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## **Efficiency and Ownership Structure – The Case of Poland**

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## **Abstract**

We examine the effects of foreign entry on productive efficiency during the Polish investment liberalization. The performance of foreign acquisitions is compared to foreign firms entering the market through greenfield entry, as well as domestic acquisitions of privatized firms, domestic greenfields and remaining state-owned (non-privatized) firms during the period 1995-2000. We find that foreign privatized firms have realized larger productivity gains than all types of domestic firms and that this is not due to higher price-cost margins, which is consistent with the idea that foreign firms bring in firm-specific knowledge. Foreign greenfields have the highest average labour productivity, while foreign privatizations show the largest productivity increase.

*JEL Classification:* F23, J31

*Keywords:* Privatizations, M&As, FDI, Foreign Ownership, Productivity

# 1 Introduction

During the last decades we have witnessed large privatization and deregulation programmes all over the world.<sup>1 2</sup> In the policy debate, it has been put forward that participation by multinational enterprises (MNEs) in the privatization and liberalization process is beneficial. First, entry by MNEs is seen as a way of raising employment and investments, but also as leading to the use of new, or better, technology. Second, entry by MNEs may challenge established (domestic) oligopolies by creating effective local rivals.<sup>3</sup>

However, there is also a concern that these foreign direct investments (FDI) are motivated by market power, or short-term gains. In particular, if foreign entry takes place through an acquisition of a local firm rather than through greenfield entry (where a new venture is setup), there is a concern that foreign entry might not increase the productive capacity and thus, lead to lower consumer welfare due to increased market power, and even increased unemployment through lay-offs.<sup>4 5</sup>

In this paper, we examine the efficiency effects of foreign entry during the Polish investment liberalization in the 1990s. To explore the effects of foreign ownership and

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<sup>1</sup> Privatization and deregulation activities are driven by factors such as a general trend of reducing the state in the economy, budgetary constraints, a need for attracting investments and a combination of technological change, liberalization and globalization of product and financial markets (Bortolotti et al (2003) and (OECD, 2000).

<sup>2</sup> Many countries also announce substantial forthcoming privatizations. Planned privatizations suggest that the privatization proceeds will remain strong through continued activities in Europe and Asia. Examples of countries with large privatization plans are China, Japan, Portugal, Thailand and Turkey (OECD, 2000).

<sup>3</sup> See Norbäck and Persson (2004, 2005) for theoretical analyses of effects of foreign owners' participation in privatizations.

<sup>4</sup> WIR (2000). For example, the Hungarian authorities argued that a European strategic investor would have been interested in running down Ikarus, a Hungarian bus manufacturer, in order to eliminate a competitor (*Financial Times*, July 2, 1991)].

<sup>5</sup> Moreover, some countries restrict the right of foreign individuals and firms to acquire domestic firms, or apply special restrictions on foreign firms in certain industries. This is the case in Malaysia and the Republic of Korea, for example. But the practice of countries in this respect has also changed over time. For instance, by May 1998, restrictions on foreign acquisitions of domestic shares in the stock market and restrictions on M&As by foreigners in the Republic of Korea had been abolished. However, the new investment policy still favours greenfield investment through, for instance, different tax treatments of M&A investments (WIR, 2000).

entry mode, we compare the performance of foreign acquisitions of privatized firms with foreign firms entering the market through greenfield entry, as well as with domestic acquisitions of privatized firms, domestic greenfield entry and remaining state-owned (non-privatized) firms. To the best of our knowledge, our study is the first to allow for such a breakdown of firm types.<sup>6</sup>

The Polish economy provides a natural experiment for such an analysis. Poland was one of the first Eastern European countries to embark on the reform trail when initiating its “Big Bang” reforms in January 1990.<sup>7</sup> The initial actions were to deregulate prices and introduce foreign competition to many industries as well as to send signals of tight monetary and fiscal policies in the future.<sup>8</sup> Privatization of state-owned firms was not part of the “Bang”, however, but was implemented gradually. In fact, Poland has been among the slowest to privatize, still retaining a relatively large number of state-owned firms. The privatization process tended to favour so-called insider ownership and domestic owners,<sup>9</sup> but a substantial number of state-owned firms were also opened to foreign purchase. Poland is also at the top in the category of creation of new firms.<sup>10</sup> Consequently, using data from Poland, we can compare the effects on efficiency and market power of different types of ownership. Moreover, while recent empirical evidence shows the impact of privatization on firms’ productivity in transition countries to mainly have been positive, it has also been acknowledged that the positive impact has taken time.<sup>11</sup>

The present study uses average labour productivity as a performance measure, and regresses it on ownership types, capital intensity, market share, import competition and

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<sup>6</sup> Many studies of privatization only focus on two types of ownership, insiders and outsiders. Insiders then refer to employees in the previously state-owned firms; see e.g. Frydman et al. (1999). We do not make this comparison, but focus on the foreign or domestic and privatization or greenfield dimensions.

<sup>7</sup> Sachs (1993).

<sup>8</sup> Bartel and Harrison (2005) also show that when increasing public efficiency, these types of reforms may be a substitute for privatizations. See also Megginson and Netter (2001).

<sup>9</sup> Estrin (2002).

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

tariff barriers. Our statistical analysis confirms the already well-known fact that foreign firms have a higher average labour productivity than domestic firms, in particular the remaining state-owned firms.<sup>12</sup> If the higher productivity for foreign firms is due to higher efficiency, this is likely to benefit the host country through lower consumer prices (or higher quality of goods), but if the superiority manifests itself through increased market power and higher prices, it will hurt domestic consumers.<sup>13</sup>

Therefore, in addition to controlling for a rich array of firm types, we also try to control for the potential bias in the productivity measure which stems from increased prices instead of increased efficiency. An indication that market power explains a higher labour productivity in foreign firms would be that foreign firms with high labour productivity also have a high (average) price-cost margin. This procedure then eliminates the difference in productivity found among the ownership categories: Domestic Greenfield, Domestic Privatization and State-owned, whereas the difference in productivity found among the ownership categories: FDI Privatization, FDI Greenfield and State-owned remains significant. This suggests that labour productivity in foreign firms is not inflated by high market power induced by FDI, and if pricing behaviour is not controlled for, the differences in labour productivity between foreign and domestic firms may be under-estimated.

The limitations of the present analysis should also be discussed. We should be cautious in interpreting the results as causal effects of privatization. For instance, it may be the case that the most efficient firms were privatized and that it is the firm-specific assets of these firms that explain the higher productivity in private-owned firms. This is the well-

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<sup>12</sup> Djankov and Murrell (2002).

