¹ a 2.6 percent annual increase in the capital stock, a 3.4 percent annual increase in real sales per worker, and a 2.1 percent annual increase in labor costs. The average ownership share of insiders (employees, managers and retired employees) dropped slightly from 37.4 to 36.3 percent,²² the share of

¹⁹ The actual number of firms used is somewhat lower and varies across regressions (from 106 in the employment equation to 93 in the training equation), depending on the availability of data for particular variables.

²⁰ Marketing expenses are usually divided into expenses for research, market communication, sales, and distribution (Preisner, 1996). In order to be able to compare firms across industries, we have excluded expenses related to salespersons employed in retailing positions.

²¹ The reservation wage is calculated on the basis of the average wage within each industry in a given region, region-specific unemployment rate, and average annual unemployment compensation:

$$W^r = AIW*(1-UR)+UC*UR,$$

where AIW = average annual wage per employee in a given industry and region, UR = average annual unemployment rate in a given region and UC = average annual unemployment compensation.

²² The average share of employees fell from 24.9 to 22.9 percent, while the managers' share rose on average from 1.8 to 2.8 percent.

investment funds from 37.9 to 35.7 percent,²³ and the share of others (small shareholders, state and banks) from 13.6 to 12.2 percent,²⁴ while the share of non-financial firms increased from 10.7 to 17.2 percent²⁵ in the period 1996-1998. Investment in fixed capital relative to sales increased from 5.6 in 1996 to 6.7 percent in 1998 and marketing expenditures to sales rose from 3.6 in 1996 to 4.1 percent in 1998. In contrast, investment in R&D relative to sales increased only by 0.24 percent points from 2.06 to 2.30 in the 1996-1998 period and training expenses actually declined from 0.28 percent in 1996 to 0.19 percent in 1998.²⁶

4. EMPIRICAL RESULTS

4.1. Employment Adjustment

In Table 2, we present the estimated coefficients of the employment adjustment model given by equation (1). Except for α_2 in the fixed effects specification, the estimated coefficients on current and lagged real revenue and wages are statistically significant in all three equations, indicating that the firms' employment adjustment has been significantly associated with changes in these variables. Hypothesis *H1* ($\alpha_1 \neq 0$ and/or $\alpha_2 \neq 0$ and/or $\alpha_3 \neq 0$ and/or $\alpha_4 \neq 0$) hence receives strong support -- in virtually all cases one cannot reject the hypothesis that each of these four coefficients is statistically different from zero.

²³ Within this category, the average share of state funds declined from 23.9 to 17.8 percent, while the share of private investment funds increased from 14 to 17.9 percent.

²⁴ Within this category, the average share of small shareholders fell from 3.8 to 3 percent, whereas the average ownership shares of banks and state remained the same at 1.3 and 2 percent, respectively.

²⁵ Non-financial firms on average increased their share from 10.7 percent to 17.2 percent, whereas the average ownership share of banks remained the same at 1.3 percent.

²⁶ Expenses for training include only payments for the services of external educational institutions. Many firms run internal training programs, the cost of which is not included in our data. Similarly, Milkovich and Boudreau (1997) report that in the United States firms with more than 100 employees paid \$10.3 billion on training to external providers, while the total training cost was \$52.2 billion in 1995.

The estimated coefficients on current and lagged values of the explanatory variables, and the corresponding calculated elasticities indicate that while the immediate (defensive) adjustment in employment is sizable, it is not complete and gradual adjustment of employment over time, associated with strategic restructuring, is both substantial and statistically significant. Hypothesis *H2b* ($\alpha_2 \neq 0$ and/or $\alpha_4 \neq 0$ and/or $\alpha_5 \neq 0$) rather than 2a ($\alpha_2 = \alpha_4 = \alpha_5 = 0$) is hence supported by the data.

The impact of the number of employees in the previous period is large in the levels equations and it also indicates that firms adjust employment relatively slowly over time. Short run elasticity of employment with respect to the labour costs per employee has a value of about -0.6 in the OLS and fixed effects models, and about -0.3 in the IV equation. The point estimates of the long run elasticities of employment to labor cost are higher (but not statistically so) than the short run ones in the OLS and IV estimations and they are similar at -0.45 in the fixed effects model.²⁷ An analogous pattern is observed in the case of employment elasticity with respect to sales except that all three estimates of the short run elasticity are similar. Firms respond to a one percent increase in sales by raising employment by about 0.2 percent in the short run, while the long-run elasticity is about 1 in the OLS and IV cases and 0.3 in the fixed effects specification.

