

CEES

Working Paper No. 43

July 2002

EMPLOYEE OWNERSHIP AND DEGENERATION ***Evidence from Estonian case studies***

Panu Kalmi

Center for East European Studies

Department of Economics

Helsinki School of Economics

P.O.Box 1210, 00101 Helsinki, Finland

Tel + 358 9431 38283 Fax + 358 9431 38738

© the author, 2002 e-mail: kalmi@hkkk.fi

Working papers from CEES can be downloaded from:

<http://www.cbs.dk/centres/cees/publications/publications.shtml>

PANU KALMI¹

EMPLOYEE OWNERSHIP AND DEGENERATION **Evidence from Estonian case studies**

August 2002

Abstract: One of the surprising developments in post-socialist economies is the high incidence of employee ownership. However, the available evidence suggests that the number of employee-owned firms is declining quite rapidly. This finding can be related to the earlier economics literature on employee ownership. The possibility of employee ownership to survive, or the tendency to 'degenerate', has bothered sympathetic observers ever since J.S. Mill, and the degeneration hypothesis has also inspired a fair amount of empirical research.

This paper uses a unique data collected from Estonia, that allows for a new empirical approach to the question of degeneration. I use survey data collected on individual employees in analysing the determinants of ownership, and the impact of ownership to job attitudes. The statistical analysis is complemented by the findings from the interviews with the managers. This approach yields some new interpretations on the process of ownership evolution in transition economies.

JEL classification: J54, M54, P31

¹ Department of Economics, Helsinki School of Economics, PO Box 1210, 00101 Helsinki, Finland. Email: kalmi@hkkk.fi I have benefited from the comments made by Saul Estrin, Pekka Ilmakunnas, Derek Jones, Klaus Kultti, Klaus Meyer, Niels Mygind, Maria Anne Skaates, Henrikki Tikkanen, Otto Toivanen, and seminar participants at the University of Oulu and Helsinki School of Economics, and conference participants at the 11th IAFEP conference in Brussels, July 2002. Leini Mägi, Andres Rõigas and Mati Tamm provided excellent assistance with the case studies and questionnaire. The representatives of the firms participating to the study were very co-operative. I have received financial support from the Danish Research Council, Yrjö Jahnsso Foundation and Marcus Wallenberg Foundation. I am extremely grateful to all of the individuals and institutions mentioned, and remain solely responsible for the content of the article.

Employee Ownership and Degeneration: Evidence from Estonian Case Studies

1 Introduction

The economic transition of post-communist countries has been accompanied with an unprecedented growth of employee share ownership. This growth resulted from the widespread application of privatisation methods that favoured employees in the process of buying the assets of state-owned enterprises. According to the *EBRD Transition Report 1997* (EBRD, 1998, p. 90), management-employee buy-outs or voucher schemes with concessions to employees were used as a primary privatisation method in 12 out of 22 surveyed countries in the area, including Russia, Poland, Slovenia, and the Ukraine. It had been used as a secondary method in four more countries surveyed, including Estonia.

The rise of employee ownership has not failed to attract the attention of transition economies scholars. Much has been written on the impact of employee ownership to the economic development of these countries.² However, more recent evidence suggests that employee ownership is in decline. It may even disappear from the scene leaving little mark on the economic or institutional development on the transition economies.³

The decline of employee ownership in transition seems to be related to an older phenomenon that has become known in the literature as ‘degeneration’. This term refers to the attrition of ownership base in employee-owned firms, because the incumbent owners have insufficient incentives to increase the number of owners. This paper documents the process of degeneration for a small sample of Estonian enterprises, from which the author managed to collect data on individual employees. In section 2 I give a brief and informal introduction to the problem of degeneration borrowing from the literature of ‘labour self-management’, and discuss earlier empirical work on the subject. In section 3 I briefly present the privatisation policies in Estonia and refer to earlier findings with firm-level data on Estonia, showing that the decline of employee ownership is really an issue in Estonia. In chapter 4, I analyse the determinants of ownership at the level of individuals in five Estonian employee-owned firms.

After showing that the exclusion of new employees is an issue in Estonia, I go on in chapter 5 to explore the possible reasons for that. I analyse the possible complementarity between employee ownership and organisational practices (or rather the lack of the link), need of equity for

² See Fitzroy *et al.* (1998) for a mainly positive evaluation and Aghion and Blanchard (1998) for an overwhelmingly negative assessment.

³ Post-privatisation ownership developments have been rather poorly documented in most cases compared to the extensive ownership surveys immediately following privatisation. Apart from the Estonian case which is discussed in this paper, the impression on declining employee ownership rests on the studies by Blasi, Kroumova and Kruse (1997); Jones (1998); Djankov (1999); Estrin and Wright (1999); and Kozarzewski and Woodward (2001).

investment funding, and the decision-making costs related to ownership. In conclusion, I find that the mechanisms that would support the sustainability of employee ownership are virtually absent, while the reasons that discourage the extension of ownership to new employees are present.

2 The problem of degeneration

2.1. The nature of the problem

The failure of democratic enterprises to ‘reproduce’ the ownership base by extending ownership rights (shares) to new employees has been a theme that has been raised on the literature on economic democracy repeatedly at least since J.S. Mill’s *Principles of Political Economy*. Avner Ben-Ner (1984) and Hajime Miyazaki (1984) introduced the issue of degeneration to the neoclassical theory of labour self-management. The idea behind their argument is simple: The more there are owners sharing the residual revenue of the firm, the less is the share of each owner individually. The type of rent insiders enjoy is not necessarily profits, but it may also take the form of greater job security or better working conditions. However, the incumbent insiders would rather enjoy more of the good by themselves. Therefore, when employee-owners retire, the incumbent owners do not extend ownership rights to new employees. In this process, ownership will shift gradually outside the enterprise and the number of employee-owners tends (‘degenerates’) to zero.

In their adopted labour-management framework, Ben-Ner and Miyazaki both assumed the absence of market for ownership. In the transition context, where employee ownership typically appears in ordinary joint-stock companies, one could expect some sort of a market for shares to develop. However, it may still be very difficult to create a market for shares in employee-owned firms (Dow and Putterman, 2000). New employees are likely to be risk averse and wealth constrained; or they may suspect that incumbent owners may offer shares only at overvalued prices. Setting a price is likely to be very difficult, since all parties are likely to lack information about the true value and earnings potential of the assets. The incumbent owners may fear that new employees may shift the balance of decision-making coalitions. For these reasons, it is very difficult to set such a price for shares that the incumbent owners would be fully compensated for their loss of rents.

The problem of degeneration thus seems to imply non-existence of employee-owned firms. However, some further qualifications can be made. Miyazaki regards the sharing of the capital investment and thereby of financial risk as the *raison d’être* for labour-managed firms, while Ben-Ner maintains that ownership may improve work motivation and therefore be sustainable.⁴ In general, it

⁴ Of course, many others think that the rarity of employee-owned organisation is related to issues of risk sharing: Ownership is best delegated altogether to risk-neutral investors operating in the equity market. However, according to Miyazaki employee ownership helps to smooth the risk associated with variations in income, since labour-managed firms are likely to provide insurance against layoffs. He shows that under certain circumstances employees would prefer to work

can be conjectured that if the owners bring substantial resources to the firm or if ownership produces behavioural changes among employee-owners, the result of declining ownership base may not hold.