<sup>13</sup> In a recent study, using very detailed data from Bulgaria and Romania, Konings et al. (2004) find that privatized firms with foreign owners are associated with higher price-cost margins and that the effects of privatization are stronger in highly competitive sectors, suggesting that privatizations result in cost-cutting by the new owners. However, they do not distinguish between acquisition entry and greenfield entry, which is the focus of our study.

known possibility of a selection bias in studies of privatizations, i.e., that the state has chosen to privatize the most productive firms first in order to get a high price, or maintain a good reputation. One way of partially controlling for this problem would be to examine the pre- and post performance of privatized firms acquired by foreign and domestic firms.<sup>14</sup> This is, unfortunately, not possible in our setting since we do not have any data on the privatized firms prior to privatization. However, while we cannot isolate the causal effect of a privatization in general, our data can still provide valuable information on the effects of allowing foreign ownership of privatized assets, due to the availability of multiple control groups. Greenfield entry may then be thought of as an alternative privatization method, as suggested by Brada (1996) and discussed in Megginson and Netter (2001), since the start-up of new firms also changes the economy's ownership structure. Thus, the effect of foreign ownership can then be compared within privatized firms, within firms established through greenfield entry, as well as between entry modes of private firms.<sup>15</sup>

With some caution, we would therefore argue that our results are consistent with the idea that foreign owners bring in firm-specific assets which are combined with the local assets and thus, these firms become more efficient.<sup>16</sup> We do not only find a significant

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<sup>14</sup> This is the approach taken by Megginson et al. (1994). See also the discussion of this approach in Megginson and Netter (2001).

<sup>15</sup> With pre-and post privatization data, a difference-in-difference method combined with matching techniques can also be used to estimate the causal effects of foreign ownership. This has recently been applied in work on cross-border acquisitions. For some examples, see Arnold and Javorcek (2005), Girma and Görg (2002), Bertrand and Zitouna (2005) and Csengödi et al. (2006). However, we should note that this method would only be applicable to acquisitions of state-owned firms since, by definition, there exists no "pre-period" for greenfield investments.

<sup>16</sup> MNEs are typically leading firms in their respective industries and possess firm-specific knowledge in terms of technology or know-how of the organization of production and marketing (see Barbaretta and Venables, 2004; Caves, 1995; and Markusen, 1995, 2002). Thus, foreign ownership can result in a more efficient use of local assets. This is formalized in Norbäck and Persson (2007) which develops a theoretical model where foreign firms can enter into an oligopolistic industry either by acquiring a local firm and investing sequentially, or by directly setting up a new plant, i.e. greenfield entry. They show that for a foreign acquisition to take place, the acquiring foreign firm must be sufficiently efficient when using the domestic assets. Put differently, there is a lower limit on how inefficient a foreign acquirer can be when using the acquired assets. The reason is that if a foreign acquisition is mainly driven by the desire to eliminate a local rival in order to increase product market prices, this will imply that rivals in the market

productivity differential between foreign and domestic privatizations – there is also a significant productivity differential between foreign and domestic greenfield investments. Moreover, these differences are not explained by higher price-cost margins, thereby suggesting a more efficient use of the assets from foreign ownership. We control for fixed industry, time and regional effects in our regressions and find that our results still hold. This suggests that the higher productivity of foreign firms is not due to foreign firms being overrepresented in high-productivity industries or regions.

We also address the concern about foreign acquisitions in the privatization and liberalization programmes that, in contrast to greenfield FDI, they do not increase the productive capacity and might lead to lower consumer welfare and lay-offs. Our statistical analysis then shows that foreign greenfield investment indeed has a higher productivity than foreign acquisitions. However, our analysis also indicates that the productivity increase is highest in foreign privatizations. Consequently, even though foreign greenfield has the highest level of productivity, foreign privatized firms are improving the most. Once more this indicates that transfers of ownership of state enterprises to foreign firms are associated with asset complementarities between MNEs' firm-specific assets and acquired state assets and that the associated dynamic effects are important for determining the welfare effects.

The paper is organized as follows: We start by a purely descriptive statistical analysis of the data used; firms are classified according to ownership types and compared with respect to average labour productivity, capital intensity, average wages paid etc. A preliminary discussion about the extent of market power is also conducted. This section is followed by an econometric study where we try to explain the differences in average

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will also have an incentive to expand their business which will reduce the profitability of the acquisition. Thus, the complementarities or synergies arising from a change of ownership need to be sufficiently large. The empirical results in this paper are thus consistent with such synergies.



labour productivity across ownership types as well as to disentangle the simultaneity relationship between productivity and market power, the latter proxied by the average price-cost margin. We follow up by a discussion about the interpretation of our results.

## 2 Privatization in Poland

Poland's transition to a market economy started in January 1990 by lifting state-controlled prices on most goods according to the so-called Balcerowicz plan. In July 1990, the Law on Privatization of State-owned Enterprises was passed and a new ministry (the "Ministry of Privatization") in charge of privatizations was formed in September the same year. The first privatizations took place late in 1990. The ambition of the first government in charge of the transition was to introduce private ownership as soon as possible.<sup>17</sup> One reason for the sense of urgency was that so-called "spontaneous" or "nomenklatura" privatizations had become a major concern. Another concern was to limit the power of workers' councils in state-owned firms, which was seen by the liberal government as conservative forces intent on resisting restructurings which threatened layoffs of workers.<sup>18 19</sup> The first three years of privatization also saw a relatively rapid pace in the ownership transformation. However, there was a backlash in 1994, with a new, left-wing government coming in, which wanted to slow down the process. Special interest groups, such as trade-unions in heavy-industry sectors (which contained many very large state-owned companies), also wanted things to slow down. Attitudes changed in 1996 and the privatization process once more picked up speed. The result was that by

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<sup>17</sup> Blaszczyk (1999).

<sup>18</sup> Frydman et al. (1993).

<sup>19</sup> Squires Meaney (1997).

the turn of the century, some sectors were almost completely privatized while others were still dominated by state-owned firms, or firms belonging to NIFs.

The sectors which still remained essentially in the state domain by the end of 1998 were oil and coal products, metal production, electricity, water and gas supply, mining and quarrying, and transport, storage and communications. The state's share of the assets in these few sectors was between 90 and 100 per cent, but if a few other large sectors are included, such as the automobile industry, apparel, machinery and equipment and food and beverages, the state's share falls to about 45 per cent.<sup>20</sup> Therefore, we conclude that by the middle of our observation period (1995-2000), the privatization process had come quite far in some industries, while it had virtually stood still in others. The reason for this uneven pattern was probably mainly political constraints, particularly the resistance of powerful interest groups in heavy industry and mining sectors. Nevertheless, the privatization process had produced a useful variation across industries with respect to ownership structures, of which we will try to take advantage in order to address the question of the connection between foreign entry, efficiency and competition.

### **3 Preliminary Analysis of Data**

The data is described in this section. The preliminary data analysis is used to establish the salient facts of the sampled firms, and set the stage for the deeper econometric analysis to follow.

To identify the firms that might be suitable to include in our study, we used a comprehensive Polish database ("Teleadreson") which contains information about the size of the firms (turnover or number of employees), production activities (NAICS- and

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<sup>20</sup> Blaszczyk (1999).

