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WHO GETS PRIVATISED? AN EMPIRICAL ANALYSIS OF POLISH MANUFACTURING

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Abstract

This paper employs a multinomial logit model to examine what determines the choice of a particular firm for a given privatisation method. A variety of hypotheses about possible determinants of ownership change are tested using an extensive data set for Polish manufacturing at the beginning of transition. The results at a firm as well as at a sector level give strong support to the hypothesis of the importance of resource constraints on the choice of ownership. Large firms with high financing requirement are more likely to be owned by outsiders. High sectoral capital intensity discourages small insider owned firms while high degree of product differentiation is a constraint for different investors, with the exception of outsiders. We also find that firm quality, measured by profitability and exporting outside the Soviet block, appeals to all types of investors but, additionally, privatisation offers outsiders ways of entering sectors with substantial entry barriers.

1. __Introduction__

East European countries at the beginning of transition were characterised by a very small private sector. Initial dramatic increases in the size of the private sector have to be attributed mainly to privatisation in the narrow sense. This narrow sense privatisation is based on the ownership transfer of assets and production facilities of the former state sector, rather than growth of the indigenous private sector starting new investment projects. Only some firms were chosen for privatisation and this process of selection of enterprises is not well documented and analysed. At the same time, the initial characteristics of the privatised firms and those remaining in the state-sector are of vital importance in making future comparisons between the performance of the private and state sector.

Megginson and Netter (2001) comment on a limited understanding of the determinants of privatisation and stress the need for different privatisation methods for different types of assets. In the context of transition, the emphasis is on the relationship between privatisation and performance, rather than the determinants of privatisation (see e.g. Djankov and Murrell, 2002 for a survey)[1]. At the same time it is recognised that the endogeneity of the timing and method of privatisation complicates any attempts to establish a casual relationship between privatisation and performance (Carlin and Landesmann, 1997).

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[1] More recently competition and policy reforms, rather than ownership as such, are identified as important factors affecting restructuring and performance (see e.g. Carlin et al (2001), Aghion et al (2002), Angelucci et al (2002)).

In this paper we focus on the process of selection of state-owned enterprises for privatisation and the choice of privatisation methods. A multinomial logit model is employed to examine what determines the choice of a particular firm for a given privatisation method. Both firm-level as well as industry specific characteristics are examined in order to determine their impact on ownership change. A unique dataset is employed which is constructed by linking the database of all privatisation transactions recorded by the Polish Ministry of Ownership Transformation in the period 1990-1993 and the database compiled from the financial statements of all state-owned enterprises which were eligible for privatisation.

The paper is organised as follows. Section 2 reviews the existing work on the determinants of ownership. In section 3 the privatisation programme in Poland is briefly presented. Data sources and the modelling framework are described in section 4. The empirical results are discussed in section 5. Section 6 concludes the paper.

2. <u>Determinants of ownership – empirical evidence</u>

When analysing ownership types, the main distinction lies between state-owned and private enterprises. Levy (1988) examines the pattern of manufacturing ownership in developing countries. He extends the industrial economics analysis of multinationals to predict the division of ownership between domestic private and state-owned firms. The empirical analysis confirms that state-owned (and foreign) firms are more likely to participate in technology-intensive sectors of industry than private firms. Also,

private local firms are disadvantaged in their access to capital, which is seen through a small share of domestic private firms in sectors where capital requirements are large.

McGuckin and Nguyen (1995) are interested in the fact of ownership change rather than in the type of new owner involved and how this is related to productivity. One hypothesis is that firms with high productivity are more likely to experience ownership change, because good firms are more attractive than bad ones. In contrast to this, under matching hypothesis, plants with low productivity due to poor match are more likely to change owners than those with good matches. This is motivated by the gains available from replacing the managers of badly performing firms.

Individual firm characteristics feature prominently in take-over activity literature where probability of acquisition taking place depends on observable and unobservable characteristics of a target in relation to the acquirer. These target characteristics usually refer to size, growth, profitability and stock market valuation (see e.g. Thompson, 1997) but general macroeconomic conditions are taken into account when acquisitions over a longer period of time are analysed (see e.g. Golbe and White, 1988).

In transition literature the issue of the determinants of ownership structures and their changes usually arises in the context of studies of ownership and performance. Many early studies that focussed solely on making performance comparisons failed to find any systematic relationship between ownership type and enterprise performance (see EBRD, 1995). Later on it has been recognised that this might be due to the assumption of no selection bias in privatisation.