These issues are ultimately empirical ones. However, some tentative hypotheses concerning the transition economies can be made. The emergence of employee-owned firms in transition economies was quite accidental and was often related to political economy of privatisation. Therefore, the incidence of employee ownership may not be so much related to risk pooling or complementarity of employee ownership to certain production technologies (as one would assume to be the case in developed economies), but it may rather reflect seizing the opportunities that opened during the privatisation process. If the motives of employee share ownership are rather related to making profits from buying undervalued assets in privatisation, or protecting jobs, then one would assume that incumbent owners do not have incentives to extend ownership to new employees.

2.2 Earlier empirical results

The problem of degeneration has been addressed also in empirical literature. There have been two types of studies: One kind of studies have discussed conversions of worker co-operatives to profit-maximising firms, and the other type have investigated changes in so-called ‘membership ratios’ (the ratio of employee-owners (members) to the total number of employees) in co-operatives. Jones (1975) showed in a pioneering study that contrary to the claims of Sidney and Beatrice Webb, the British worker co-operatives found in the 19th century had a better survival record than their capitalist counterparts. Jones (1979) and Pérotin (1997) obtained similar results for US and French co-operatives, respectively. However, Russell (1995) provides evidence on substantial degeneration among Israeli industrial worker co-operatives. The studies of the second kind have also often found evidence on degeneration; for instance, Estrin and Jones (1992) found evidence that membership ratios declined when the age of the co-operative increased, and Russell and Hanneman (1994) reported similar results for Israeli co-operatives. Also Craig and Pencavel (1992), though not focusing on degeneration, report declining membership ratios in their sample of US plywood co-operatives. The conclusion emerging from the literature seems to be that employee-owned firms are subject to degenerative pressures, but when it comes to survival, the record is by no means worse than it is for investor-owned or entrepreneurial firms.

However, neither of these measures provides direct evidence on the failure to include new employees as owners. In this paper, I am able to analyse this issue directly, since I have information on the ownership status of individuals and on the timing of their entry to the firm. More generally, this

in employee-owned firms rather than in conventional firms. When this happens, it is optimal for the employee-owners to share the financial risk (to some degree).

paper is one of the very few papers that examine the determinants of employee ownership on the individual level.⁵

3 Privatisation and secondary ownership transfers in Estonia

Employee financial participation played a large role in Estonian privatisation processes. However, it was largely limited to the early privatisation in Estonia. The earliest form of employee ownership in Estonia were the co-operatives and small state enterprises that were related to Gorbachev's reform policies in the late 1980s. Afterwards, the leasing processes that were initiated mainly in 1990-1991 and the privatisation of collective farms, that took place mainly in 1992-1993, added to the number of employee-owned firms. According to the estimations based on a large sample of firms, employees became the largest group of owners in around 25% of firms privatised before 1995 (Kalmi, 2002).⁶ The establishment of employee-owned firms was certainly not limited to the smallest firms; on the contrary, some of the largest firms in the sample were privatised to employees. However, the establishment of Estonian Privatisation Agency in 1993 and the accompanied change in privatisation policies put an end to the ownership transfers to employees.

After the early privatisation, the importance of employee privatisation has declined in two ways: First, there has been significant exit from employee ownership. Kalmi (2002), using the panel data on Estonian enterprises, shows that of 46 enterprises in which employees were the largest group of owners in 1995 only 12 remain employee-owned in 1999, i.e. almost 75% of initially employee-owned firms change into other ownership categories (to outsider ownership, managerial ownership, or to the ownership of former employees).⁷ High exit rates of course contribute to the decline of employee ownership, but it is also noteworthy that the entry rates of employee-owned firms have also remained low after the initial burst of privatisation. It is very rare that employees take over a private firm: this happens only in around 5% of the sample firms. Because of the change in privatisation policies, ownership transfers to employees became very rare in Estonian privatisation process.

Unlike in Western economies, high exit rates thus seem to be a significant phenomenon for employee owned firms in transition. The interesting question is how this development takes place. In early transition, some observers believed that employees would sell their shares after privatisation in the secondary markets for shares (e.g. Chilosi, 1996). However, Kalmi (2002), who conducted a survey in around 80 Estonian enterprises with some degree of insider ownership, finds that the secondary market for shares has remained undeveloped and the trading takes place infrequently. If there is any trading of shares, it is typically not the incumbent employees who sell their shares, but

⁵ An exception is the recent paper by Dong, Bowles and Ho (2002a).

⁶ Other papers that describe the increase of employee ownership in Estonia include Jones and Mygind (1999) and Mygind (2000).

rather former employees. The buyers are most often managers. It is somewhat more common that the ownership relations are shaken in new share issues, but the most important cause for ownership changes seems to be employee turnover. In the same survey, it was found out that only one firm had a mechanism to extend ownership to new employees.

4 Empirical evidence

4.1 Introduction

Case studies can help us to learn more about the phenomenon of degeneration. It is especially important that with the help of individual survey data, we can find the determinants of employee ownership at the individual level. This helps us to get direct evidence on degeneration, i.e. whether the new employees are excluded from ownership or not.

The individual-level data presented here is collected from five case studies the author conducted in Estonia during spring-autumn 1999. The case studies involved two interviews with the managing director and a survey questionnaire directed to the employees. One should note a selection bias arising from the objectives of the study and its cross-sectional design. To analyse the determinants of ownership at the individual level, I had to select enterprises where there was still a substantial amount of employee ownership left. Thus, the selection was biased towards the enterprises that had been more resistant to ownership change than what was the case in Estonian employee-owned enterprises in average. Therefore, the case firms do not provide evidence on how ownership typically evolves in Estonian employee-owned organisations. On the other hand, if we find evidence on degeneration from these firms, we may generalise these findings to the population of Estonian employee-owned enterprises with some confidence: If degeneration is an issue in these firms where employee ownership has been (relatively) long-lasting, then the same applies probably also to those firms which have changed to have a different composition of ownership.

Of the case study firms, 3 were public limited companies, 1 private limited company, and 1 co-operative. Despite the differences, ownership form was not particularly important determinant of ownership structures or of change in them. In all of the firms (including the co-operative), ownership was based on individual shares. Moreover, in all cases the shares were transferable only among incumbent shareholders, but on the resolution of management board or shareholder meeting could be extended to new shareholders as well. Perhaps the most important difference was that in the co-operative the shares were required to be equal among the members of the co-operative. This prevented ownership concentration typical to some other firms in the sample.

⁷ Enterprises move to the ownership of their former employees when there is significant exit from the firm and there are no developed market for shares, in which case the ownership shifts outside the enterprise along with former employees.

INSERT TABLE 1 HERE

An overview table 1 summarises the ownership development in the surveyed firms. The first row indicates the year of privatisation. 4 of the 5 firms are privatised in early transition. The firm A is exceptional, since its employees own part of the shares although the firm is privatised quite late (in 1997). The initial degree of employee ownership varied quite much. In firms B and D, employees owned over 95 % of shares. The co-operative E was co-owned to a considerable degree by local inhabitants and its former employees (i.e. members of the previous collective farm, of which E was a successor). Firm A was the only case where employees had initially only a minority shareholding. The majority of shares was in this firm owned by 6 management members.

Participation ratios are defined as the number of employee-owners to the total number of employees and they are also displayed in the table 1. One can see that 4 of the 5 sample firms show substantial similarity: With the exception of the firm D, the participation ratios are around 80 %. In firm D, only 28 % of the workforce in 1991 shared in ownership.