The estimated coefficients $\alpha_6, \alpha_7, \alpha_8, \alpha_9$, and α_{10} provide strong evidence against the hypothesis that insider privatisation, employee ownership and employee control through board membership are associated with higher or lower employment intensity. In particular, both estimates of the form of privatisation are statistically insignificant, thus giving support to hypothesis *H3b* ($\alpha_6 = 0$).

Similarly, eight out of nine estimated ownership coefficients are statistically

²⁷ Since the Hausman test identifies fixed effect as being the preferred specification, we report the fixed effects estimates.

insignificant, and the one statistically significant coefficient (the IV estimate of the effect of ownership by other firms) is positive but minute. Our results thus indicate that particular forms of internal and external ownership are not associated with different employment policies of firms, thus providing strong support for hypothesis *H4b* ($\alpha_7 = \alpha_8 = \alpha_9 = 0$). Finally, while two of the three estimates of the effect of greater representation of non-employee outsiders on the supervisory board of the firm are negative and significant (suggesting that greater employee representation increases employment), their quantitative effect is miniscule. Hence, while statistically hypothesis *H5a* ($\alpha_{10} < 0$) receives some support, our results indicate that substantively the composition of the supervisory board is not associated with differences in employment policies in the transition firms. We have also tested an encompassing hypothesis that all five coefficients related to internal vs. external privatization, ownership and control are jointly statistically not different from zero ($\alpha_6 = \alpha_7 = \alpha_8 = \alpha_9 = \alpha_{10} = 0$) and could not reject this broader hypothesis.²⁸

The three estimates of coefficient α_{11} in Table 2 are all insignificant, supporting hypothesis *H6a* ($\alpha_{11} = 0$) that firms selling a larger proportion of their output on the domestic (home) market use the same amount of labor, *ceteris paribus*, as firms that sell more output on the foreign market. This evidence suggests that competition brought about by the openness of the transition economies to world markets ensures that exporting and non-exporting firms pursue the same employment policies.

²⁸ The F test results (OLS: $F(5, 250)=0.52$; FE: $F(4,150) = 1.70$; IV: $F(5, 153)=0.93$) do not permit us to reject the null hypothesis.

4.2. Investment

Estimated coefficients of Equation (4), relating to strategic restructuring of firms through investment, are reported in Table 3. The first point to note is that investment in employee training is virtually unrelated to any of the explanatory variables, suggesting that firms in transition economies do not treat training as an investment, a point to which we return presently.

The neoclassical and accelerator models of firm behavior receive support with respect to investment in R&D and marketing in both domestic and foreign markets, with the β_1 coefficient on sales revenues being positive and statistically significant in both estimating procedures. The support is more mixed for investment in fixed capital and employee training, where the estimates of β_1 are positive and statistically significant in the random effects specifications and positive but statistically insignificant in the IV equations. Overall, we hence find considerable though not overwhelming support for hypothesis $H7$ ($\beta_1 > 0$) that the transition firms' restructuring through investment is positively related to the demand for their product as reflected in their sales revenue in the relevant domestic or foreign market.

For investment in R&D and domestic marketing, there is also strong evidence for $H8$, namely that investment depends positively on the level of internal funds ($\beta_2 > 0$), suggesting that in these areas firms face financial constraints (or at least a higher borrowing than lending rate of interest). The evidence on $H8$ is mixed with respect to investment in fixed capital and marketing on foreign markets, where all four estimated coefficients of β_2 are positive but two are statistically insignificant. There is no support for $H8$ in either specification in the case of investment in employee training. The finding that investment in R&D is strongly related to internal funds makes sense since this is an

investment area with the greatest information asymmetry and moral hazard problem because it is difficult for external investors to evaluate the results of this type of investment (Arrow, 1962, and Himmelberg, Petersen, 1994). Overall, the Slovenian capital markets hence appear to have suffered from imperfections in the second half of the 1990s and firms may have suffered from credit rationing. This conclusion is also supported by the fact that most firms used external financing to a very limited extent, with internally generated funds (depreciation and retained profit) constituting the main source of investment funds.²⁹