The problem of selectivity can be addressed in different ways. For example, when analysing the impact of ownership on performance, Frydman et al (1999) use a fixed effects model in order to insulate their conclusions against the arguments that better firms might have been chosen for some types of privatisation. Marcinein and van Wijnbergen (1997) in their analysis of Czech privatisation assume that enterprises were selected for privatisation non-randomly. They apply Heckman two-step regression and estimate a selection rule first before analysing several measures of performance. In particular, they conclude that undercapitalised, low profit companies were the most likely to be selected for pure voucher privatisation. Similarly, Smith et al (1997) use a two-stage Tobit procedure to control for simultaneity between privatisation and firm performance during spontaneous privatisation in Slovenia. They predict employee and foreign ownership shares as determined by a range of factors such as exports, profits, long- and short-term foreign credit. In general, there are some studies with primary interest in the impact of privatisation on performance but they examine the determinants of ownership change so that predicted ownership shares can be used later on as explanatory variables in performance analysis.

In contrast to this, Jones and Mygind (1999) specifically concentrate on ownership changes rather than the link between privatisation and performance. They use a Tobit model to explain the extent of a particular form of ownership (employee, manager, foreign, domestic outsider and state). They also look at ownership transformations, such as transition from insiders to outsiders, and use a multinomial logit to evaluate the probability of a particular type of transformation. Possible determinants of

ownership such as size, capital intensity and financing requirement are included, together with a group of factors capturing the quality of a firm[2].

Grosfeld and Hashi (2003) assess the evolution of the ownership structure among the firms privatised through two different mass privatisation programmes: the Czech voucher scheme and the Polish National Investment Funds. The concentration of ownership is determined by a variety of firm specific characteristics such as size, investment, leverage and type of shareholder. It also depends on the degree of uncertainty in the firm's environment.

On the whole, the studies involving ownership change analyse a variety of processes ranging from initial selection for mass privatisation to subsequent ownership transformations within the private sector. There is, however, some overlap in the variables included as determinants of ownership structure.

3. The privatisation programme in Poland

In order to transform an economy dominated by state-owned enterprises a privatisation programme was needed. Different methods ranging from outright sales to free distribution were adopted in different countries. The methods involved can be broadly classified using different criteria. The main distinction is made between selling or giving away. A second distinction is whether the assets are transferred to

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[2] Jones et al (2003) use more recent data to analyse the impact of resource constraints and risk aversion on ownership transformations in Estonia.

insiders, managers or workers, or to outside foreign or domestic investors. Top-down privatisation, where the government takes the initiative in privatising a firm is contrasted with bottom-up privatisation, with the managers of a firm playing an important role.

In 1990 the Polish parliament approved the Law on Privatisation of State-Owned Enterprises and founded the Office of Ownership Transformation. The legislation facilitated three main methods of privatisation (Bornstein, 1997). Under 'capital privatisation' some state-owned enterprises were to be transformed into joint-stock companies to be sold to private investors. The Ministry of Ownership Transformation started this process by transforming a state-owned enterprise into a joint stock company with the state as a single shareholder, although often the initiative belonged to the enterprise concerned. Privatisation through 'liquidation' was very popular. Under this procedure, a given state-owned enterprise is dissolved and its assets are sold, transferred to another company or leased. This method can be applied to two types of enterprises. Insolvent enterprises are closed down and their assets sold but the legislation allows for solvent enterprises ceasing to exist, with their assets acquired by a new private company. Although the programme of mass privatisation did not come into operation until much later, between 1990 and 1993 some enterprises were designated for this method of privatisation. This leads to four possible paths of privatisation:

- by sale

- mass privatisation

- dissolution in order to privatise

- dissolution because of bankruptcy.

The first method should guarantee an outsider ownership, while mass privatising usually leads to dispersed ownership. The remaining two methods are often associated with assets acquired by the insiders.

4. Data sources and model description

The Polish Central Statistical Office routinely collects data from all firms employing five or more workers, using a questionnaire which covers different aspects of firm performance. The coverage is very high and the firms in the database represent around 90% of manufacturing sales. We use the database containing company balance sheets to select all state-owned firms which were eligible for privatisation. Privatisation episodes are reported to the Central Statistical Office at the point when privatisation proceedings are initiated using special questionnaires, stating the type of privatisation method involved. We use these questionnaires to identify the firms being privatised in a given year. Then we obtain past characteristics from their balance sheets and their profit and loss accounts in the original database. We also use the main database to evaluate some industry level characteristics such as concentration or sectoral capital intensity. Our data covers privatisations which took place between 1990 and 1993 and firm-level characteristics go back to 1988. The number of cases of privatisation we start with coincides with the totals given in the report on the progress in privatisation (Ministry of Ownership Transformation, 1995). Some observations had to be excluded due to incomplete data. In the end our analysis covers some 800 cases of privatisation, with around 3000 state-owned enterprises in each year.

Our analytical framework is inspired by the models of take-over activity. Take-over can broadly be seen as a response to changes in economic environment that make some assets less productive in their current use than they would be in some alternative use (Hall, 1988). For this reason a rearrangement of productive assets is needed. The value of assets of a particular firm can be denoted as $V(X) = V(X_1, X_2, \ldots)$, where X is a vector of firm characteristics. It is not necessary to identify the value function with the current stock market value of the firm. There are two types of firms: the acquiring ones, subscripted j, and the possible targets, subscripted i. Firm j will buy firm i if

$V_j(X_i) - P_i > V_j(X_k) - P_k$ for all firms k in the sample.