SIC-codes), ownership category, and date of foundation. The data for individual firms in this database was mostly from 1999, but some was from 2000. This database was used to identify the ten largest firms in each four-digit (SIC) industry according to the number of employees, given that the smallest firm contained at least 100 employees.<sup>21</sup>

Since there were some missing observations on the number of employees, the database was also sorted by turnover (for each industry), and the ten firms with the largest turnover were identified. Focusing on the manufacturing and mining sectors, the number of four-digit SIC-industries became 408, but only a few of these industries actually had ten or more firms with at least 100 employees. The number of firms identified in this first stage was 1,619. The total number of employees within the sampled firms was about 1.91 million. In 1998, total employment in manufacturing, mining and quarrying, the sectors which most closely cover the sector used in the sample, was 2.56 million;<sup>22</sup> the firms included in this database therefore comprise about 75 per cent of the total employment of all firms.

Table 3.1 contains a description of the number of firms in each ownership category and their average sizes in 1999/2000. Of the total number of firms in the sample, 38.3 per cent were still state-owned, 6.7 per cent were foreign owned, privatized firms and 18.2 per cent were privatized firms with domestic (Polish) owners. The transition, and privatization, process started in 1990 and since then, there has been a steady formation of new firms. By 1999 there were 409 newly established firms that met the selection criteria, i.e., firms which were privately owned and not privatized formerly state-owned firms with at least 100 employees and among the ten largest firms in their respective four-digit SIC-industry. 27.6 per cent of these were foreign owned (so-called *greenfields*). The

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<sup>21</sup> This was done since the Amadeus database, which we use to obtain accounting data, only contains information on firms of medium or large size.

<sup>22</sup> Tabl. 5 (154), in *Statistical Yearbook of the Republic of Poland*, 1999.

respective average sizes of the still state-owned and privatized formerly state-owned firms were quite similar, while domestic greenfield firms were much smaller than the corresponding foreign-owned firms.

[Table 3.1 about here]

To obtain more useful economic data, we used the Amadeus database<sup>23</sup> to get accounting data for as many of the firms identified in the first stage as possible. Table 3.2 shows the number of firms, total employment and average size of the subset of firms identified from Amadeus. A comparison of Tables 3.2 and 3.1 shows an overall coverage in the Amadeus database of 69.4 per cent of the firms identified through Teleadreson. The highest degree of coverage is for the first three ownership categories (80 per cent, 77 per cent and 74 per cent, respectively), while it is lower for the last two categories (57 per cent and 69 per cent); in terms of the number of firms identified. As can be seen from the last lines of Tables 3.2 and 3.1, the firms selected into the Amadeus database are close, in terms of average size, to the firms in the Teleadreson database. Therefore, we are confident that our sample is representative of the population.

[Table about 3.2 here]

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<sup>23</sup> AMADEUS stands for “Analyse major databases from European sources”, and is produced by Bureau van Dijk Electronic Publishing. It contains economic information from about five million European companies.

### **3a Firm Type and Productivity**

We first want to find out whether there are any differences in the level of average labour productivity among various types of firms, where type is defined on basis of ownership. In particular, is there any difference between domestic firms with private owners and foreign owners? Are newly started firms (so-called *greenfields*) more productive than older, privatized firms? Our reference will be older non-privatized, i.e. still state-owned, firms. The natural prior belief is that the latter firms are the least productive since the government has probably chosen to privatize the “best” firms first; the remaining firms may be loss-making and/or in a state of reconstruction in order to be privatized subsequently.

Making use of the Amadeus data, we derive a measure of average labour productivity for each firm and year. We call this variable *ALP* and construct it by using information on total sales, *S*, minus total cost of production, *TC* (excl. financial costs) and add labour cost, *LC*; all variables expressed in current local currency. Labour cost was missing for roughly half the sampled firms and therefore, we use average, yearly wage levels at the three-digit level, multiplied by the number of workers in each firm, to get an approximate measure of labour cost for the missing firms. Thus, the average labour productivity for firm *i* in year *t* is defined as,

$$ALP_{it} = \frac{S_{it} - TC_{it} + LC_{it}}{L_{it}} \quad [1]$$

Table 3.3 contains the ratio of the mean of this variable for each ownership category divided by the mean for state-owned firms, for each year. These numbers are given as an

aggregate for all sectors and are broken down into three broadly defined sectors (raw material industries, consumer goods industries and industrial goods industries)

[Table 3.3 about here]

The numbers indicate that foreign-owned firms, both privatized firms and greenfields, have the highest relative labour productivity, while domestic greenfields are more productive than state-owned or domestic privatized firms. For example, in Table 3.3 the number 1.36 in 1995 for foreign privatized firms in the “All industries” part of the table indicates that they had 36 per cent higher average labour productivity than state-owned firms in that year. The category “Foreign Greenfields” has the highest relative labour productivity, but also contains the fewest observations. The last row shows the average proportions in the sample for each category over the entire observation period. Note that the 45 per cent for state-owned firms is the same proportion as that reported by Blaszczyk (1999) for the proportion of state-owned assets as of 1998, for roughly the same industries as those we include.

The higher average labour productivity in privatized firms in general may be due to the fact that the state chose to privatize the “best” (or least inefficient) firms first. Alternatively, it found no buyer that was prepared to pay the state’s reservation price for the least inefficient firms. The higher productivity in greenfield firms indicates that newer technology is used, which improves labour productivity. Foreign greenfields (even though not so prevalent in the sample) show the highest labour productivity by far. This may indicate that foreign firms have access to superior technology, which they use when building plants from scratch. That foreign greenfield investments exhibit higher

productivity than state-owned companies privatized into foreign owners may also be due to restrictions on firing workers during the privatization process. It is also possible that foreign firms are more common in industries which are capital intensive and therefore have a higher labour productivity. Table 3.3 also shows that there are differences between different industrial sectors. The relative superiority of foreign firms is most pronounced in consumer goods industries, followed by industrial goods industries. Foreign presence is the lowest in the raw material sector and average labour productivity is sometimes even lower than in state-owned firms. However, as can be seen in the table, the average number of firms is around 50 and of these only 2 per cent are privatized.. The absence of foreign firms in the raw material sector reflects the fact that privatizations in this sector in general, and to foreign owners in particular, has been the most politically sensitive.

Table 3.4 shows the ratio of a measure of the physical capital stock to the number of employees (K/L), relative to the same ratio in state-owned firms. It is obvious that foreign firms (both privatized and greenfields) have a considerably higher K/L-ratio than domestic firms (either private or state-owned firms). Hence, it is possible that foreign firms augment the capital stock while also bringing in new technology (embodied in the capital goods), which explains the higher labour productivity. There is also a marked increase in capital intensity among foreign firms established through privatization. This may mirror increased capital investment over the sample period.<sup>24</sup>

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<sup>24</sup> It should be pointed out that firms' real capital stocks could be severely mismeasured in the accounting data used. We do not have any information about the quality of Polish accounting standards, so we do not have any prior beliefs about the direction of possible biases in the measures. From Table 3.4 we note that both categories of domestic firms have (mostly) a lower capital-labour ratio than state-owned firms, while both types of foreign firms have a consistently higher ratio, which furthermore is of the same order of magnitude. We think that these numbers indicate that there is no systematic bias which overestimates the capital-intensity of foreign firms vis-à-vis domestic firms. It is still possible that the remaining state-owned firms have too low a recorded capital stock. With this caveat in mind, we still conclude that the results in Table 3.4 indicate that foreign firms use different technologies than domestic firms, in particular state-owned firms.