The two next rows present employee ownership in equity in 1999 and participation ratio in 1999. Compared to the figures at the time of privatisation, one may note that with one exception, all of the figures have declined. This exception is the participation ratio in firm D, which has increased a surprising 30 percentage points (from 28 % to 58 %). However, this is not because of new shares issued to employees, but rather because the number of employees in this firm has declined from 549 to 172, but over 60 % of initial shareholders still work in the firm.⁸ Employees had remained majority owners in firms B and D, and in C they were dominant owners.

Again, these declines can be interpreted as evidence on degeneration. However, the development of ownership was quite different across firms. Increases in the ownership of former employees were particularly pronounced in firms D and E, and in the latter one former employees were at the time of interview already dominant ownership group. In both of these firms, there had been very limited trading with shares; in the firm D, there had been actually no trading with shares since 1991, when the firm was privatised! The situation was different in firms B and C, where former employees owned only around 20 % of shares. This was largely because in both of these firms shares had been purchased from former employees when they left the firm, and also partly because there had been new share issues that had led to further concentration of ownership. Finally, in firm A the trading of shares had been rather limited during the 1,5 year period from privatisation to the first interview in this firm. However, quite soon after the first interview an extra shareholder meeting was held, and as a result the management team bought the remaining shares from the employees.

⁸ As this case shows, in relatively short run increases in participation ratios are often not evidence against degeneration. It may be that employee-owners have a higher job security than non-owners, or that those employees who buy shares are more committed to the company. In a situation where the total number of employees is decreasing and non-owners

4.2 Evidence from Employee Survey

I collected individual-level data from employees in the case study firms. This was done by a questionnaire. The questionnaire was delivered in two languages, Estonian and Russian.

The number of employees in the firms varied between 96 and 193 (see table 1). The aim was to get responses from around 20 % of the employees in the firms. The realised response rates varied between 19.1 % - 26.2 %, in only one firm the response rate being lower than 20 %. The survey was administered in all of the firms by the secretary of the managing director. The author asked the secretary to select the respondents so that the composition of the sample regarding to ownership, occupational structure and gender would reflect the population (i.e. workforce in the given firm) as closely as possible. When I later compared the sample characteristics with the population characteristics, I found that the sample was generally well representative. However, more respondents characterised themselves as 'specialists' than was the case with the statistics provided by the management. It is possible that this reflected rather the tendency of the respondents to exaggerate their occupational status in the firm. It is also possible that the secretaries chose the respondents partly based on their cooperativeness. However, if cooperativeness is not strongly correlated with any of the variables of interest, this should not bias the results.

The key variable of interest is thus the tenure of the individual in the firm. I measured tenure with two variables, TENURE which indicated the number of years respondent had been at the enterprise, and a dummy variable called PRTENURE, which indicated whether the respondent had been in the firm before privatisation had occurred. Although in empirical research continuous measures are often preferred over categorical measures, in this case there seems to be good reasons to employ categorical measures. Early privatisation policies in Estonia emphasised broad-based employee ownership, while no requirements were imposed to include new employees as owners. Therefore, one could think that at the time of privatisation it was relatively uncomplicated to become an owner, and considerably more difficult once privatisation was accomplished. In such a case, a qualitative variable may be preferred over a quantitative one.⁹

It is plausible that there are other determinants of ownership than the tenure in the firm. For instance, it is well-known that in Estonia as well as in other transition economies managers own larger proportions of stock than ordinary employees, though what is usually compared is the ownership of top managers vs. the rest of the employees. Whether this finding can be applied across occupational

constitute a higher proportion of employee outflow than owners, participation ratios may rise, even when shares were not offered to new employees.

⁹ There are also other difficulties with the continuous measure for tenure. First of all, the time of privatisation varied across firms, as presented in table 2. Thus, while a tenure of at least 8 years was required in three firms for PRTENURE to be 1, in firm A two years were sufficient. Moreover, the firm B had been in existence only 15 years. Several respondents from this firm had this value for TENURE, while in other firms there were values in excess of 40 for TENURE.

differences more broadly can be tested. The variable in the questionnaire denoting the occupational status is rank, which is divided into three categories (0 for shopfloor workers, 1 for specialists, 2 for managerial employees).

One would also believe that the financial situation of the respondent would influence the ownership status. This was measured by the average wage the respondent earned during the last year (WAGE, in seven categories). However, in most cases the shares had been acquired already years back, so wage or wealth at the time of privatisation would have been a more appropriate variables. Unfortunately, this information was not available. On the other hand, if current wage is correlated with financial means at privatisation, it can be an acceptable proxy.

In addition, two control variables were included into the analysis: FEMALE for gender (0 if male, 1 if female), and EDU for education, where 0 represents basic education, 1 secondary education, and 2 university-level education. The expectation was that males and respondents with higher level of education would be more likely to own shares (and to own more shares). Moreover, I included a dummy variable for each firm separately.

Like tenure, ownership was also measured as a quantitative variable, but I use also the dichotomous variable in the analysis. This variable OWN gets the value 1 if respondent owns shares and 0 if not. The variable SOWN is the percentage the respondent owns shares from the total equity. All variables are explained in Appendix, and a summary statistics appears in Table 2.

INSERT TABLE 2 AROUND HERE

The initial data analysis is done by analysing the 2 x 2 contingency tables. The association between PRTENURE and OWN is very clear, and is shown in table 3. Of the respondents who were employed by the firm before privatisation, three in four share in ownership. Of those employees who joined the firm after privatisation, only one in seven shares in ownership.

INSERT TABLE 3 AROUND HERE

Though this table provides strong evidence to support the notion of degeneration, chi-square tests found strong interrelationships between other variables as well, especially between ownership and education, ownership and occupational status, ownership and firm, and ownership and gender. Contrary to the expectations, the test failed to find evidence that ownership and wage level were related.

It thus seems appropriate to test the hypotheses on the determinants of ownership in a multivariate regression framework. Logit modelling is appropriate for a dependent variable that follows a binomial distribution. Specified models were estimated by the help of SAS statistical software.

INSERT TABLE 4 AROUND HERE

The binary logit estimates on OWN are presented in the table 4. The likelihood ratio indicates that hypothesis that the impact of the independent variables jointly to the dependent variable is zero is clearly rejected. On the individual variables, the impact of PRTENURE is extremely high. While the estimated probability of ownership for someone who has joined the firm before privatisation is only around 6%, if the same respondent had joined the firm before privatisation, the probability would have been raised already to 74%. It also appears that higher education and higher occupational status increase the probability of ownership. However, gender does not have a statistically discernible impact on ownership the multivariate test, neither does the current wage level.

It seems also to be the case that EDU and RANK suffer to some degree of multicollinearity. When one of them is excluded in the regression, the parameter coefficient for the other increases, and the coefficient for PRTENURE decreases somewhat. Even so, it seems clear that PRTENURE is the most important variable in determining the ownership status. Therefore, it seems that it is more meaningful to examine the influence of the other independent variables in determining ownership separately for the case PRTENURE=1. For this specification, I use the continuous variable TENURE.