P_i and P_k are the prices the acquiring firm j will have to pay for i's and k's assets respectively, and $V_j(X_i)$ is the gain to firm j attributable to the acquisition of i.

This gain can be partitioned into observable and unobservable components as follows:

$V_j(X_i) - P_i = f(X_i, X_j) + \varepsilon_{ij}$

where $f(X_i, X_j)$ is a function of observable characteristics of the acquirers and the potential targets and ε_{ij} is an error term. The probability that an acquisition will take place can be obtained from a multinomial logit model

$$P('j'\,buys\,'i' \mid C) = \frac{\exp\left[f\left(X_j, X_i\right)\right]}{\sum_k \exp\left[f\left(X_j, X_k\right)\right]} \tag{1}$$

where C is the entire pool of firms available for acquisition.

In order to model privatisation in Eastern Europe this framework has to be modified in two ways. First, instead of thinking about two different types of firms and the relationship between the characteristics of the acquiring firm and those of the acquired firm, we need to focus solely on the characteristics of potential targets. It is possible

though to consider different types of acquisitions, corresponding to different methods of privatisation. The statement 'j buying i' should then mean a particular type of buyer j acquiring a target rather than firm j acquiring some other firm. This framework, based on a multinomial model, is essential in investigating how different characteristics of a target are valued by different types of investors. Second, it may not be possible to include prices P_i and P_k in the valuation expression. This information may not be available alongside information on firm-level characteristics. Also, under some privatisation methods the assets of privatised firms are distributed free.

We model the probability of firm i being chosen for a given privatisation method depending on their current and past characteristics. There are four different methods of privatisation, as outlined in section 3. The firms remaining state-owned are a comparison group. All state-owned firms surviving till the following year provide a pool of firms available for privatisation.

It is expected that particular firm characteristics will make them attractive to different types of investors who have different objectives and who may face different budget constraints. In the first place we include **Size**, measured by the number of employees. It is predicted that large firms will be more attractive to outsiders such as institutional investors. Insiders such as managers or employees are less likely to invest in large firms because they cannot afford to do so or because they are more risk averse.

Another determinant may be the quality of the firm (Earle and Estrin, 1997). In principle, all types of investors should be interested in high performing firms. On the

other hand, workers in poor performing firms might be more concerned with preserving their jobs and inclined to acquire their failing firms. We measure quality by firm **profitability** and **productivity**. We also take into account **past profitability and growth in sales** and introduce a dummy variable **old** to identify firms that existed before 1990. As there is a lot of empirical evidence that exporters are performing better than non-exporters (see e.g. Bernard and Jensen,1999), we also include the **share of exports** in total output as a potential indicator of quality. For the period before the collapse of the CMEA (Council for Mutual Economic Aid) we examine the share of exports outside the Eastern block, rather than the share of total exports. This coincides with Walsh and Whelan (2000) who make a distinction between the CMEA and EU trade to conclude that inherited trade orientation is an important determinant of performance. Firms that are EU trade oriented perform significantly better than those firms that inherited products historically produced for the CMEA markets under central planning. **Trade orientation** is a dummy variable that is set to 1 if a firm exports outside the CMEA block.

There are also some other characteristics that might put off certain types of investors. In particular, some firms might show signs of **financial distress**, making them less attractive to investors. We measure financial distress by the amount of interest payments arrears. The negative characteristics might also apply to **capital intensity** and **financing requirement**. Compared to outsiders, insiders are less likely to invest in capital intensive and investment intensive firms. Moreover, financing needs are presumed to constrain large foreign and institutional investors less than individual small investors. We measure financing requirement by short-term credit.

Many of the above firm characteristics attracting or deterring different types of investors can also be interpreted in terms of risk and uncertainty. Investors who value current consumption over uncertain future consumption would choose a more profitable firm. Insiders are usually considered more risk averse and for this reason insider ownership should be associated with higher profits.

There are also some hypotheses regarding different privatisation methods. Sale of assets is considered preferable on the grounds of improving efficiency and generating government revenue. On the other hand, relying exclusively on this method would be too slow and mass privatisation was pursued to overcome shortage of finance and to increase public support. This might imply that 'better' enterprises were chosen for privatisation by sale rather than for mass privatisation. There is also some ambiguity about the role played by insiders in influencing the process of selection and pre-privatisation performance of their enterprises.

