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**EMPLOYEE OWNERSHIP AND  
FIRM-SPECIFIC HUMAN CAPITAL**

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# Employee Ownership and Firm-Specific Human Capital

## Abstract

*In this paper, we develop, analyse, and test the hypothesis that partial employee ownership may be used as an institutional arrangement to economise on the costly problem of ex post opportunism inherent in the investment of specific human capital. Based on a unique survey of 655 British firms, we examine the empirical link between the likelihood of partial employee ownership and the presence of firm-specific human capital, as well as uncertainty (internal and external) and the frequency of transactions. Adjusted for possible structural differences, empirical evidence suggests considerable support for our hypothesis. Our results are also broadly consistent with the idea that institutional arrangements can be analysed as transaction cost minimising choices to govern specific transactions by providing economising degrees of ex ante incentive compatibility and ex post contractual safeguard.*

*(JEL: D23; G32; J41; L22)*

Keywords: Specific human capital; Governance structure; Employee ownership; Transaction Cost.

## 1. Introduction

In recent years employee share ownership (ESO) has attracted the interest of policy-makers, managers and employees for a variety of reasons. Most advocates have focused on the microeconomic benefits of offering employees an ownership stake, based on the expectation that it will generate more 'favourable' attitudes towards the company and motivate employees to perform well (see recent ESO legislation in the UK, Finance Act 2000). Some advocates emphasise the shift towards contingent compensation systems in the context of the fundamental restructuring of economies and firms (Pendleton, 2001, p6); particularly in an era of intense product market competition (Pendleton, 1997; Robinson and Wilson, 2001) and the collapse of the

‘fixed wage’ system (Blasi, Kruse and Sesil, 1999). Alternatively, in a number of former socialist countries ESO has been a key feature of their transition to greater private ownership. Others have made a moral or ideological argument for ESO. At one end of the spectrum, widening the ownership of productive assets is seen as a means of strengthening support for the capitalist system (Kelso and Adler 1958; Gates, 1998) as well as ‘by-passing’ unions (Ackers et al, 1992) and reducing wage pressures. At the other end there is the belief that employees deserve to share directly in economic outcomes, and that these policies can enhance social cohesion and equality by distributing the fruits of economic success more widely and equitably (see Kruse, 1999).

Recently a new literature has emerged which gives a new insight into the spread of ESO in developed countries. Grounded in the corporate governance literature of financial economics, Margaret Blair (1995a, 1995b, 1995c, 1999) argues that in instances where employees make highly specialised investments in human capital, such ‘assets’ are at risk in much the same way that a shareholders equity capital is at risk. (Blair, 1999, p62). Investments in knowledge, skills, relationships and other forms of human capital that are non-transferable outside the place of work are not easily recoverable. Furthermore, there are opportunity costs to employees in so far as they could have invested their human capital in more remunerative ways elsewhere. As such, Blair argues, investments in firm-specific human capital should be treated in the same way as the investment of equity capital. Once such investment have been committed to an enterprise, employees, as well as shareholders, should have rights to residual income and control, something which is facilitated through ESO. The other side of the coin is that firms need to find ways of binding employees with highly developed firm-specific knowledge to the firm, so as to protect investments the firm

has made in training and development. Employee ownership, both as a remuneration and as a governance device provides a way of doing this. As Blair writes ‘employee-owned companies are the ultimate examples of governance structures that empower employees and protect investments in firm-specific capital’ (Blair, 1995a: p228).

The contemporary significance of this interpretation resides in the growing importance of human capital relative to physical capital, as a key to competitive advantage and business success. In advanced economies, Stewart (1997) observes that with the supplanting of the Industrial Age by the Information Age, wealth creation has become the product of knowledge rather than physical resources. In these circumstances, the attractiveness of including human capitalists in governance increases. Indeed this fits with the stylised facts of corporate governance in many knowledge led and human capital-intensive firms. In many software development companies and firms providing professional services, ownership and control is typically vested solely in the human capitalists either through ESO or along partnership lines (see Roberts and ). Yet, while it is possible to identify ‘cases which exemplify these developments and the possibilities, in the main these types of argument tend to be speculative and prescriptive. As yet they are not firmly based on specific empirical research’ (Pendleton, 2001, p9). Even though there is evidence that the use of equity based compensation systems is growing and being strongly promoted in the U.K., no definitive empirical studies have linked employee ownership in firms to investments in firm-specific human capital.

The aim of this paper is to make the case for a new and important function of employee ownership, namely that employee ownership acts to safeguard competitive-advantage-generating firm-specific investments in human capital and, by implication, to encourage these investments. We make the case by developing a conceptual analysis

from which hypotheses are drawn and empirically tested. Our analysis is built upon identifying the problems of how to safeguarding firm-specific investments in employees' human capital, as against generic investments in human capital. Our analysis suggests the hypothesis that partial employee ownership is related to the efforts to overcome the problems related to safeguarding firm-specific investments in human capital.