INSERT TABLE 5 AROUND HERE

Table 5 shows the results for this case. An interesting and somewhat surprising result is that tenure increases the probability of ownership also beyond the qualitative change captured by PRTENURE: among those who worked in the firm when it was privatised, respondents with higher tenures are more likely to own shares. A one year increase in tenure increases the probability of ownership from 18.8 % to 20.2 %, or by 1.4 percentage points, evaluated at the mean.¹⁰ One reason for this might be that in some privatisation processes employees who had been longer in the firm were allowed to buy more shares in concessionary terms than other employees. This was especially the case in some agricultural privatisations.¹¹

Other parameter coefficients in the far left column of table 5 are quite similar to those presented in table 4. However, the situation changes when the FEMALE and WAGE are dropped, and EDU and RANK are brought into the regression separately. The parameter coefficient for RANK in column 2 is a lot higher than in column 1, and the parameter coefficient for EDU is likewise much higher in column 3 than in column 1. Both education and occupational status strongly affect ownership, but it is difficult to evaluate this impact simultaneously.

¹⁰ The mean of TENURE for the specifications presented in the table 5 is 21.619, with standard deviation 9.325. Other variables were kept at zero when evaluating the effects on probability.

¹¹ However, in our data the only example of agricultural privatisation was the firm E, where this clearly was not the case; all employee owners had an equal share. Nevertheless, this practice might have spread to some other privatisations, too.

We can also estimate the determinants of ownership by using a tobit model. Tobit analysis has the advantage over binary regression that it predicts the level (and not only the status) of ownership. Tobit model is more appropriate in situations where the dependent variable is censored. In fact, quite many observations are censored (51 or 46%), so the use of linear regression model would be particularly misplaced. In the tobit estimation, I had to omit data from the co-operative E, since in E there were actually only two possible ownership stakes: either 0 or 0.3%. This violates the assumptions of the tobit model on the distribution of the variable. In the estimation, I replaced PRTENURE with the dichotomous variable TENURE.

INSERT TABLE 6 AROUND HERE

Table 6 presents the results of the tobit model. It should be realised that some of the difference between the regression tables 4 and 6 comes from the fact that the sample is different. The estimation results show that the continuous variable for TENURE also has a decisive influence on ownership. This variable is significant at 1 % level. The expected mean of ownership is 0.41% of the total stock of the firm. This is increased by 0.04% when tenure is increased by one year. Instead, the coefficient RANK is not significant in this specification, and EDU is significant now only at 10 % level.¹²

To sum up, there seems to be three different types of effect of tenure on ownership: 1) Employees employed before privatisation are much more likely to own shares than employees that joined the firm afterwards; 2) Among those employees who were employed before privatisation, higher tenure increases the likelihood of ownership; 3) Higher tenure increases not only the likelihood of owning shares, but also the number of shares owned. Of these three types of effect, 1) is the strongest.

4.3 Reasons for not having shares

In this section, I elaborate the failure to extend ownership to new employees. Earlier, I have stressed the disincentives of incumbent insiders to extend ownership to new employees. However, it is also possible that new employees are simply not interested in becoming owners. In this section, the question is whether new employees fail to become owners because they do not have the opportunity to do so, or whether it is caused by a lack of interest towards ownership, or a lack of money.

In the employee questionnaire, I asked those employees who had not bought shares why they had not done this. While there was some firm-specific variation in responses, more interesting findings were related to the employment status at privatisation. The expectation was that new

¹² If a specification similar to that presented in table 4 is used for the sample excluding E (i.e. using OWN instead of SOWN and PRTENURE instead of TENURE), the coefficient for RANK is not significant. Instead, the coefficient for EDU is significant at 5 % level.

employees would more often give 'not offered' as an explanation for the failure to own shares, while old employees would say 'no money' or 'no interest'. This expectation is confirmed by the empirical data, as table 7 shows. 66% of new employees say that the reason for not owning shares is that shares have not been offered, 31% say that they have no money and 31% that they are not interested. Only 18 % of old employees say that shares have not been offered and 82 % of them state that they had no money to buy shares.

INSERT TABLE 7 AROUND HERE

5 Reasons of degeneration

5.1 Employee ownership and regeneration

The case study evidence strongly supports the notion that the decline of employee ownership takes place because ownership is not extended to new employees. We still have to find out why this is the case, and why the firms do not "regenerate" i.e. issue shares to new employees. One would expect that complementarity between ownership and participation, or the need to attract new finance, would encourage firms to offer shares to new employees. On the other hand, expected increase in decision-making costs would discourage firms offer shares to new employees.

5.2 Effects of ownership and participation

Ben-Ner's (1984) analysis strongly suggests that employee ownership can be reproduced only in conditions where there is a causal link between employee ownership and improved organisational performance. There is also a large body of literature that argues for the possibility of productivity gains through employee ownership. It has been argued that employee ownership may contribute to increased commitment, higher motivation, and lower turnover of the workforce, and thereby to higher productivity (e.g. Long, 1978; Pierce et al., 1991; Kruse and Blasi, 1997). The positive impact of ownership is perceived to come from the financial incentives ownership creates, from the decision-making rights associated with it, and from the intrinsic satisfaction it gives ('pride of ownership').¹³ Several studies have pointed out that certain human resource management practices are complementary to ownership, in the sense that improved organisational performance can be attained

¹³ Klein (1987); Pierce *et al.* (1991).

only by introducing a ‘bundle’ of practices rather than introducing them in isolation.¹⁴ Such practices include participation in the decision-making at job level, collective interest representation of workers, information sharing, employee training, and representative participation.

The link between organisational practices and employee ownership was quite weak in the case study firms. Typically, the managers argued that employees' individual stakes are too small to give incentives for improving performance through effort-reward link. The formal representation of employees was likewise modest. In B and D, the majority of employees were unionised. However, the union did not use an active voice in ownership-related matters, even though in D it was the largest shareholder. In B and D there was no employee representation on the supervisory board. In A and C there was one representative. E did not have a supervisory board. However, employees were well-represented in the governance of this co-operative. E was the only firm where both employees and managers perceived that ownership transformed into influence in decision-making. However, the manager of E perceived this in entirely negative terms, saying that employee ownership paralyses decision-making and contributes to the excess employment in the firm.

The impact of employee ownership to organisational performance can be further studied by evaluating the effects on employee attitudes. Ownership along with various control variables are used to explain employee attitudes. This approach is based the contributions of Long (1978) and Pierce, Morgan and Rubinstein (1991).¹⁵

The dependent variables that are taken as proxies of organisational commitment are integration, measured by the statement ‘My personal welfare is closely linked to the welfare of the firm’, involvement, measured by the statement of ‘I feel I am an important member of the firm’ and job satisfaction, measured by the statement ‘I am satisfied with my work’. The fourth dependent variable, loyalty, is formed by constructing a measure for quit intentions, measured by statements ‘I often think about quitting’ and ‘If I could get a similar job in another firm I would take it’, and reversing the scale. Though it might have been preferable to include more statements to measure the dependent variables, the number of statements was kept small in order to ensure more responses from employees. To improve the reliability of parameter estimates, the number of categories was reduced from 5 to 4, merging the two categories indicating disagreement. The dependent and independent variables that are used in the analysis are described in appendix.

The independent variables for the multivariate analysis were chosen, first of all, on the basis of their relevance to the theoretical framework and on their use in previous analysis, and secondly, on their significance for different alternative specifications of the model. Ownership was measured on the

¹⁴ The argument that clusters of related work practices have a larger positive impact on performance than introducing them in isolation has been made in theoretical work by Holmström and Milgrom (1994); Milgrom and Roberts (1995) and in the empirical work of Ichniowski, Shaw and Prennushi (1997). See also Ben-Ner and Jones (1995) and Levine (1995).