Our specifications also include some sectoral variables. The rationale is as follows. The privatisation programme was also seen as a way of restructuring certain sectors of the economy and privatisation is equivalent to leaving the state-sector and entering the private sector. For this reason factors included in standard models of entry and exit (see e.g. Shapiro and Khemani, 1987 and Geroski, 1995) could be useful in explaining the determinants of ownership change. Also, some investors might be interested in a particular firm because of their industry affiliations. It might be the attractiveness of certain sectors rather than the characteristics of a firm that appeal to potential investors. Among sectoral variables we include **concentration** (measured by a four-firm sales concentration ratio C4), the degree of **turnover** (measured by entry rate),

profitability and **capital intensity**. The **consumer-good dummy** is added to proxy entry barriers associated with product differentiation. Following Roberts and Thompson (2003), the size of the **state-owned sector** (measured by the proportion of state-owned firms in the total number of firms in a given industry) is included to allow for additional barriers in a transitional economy.

5. Empirical results

5.1 Determinants of privatisation

First we model the probability of being selected for a different privatisation method using a range of firm level characteristics. There are four possible paths of privatisation and the firms remaining state-owned are a comparison group. State-owned manufacturing firms potentially eligible for privatisation and the cases of privatisations taking place between 1990 and 1993 are pooled giving us over 8000 firms to be analysed. The multinomial logit estimates are reported in Table 1, with each column representing a separate set of estimates for a different privatisation method.

Size is significant for all four methods but firms chosen for sale or mass privatisation are larger than their state-owned counterparts. In contrast, dissolved firms tend to be much smaller. The impact of capital and investment intensity varies for different privatisation methods but it is usually insignificant. Short-term credit has a significant

effect on the selection process. The probability of being privatised is positively related to the short-term credit for enterprises privatised by sale as well as for those chosen for mass privatisation. On the other hand, high short-term credit puts off smaller investors and reduces an enterprise's chances of being privatised by dissolution. The coefficients by size and by short-term credit give strong support to the hypothesis of the importance of resource constraints on the choice of ownership (Jones et al 2003). Consistent with predictions by Aghion and Blanchard (1998), large firms with high financing requirement are more likely to be owned by outsiders.

The relationship between the probability of being privatised and productivity is nonlinear. The coefficient on the squared term of productivity is negative although not always significant. This suggests that productivity, as a sign of quality of a firm, yields decreasing returns beyond a certain level. If productivity is not treated as a quality indicator but serves to denote the scope for efficiency gains, our results give support to matching hypothesis as ownership changes are more likely at low level of productivity. In the context of transition this is consistent with the hypothesis that privatisation is driven by efficiency motives and for this reason government should privatise the least efficient firms first (Gupta et al 2001). Privatisation is a necessary restructuring process for lower productivity firms, while higher productivity firms are not privatised because restructuring to improve efficiency is not required.

Privatised firms are profitable with the exception of firms dissolved because of bankruptcy. Interest arrears are only significant for enterprises dissolved because of their financial condition and the sign is positive. The probability of being privatised is positively related to the export share for privatisation by sale and for mass

privatisation but negatively related for privatisation by other methods. This effect is significant only for privatisation by sale. However, trade orientation is significant for all methods but privatisation via bankruptcy, although the strength of this effect varies. Trade orientation rather than export intensity seems to be a better indicator of the quality of a firm. The coefficient by the dummy variable 'old' is significant for all methods except privatisation by dissolution, indicating that enterprises chosen for this method might have undergone some restructuring (for example a break-up) before being offered for privatisation. In contrast to this, the enterprises selected for other methods existed in the same form before 1990. This gives some support to the hypothesis that insiders exerted control over the privatisation process. There is no evidence though that most profitable enterprises went to insiders. In fact, the best enterprises were privatised by sale.

The interpretation of the results based directly on the coefficients is promoted in Verbeek (2000), p. 196, with a positive coefficient implying that positive utility is attached to the corresponding characteristic. However, Powers and Xie (2000), p. 231, warn that the marginal effects for multinomial models can be ambiguous and recommend the interpretation based on odds and odds-ratio for a binomial logit model (p.76). For a dummy variable d_i , the odds-ratio is constructed as

$$\theta = \frac{\omega_1}{\omega_2} = \frac{\Pr(y_i = 1 | d_i = 1) / \Pr(y_i = 0 | d_i = 1)}{\Pr(y_i = 1 | d_i = 0) / \Pr(y_i = 0 | d_i = 0)} = \exp(\hat{\beta}) \qquad (2)$$

where y is a dependent variable, and β is a coefficient by d_i .

For a continuous variable, we can construct the odds for value x+c, relative to the odds with value x as

$$\frac{\exp\{\hat{\gamma}(x+c)\}}{\exp\{\hat{\gamma}(x)\}} = \exp\{\hat{\gamma}(c)\} \qquad (3)$$

where γ is the relevant coefficient.