In the case of investment in R&D, we find strong support for hypothesis $H9$ ($\beta_3 < 0$) that employees are able to appropriate funds that would otherwise be used for this type of investment. The support for $H9$ is less strong in the case of investment in domestic and foreign marketing, with the estimate of β_3 being negative in both specifications, but statistically significant in only one of them. There is no evidence that workers appropriate funds that would be used for investment in fixed capital ($\beta_3 = 0$), and the coefficient is also insignificant in the IV specification in the case of investment in training. Interestingly, the effect is estimated to be positive and significant at the 10% test level for training in the random effects model. The positive effect may be brought about by the fact that firms sometime pursue policies that make the amount allocated to training funds proportional to the level of wages. In this case, the funds used to pay above market wages would be by design complemented by funds allocated to training, rather than being allocated to wages at the expense of investment in training. Overall, we hence find that above market wages and fringes are not paid at the expense of investment in fixed capital

²⁹ The average firm in our sample financed more than 60 percent of its investment in fixed capital by depreciation, 10 percent by retained profit, 10 percent by long-term loans, 5 percent by short-term loans, 5 percent by state funds and loans from other firms, 5 percent by disinvestments, and less than 1 percent by issues of shares. As to investment in R&D, the sampled firms on average financed 90 percent of this

or employee training, but a tradeoff is detected with respect to investment in R&D and less robustly with respect to investment in marketing on domestic and foreign markets.

The estimated coefficient on external privatization (β_4) suggests that firms privatized primarily to external owners invest less in R&D ($\beta_4 < 0$) but more in marketing on domestic and foreign markets ($\beta_4 > 0$) than firms privatized primarily to insiders. Moreover, privatization to insiders vs. outsiders has no significant effect on investment in fixed capital and employee training ($\beta_4 = 0$). We hence find support for hypothesis *H10a* ($\beta_4 > 0$) with respect to investment in marketing, but *H10b* ($\beta_4 = 0$) with respect to investment in fixed capital and training. While only marginally significant, the IV result that firms privatized to external owners invest less in R&D ($\beta_4 < 0$) is unexpected, given the substantial theorizing on this subject. One possible explanation for this negative coefficient and the insignificant coefficients in the case of investment in fixed assets is that the arguments about the myopic behavior of insiders are misplaced, especially once the shares are tradable and workers, like other investors, can behave as if they had an infinite investment horizon. Another possibility is that the negative effect reflects a more complicated relationship (than explored here) between EXTPRIV and the positive effects of external ownership that we report presently. Finally, as we mentioned in the methodology section, it is possible that in the IV specification the effect reflects nonrandom allocation of firms to the two forms of privatization. With respect to the last interpretation it should be noted, however, that we did not obtain qualitatively different results when we instrumented EXTPRIV.

investment from internal funds, 3 percent by loans, less than 2 percent by funds firms received from the National Fund for Technology and Development, and 2 percent by funds from partners.

Hypothesis *H11a* that firms owned more by outsiders (investment funds, other firms and miscellaneous other owners) invest more than firms owned more by insiders ($\beta_5 > 0$ and/or $\beta_6 > 0$ and/or $\beta_7 > 0$) does not receive much support in the data. In particular, we find one positive effect ($\beta_6 > 0$) on ownership by other firms in the fixed effects specification of the investment in fixed assets and two positive effects with respect to investment in R&D ($\beta_6 > 0$ and $\beta_7 > 0$). All three effects are quantitatively rather small and the effect on fixed investment is only significant at the 10 percent test level. In contrast, the competing hypothesis *H11b* that firms owned more by outsiders invest the same as firms owned more by insiders ($\beta_5 = \beta_6 = \beta_7 = 0$) is fairly uniformly supported in the case of investment in fixed assets, employee training and marketing on foreign markets. It is also uniformly supported in the fixed effects specification in the case of investment in R&D and marketing on the domestic market. Interestingly, in the IV specification for investment in marketing on the domestic market, the effects of all three types of external ownership are negative, though quantitatively they are again not very large. These results complement the negative effect found earlier with respect to privatization to external owners.

A higher percentage of external members on the supervisory board is found in most cases not to be associated with the firm's propensity to invest, the exception being a small positive IV estimate with respect to investment in domestic marketing and a small negative IV estimate for investment in foreign marketing. Overall, the results therefore support hypothesis *H12b* ($\beta_8 = 0$).

As in the case of labor adjustment, firm's export vs. domestic market orientation is in virtually all cases unrelated to the intensity of investment activities. The one statistically significant coefficient is the negative effect of

domestic market orientation on investment in R&D, but the effect is quantitatively negligible. Our estimates hence provide support for hypothesis *H13b* ($\beta_9 = 0$) that firms oriented more towards the domestic market invest the same as export-oriented firms, *ceteris paribus*.