[Table 3.4 about here]

The sectoral break-down shows the same pattern as for average labour productivity; the relative superiority of foreign firms is most pronounced in the consumer and industrial goods sectors. It is also of interest to see whether foreign firms pay higher wages than domestic firms. Table 3.5 gives the wage levels relative to the average wage in state-owned firms. As previously discussed, we have much fewer observations here, since individual labour cost data is missing for a majority of the firms in each year. It is notable that domestic private firms do not differ considerably from state-owned firms, but foreign firms have a significantly higher wage level, in both privatized and greenfield firms. Apart from foreign greenfields in the raw material sector (which we have noted have very few observations), foreign firms pay higher wages in all sectors. An explanation for this is that foreign firms hire more highly educated, and therefore more expensive, workers with the skills to work with the more advanced capital equipment. To find out whether this is indeed the case, we should ideally add a proxy for human capital-intensity to our later regression equations. Unfortunately, such proxies, e.g. the average years of schooling of employees, are not available in the databases used and therefore, this question cannot be resolved here. An alternative explanation, which we cannot disprove either, is that foreign firms pay higher wages to induce a higher work effort, in line with efficiency wage theory arguments. This could also be a partial explanation for their higher average labour productivity.<sup>25</sup>

[ Table 3.5 about here]

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<sup>25</sup> It is well-known in the literature that foreign-owned firms pay higher wages than domestically owned ones. For instance, Lipsey and Sjöholm (2004) find foreign ownership in Indonesia to be associated with paying higher wages, even when controlling for plant-level characteristics as well as for educational characteristics of workers.



### **3b Firm Type and Price-cost Margins**

Apart from higher capital-intensity (real and/or human), another explanation for the higher measured average labour productivity is that foreign firms enjoy some degree of market power in the host country market. Our measure of average labour productivity is constructed from firms' sales figures which are the product of price and quantity. If a firm gains market power, it can increase its sales in value terms by increasing the price and reducing the quantity sold. Higher average labour productivity, and sales, in foreign-owned firms may therefore be due to market power instead of higher efficiency in the use of resources. Since prices set by individual firms are not available, it is difficult to explicitly test this hypothesis.

An ideal measure of market power is the Lerner index, i.e. the markup of prices over marginal cost. However, we do not have enough information to estimate cost functions and marginal costs. Instead, we use the average price-cost margin, i.e. price minus average total cost divided by price, or sales minus total cost of production divided by sales, as an admittedly imperfect measure of market power. Our measure of the (average) markup, or price-cost margin is

$$PCM_{it} = \frac{S_{it} - TC_{it}}{S_{it}} \quad [2]$$

Table 3.6 shows how this measure of market power has developed over the observation period for the different ownership types, once more relative to state-owned firms.

[Table 3.6 about here]

Both foreign privatized and domestic firms of both types have had a consistently higher price-cost margin than state-owned firms over the whole period. Foreign greenfields show a pattern of increasing margins over time. The pattern is most uneven within the raw material sector, while it seems that foreign privatized firms have the lowest margins as compared to the other types in the industrial goods sector.

One explanation for the higher efficiency of foreign firms could be the exercise of market power. In the next section, we will analyse the simultaneous determination of labour productivity and price cost margins, but as a preliminary step we consulted the *Polish Statistical Yearbook* to get information about how relative prices for various goods had changed over the observation period. In the statistical yearbook, we found prices for a large number of products, but only a small subset fitted into the industrial classification used in constructing the database of firm information. The relative price changes in the selected industries (relative to the general change in consumer and producer prices) are shown in Table 3.7, together with market shares for the three ownership types. From this table, we calculated the correlation coefficients between relative price changes and market shares for State, Foreign and Domestic, with the following results: State: 0.47, Foreign: -0.22 and Domestic: -0.35. This evidence suggests that prices have increased more in markets dominated by still state-owned firms. This lends some support to the view that the high margins enjoyed by private firms (of all types) is more a result of rapid productivity improvements than the exercise of market power.

[Table 3.7 about here]

## 4 Econometric analysis

### 4a Examining average labour productivity

We start by specifying a regression equation to examine differences in average labour productivity between the five ownership types. To avoid sector-specific disturbances, we estimate fixed-effect regressions controlling for industry-specific effects at the four-digit level (for 315 industries), regional-specific effects (for 16 regions) and time-specific effects (for 7 years). The first specification of average labour productivity regressions is:

$$ALP_{it} = \alpha_0 + \alpha_1 DG_i + \alpha_2 DP_i + \alpha_3 FDIG_i + \alpha_4 FDIP_i + \alpha_j + \alpha_t + \alpha_r + \varepsilon_{it} \quad [3]$$

where  $ALP_{it}$  is defined in Equation (1). Once more, we calculate average, yearly wage levels at the three-digit level for firms with missing wage costs. However, since we noted above that foreign firms pay higher wages than domestic firms, we calculate these average industry wages separately for foreign and domestic firms.  $DG_i$ ,  $DP_i$ ,  $FDIG_i$  and  $FDIP_i$  are dummy variables indicating ownership types.  $DG$  stands for Domestic Greenfield,  $DP$  stands for Domestic Privatization,  $FDIG$  stands for FDI Greenfield and  $FDIP$  stands for FDI Privatization. Since we use state-owned firms as the reference, these coefficients tell us how much, on average, labour productivity differs between a specific ownership type and state-owned firms. Industry, time and regional fixed-effects are

captured by the terms  $\alpha_j$ ,  $\alpha_t$  and  $\alpha_r$ . By including fixed-effects, we hope to isolate the pure effect of ownership type on labour productivity; a higher ALP in foreign firms could be due to the clustering of such firms in particularly profitable and growing sectors and/or a timing effect meaning that entry of foreign firms has occurred at beneficial times, for example.