Following this interpretation, the odds of being privatised by sale (versus remaining state-owned) for an exporter to a non-CMEA area (Trade orientation = 1) are 2.49 times those of other firms. The odds of being chosen for mass privatisation, based on trade orientation only and keeping other determinants constant, are even higher (6.63 times the odds for firms not exporting outside the Eastern block). The odds of being privatised increase with profitability for all methods but privatisation via bankruptcy. In particular, a change in profitability by 10 percentage points increases the odds of being privatised by sale by 38%, and the odds of being chosen for mass privatisation by 22%. Size, measured by employment, is a significant determinant of privatisation although it enters the logit regression with a different sign for different methods. The estimated coefficients indicate that for a firm with one thousand less employees the odds of privatisation by dissolution and by bankruptcy increase by 58% and 89% respectively.

We also examined how some relative characteristics of different enterprises affect their chances of privatisation. In particular we introduced relative profitability and capital intensity measured by deviations from sectoral averages. The variables displayed the pattern of significance very similar to that in Table 1 and we do not report the estimates here.

In Table 2 we include past profitability and growth but the selection of firms is restricted to those for which past observations are available. Surprisingly, growth is insignificant when explaining the determinants of privatisation by sale. Growing firms

are less likely to be selected for mass privatisation and less likely to face dissolution through bankruptcy procedures. Past profitability, although it displays the expected sign, is not always significant. Perhaps information on past performance is not as easily available as more current characteristics, or investors do not consider past performance a good indictor of a firm's future prospects. Past profitability is significant in the estimates for firms privatised following bankruptcy and it enters with a negative sign. This is confirmation that firms were going bankrupt as a result of long-term problems. With past characteristics added, some variables, such as interest arrears, lose significance altogether.

While explaining the determinants of ownership change, we also introduce some sectoral variables. The results of multinomial regression with firm-level as well as industry-specific characteristics are given in Table 3. In general, the firm-level variables display a very similar pattern to that seen in Table 1. There is also a number of significant sectoral variables.

For dissolved enterprises, the size of the state sector is negatively related to the probability of being privatised, implying that the larger the state sector the less likely privatisation by dissolution. This effect might be associated with the time profile of privatisation. Privatisation by sale and the selection for mass privatisation took place at the very beginning of transition. Later on, when the state-owned sector was becoming smaller as a result of new private firms entering, government had to resort to other methods of privatisation in order to speed up the process of ownership transformation. Although the sign by the size of state sector is as expected, the coefficient is only significant for the firms dissolved in order to be privatised.

While firm-level profitability is important in all privatisation methods, sectoral profitability is only significant for mass privatisation, and the sign is negative. Sectoral profitability does not seem to be a factor attracting the investors. Sectoral capital intensity is negative and significant for firms dissolved for privatisation, coinciding with Levy's (1988) prediction that small private firms are disadvantaged in sectors with high capital and financial requirement.

High concentration might have added to the attractiveness of certain enterprises because of their position in relatively monopolised industries rather than because of their individual characteristics. Consistent with this statement the coefficient by concentration has the expected sign but is insignificant for most methods. In contrast to this, for privatisation because of bankruptcy, concentration is significant and enters with the negative sign, confirming that this method of privatisation is associated with later stages, when the state-sector was smaller and concentration level was lower. The coefficient by entry rate is consistently negative suggesting that privatisation might have been a way of entering sectors with substantial barriers to entry. This coefficient is significant, though, for privatisation by sale and mass privatisation only. The sign and the significance level for the coefficient by the consumer industry dummy varies but there is evidence that enterprises privatised by sale are more likely to manufacture consumer goods, while those chosen for mass privatisation are more likely to come from producer goods industries. This confirms that product differentiation is not a constraint for outsiders, while other types of investors are put off by the prospect of high advertising expenditure and non-price competition.

5.2 The sequence of privatisation

In the previous section we investigated the choice of firms for different privatisation methods. Here we explore another important aspect of transition, namely that not all firms were privatised simultaneously. This gives rise to the issue of sequencing of privatisation (Gupta et al, 2001). We approach this by investigating how firms changed in the run up to privatisation and whether those privatised first were different from those privatised later. For this purpose the data used in the previous section has been reorganised to form a panel.

The model of the probability of privatisation, accounting for individual characteristics of different firms, takes the general form of

$$\Pr ob(y_{it} = 1) = \frac{e^{\alpha_i + \beta' x_{it}}}{1 + e^{\alpha_i + \beta' x_{it}}} \tag{4}$$

where y_{it} = 1 if firm i is privatised at time t (Greene, p. 899). We consider jointly privatisation by sale, mass privatisation and privatisation by dissolution but exclude firms dissolved because of bankruptcy as they showed characteristics different from other privatised firms. The list of explanatory variables is similar to the one considered in the previous specifications. However, the fixed effects estimator eliminates any time-invariant variables from the model, so characteristics such as trade orientation are dropped.