5. CONCLUDING OBSERVATIONS

While corporate restructuring plays an important part in all economies, it is of particular significance in the transition countries that started from a communist system characterized by firms dependent on government orders and subsidies, a lack of market-based activities in the factor and product markets and limited use of modern managerial techniques within firms.³⁰ During the last decade, firms in the transition economies have responded to the major shock and challenge with substantial defensive (reactive) and strategic restructuring as they have tried to catch up with firms in the advanced countries.

Our analysis covers the 1996-98 post-privatization period of transition and is based on rich data from a sample of 130 firms in Slovenia, one of the most developed transition countries. The analysis allows us to draw the following conclusions with respect to employment adjustment:

1. Firms actively adjust employment and the adjustment is of both defensive (short-term) and strategic (long-term) nature. Our results support hypotheses *H1* and *H2b*.
2. Despite the long standing debate in the literature about the employment effects of insider ownership and control of firms, we find strong evidence against the hypothesis that insider privatisation, employee ownership and employee control

³⁰ In the early phases of restructuring, many of these firms broke up into several units or spun off parts of the original firm (Lizal, Singer and Svejnar, 2001).

through supervisory board membership are associated with higher or lower employment intensity. Our analysis hence supports hypotheses *H3b*, *H4b* and *H5b*.

3. With the fall of the communist regime, many transition countries moved virtually overnight into the ranks of the most open economies in the world, thus defying the widely accepted infant industry thesis. Our results indicate that that firms selling a larger proportion of their output on the domestic market use the same amount of labor, *ceteris paribus*, as firms that sell more output on the foreign market. This evidence suggests that competition brought about by the openness of the transition economies to world markets ensures that exporting and non-exporting firms pursue the same employment restructuring policies, providing support to hypothesis *H6a*.

Our conclusions with respect to strategic restructuring carried out through investment in fixed assets, R&D, marketing on domestic and foreign markets, and employee training are as follows:

4. Investment in employee training is small and virtually unrelated to any of the explanatory variables, suggesting that in the first decade of the transition firms have not been treating employee training as an investment.
5. We find considerable though not complete support for the hypothesis that the firms' restructuring through investment is consistent with profit maximizing behavior. In the context of our model, this is reflected in investment being positively related to the demand for the firm's product in the domestic or foreign market. The data hence provide reasonably strong support to hypothesis *H7*.
6. While firms rely primarily on internal financing to fund most of their investment, the evidence that restructuring through investment depends positively on the

firm's level of internal funds (hypothesis *H8*) is strong but not complete.

Slovenian capital markets hence appear to have suffered from imperfections in the second half of the 1990s and firms may have suffered from credit rationing that made restructuring of the less successful firms more drawn out.

7. The ability of workers to appropriate firm's internal funds as above-market wages does not appear to affect negatively restructuring through investment in fixed capital or training, but a trade-off between wages and investment (hypothesis *H9*) is detected with respect to investment in R&D and, less robustly, with respect to investment in marketing.
8. Evidence about the effect of privatization to external vs. internal owners is mixed, with the effect of external privatization on investment being insignificant in the case of fixed investment and investment in training (hypothesis *H10b*), while it is positive in the case of investment in marketing (hypothesis *H10b*). Interestingly, the effect is positive and marginally significant with respect to R&D, a finding that we discuss in the text.
9. We find quite strong support for the hypothesis (*H11b*) that firms owned more by outsiders than employee-insiders invest the same, controlling for other factors. Our findings, covering several areas of investment, suggest that the frequently voiced arguments about the inferiority of employee ownership for investment and long term prosperity of firms need to be re-examined.
10. The proportion of external members vs. employee representatives on the supervisory boards is by and large found to be unrelated to the firm's restructuring through investment. This result supports hypothesis *H12b* and suggests that employee control through board representation may provide voice but does not affect restructuring decisions.

11. As in the case of labor adjustment, the firm's export vs. domestic market orientation is found to be unrelated to investment activities. This evidence suggests that the relative openness of the transition economies to world markets has ensured that exporting and non-exporting firms pursue the same restructuring policies, providing support to hypothesis *H13b*.