Equation (1) is our basic regression equation, which we expand by gradually including additional control variables. The final specification of the regression equation is:

$$ALP_{it} = \alpha_0 + \alpha_1 DG_i + \alpha_2 DP_i + \alpha_3 FDIG_i + \alpha_4 FDIP_i + \alpha_5 MS_{it} + \alpha_6 KL_{it} + \alpha_7 Tariff_{jt} + \alpha_j + \alpha_t + \alpha_r + \varepsilon_{it} \quad (4)$$

where subscript  $i$  stands for an individual firm, subscript  $j$  stands for the four-digit Primary US-SIC industry and  $t$  is year  $t$ . The control variables are: the firm market share of domestic production,  $MS_{it}$ , the capital-labour ratio,  $KL_{it}$  and tariff rates,  $Tariff_{jt}$ . Tariff data is from Jon Haveman and indicates the average tariff rates at the industry level.<sup>26</sup>

The results of (2) are presented in Table 4.1. Specification (i) confirms the results from the preliminary statistical analysis in Table 3.3. FDI Greenfield had on average about 45200 Zloty higher average labour productivity than state-owned firms. All ownership types but Domestic Privatization have a significantly higher average labour productivity than state-owned firms, with the ranking from the highest to the lowest being: FDI Greenfield, FDI Privatization, Domestic Greenfield and Domestic Privatization, which is confirmed by Wald tests. Thus, when controlling for industry, time and region

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<sup>26</sup> These data are available at <http://www.macalester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/TradeData.html>.

characteristics, we do not find that firms being privatized to domestic owners have a higher labour productivity than state firms, while there is a positive significant difference for the remaining types.

[Table 4.1 about here]

Specification (ii) controls for capital intensity. As we would expect from the preliminary analysis in Section 3a, there is a significant, positive relationship between KL and ALP. The differences in ALP between state-owned firms and other firms are reduced; mostly so for foreign firms of both types. Hence, a large part of the higher ALP in foreign firms can be explained by higher capital intensity. Note, however, that the relative ranking of ownership types is not affected.

Specifications (iii) and (iv) add market shares of domestic production for each firm and tariff rates at the three-digit industry level, respectively. These variables are included to control for market power effects which could bias ALP upwards. Both variables have significantly positive effects on ALP, as expected but, once more, the rankings among all types of firms are not greatly affected.<sup>27</sup>

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<sup>27</sup> Note that adding these controls substantially reduces the difference in productivity between state-owned firms and foreign firms, while having no effect on the difference in productivity between state-owned firms and domestic private firms. This suggests that the difference in labour productivity between foreign firms and domestic firms is reduced when control variables are included. We should emphasize that this does not imply that foreign ownership becomes less important in a host-country perspective. To see this, define the *unconditional average difference* as the average differences in productivity between foreign and domestic firms obtained in equation (3), where no control variables are added. Then define the *conditional average difference* as the average difference in productivity between foreign and domestic firms in equation (4), where control variables are added to the regression. Note that the conditional difference tells us how large the average productivity difference is between a foreign firm and a domestic firm with the *same* capital/labour ratio and the *same* market share. If we believe that domestic firms do not have access to the same amount of capital, or the same type of firm-specific assets (as manifested through the size of the market shares) as the foreign firms, the unconditional average difference may be a more relevant policy measure. For a more elaborate discussion of so-called “conditional and unconditional effects” of foreign ownership, see Barba Navaretta and Venables (2004), Chapter 7.

In Table 4.2, we check that the results do not change when only using observations where firms report both labour costs and employment numbers, remembering that for firms with missing labour cost information, we replaced wages with the average wage by industry paid by foreign and domestic firms, respectively. While this generates a smaller sample, the results are qualitatively similar and we conclude that approximating wages from industry data does not bias the results. In the remaining parts of the paper, we therefore use the wider sample. In unreported results, we also estimated (4) on a yearly basis to control for firm types being identified in the latter part of the sample period of 1995-2000, while we use data for the full period. This did not qualitatively change our results. We also used total factor productivity as an alternative dependent variable. Once more, there was no qualitative change in the results.

[Table 4.2 about here]

The evidence so far points in the direction of foreign firms, of both types, being more productive than state-owned firms and in most specifications also more productive than private domestic firms (of both types).

These results indicate that ownership identity and entry mode indeed affect the productivity of a firm. However, these results could, of course, be due to special initial conditions or restrictions on specific owners or entry mode, which would explain the result. For instance, it might be the case that foreign owners are not more efficient but only participate when efficient firms are privatized. Or it could be the case that when acquiring a firm, the government puts more restrictions on the firm, such as employment guarantees, as compared to the case with greenfield entry.

Therefore, we examine the change in productivity by estimating the following regression equation:<sup>28</sup>

$$\Delta ALP_{it} = \alpha_0 + \alpha_1 DG_i + \alpha_2 DP_i + \alpha_3 FDIG_i + \alpha_4 FDIP_i + \alpha_5 \Delta MS_{it} + \alpha_6 \Delta KL_{it} + \alpha_7 \Delta Tariff_{jt} + \alpha_j + \alpha_t + \alpha_r + \varepsilon_{it} \quad [5]$$

Using the same sequential approach as in the levels-specifications, the results in Table 4.3 indicate that the productivity increase is highest in Foreign Privatizations. This is the only ownership category which seems to have significantly higher increases in ALP than State-owned firms. For example, even though Foreign Greenfields have the highest absolute productivity, Foreign Privatized firms seem to be improving the most. This indicates that transfers of ownership of state enterprises to foreign firms have dynamic productivity effects. Thus, a foreign acquisition could in the long run lead to larger gains in productivity than greenfield entry, when complementarities arising from combining local assets with the firm-specific assets of the foreign firm materialize.

[Table 4.3 about here]

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<sup>28</sup> We cannot apply firm fixed effects when estimating the effect on firm type on the level of average labour productivity in (4) since, by definition, there is no change in status for firms started by greenfield entry over time. In addition, most privatized firms have been included in the Amadeus database after privatization. Consequently, there are only a few firms where we have data before and after a privatization.

## 4b Examining Price-cost Margin and Firm Type

The preceding section suggests that foreign entry should be beneficial since domestic assets become more efficiently employed under foreign ownership. However, in order to make this conclusion, we ought to address the problem that high labour productivity may be due to high mark-up due to market power.

To estimate the average price-cost margin, we use the following specification:

$$PCM_{it} = \beta_0 + \beta_1 DG_i + \beta_2 DP_i + \beta_3 FDIG_i + \beta_4 FDIP_i + \beta_5 TFA_{it} + \beta_6 TFA_{it}^2 + \beta_7 MS_{it} + \beta_8 KL_{it} + \beta_9 Tariff_{jt} + \beta_j + \beta_t + \beta_r + \varepsilon_{it} \quad [6]$$

where the dependent variable is calculated from equation (2). Equation (6) contains the same variables as those used in the ALP-regressions (except the wage level), and in addition,  $TF_{it}$ , which is tangible fixed assets for firm  $i$  in period  $t$ , and  $TF_{it}^2$ , which is the square of the same variable. We include the square of TFA to pick up potential scale effects, which would result in higher price-cost margins for firms with larger plant sizes.