The resulting data set is an unbalanced panel, where up to 3 observations might be available for a particular firm. However, many firms have to be excluded because of

the requirements of fixed effects estimation. First, firms for which only one observation exists are discarded from estimation. Also, those firms that are not privatised over the period under consideration are dropped due to all negative outcomes. In the end we are left with around 350 firms. All those firms were privatised at some point and those that remained state-owned had to be excluded. It should be stressed that even though the model considered here looks similar to the specifications used in the previous section, its interpretation is very different. We still model probability of being privatised but the reference groups is no longer the pool of all firms eligible for privatisation. What we are doing here is to compare the firms at the point of privatisation with those that have not yet been privatised.

The results of fixed effects estimation are given in Table 4. Four different specifications are considered corresponding to the specifications in Tables1-3. We also introduce a specification with relative profitability and capital intensity, measured by deviations from sectoral averages.

Size is insignificant in all specifications, indicating that enterprises at the point of privatisation are not different, size-wise, from what they were before. In the run-up to privatisation absolute profitability declines but there is no significant effect in terms of relative profitability. A significant, negative coefficient by the export share in some specifications suggests that quality of firm, measured by export capability, might deteriorate. Similarly, a significant positive coefficient by interest arrears in one of the specifications is another sign of deteriorating quality. Capital intensity also declines in absolute terms, which does not need to be a sign of asset stripping, but might reflect general trends in a given sector, as relative capital intensity turns out

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insignificant. Higher level of investment in relation to output increases chances of privatisation, as firm-level specifications indicate. For enterprises at the point of privatisation, their short-term credit is less than it used to be, which might indicate the reluctance of banks to offer credit to enterprises in the run-up to a major ownership transformation.

When sectoral variables are included, all firm level variables become insignificant. At the same time all sectoral variables are significant and display the signs encountered in some of the previous experiments. Enterprises from sectors with lower sectoral profitability and capital intensity are more likely to be privatised. Also, after accounting for individual characteristics, and looking among the pool of firms to be privatised at some point, it turns out that the occurrence of privatisation is associated with a declining state sector, decreasing concentration and lower entry barriers.

We use information about the identity of individual firms to identify those privatised straightaway or later on and compare enterprises chosen for privatisation 'in the first wave' and those that were left out and chosen for privatisation later on. The pool of firms privatised straightaway is not restricted to those privatised in the year the privatisation programme was launched. Some of those firms might have been privatised later into transition but they were new entities, sometimes created as an effect of restructuring. The firms labelled as 'privatised later' are those for which we have more observations, indicating that, even though they were eligible for privatisation at a particular point in time, they were not chosen and they joined the pool of eligible firms again to be privatised in the next period. We run a simple multinomial logit model and present the marginal effects of firm characteristics on the

probability of being privatised in Table 5. Size and profitability are significant for all privatisation methods but the strength of this effect differs for different privatisation methods. Export share is only significant for privatisation by sale.

On the whole, in contrast to Gupta et al (2001), we do not find strong evidence that more profitable firms were privatised. The view that the best firms were chosen for privatisation first is only confirmed for the enterprises privatised by sale. For mass privatisation and privatisation by dissolution the marginal effect is larger for the firms privatised later on. Privatisation via bankruptcy is associated with negative characteristics[3]. There is some evidence, however, that privatisation by sale was pursued in the first place but then the government had to resort to other methods of privatisation.

6. Conclusions

We use an extensive data-set of state-owned manufacturing firms in Poland between 1988 and 1993 to examine the characteristics of firms being privatised using different methods. Several of the firm-specific characteristics have significant effects on the probability of being privatised. In particular, size, profitability, short-term credit and trade orientation are among those with a significant effect on ownership transformations. Sometimes, though, the direction of these effects differs by type of ownership.

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[3] A one unit decline in profitability increases the chances of privatisation by 0.0426 for those privatised straight away but by 0.0613 for those privatised later.

Our results give strong support to the hypothesis of the importance of resource constraints on the choice of ownership. In particular, the coefficients by size and by short-term credit indicate that large firms with high financing requirement are more likely to be owned by outsiders. The significance of resource constraints is confirmed by an analysis at the sectoral levels. High sectoral capital intensity discourages small private firms. High degree of product differentiation is a constraint and a barrier to entry for different groups of investors, with the exception of outsiders.

Quality measured by profitability and exporting outside the Soviet block appeals to all investors. Productivity can only be treated as a sign of quality to some extent. As low productivity firms are more likely to change owners, this gives support to the view that privatisation was expected to be a way of improving efficiency. Sectoral characteristics such as high concentration and low turnover attract outsider ownership indicating that privatisation offers ways of entering sectors with substantial entry barriers.

At the firm-level, there are no pronounced differences between privatisation by sale and through mass privatisation. In fact, enterprises chosen for these two methods of privatisation are similar in terms of their size, profitability, export rather than domestic orientation. Lower growth and affiliation with low profitability sectors are the only indications of inferior performance of enterprises selected for mass privatisation. Enterprises dissolved because of bankruptcy are less profitable, show signs of financial distress, and tend to produce for local domestic rather than

international markets. There does not seem to be a deterioration of economic indicators in the run-up to privatisation and the enterprises selected for this method of privatisation suffer from long-term problems with profitability and growth. Privatisation by dissolution, which can be linked to insider ownership, applies to small but profitable enterprises with low capital output ratio and displays characteristics similar to other privatisation methods. In general, there is no strong evidence that most profitable firms were privatised first but there is some indication that privatisation by sale was used before other methods.