¹⁵ For recent empirical work, see Pendleton, Wilson and Wright (1998), and Dong, Bowles and Ho (2002b).

basis of the percentage of shares the respondent owns of the total equity (SOWN). Participation (PARTIND) was measured by constructing an index by summing the scores given to the statements ‘employees may participate in the decisions made at job level’; ‘employees may participate in the decisions made at firm level’; ‘employees are encouraged to present their opinions to their supervisors’; and ‘I am satisfied with the opportunities for participation’, and dividing the resulting sum by four. The correlation coefficients for these statements were in the range of 0.42-0.62. Perceptions on the availability of information about enterprise affairs (INFO) was taken separately as an independent variable, since it had a substantially lower correlation with some of the other variables included in the participation index.

Unlike in earlier studies, I also included the perception of workplace relations as an independent variable. There were two statements in the questionnaire dealing with workplace relations, one assessing the relationship of the respondent with his/her peers and the second assessing general management-employee relations. However, the correlation between these two was only moderate (0.33), and management-employee relations did not, individually, have an impact on dependent variables, so I decided to use the perceived relations with peers alone as an indicator of workplace relations (EMPREL).

Of the personal characteristics of the respondent, I took wage (WAGE, in seven categories) and occupational status (RANK, in three groups) into the model. In addition, there were firm dummies controlling for firm-specific variation. Of other possible variables, education was excluded because of its high correlation with RANK, and gender and tenure because of their non-significance in all specifications.

The main interest in the analysis was the impact of ownership on the dependent variables, and other variables were included mainly to control for their influence. In particular, I believed that perceptions of participation would be important. French and Rosenstein (1984) found a significant and positive relationship between occupational status and commitment. Clear perceptions of employee relations and higher wages could also increase commitment. In general, I expected that if there was a significant relation between independent and dependent variables, it would be a positive one.

INSERT TABLES 8A AND 8B AROUND HERE

Table 8a gives the frequencies, means and standard deviations for the dependent variables, and table 8b gives the means and standard deviations, and correlations for the dependent and independent variables. The number of observations in table 8 is lower than in the sample, because I have included only those observations that were included in the regressions. The remaining observations (20 or 21 in each regression) were deleted because of missing values in some of the variables.

Of the dependent variables, employees gave the highest scores to job satisfaction. 100 of 142 respondents agreed either fully or somewhat with the statement that they are satisfied with their jobs. The agreement for the variable measuring involvement was considerably lower. The correlation coefficients between the dependent variables variables confirm that it is best to examine them separately: the highest value of correlation coefficient is between job satisfaction and loyalty ($r=0.343$), while loyalty and involvement are not correlated at all ($r=0.041$).

I estimated the following model:

$$\text{Commitment} = F(\text{SOWN}, \text{PARTIND}, \text{INFO}, \text{EMPREL}, \text{RANK}, \text{WAGE}, \text{FIRM})$$

Integration, involvement, loyalty and job satisfaction were used as different aspects of commitment. The model was estimated by ordered logit regression. Ordered logit is a statistical technique to deal with a categorical dependent variable where the response levels are ordered (Greene, 1993). A common example of this is survey responses. The parameter estimates are solved iteratively using the maximum-likelihood method.

INSERT TABLE 9 HERE

Table 9 presents the regression results. The likelihood ratio (LR) statistics that indicate the goodness of fit varies somewhat between the regressions. The model works best for involvement and job satisfaction, while the likelihood ratio statistics fit somewhat less with integration and loyalty. However, the null hypothesis that the joint effect of independent variables is zero is rejected in all models.

As is apparent from the regression table, the impact of ownership on commitment is generally insignificant. The null hypothesis that ownership does not impact commitment is accepted by a wide margin. The parameter coefficient is closest to significance ($p=0.152$) in involvement, but the sign of the coefficient is negative, thus opposite to the expectation.

Perceptions on participation clearly have more influence on dependent variables than ownership.¹⁶ The coefficient for PARTIND is significant in three of four regressions, and it has the largest (positive) effect on integration and involvement. It has also a significant and positive coefficient on job satisfaction. Perceptions on information does have a surprisingly large impact on job satisfaction, where the parameter estimate is significant at 1 % level, but elsewhere the impact of information is insignificant.

Employee relations have a considerable influence on all dependent variables other than integration. It has a large positive effect on job satisfaction and on loyalty, and moderately positive

effect on involvement. Further studies on the impact of ownership on commitment should consider of including this variable in regressions.

Occupational status has a large positive impact on integration, a moderate positive effect on involvement, but no impact on loyalty or job satisfaction. Wage has a large positive impact on involvement, and, surprisingly, a large negative effect on job satisfaction.

There are differences between firms in these respects, but a closer look at the firm level does not either support the hypothesis that ownership would influence attitudes. Of the 20 possible comparisons between owners and non-owners (five firms times four commitment items), in 10 cases owners have higher scores, in 9 cases non-owners have higher scores, and once the scores are equal. In none of the firms did owners have consistently higher scores than non-owners (the reverse is also true).

In conclusion, ownership and job attitudes appear to be completely unrelated. This puts into question the claim that employee ownership could improve organisational practices, and suggests that incumbent employees do not perceive employee ownership as a tool to improve productivity. Consequently, they should have little incentives to extend ownership to new employees.

5.3 New employees as a source of finance

In Miyazaki's model, the reason to extend ownership to new employees is that the costs of capital and risk can be shared to larger group of people. However, this result is largely caused by the labour-management framework he uses. In this framework, the members share the capital costs equally. In our case studies, the companies are (with the exception of the co-operative E) joint-stock companies. This means that the share ownership can be unequal, and the amount of equity available does not directly depend on the number of owners. Presence of wealthier insiders limits the number of needed suppliers of equity capital. However, especially at privatisation it sometimes was the case that the number of owners was increased in order to pool the savings of employees. In particular, this was the case with firm A. The management initially wanted to buy the company, but they needed also employee participation in order to finance the transaction. However, later on firms A, B and C have moved into the direction of further concentration of ownership and increased managerial ownership.

When the firm is in the need of equity capital that cannot be financed by incumbent insiders, new employees are not the persons they will typically turn to first. Instead, the managers of firms C, D and E regarded outsider investors as the only possibly source for equity capital. The fear of losing control has so far prevented the managers from turning to outsider investors, but the need to invest

¹⁶ In unreported regressions, I attempted to estimate the possible interaction between ownership and participation, but the parameter coefficients were not significant and the goodness of fit statistics deteriorated, so I concluded that there was no

in new equipment may change this. Bank loans are in Estonia available only for relatively large companies or for companies with good growth prospects, and of our case study sample only firm B had access to bank loans. For other companies, loan capital cannot substitute for equity capital. It is thus more likely that the new equity capital is received from outside investors rather than new employees, so the need for equity is not likely to cause regeneration of employee ownership.

5.4 Decision-making costs

Hansmann (1996) has argued that the firms design their ownership structures in order to minimise the costs of ownership and market contracting. It is useful to investigate the former type of costs in seeking an explanation for the question of decline in employee ownership. According to Hansmann, there are different types of decision-making costs related to ownership, including the costs caused by inefficient decisions and costs of the use of decision-making procedures. Both type of costs are likely to rise with the more there are owners (decision-makers), the more equally ownership is divided among them, the more heterogenous their preferences are, and the more they actually participate in decision-making.