Table 4.4 presents the regression results on  $PCM$ , where specification (i) directly estimates equation (6). For comparison, we also include the ALP-regression using specification (iv) from Table 4.1, here re-labelled as specification (ii). Then, we continue by simultaneously estimating the PCM- and ALP-equations (4) and (6). This is done, in specification (iii), in order to correct for simultaneity between  $PCM$  and  $ALP$  arising from price-setting behaviour by firms with market power. The simultaneous equation system



was estimated using 3SLS. From (i), we can see that the differences in *PCM* are quite small among private firms, even though (with the exception of Foreign Privatizations) they are significantly higher than those for state-owned firms. Controlling for the simultaneity between *PCM* and *ALP* in (iii) reduces both for all firms. However, while there is still a significant positive difference in *ALP* between foreign firms of both types, this difference disappears for domestic firms where we find that, controlling for pricing behaviour, Domestic Privatizations have an even significantly lower *ALP* than State-owned firms. Conversely, price-cost margins are now not significantly higher for foreign firms, as compared to State-owned firms, while it remains higher for both types of domestic firms. From the simultaneously estimated regressions, it appears that the difference in productivity found between the ownership categories Domestic Greenfield, Domestic Privatization and State-owned can be explained by differences in price-cost margin, but the difference in productivity found among FDI Privatization, FDI Greenfield and State-owned cannot be explained in this way.

Hence, not controlling for pricing behaviour, the differences in labour productivity between foreign and domestic firms are under-estimated. This seems to counter our prior of labour productivity in foreign firms being inflated by high market power induced by FDI.

[Table 4.4 about here]

## 5 Conclusions

In this paper, we have found some evidence of foreign ownership of privatized firms and the entry of new foreign firms in Polish manufacturing industries having led to real productivity gains. The higher measured labour productivity is not due to higher price-cost margins which would have been negative for Polish consumers.<sup>29</sup>

We have also addressed the concern about foreign acquisitions in the privatization and liberalization programmes that, in contrast to greenfield FDI, they do not increase the productive capacity and might lead to lower consumer welfare and lay-offs. Our statistical analysis shows that foreign greenfield investments indeed have a higher productivity than foreign acquisitions. However, our analysis also indicates that the productivity increase is highest in foreign privatizations. Consequently, even though foreign greenfields have the highest absolute productivity, foreign privatized firms are improving the most. This is in contrast to the often held view that FDI by greenfield investment should be the preferred mode of entry. Hence, it is important to take into account that a foreign acquisition could in the long run lead to larger productivity gains when complementarities arising from combining local assets with the firm-specific assets of the foreign firm materialize. This, in turn, may also benefit consumers through lower prices and higher quality.

Finally, an aspect not dealt with is spillovers.<sup>30</sup> In future work, the data employed in this study can be used to also examine other effects of foreign entry. For instance, governments often promote FDI with the belief that these investments have positive externalities on the rest of the economy, i.e., spillovers to other agents in the economy.

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<sup>29</sup> As discussed in the introduction, some caution should still be exercised when interpreting this as a causal relationship, since the effect of foreign ownership is identified through a comparison of the post-greenfield and post-acquisition performance of foreign and domestic firms.

<sup>30</sup> For an overview of how domestic firms are affected by the presence of foreign firms, see Görg and Greenaway (2004).

Whether such spillovers are different for greenfield investments than for investment by acquisitions is an issue for future research.

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Table 2.1 Description of firms in “Teleadreson-database”

<i>Measure:</i>	<i>State-owned</i>	<i>Foreign Privatized</i>	<i>Foreign Greenfield</i>	<i>Domestic Privatized</i>	<i>Domestic Greenfield</i>
Number of firms	621	108	113	482	295
Total number of employees	805,744	148,570	85,981	329,053	111,698
Average size (employees)	1,178	1,376	761	683	379

Table 2.2 Description of firms identified through Amadeus

<i>Measure:</i>	<i>State-owned</i>	<i>Foreign Privatized</i>	<i>Foreign Greenfield</i>	<i>Domestic Privatized</i>	<i>Domestic Greenfield</i>
Number of firms	493	83	83	296	168
Total number of employees	422,872	90,450	48,975	153,674	57,176
Average size (employees)	1,059	1,310	670	676	386

Table 3.3 Average labour productivity across all industries and three major industrial sectors

<i>Year</i>	<i>Number of observations</i>	<i>State-owned</i>	<i>Foreign Privatized</i>	<i>Foreign Greenfields</i>	<i>Domestic Privatized</i>	<i>Domestic Greenfields</i>
<b>All industries</b>						
1995	622	1	1.36	1.67	1.12	1.64
1996	853	1	1.68	2.46	1.16	1.49
1997	1002	1	1.77	2.52	1.23	1.50
1998	1084	1	1.94	3.69	1.32	1.46
1999	1073	1	1.78	2.50	1.30	1.28
2000	777	1	1.71	2.91	0.98	1.29
Proportions (%)		45	9	7	27	13
<b>Raw material industries</b>						
1995	28	1	1.31	na	1.02	1.02
1996	44	1	1.48	0.41	1.31	1.02
1997	51	1	1.26	0.05	0.97	0.81
1998	60	1	0.95	na	1.15	0.93
1999	61	1	0.85	0.12	0.83	0.86
2000	27	1	na	na	0.97	1.24
Proportions (%)		67	7	2	18	7
<b>Consumer goods industries</b>						
1995	303	1	1.22	1.34	1.02	1.57
1996	397	1	1.62	2.27	1.06	1.24
1997	452	1	1.85	2.90	1.11	1.23
1998	486	1	2.29	3.33	1.09	1.34
1999	471	1	1.98	2.82	1.41	1.22
2000	304	1	1.86	3.76	1.15	1.07
Proportions (%)		38	10	11	28	13
<b>Industrial goods industries</b>						
1995	291	1	1.52	2.41	1.21	1.73
1996	412	1	1.65	2.59	1.23	1.76
1997	499	1	1.64	1.24	1.36	1.82
1998	538	1	1.57	4.81	1.53	1.61
1999	541	1	1.68	2.16	1.27	1.39
2000	446	1	1.71	2.35	0.90	1.28
Proportions (%)		48	7	4	27	13



Table 3.4 Capital intensity and firm type across all industries and three major industrial sectors

<i>Year</i>	<i>Number of observations</i>	<i>State-owned</i>	<i>Foreign Privatized</i>	<i>Foreign Greenfields</i>	<i>Domestic Privatized</i>	<i>Domestic Greenfields</i>
All industries						
1995	622	1	1.77	3.18	0.89	0.75
1996	855	1	2.05	2.19	0.89	0.80
1997	1004	1	2.13	2.26	0.90	0.77
1998	1084	1	3.08	2.98	0.93	0.90
1999	1073	1	2.49	2.28	0.82	0.83
2000	777	1	2.72	2.28	0.84	1.28
Proportions (%)		45	9	7	27	13
Raw material industries						
1995	27	1	0.92	na	0.63	0.31
1996	45	1	0.87	1.15	0.38	0.41
1997	52	1	0.92	0.93	0.36	0.36
1998	61	1	1.66	2.73	0.37	0.45
1999	61	1	2.62	0.66	0.34	0.53
2000	27	1	na	na	0.52	0.81
Proportions (%)		66	7	2	18	7
Consumer goods industries						
1995	304	1	1.80	3.45	0.87	0.83
1996	397	1	2.12	2.56	0.89	0.83
1997	452	1	2.18	2.22	0.86	0.72
1998	485	1	3.46	2.73	0.90	0.92
1999	471	1	3.31	2.37	0.87	0.76
2000	304	1	5.21	2.37	0.99	1.01
Proportions (%)		38	10	11	28	13
Industrial goods industries						
1995	293	1	1.85	3.43	0.98	0.75
1996	413	1	2.31	2.29	0.97	0.84
1997	500	1	2.33	2.96	1.02	0.87
1998	538	1	3.09	4.17	1.04	0.97
1999	541	1	2.09	2.82	0.87	0.93
2000	446	1	1.81	2.12	0.85	1.45
Proportions (%)		48	7	4	27	13