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TABLE 1: SUMMARY STATISTICS FOR VARIABLES USED IN ESTIMATING LABOR ADJUSTMENT AND INVESTMENT EQUATIONS

Variable	N	Mean	Standard deviation	Description
L_t	390	573.2	770.807	Number of employees
* $W_t = y_t/L_t$	380	2028.368	743.365	Labor costs per employee
* Q_t/L_t	379	10675.36	7157.959	Sales per employee
* K_t	378	3110006	5629635	Value of tangible assets in 1996 prices
I_t/K_{t-1}	317	0.147	0.171	Investment in fixed capital/ capital ₁
$I_{RD,t}/K_{t-1}$	350	0.076	0.188	R&D Investment/ capital ₁
$I_{M,t}/K_{t-1}$	311	0.154	0.513	Total marketing expenses/ capital ₁
$I_{MD,t}/K_{t-1}$	305	0.125	0.511	Marketing expenses on domestic market/ capital ₁
$I_{MF,t}/K_{t-1}$	305	0.030	0.069	Marketing expenses on foreign markets/ capital ₁
$I_{T,t}/K_{t-1}$	270	0.007	0.024	Investment in training/ capital ₁
π^a_t/K_{t-1}	275	0.461	0.653	Value added less reservation labor costs plus R&D expenses, marketing expenses and training expenses/ capital ₁
$(WL - W^aL)_t/K_{t-1}$	367	0.052	0.830	Labor costs less reservation labor costs/ capital ₁
Q_t/K_{t-1}	367	2.842	2.661	Sales revenue/ capital ₁
OWNERINSIDERS_t	368	37.618	19.503	Ownership share of managers, workers and former employees
OWNERFUNDS_t	368	37.018	17.773	Ownership share of state funds and investment companies
OWNERFIRMS_t	368	13.788	27.808	Ownership share of other firms
OWNEROTHER_t	368	11.556	16.663	Ownership share of banks, small shareholders, state, unrealised internal buy-outs and other
EXTBOARD_t	369	42.627	21.223	Share of non-employees' representatives on the Supervisory Board
HOMEMKT_t	298	60.494	34.182	Sales on domestic market relative to total sales
EXTPRIV	640	0.468	0.499	Privatisation dummy (1=external; 0=internal)

* Variables are measured in 1000 SIT in 1996 prices.

TABLE 2: LABOR ADJUSTMENT(The dependent variable is $\ln(L_t)$, standard errors are reported in parentheses)

Variables	Coefficients	OLS	Fixed Effects	IV
$\ln Q_t$	α_1	0.252 ^a (0.050)	0.181 ^a (0.036)	0.215 ^a (0.043)
$\ln Q_{t-1}$	α_2	-0.149 ^a (0.054)	-0.046 (0.042)	-0.091 ^c (0.049)
$\ln W_t$	α_3	-0.651 ^a (0.171)	-0.617 ^a (0.106)	-0.318 ^a (0.120)
$\ln W_{t-1}$	α_4	0.495 ^a (0.170)	0.336 ^a (0.094)	0.108 (0.119)
$\ln L_{t-1}$	α_5	0.900 ^a (0.030)	0.371 ^a (0.074)	0.887 ^a (0.030)
EXTPRIV _t	α_6	-0.005 (0.010)	N.A.	-0.001 (0.014)
OWNERFUNDS _t	α_7	0.000 (0.000)	-0.000 (0.001)	0.000 (0.000)
OWNERFIRMS _t	α_8	0.000 (0.000)	-0.000 (0.001)	0.000 ^c (0.000)
OWNEROTHER _t	α_9	-0.000 (0.000)	0.000 (0.001)	-0.000 (0.000)
EXTBOARD _t	α_{10}	-0.000 ^b (0.000)	-0.000 (0.000)	-0.000 ^c (0.000)
HOMEMKT _t	α_{11}	-0.000 (0.000)	-0.000 (0.001)	-0.000 (0.000)
YEAR 97	α_{12}	-0.004 (0.011)	-0.008 (0.010)	-0.013 (0.013)
YEAR 98		0.023 ^c (0.013)	-0.002 (0.012)	0.003 (0.013)
Constant	α_0	0.333 (0.318)	3.995 ^a (1.054)	0.544 ^b (0.230)
Industry dummies		Yes	No	Yes
Short-run Elast. of L to W	α_3	-0.651 ^a (0.078)	-0.617 ^a (0.106)	-0.318 ^a (0.120)
Long-run Elast. of L to W	$\frac{\alpha_3 + \alpha_4}{1 - \alpha_5}$	-1.560 ^b (0.721)	-0.446 ^b (0.231)	-1.867 ^a (0.772)
Short-run Elast. of L to Q	α_1	0.252 ^a (0.029)	0.181 ^a (0.036)	0.215 ^a (0.043)
Long-run Elast. of L to Q	$\frac{\alpha_1 + \alpha_2}{1 - \alpha_5}$	1.032 ^b (0.459)	0.215 ^a (0.091)	1.097 ^c (0.820)
R²		0.991	0.974	0.990
N		268	268	200

Notes:

1. a, b and c denote statistically significant values at 1%, 5% and 10% on a two tail test, respectively.
2. Hausman Tests χ^2 -value FE vs RE:2762.51^a.
3. All estimates are corrected for heteroskedasticity applying Huber-White-Sandwich estimator of variance.
4. N.A. is the abbreviation for Not Applicable.