The beginning of transition marks the start of a process of ownership transformation. In the first stage the main preoccupation was with privatising the predominantly state-owned sector. This process was initially helped by different privatisation programmes but will continue in the way ownership changes occur frequently in mature market economies. For this reason it is important to understand the determinants of ownership change and the characteristics that are taken into account and appeal to different types of owners.

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Table 1   Firm-level characteristics and the probability of privatisation –
               multinomial logit estimates

	Method of privatisation			
	By sale	Mass privatisation	Dissolved in order to privatise	Dissolved because of bankruptcy
Size	0.0435 (2.35)	0.0703 (3.95)	-0.8594 (-4.42)	-2.2419 (-5.62)
Profitability	3.1940 (6.53)	1.9819 (3.01)	1.5567 (3.31)	-1.8578 (-8.59)
Productivity	0.4871 (2.49)	11.6483 (2.55)	0.0523 (1.72)	0.0995 (1.56)
Productivity Squared	-0.0250 (-1.67)	-17.4952 (-4.08)	-0.0003 (-1.26)	-0.0008 (-0.76)
Capital intensity	0.1888 (2.89)	-0.1258 (-0.63)	-0.1191 (-1.32)	0.0438 1.44
Investment intensity	-0.0992 (-0.18)	-3.7943 (-1.96)	-1.4286 (-1.27)	0.0846 (0.68)
Short-term credit	0.0986 (4.56)	0.1101 (4.16)	-0.0295 (-1.63)	-0.1422 (-6.15)
Interest arrears	-0.0050 (-0.15)	0.0164 (0.51)	-0.0480 (-1.26)	0.0511 (2.04)
Export share	1.1070 (3.73)	0.5490 (1.25)	-0.0456 (-0.11)	-0.4923 (-0.93)
Trade orientation	0.9138 (4.13)	1.8924 (4.83)	0.3546 (2.04)	0.1172 (0.63)
Old	1.4657 (3.77)	1.9684 (3.08)	0.1480 (0.78)	0.8354 (4.07)

Notes: N= 8043, Log likelihood = -3050.29, Year dummies included;
              z-values in brackets

Table 2   Past performance and the probability of privatisation –
                      multinomial logit estimates

	Method of privatisation			
	By sale	Mass privatisation	Dissolved in order to privatise	Dissolved because of bankruptcy
Size	0.0905 (2.97)	0.1271 (3.53)	-0.7598 (-3.93)	-1.5169 (-4.13)
Profitability	3.2339 (5.44)	2.5376 (3.09)	0.5938 (1.16)	-0.8666 (-3.40)
Productivity	0.3647 (1.78)	12.5174 (4.70)	0.0519 (1.72)	0.0923 (2.29)
Productivity Squared	-0.0155 (-1.03)	-18.6796 (-4.16)	-0.0003 (-1.24)	-0.0006 (-1.11)
Capital intensity	0.1779 (3.40)	-0.1955 (-0.92)	-0.1077 (-0.99)	0.0069 (0.24)
Investment intensity	-1.0779 (-0.89)	-3.9130 (-1.95)	-1.0378 (-0.98)	0.5608 (2.17)
Short-term credit	0.0950 (4.24)	0.1090 (4.02)	-0.0298 (-1.56)	-0.1405 (-5.78)
Interest arrears	-0.0027 (-0.08)	0.0163 (0.50)	-0.0636 (-1.55)	-0.0148 (-0.54)
Export share	1.1078 (3.49)	0.5770 (1.29)	-0.0962 (-0.22)	-0.1760 (-0.32)
Trade orientation	0.8250 (3.64)	2.1172 (4.51)	0.3548 (1.97)	0.0087 (0.04)
Old	0.5514 (1.18)	18.1598 (25.63)	0.1034 (0.43)	0.3719 (1.56)
Past profitability	0.3991 (0.72)	0.0065 (0.01)	0.7645 (1.79)	-1.8035 (-5.33)
Growth	0.0922 (0.42)	-0.9620 (-2.81)	0.3967 (2.55)	-1.9456 (-6.21)

Notes: N= 6688, Log likelihood = -2769.03, Year dummies included;
                    z-values in brackets

Table 3   Firm- and industry-level characteristics and the probability of privatisation – multinomial logit estimates