The findings among the case studies confirm the concern of inefficient decision-making structures. The manager of the co-operative E said that the excessive number of members in the co-operative paralyses the decision-making. Most of the members are not any longer working in the co-operative, so the preferences of retired members can be expected to differ from the preferences of worker-members. On the other hand, excessive employment is one of the biggest concerns of this co-operative, but this cannot be expected to be in the interest of non-working members, so it is plausible that the incumbent employees still control the decision-making processes.

Similar evidence was received from the interview with the manager of the firm B. This firm had been very successful in Estonian standards. Those employees who had invested to the shares of the firm had already got their investment back in dividends. Several of the respondents who did not own shares (mainly because of coming to the firm 'too late') indicated in their comments that they had tried to buy shares but had found it impossible. The director gave two reasons why he did not want to sell shares to new employees: First, he said that *'those employees who had been long employed (i.e. already before privatisation) in the firm have a more legitimate claim to ownership'*. One possible interpretation for this statement is that old employees had earned the benefit of buying shares at initial moderate price, while new employees had not (at least yet) earned the privilege. However, the price of the shares could be raised from their apparently undervalued level. That could potentially improve the allocation of shares among employees. However, this was not considered, and perhaps for the second reason the managing director gave against increasing the

evidence for the interaction of these two variables.

number of owners: '(...) we would rather see the number of owners to decrease than to increase (...) it is impossible to make decisions when there is too many owners'. The manager also tried to control the costs of decision-making by not involving employees into decisions concerning firm-level questions.¹⁷ In his words, "*decision-making is not the business of employees*".

6 Discussion and conclusions

This paper has discussed the problem of 'degeneration' of employee ownership in the context of transition economies. Consistent with the argument of Ben-Ner and Miyazaki, degeneration was defined as a failure to include new employees as owners of the enterprise. This paper presented direct statistical evidence on the issue and found that in the sample of five Estonian employee-owned enterprises, the degeneration hypothesis was supported by the facts. In all of these enterprises, new employees were almost always excluded from sharing in ownership.

The reason behind degeneration, as proposed by the theory, is related to the protection of ownership related rents – income derived from ownership and possibly higher job security. An additional reason for restricting the number of owners may be that the transaction costs related to decision-making increase when the number of owners increases. It is interesting that degeneration in Estonia seems to be much more pronounced than one could expect from experience of employee ownership in the West. It also surprising - and contrary to the previous literature - that employee ownership has no impact on job attitudes. Since it does not lead into improved organisational performance, and there are other sources of equity investment than new employees, it seems quite obvious that the costs of extending ownership to new employees outweigh the possible benefits. The result is concentration in ownership and sharp declines in employee ownership.

It is interesting why the results from a transitional economy differ so much from what we observe in developed economies. The answer to this may lie in the exceptional way employee ownership emerged in transition economies. At least in Estonia, enterprise insiders were not very committed to it from the start, neither were policymakers. Employee ownership was in the early privatisation rather tolerated than supported. At no stage, there emerged any policies of supporting the sustainability of employee ownership. There is a need for further research on this issue, especially regarding the transition economies, in order to see whether the results from Estonia can be generalised to transition more broadly, or whether institutional factors have led into different outcomes in some other transition economies.

¹⁷ However, employees had in this firm relatively much decision-making power concerning job-level decisions.

REFERENCES

Aghion, Philippe and Olivier Blanchard (1998): 'On Privatisation Methods in Eastern Europe and Their Implications', *Economics of Transition*, 6:87-99.

Ben-Ner, Avner (1984): 'On the Stability of Cooperative Type of Organization', *Journal of Comparative Economics*, 8:247-260.

Ben-Ner, Avner and Derek C. Jones (1995): 'Employee Participation, Ownership and Productivity: A Theoretical Framework', *Industrial Relations*, 34: 532-555.

Blasi, Joseph R., Maya Kroumova and Douglas Kruse (1997), *Kremlin Capitalism: Privatizing the Russian Economy*, Ithaca: Cornell University Press.

Chilosi, Alberto (1996): 'Distributional Consequences of Privatization in the Economies in Transition: An Analytical Framework', *Moct-Most*, 6:75-93.

Craig, Ben and John Pencavel (1992): 'The Behavior of Worker Cooperatives: The Plywood Companies of the Pacific Northwest', *The American Economic Review*, 82:1083-1105.

Djankov, Simeon (1999): 'Ownership Structure and Enterprise Restructuring in Six Newly Independent States', *Comparative Economic Studies*, 41: 75-95.

Dong, Xiao-yuan, Bowles, Paul, and Ho, Samuel P. (2002a): 'The Determinants of Employee Ownership in China's Privatized Rural Industry: Evidence from Jiangsu and Shandong', *Journal of Comparative Economics*, 30: 415-37.

Dong, Xiao-yuan, Bowles, Paul, and Ho, Samuel P. (2002b): 'Share Ownership and Employee Attitudes: Some Evidence from China's Post-Privatisation Rural Industry', *Journal of Comparative Economics*, forthcoming.

Dow, Gregory K. and Louis Putterman (2000): 'Why Capital Suppliers (Usually) Hire Workers: What We Know and What We Need to Know', *Journal of Economic Behavior and Organization*, 43: 319-336.

EBRD (1998): *Transition Report 1997: Enterprise Performance and Growth*, London: European Bank for Reconstruction and Development.

Estrin, Saul and Derek C. Jones (1992): 'The Viability of Employee Owned Firms: Evidence from France', *Industrial and Labor Relations Review* 45(2): 323-338.

Estrin, Saul and Mike Wright (1999): 'Corporate Governance in the Former Soviet Union: an Overview', *Journal of Comparative Economics*, 27:398-421.

Fitzroy, Felix *et al.* (1998): *Employee Ownership in Privatization: Lessons from Central and Eastern Europe*, Geneva: ILO.

French, J. Lawrence and Joseph Rosenstein (1984): 'Employee Ownership, Work Attitudes, and Power Relationships', *Academy of Management Journal*, 27:861-869.

Greene, William H. (1993): *Econometric Analysis*, New York: Macmillan (2nd ed.).

Hansmann, Henry (1996): *The Ownership of Enterprise*, Cambridge, MA: Belknap Press.

Holmström, Bengt and Paul Milgrom (1994): 'The Firm as an Incentive System', *American Economic Review* 84:972-91.

Ichniowski, Casey, Kathryn Shaw and Giovanna Prennushi (1997): 'The Effects of Human Resource Management Practices on Productivity: A Study of Steel Finishing Line', *American Economic Review*, 87:291-313.

Jones, Derek C. (1975): 'British Producer Cooperatives and the Views of Webbs on Participation and Ability to Survive', *Annals of Public and Cooperative Economics*, 46: 23-44.

Jones, Derek C. (1979): 'US Producer Co-operatives: The Record to Date', *Industrial Relations*, 18:342-357.

Jones, Derek C. (1998): 'The Economic Effects of Privatization: Evidence from a Russian Panel', *Comparative Economic Studies*, 40:75-102.

Jones, Derek C. and Niels Mygind (1999a): 'The Nature and Determinants of Ownership Changes After Privatization: Evidence From Estonia', *Journal of Comparative Economics*, 27: 422-441.