Table 3.5 Average wage and firm type across all industries and three major industrial sectors

<i>Year</i>	<i>Number of observations</i>	<i>State-owned</i>	<i>Foreign Privatized</i>	<i>Foreign Greenfields</i>	<i>Domestic Privatized</i>	<i>Domestic Greenfields</i>
All industries						
1995	231	1	1.20	1.43	1.10	1.35
1996	238	1	1.96	1.58	1.05	0.96
1997	380	1	1.36	1.27	1.03	1.11
1998	366	1	1.44	1.52	1.04	1.11
1999	515	1	1.47	1.41	1.01	0.97
2000	376	1	1.35	1.57	0.98	1.20
Proportions (%)		44	9	9	25	13
Raw material industries						
1995	13	1	1.11	na	0.97	0.87
1996	17	1	1.12	na	1.03	na
1997	20	1	1.30	na	0.95	0.75
1998	24	1	1.11	0.79	1.32	0.75
1999	31	1	1.19	0.72	0.96	0.76
2000	11	1	Na	na	1.14	na
Proportions (%)		73	5	1	17	4
Consumer goods industries						
1995	112	1	1.20	1.45	1.00	1.57
1996	104	1	1.35	1.60	1.03	0.84
1997	155	1	1.33	1.30	0.95	0.95
1998	164	1	1.49	1.75	0.98	1.03
1999	203	1	1.47	1.49	1.01	0.91
2000	126	1	1.25	2.02	1.05	1.16
Proportions (%)		38	9	13	26	14
Industrial goods industries						
1995	106	1	1.24	1.48	1.23	1.22
1996	117	1	2.86	1.58	1.14	1.17
1997	205	1	1.29	1.14	1.14	1.26
1998	178	1	1.40	1.35	1.12	1.29
1999	231	1	1.45	1.40	1.04	1.04
2000	239	1	1.35	1.26	0.95	1.24
Proportions (%)		48	9	6	26	13

Table 3.6 Price-cost margins, ratios of median values across all industries and three major industrial sectors

<i>Year</i>	<i>Number of observations</i>	<i>State-owned</i>	<i>Foreign Privatized</i>	<i>Foreign Greenfields</i>	<i>Domestic Privatized</i>	<i>Domestic Greenfields</i>
<b>All industries</b>						
1995	656	1	1.26	0.95	1.23	1.32
1996	894	1	1.43	1.42	1.32	1.25
1997	1012	1	1.60	1.57	1.49	1.53
1998	1087	1	1.24	1.72	1.24	1.50
1999	1080	1	1.52	2.18	1.34	1.57
2000	778	1	1.27	2.07	1.31	1.49
Proportions (%)		44	9	7	27	13
<b>Raw material industries</b>						
1995	36	1	0.62	na	0.83	1.40
1996	46	1	2.03	na	3.50	1.58
1997	51	1	1.67	na	0.90	0.65
1998	60	1	0.55	na	1.05	1.10
1999	61	1	0.91	na	0.93	1.29
2000	27	1	na	na	2.26	3.34
Proportions (%)		67	6	2	18	7
<b>Consumer goods industries</b>						
1995	321	1	1.29	0.61	1.26	1.18
1996	414	1	1.53	1.47	1.51	1.37
1997	460	1	1.63	1.71	1.66	1.58
1998	488	1	1.60	1.77	1.21	1.57
1999	476	1	1.65	2.30	1.51	1.55
2000	305	1	1.20	1.65	1.17	0.94
Proportions (%)		38	10	11	28	13
<b>Industrial goods industries</b>						
1995	299	1	1.16	1.71	1.13	1.36
1996	434	1	1.41	1.74	1.15	1.24
1997	501	1	1.44	1.43	1.41	1.56
1998	539	1	0.89	1.90	1.35	1.54
1999	543	1	1.07	2.89	1.39	1.90
2000	446	1	1.18	2.48	1.22	1.58
Proportions (%)		48	7	4	27	13

Table 3.7 Price changes and ownership type

<i>Product</i>	<i>Relative price change (%)</i>	<i>Share of output (%)</i>			<i>HHI (firms)</i>
		State	Foreign	Domestic	
Coal	16.66	100	0	0	1247
Meat	3.70	44	0	56	755
Sausages	2.38	14.7	18.5	66.8	1660
Poultry	-26.13	32.7	1.4	65.9	1332
Butter	18.79	0	0	100	3982
Cheese	3.45	0	25.3	74.7	6216
Milk	7.70	0	87.7	12.3	4471
Flour	10.41	100	0	0	2593
Bread	30.71	42.3	3.6	9.7	3161
Sugar	-12.72	8.4	9.5	82.1	885
Candy	4.27	25.6	29.7	44.7	1550
Chocolate	1.96	5	95	0	3831
Vegetable oil	1.05	37.4	53.4	9.2	2796
Fats and oils	0.25	55.2	0	44.8	4067
Malt beverages	19.68	41	45.3	13.6	3021
Liquor	21.53	95.5	0	4.5	2477
Canned fish	10.26	22.4	27.6	50	2121
Roasted coffee	-11.94	16.3	54.4	29.2	2245
Cigarettes	60.99	3.1	95.9	0.9	2174
Women's hosiery	24.49	70.8	0	29.2	5868
Carpets and rugs	8.73	43.6	0	56.4	2310
Men's suits and coats	8.67	42.2	4.1	53.7	910
Men's shirts	34.54	41.9	43.6	14.5	3867
Men's trousers	4.03	0	56.7	43.3	4551
Curtains and draperies	-6.97	0	0	100	4744

Table 4.1 Estimating average labour productivity (ALP)