	Method of privatisation			
	By sale	Mass privatisation	Dissolved in order to privatise	Dissolved because of bankruptcy
Size	0.0398 (2.19)	0.0647 (3.51)	-0.8505 (-4.33)	-2.2083 (-5.47)
Profitability	3.0257 (5.14)	2.7084 (3.36)	1.4247 (2.89)	1.8459 (-8.38)
Productivity	0.5024 (2.39)	11.9286 (4.62)	0.0604 (1.99)	0.1199 (1.84)
Productivity squared	-0.0258 (-1.62)	-17.6512 (-4.21)	-0.0003 (-1.41)	-0.0010 (-1.02)
Capital intensity	0.1802 (2.62)	-0.2404 (-1.02)	-0.0431 (-0.50)	0.0401 (1.33)
Investment intensity	-0.2086 (-0.33)	-3.7953 (-1.91)	-1.1675 (-1.11)	0.0760 (0.64)
Short-term credit	0.0937 (4.32)	0.1106 (4.15)	-0.0215 (-1.15)	-0.1415 (-6.03)
Interest arrears	-0.0069 (-0.21)	-0.0004 (-0.01)	-0.0373 (-0.97)	0.0559 (2.18)
Export share	1.0559 (3.54)	0.5037 (1.13)	-0.1248 (-0.307)	-0.5062 (-0.95)
Trade orientation	0.9100 (3.97)	1.9265 (4.86)	0.3535 (1.98)	0.2114 (1.08)
Old	1.3798 (3.44)	1.4908 (2.30)	0.0347 (0.18)	0.8566 (4.11)
Size of state sector	0.2997 (0.90)	0.0591 (0.13)	-1.1786 (-3.18)	-0.7907 (-1.59)
Sectoral profitability	0.1873 (0.23)	-3.2965 (-2.94)	1.3970 (1.43)	0.0181 (0.02)
Sectoral capital intensity	0.1823 (0.90)	-0.1921 (-0.55)	-0.5591 (-1.82)	0.4186 (1.46)
Concentration (C4)	0.3436 (1.02)	0.5447 (1.23)	0.1009 (0.27)	-1.2793 (-2.82)
Entry rate	-0.2820 (-1.62)	-0.6701 (-1.92)	-0.0835 (-0.70)	-0.0815 (-0.58)
Consumer industry dummy	0.3145 (1.97)	-0.7304 (-3.18)	-0.1458 (-0.84)	0.1083 (0.51)

Notes: N= 8043, Log likelihood = -3007.66, Year dummies included
z-values in brackets

Table 4   Probability of privatisation – fixed effects estimates

	(1)	(2)	(3)	(4)
Size	-0.0010 (-0.02)	0.0363 (0.94)	0.0001 (-0.01)	-0.1311 (-0.58)
Profitability	-17.8163 (-8.95)		-22.9203 (-7.03)	
Relative profitability		0.4909 (0.50)		-2.6980 (-0.66)
Productivity	0.8542 (1.53)	5.8383 (4.82)	0.5761 (1.89)	0.7890 (1.48)
Productivity^2	-0.0107 (-1.36)	-0.0780 (-4.72)	-0.0070 (-1.31)	-0.0099 (-1.07)
Export share	-1.1954 (-0.65)	-2.7452 (-2.55)	-5.4515 (-1.86)	5.2139 (1.43)
Capital intensity	-1.1215 (-7.68)		-1.5300 (-6.19)	
Relative cap. intensity		0.1715 (1.18)		-0.2615 (-0.79)
Investment intensity	11.8203 (1.86)	23.5425 (3.85)	17.2734 (-1.53)	-14.6110 (-0.78)
Short-term credit	-0.1026 (-1.88)	-0.0934 (-2.58)	-0.2096 (-2.52)	0.0233 (0.14)
Interest arrears	-0.0150 (-0.19)	0.1530 (2.81)	-0.0938 (-0.83)	-0.1440 (-0.665)
Past profitability			-12.0660 (-5.62)	
Growth			1.2441 (2.04)	
Size of state sector				-8.3017 (-1.73)
Sectoral profitability				-59.2131 (-3.53)
Sectoral capital intensity				-7.9447 (-2.05)
Concentration (C4)				-12.2171 (-1.66)
Entry rate				1.9681 (2.73)
No of observations	776	776	658	776
No of groups	348	348	296	348
Log Likelihood	-111.20	-214.60	-56.64	-24.27

Table 5 Marginal effects of firm characteristics on the probability of being privatised

	Method of privatisation			
	By sale	Mass privatisation	Dissolved in order to privatise	Dissolved because of bankruptcy
For firms privatised straightaway :				
Size	0.0749*	0.0129*	-0.0567*	-0.0336*
Profitability	1.2371*	0.1723*	0.2020*	-0.0426*
Export share	0.1155*	0.0146	0.0157	0.0039
For firms privatised later :				
Size	0.0097*	0.0415*	-0.0609*	-0.0511*
Profitability	0.2505*	0.5315*	0.3162*	-0.0613*
Export share	0.0287*	0.0788	-0.0353	-0.0242

Note:
* - significant at 10% significance level