Kalmi, Panu (2002): *On the (In)stability of Employee Ownership: Estonian Evidence and Lessons for Transition Economies*, Ph.D. dissertation series 10/02, Copenhagen Business School.

Klein, Katherine J. (1987): 'Employee Stock Ownership and Employee Attitudes: a Test of Three Models', *Journal of Applied Psychology*, 72:319-332.

Kozarzewski, Piotr and Richard Woodward (2001): 'Secondary Privatisation in Poland (Part I): Evolution of Ownership Structure and Company Performance in Firms Privatized by Employee Buyouts', CASE Reports No. 47, Warsaw: CASE Foundation.

Kruse, Douglas L. and Joseph R. Blasi (1997): 'Employee Ownership, Employee Attitudes, and Firm Performance: A Review of the Evidence', in David Lewin, Daniel J.B. Mitchell, and Mahmood A. Zaidi (1997, eds.): *The Human Resource Management Handbook, part I*, Greenwich, CT: JAI Press.

Levine, David I. (1995): *Reinventing the Workplace: How Business and Employees Can Both Win*, Washington, D.C.: Brookings.

Long, Richard J. (1978): 'The Effects of Employee Ownership on Organisational Identification, Employee Job Attitudes, and Organisational Performance: A Tentative Framework and Empirical Findings', *Human Relations*, 31: 29-48.

Milgrom, Paul and John Roberts (1995): 'Complementarities and Fit: Strategy, Structure, and Organizational Change in Modern Manufacturing', *Journal of Accounting and Economics*, 19: 179-208.

Miyazaki, Hajime (1984): 'On Success and Dissolution of the Labor-managed Firm in the Capitalist Economy', *Journal of Political Economy*, 92: 909-931.

Mygind, Niels (2000): 'Privatisation, Governance and Restructuring of Enterprises in the Baltics', OECD, Centre for Co-operation with non-members, working paper CCNM/BALT, 6, 1-83.

Pendleton, Andrew, Nicholas Wilson and Mike Wright (1998): 'The Perception and Effects of Share Ownership: Empirical Evidence from Employee Buy-Outs', *British Journal of Industrial Relations*, 36:99-123.

Pérotin, Virginie A. (1997): *What Makes Coops Work? Institutional Viability, Firm Creation, Survival and Closure Among Workers' Cooperatives in France*, Ph.D. dissertation, Department of Economics, Cornell University.

Pierce, Jon L., Stephen A. Rubinfeld, and Susan Morgan (1991): 'Employee Ownership: A Conceptual Model of Process and Effects', *Academy of Management Review*, 16: 121-44.

Russell, Raymond (1995): *Utopia in Zion: The Israeli Experience With Worker Cooperatives*, Albany, NY: State University of New York Press.

Russell, Raymond and Robert Hanneman (1994): 'The Use of Hired Labor in Israeli Worker Cooperatives, 1933-1989' in Derek C. Jones and Jan Svejnar (eds.), *Advances in the Economic Analysis of Participatory and Labor-Managed Firms*, vol. 5, Greenwich, CT: JAI Press, 23-51.

TABLE 1 OVERVIEW TABLE ON EMPLOYEE OWNERSHIP AND OWNERSHIP CHANGE

Firm	A	B	C	D	E
Number of employees, 1999	96	163	110	172	193
Ownership form	Public limited	Private limited	Public limited	Public limited	Co-operative
Year of privatisation	1997	1991	1991	1991	1993
Employee ownership at privatisation, % of equity	39 %	95 %	53 %	97 %	61 %
Participation ratio at privatisation, % of workforce	77 %	80 %	80 %	28 %	83 %
Employee ownership in 1999, % of equity	23 %	65 %	46 %	59 %	40 %
Participation ratio in 1999, % of workforce	58 %	66 %	24 %	58 %	65 %
Other developments	Management buy-out after the interview	Share issues, ownership concentration	Share issues, ownership concentration	No trading with shares	Little trading of shares
Number of respondents to the questionnaire (response rate)	20 (20.8%)	33 (20.2%)	21 (19.1%)	43 (22.3%)	45 (26.2%)
Percentage of respondents who are owners	75 %	64 %	40 %	46 %	81 %

Source: Case database.

TABLE 2 MEANS AND STANDARD DEVIATIONS OF DEPENDENT AND INDEPENDENT VARIABLES

Variable	Mean (standard deviation)
OWN	0.619 (0.487)
SOWN*	0.335 (0.742)
PRTENURE	0.778 (0.417)
TENURE	17.994 (11.049)
WORKER	0.500 (0.501)
GENDER	0.444 (0.498)
EDU	2.143 (0.579)
WAGE	2.763 (1.807)

*Excluding co-operative E.

Source: Case database.

TABLE 3 CROSS-TABULATION OF OWNERSHIP AND EMPLOYMENT STATUS AT PRIVATISATION

	Owner	Not an owner	Total
The respondent was employed by the firm before privatisation	94	31	125
The respondent joined the firm after privatisation	5	30	35
Total	99	61	160

Source: Case database.

TABLE 4 DETERMINANTS OF OWNERSHIP: LOGIT MODEL

The model estimates the probability at which the individual owns shares in the firm. The tables presents logit parameter coefficients, standard errors and *p*-values, and marginal effects. Marginal effects are percentage unit changes when the independent variable changes by one unit. They are counted by keeping all variables at zero. Reference firm is B.

Variable	OWN (N=154)	Marginal effect
Intercept	-2.703* (1.465) (0.065)	6.3 %
PRTENURE	3.778*** (0.737) (0.0001)	68.3
GENDER	0.405 (0.495) (0.414)	
RANK	0.981** (0.411) (0.017)	8.9
WAGE	-0.214 (0.213) (0.316)	
EDU	1.037** (0.475) (0.029)	9.6
Firm dummies	YES	
Lr statistics (p-value)	75.516*** (0.0001)	
Generalised R-square	0.388	

Source: Case database.

Significance levels= * significant at 10% level; ** significant at 5% level; *** significant at 1 % level.

TABLE 5 DETERMINANTS OF OWNERSHIP: LOGIT MODEL II

The model estimates the probability at which the individual owns shares in the firm. The tables presents logit parameter coefficients, standard errors and *p*-values, and marginal effects. Marginal effects are percentage unit changes when the independent variable changes by one unit. They are counted by keeping all variables at zero. Reference firm is B. The sample contains only observations for which PRTENURE=1.

Variable	Specification 1	Specification 2	Specification 3
Intercept	-3.385** (1.502) (0.024)	1.228 (0.819) (0.134)	-1.584 (1.288) (0.219)
TENURE	0.089*** (0.031) (0.0041)	0.074** (0.029) (0.0101)	0.093*** (0.030) (0.0019)
GENDER	0.416 (0.578) (0.471)		
RANK	0.896* (0.462) (0.053)	1.093*** (0.387) (0.0047)	
WAGE	-0.2223 (0.241) (0.354)		
EDU	0.911* (0.524) (0.082)		1.309*** (0.469) (0.0052)
Firm dummies	YES	YES	YES
Lr statistics (p-value)	34.064*** (0.0001)	30.407*** (0.0001)	29.310*** (0.0001)
Generalised R-square	0.244	0.216	0.211

Source: Case database.

Significance levels= * significant at 10% level; ** significant at 5% level; *** significant at 1 % level.

TABLE 6 THE DETERMINANTS OF OWNERSHIP, TOBIT MODEL

The middle column shows the parameter coefficients and associated *p*-values. The column on the right shows marginal effects.