TABLE 3: INVESTMENT IN FIXED ASSETS, R&D, MARKETING, AND TRAINING
(Standard errors are reported in parentheses.)

Regressors	Dep. Variables	I_t/K_{t-1}		$I_{RD,t}/K_{t-1}$		$I_{MD,t}/K_{t-1}$		$I_{MF,t}/K_{t-1}$		I_t/K_{t-1}	
		Random Effects	IV	Fixed Effects	IV	Fixed Effects	IV	Random Effects	IV	Random Effects	IV
Q_t/K_{t-1}	β_1	0.018 ^a (0.006)	0.015 (0.022)	0.018 ^a (0.002)	0.067 ^a (0.021)	0.031 ^a (0.003)	0.043 ^a (0.016)	0.020 ^a (0.002)	0.017 ^a (0.003)	0.000 ^c (0.000)	0.001 (0.001)
π^a_t/K_{t-1}	β_2	0.031 (0.033)	0.182 ^b (0.081)	0.097 ^a (0.016)	0.298 ^b (0.124)	0.245 ^a (0.020)	0.220 ^a (0.073)	0.028 ^a (0.005)	0.031 (0.023)	-0.000 (0.001)	-0.001 (0.002)
$(WL - W^aL)_t/K_{t-1}$	β_3	-0.066 (0.084)	-0.561 (0.517)	-0.159 ^a (0.034)	-1.286 ^a (0.409)	-0.201 ^a (0.043)	-0.237 (0.405)	-0.026 ^b (0.011)	-0.046 (0.072)	0.006 ^c (0.003)	-0.007 (0.025)
EXTPRIV	β_4	0.003 (0.027)	-0.031 (0.028)	N.A.	-0.069 ^c (0.040)	N.A.	0.089 ^c (0.046)	0.018 ^b (0.007)	0.021 ^a (0.007)	-0.000 (0.001)	-0.000 (0.001)
OWNERFUNDS _t	β_5	-0.000 (0.001)	-0.000 (0.000)	-0.000 (0.000)	0.001 (0.001)	0.000 (0.000)	-0.003 ^a (0.001)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
OWNERFIRMS _t	β_6	0.001 (0.000)	0.001 ^c (0.001)	-0.000 (0.000)	0.001 ^b (0.000)	0.000 (0.000)	-0.002 ^a (0.001)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
OWNEROTHER _t	β_7	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.002 ^b (0.001)	0.000 (0.000)	-0.002 ^b (0.001)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
EXTBOARD _t	β_8	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.001 ^a (0.000)	-0.000 (0.000)	-0.000 ^c (0.000)	0.000 (0.000)	-0.000 (0.000)
HOMEMKT _t	β_9	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 ^c (0.000)	N.A.	N.A.	N.A.	N.A.	-0.000 (0.000)	-0.000 (0.000)
Year dummies	β_{10}	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	β_0	0.061 ^c (0.060)	0.014 (0.080)	0.033 ^b (0.040)	-0.142 ^b (0.102)	-0.078 ^c (0.041)	0.018 (0.054)	-0.026 ^b (0.012)	-0.015 (0.012)	0.004 (0.003)	0.005 (0.003)
Industry dummies		Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes
R^2		0.21	0.08	0.60	0.21	0.65	0.67	0.57	0.57	0.12	0.04
X^2 value (FE vs. RE)		10.65		32.07 ^a		27.13 ^a		7.23		6.65	
N		237	237	237	237	232	232	232	232	212	212

Note:

1. a, b and c denote statistically significant values at 1%, 5% and 10% on a two tail test, respectively.
2. N.A. is the abbreviation for Not Applicable.
3. In the IV models we use lagged levels of value added, labor costs and sales per capital, and regional dummies as instruments.
4. All estimates are corrected for heteroskedasticity applying Huber-White-Sandwich variance estimator.
5. In the case of investment in marketing on domestic and foreign markets we use Q_t to reflect sales revenues on domestic and foreign markets respectively.

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