	<i>Specifications:</i>			
	(i)	(ii)	(iii)	(iv)
FDI Greenfield	45.157 <sup>***</sup> (14.29)	33.569 <sup>***</sup> (12.85)	31.008 <sup>***</sup> (11.88)	29.962 <sup>***</sup> (11.26)
FDI Privatized	29.496 <sup>***</sup> (9.18)	20.400 <sup>***</sup> (7.71)	17.090 <sup>***</sup> (6.43)	17.052 <sup>***</sup> (6.18)
Domestic Greenfield	8.668 <sup>***</sup> (3.96)	8.748 <sup>***</sup> (4.87)	9.455 <sup>***</sup> (5.31)	9.950 <sup>***</sup> (5.43)
Domestic Privatized	2.648 (1.63)	1.838 (1.38)	1.538 (1.16)	1.793 (1.31)
Capital Labour Ratio		0.114 <sup>***</sup> (38.56)	0.109 <sup>***</sup> (36.93)	0.109 <sup>***</sup> (36.42)
Market Share			0.302 <sup>***</sup> (7.75)	0.317 <sup>***</sup> (7.77)
Tariff				0.058 <sup>***</sup> (2.23)
R <sup>2</sup>	44.5	62.6	63.4	63.0
Adj R <sup>2</sup>	38.1	58.5	59.3	58.9
F	21.31 <sup>***</sup>	92.19 <sup>***</sup>	92.63 <sup>***</sup>	86.45 <sup>***</sup>
F(industry)	4.63 <sup>***</sup>	4.94 <sup>***</sup>	5.09 <sup>***</sup>	4.69 <sup>***</sup>
Observations	3387	3386	3386	3237

*Note:* \*, \*\*, \*\*\* indicate the significance at the one-percent, five-percent and ten-percent level, respectively. Heteroskedasticity consistent *t*-statistics are in parenthesis. Unreported time, industry and regional dummies are always included. Industry-specific effects are at the four-digit level (for 315 industries), regional-specific effects are defined for 16 regions.

Table 4.2 Estimating average labour productivity (ALP) using only observations with complete labour cost information

	Specifications:			
	(i)	(ii)	(iii)	(iv)
FDI Greenfield	56.507 <sup>***</sup> (12.42)	41.862 <sup>***</sup> (9.51)	40.490 <sup>***</sup> (9.10)	37.763 <sup>***</sup> (8.20)
FDI Privatized	24.101 <sup>***</sup> (5.38)	20.400 <sup>***</sup> (7.71)	12.713 <sup>***</sup> (2.93)	11.858 <sup>***</sup> (2.68)
Domestic Greenfield	7.058 <sup>**</sup> (1.92)	8.236 <sup>**</sup> (2.39)	8.634 <sup>**</sup> (2.50)	9.001 <sup>**</sup> (2.55)
Domestic Privatized	-1.823 (-0.61)	-0.899 (-1.38)	-1.058 (-0.38)	0.162 (0.06)
Capital Labour Ratio		0.125 <sup>***</sup> (13.56)	0.121 <sup>***</sup> (13.00)	0.109 <sup>***</sup> (36.42)
Market Share			0.137 <sup>**</sup> (1.98)	0.151 <sup>**</sup> (2.08)
Tariff				0.093 <sup>*</sup> (1.81)
R2	52.5	58.2	58.3	58.1
Adj R2	41.8	48.9	49.0	48.5
F	21.31 <sup>***</sup>	24.82 <sup>***</sup>	24.04 <sup>***</sup>	21.40 <sup>***</sup>
F(industry)	3.11 <sup>***</sup>	2.54 <sup>***</sup>	2.56 <sup>***</sup>	2.45 <sup>***</sup>
Observations	1610	1610	1609	1529

Note: \*, \*\*, \*\*\* indicate the significance at the one-percent, five-percent and ten-percent level, respectively. Heteroskedasticity consistent *t*-statistics are in parenthesis. Unreported time, industry and regional dummies are always included. Industry-specific effects are at the four-digit level (for 315 industries), regional-specific effects are defined for 16 regions.

Table 4.3 Estimating the first-difference of ALP

	Specifications:			
	(i)	(ii)	(iii)	(iv)
FDI Greenfield	7.805** (2.56)	2.237 (0.78)	1.298 (0.46)	0.833 (0.29)
FDI Privatized	7.561** (2.45)	7.584*** (2.64)	7.542*** (2.64)	7.796*** (2.62)
Domestic Greenfield	2.274 (1.24)	1.750 (1.02)	1.818 (0.98)	1.633 (0.84)
Domestic Privatized	-0.031 (-0.02)	0.280 (0.22)	0.043 (0.03)	0.060 (0.04)
$\Delta$ Capital Labour Ratio		0.119*** (9.20)	0.114*** (8.88)	0.118*** (9.04)
$\Delta$ Market Share			0.401*** (5.61)	0.516** (6.52)
$\Delta$ Tariff				0.039 (1.36)
$R^2$	15.0	20.1	21.3	22.5
Adj $R^2$	1.8	7.6	9.0	10.2
F	1.46*	5.40***	6.57***	6.95***
F(industry)	1.05	1.06	1.08	1.10
Observations	2477	2475	2322	2218

Note: \*, \*\*, \*\*\* indicate the significance at the one-percent, five-percent and ten-percent level, respectively. Heteroskedasticity consistent  $t$ -statistics are in parenthesis. Unreported time, industry and regional dummies are always included. Industry-specific effects are at the four-digit level (for 315 industries), regional-specific effects are defined for 16 regions

Table 4.4 Estimating average labour productivity and price-cost margins simultaneously

	Specifications:			
	(i): OLS	(ii): OLS	(iii): 3SLS	
	PCM	ALP	PCM	ALP
FDI Greenfield	0.026** (2.17)	29.962*** (11.20)	0.018 (1.31)	22.506*** (6.83)
FDI Privatized	0.081 (0.58)	17.052*** (65.18)	0.002 (0.17)	15.411*** (4.62)
Domestic Greenfield	0.032*** (3.05)	9.950*** (5.43)	0.030*** (3.46)	-0.279 (-0.12)
Domestic Privatized	0.024*** (3.70)	1.793 (1.31)	0.023*** (3.51)	-4.148** (-2.40)
TFA	-0.109*** (-8.07)		-0.105*** (-11.97)	
TFA <sup>2</sup>	0.009*** (7.97)		0.008*** (9.38)	
Market share	0.098*** (5.20)	0.317*** (7.77)	0.089*** (4.39)	7.268 (1.35)
Capital labour ratio		0.109*** (36.42)		0.109*** (30.28)
PCM				221.150*** (11.09)
ALP			0.0003*** (2.20)	
Tariff		0.058** (21.23)	-0.0005 (-0.42)	0.063** (2.03)
R <sup>2</sup>	33.5	63.0	35.9	40.3
Adj R <sup>2</sup>	26.1	58.9		0.44
F	32.47***	86.45***		
$\chi^2$			1732.59***	3543.68***
Observations	3384	3237	3235	3235

Note: \*, \*\*, \*\*\* indicate the significance at the one-percent, five-percent and ten-percent level, respectively. Heteroskedasticity consistent *t*-statistics are in parenthesis. Unreported time, industry and regional dummies are always included. Industry-specific effects are at the four-digit level (for 315 industries), regional-specific effects are defined for 16 regions.