N=111. Uncensored observations N=60. Censored observations N=51.

VARIABLE	PARAMETER COEFFICIENT	MARGINAL EFFECT
Intercept	-1.865*** (0.0007)	0.410
TENURE	0.082*** (0.0001)	0.043
RANK	0.226 (0.272)	0.124
EDU	0.484* (0.066)	0.290
GENDER	0.057 (0.822)	0.029
WAGE	-0.007 (0.940)	
Firm dummies	YES	
Sigma	1.0103	
LR statistics	48.9216*** (0.0001)	

Source: Case database.

Significance levels= * significant at 10% level; ** significant at 5% level; *** significant at 1 % level.

Note: Marginal effects are evaluated keeping TENURE at the mean, dichotomous variables (firm dummies and GENDER) at zero, and other categorical variables at their median values (RANK and EDU=1, WAGE=2). Predicted mean of SOWN for these values 0.410 (for the censored distribution). Marginal effects are deviations from this value when the explanatory variable increases by one unit.

TABLE 7 REASONS FOR NOT BUYING SHARES BY EMPLOYMENT STATUS AT PRIVATISATION

	Shares have not been offered	No money	No interest
Employed before privatisation (N=28)	5 (18%)	23 (82 %)	6 (21 %)
Employed after privatisation (N=29)	19 (66%)	9 (31%)	9 (31 %)

Source: Case database. Note: Multiple responses were permitted, therefore rows may sum up over to the number of observations.

TABLE 8a SUMMARY STATISTICS FOR THE DEPENDENT VARIABLES

	0	1	2	3	MEAN	STD
Integration (N=142)	43	23	40	36	1.486	1.171
Involvement (N=142)	55	42	33	12	1.014	0.982
Loyalty (N=141)	25	36	54	27	1.585	0.991
Job satisfaction (N=142)	24	18	65	35	1.782	1.004

0=disagree; 1=neutral; 2=agree somewhat; 3=agree completely (with the statements presented in the questionnaire; see appendix).

TABLE 8b SUMMARY STATISTICS AND CORRELATION COEFFICIENTS FOR THE INDEPENDENT VARIABLES

		SOWN	RANK	WAGE	EMPREL	INFIND
SOWN	0.335 (0.742)					
RANK	0.690 (0.774)	0.196				
WAGE	1.782 (1.826)	0.127	0.178			
EMPREL	4.077 (0.744)	-0.146	-0.069	-0.102		
INFO	3.021 (1.604)	0.092	0.434	0.101	0.076	
PARTIND	2.930 (1.058)	-0.031	0.185	-0.0034	0.065	0.436

Source: Case database.

TABLE 9 DETERMINANTS OF EMPLOYEE COMMITMENT.

Parameter coefficients are estimated using ordered logit model. The table gives parameter coefficients and associated *p*-values.

Variable	Integration (N=142)	Involvement (N=142)	Loyalty (N=141)	Job satisfaction (N=142)
Intercept1	-3.179*** (1.183) (0.0072)	-6.900*** (1.418) (0.0001)	2.174* (1.206) (0.071)	-6.839*** (1.388) (0.0001)
Intercept2	-1.752 (1.161) (0.131)	-4.993*** (1.369) (0.0003)	3.644*** (1.223) (0.0029)	-4.221*** (1.309) (0.0013)
Intercept3	-0.944 (1.157) (0.414)	-3.439*** (1.333) (0.0099)	5.215*** (1.261) (0.0001)	-3.262** (1.292) (0.012)
SOWN	0.004 (0.221) (0.984)	-0.362 (0.253) (0.152)	-0.014 (0.224) (0.949)	0.016 (0.236) (0.945)
PARTIND	0.638*** (0.172) (0.0002)	0.523*** (0.174) (0.0026)	0.199 (0.168) (0.225)	0.348** (0.174) (0.045)
INFO	-0.187 (0.122) (0.127)	0.006 (0.125) (0.964)	0.116 (0.122) (0.339)	0.516*** (0.133) (0.0001)
EMPREL	0.063 (0.219) (0.774)	0.507** (0.255) (0.047)	0.588** (0.233) (0.0104)	0.943*** (0.252) (0.0002)
RANK	0.687*** (0.262) (0.0086)	0.472* (0.260) (0.070)	0.031 (0.260) (0.903)	0.020 (0.269) (0.941)
WAGE	-0.051 (0.138) (0.711)	0.378** (0.149) (0.011)	0.154 (0.141) (0.269)	-0.373** (0.151) (0.013)
Firm dummies	YES	YES	YES	YES
Lr statistics	27.064*** (0.0025)	41.945*** (0.0001)	20.275** (0.0268)	55.323*** (0.0001)

Source: Case database.

Significance levels= * significant at 10% level; ** significant at 5% level; *** significant at 1 % level.

Appendix: DEFINITIONS OF THE VARIABLES USED IN REGRESSION ANALYSIS

Ownership analysis

Dependent variables

OWN: Dummy variable, 0 for non-owners, 1 for owners. Used in the binary logit analysis.

SOWN: The percentage of shares owned by individual employees from the total stock of the firm.

Independent variables

PRTENURE: Dummy variable, gets the value of 1 if the respondent in the firm before privatisation and 0 if not.

TENURE: Tenure in years.

GENDER: 1 if female, 0 if male.

WORKER: Occupational status in two categories: Ordinary worker (including foremen), get the value 1, specialists, middle- and top-managers get the value 0.

WAGE: Measured in seven categories 1-7.

EDU: Education measured in three categories: 1 if basic education, 2 if secondary education, 3 if university education.

Attitude analysis:

Dependent variables

Integration: Measured by the statement 'The welfare of the company and my personal welfare are closely linked' at the scale of 1 (complete disagreement) to 5 (complete agreement): The two lowest categories are merged. The variable gets values 0-3.

Involvement: Measured by the statement 'I feel I am an important member of the firm' at the scale of 1 (complete disagreement) to 5 (complete agreement). The two lowest categories are merged. The variable gets values 0-3.

Loyalty: Measured by statement 'I often think about quitting' and 'If I could get a similar job elsewhere I would take it' at the scale of 1 (complete disagreement) to 5 (complete agreement). The scale was then reversed, the responses were summed and divided by two. The two lowest categories are merged. The variable gets values 0-3.

Job satisfaction: Measured by the statement 'I am satisfied with my job' at the scale of 1 (complete disagreement) to 5 (complete agreement). The two lowest categories are merged. The variable gets values 0-3.

Independent variables

SOWN The percentage of shares owned by the respondent from the total stock of the firm

PARTIND: A composite variable of the four statements ‘Employees may participate on the decisions at the job level’, ‘employees may participate at the decisions made at the firm level’, ‘the managers encourage employees to voice their opinions’, and ‘I am satisfied with the opportunities for participation in this firm’; all items measured in the scale of 1 (disagree completely) to 5 (agree completely). The scores were summed and divided by four. The variable takes values from 1 to 5.

INFO: Measured by the statement ‘I get enough information about the firm performance’ at the scale from 1-5.

EMPREL: Subjective evaluation of relationship with peers at the scale from 1-5.

RANK: Occupational status in three categories: Ordinary worker (including foremen), gets the value 0, specialist (value 1), manager (middle- or top manager, value 2).

WAGE: Measured in seven categories 0-6.