## **2. Conceptual Analysis**

Property rights theorists such as Pejovich (1978:17) regard ownership rights as being instrumental in steering resources to their highest valued uses and thus crucial to achieving operating efficiency. Traditional has dictated that the most efficient organisational structure is one which rests on a functional division of task and income between capital and labour. This treatment of shareholders as the sole 'owners' of firms, however 'undermines the expectation of other participants in the firms that their investments will be protected too' (Blair, 1995b: 19). Employees, in particular, make specific investments in the wealth creating activities of firms through the accumulation of firm-specific knowledge which, by definition, is valueless elsewhere. Without the appropriate incentives, employees will be discouraged from committing themselves to investments in firm-specific skills, preferring instead to make investments in those more generic skills that they can take elsewhere. If this happens, these potential benefits of workers investments in firm-specific human capital will be lost to today's 'knowledge economy' (Blair, 1995b: 19). Clearly, this need not happen. As the 'knowledge economy' becomes more prominent it will be those firms who encourage and protect this valued human capital who will flourish. However, how this is achieved is not a straightforward issue.

Wealth creation, therefore, is about much more than managing the firm's physical assets, it concerns the co-ordination of bundles of specialised investments. As some of the newest work in the economics of organisations is beginning to realise (Williamson, 1996), such specialised investments in human capital create complex governance problems for firms. These are particularly acute where such investment is firm specific and thus not readily transferable between firms, and where a firm's physical and human assets are 'non-separable' or co-specialised. In the latter case, the fact that employees have to work with the other assets of the firm in order to generate value means that the value of an investment in human capital, once made, is non-separable to machines and other physical assets in the firm (e.g. Hart 1984; Marx 1967 **references needed**). Shareholders may own all the physical capital, but this is worthless without the human capital, and similarly once separated from the firm that owns the physical assets, investments in human capital become valueless. However, this result only applies to the fraction of an investment in human capital that is non-separable to firm-specific physical assets. Only this fraction of the investment in human capital is firm specific. The rest of the investment in human capital, non-separable only to generic physical assets, is generic because it maintains full value if transferred out of the firm. Thus, an investment in human capital consists of two parts: generic (with its value tied to generic physical assets) and firm-specific (with its value tied to firm-specific physical assets).

Generally speaking, employees of a firm would want to pay for the generic part of investments (e.g. acquiring technical skills and/or general knowledge) in their human capital for three reasons. First, they own the investments, they receive compensation from the firm for services rendered by these investments, and finally, generic investments have alternative use outside the firm. Problems lie in the firm-specific part

of these investments in employee's human capital (i.e. the part tied to firm-specific physical assets). Without a measure of safeguard, neither the firm nor the employees would want to pay for firm-specific investments in human capital even when it is a major driver of competitive advantage.

If employees pay for firm-specific part of investments in their human capital, the firm ex post may threaten not to use the services rendered by these investments in order to extract a greater share of the "rent" or "surplus value" resulting directly from the firm-specificity of these investments. Similarly, if the firm pays for its employees investments in firm-specific human capital, the employees ex post may threaten to 'hold-up' their employers by not making use of the investments in order to extract greater returns for themselves. Foreseeing the opportunistic hazards, both employees and their firms would refrain from paying for any firm-specific investment in the human capital of its employees. The resultant lack of or under-investment in firm-specific human capital is serious in the long run because it dilutes the firm's profit-generating competitive advantage.

One possible solution would be that both the firm and the employees make firm-specific investments in human capital together and share the returns equally. The proposal, however, is unworkable because the contracting process of agreeing on and monitoring the respective investments and of separating the respective streams of returns makes impossible cognitive and informational demands on the parties. The process would be intractable or too costly to be feasible (e.g. Williamson, 1996).

Non-contractual mechanisms, on the other hand, seem to offer a more viable set of institutional arrangements that overcome these contracting problems. For example, social norms of lifetime employment, corporate culture, unions, job ladders and career paths may all act to safeguard investments in firm-specific human capital and give

employees some assurance that such investments are worthwhile. By encouraging long-term employment relationships these institutions also enable firms to more accurately monitor an employee's contribution to wealth creation (for fuller discussion of these issues see Blair, 1999: 74-77).

A less obvious but workable non-contractual arrangement for protecting specific investments is 'ownership' or 'property rights'. This re-organisation of residual control rights would encourage and reward the employees of a firm for making firm-specific investments in their human capital. Further, due to the potential opportunistic hazards arising from co-specificity, compensating employees with equity stakes provides protection from opportunism and rewards employees who make investments that sustain and enhance the firm's profit generating competitive advantage.

Conceptually, when efficiency invites the investments of specific human capital by both employers and employees, firms may use employee share ownership as an institutional arrangement to provide economising degrees of ex ante incentive compatibility and ex post contractual safeguard both to encourage and protect firm-specific investments in human capital. Employee share ownership provides both a measure of residual control to deter employer ex post opportunism and a measure of profit-sharing to discourage employee ex post opportunism<sup>11</sup>. In this regard, employees enjoying equity ownership are under a form of hybrid contracting: the generic fraction of human capital usage is compensated through wages while the firm-specific fraction is compensated through partial ownership. This implies that employee share ownership may function as a transaction cost economising institutional arrangement to govern human capital specific transaction.

### **3. Hypotheses.**

Granted a wealth creation case can be made for firm-specific investments in employee human capital, our conceptual analysis above considers the problems that may prevent these investments from being made. Based on the idea of “non-separabilities,” we clarified the difference between firm-specific and generic investments in human capital and suggest employee share ownership may a way to overcome these problems. The analysis reveals that ESO is more likely to be observed in a firm that encourages employees to make firm-specific investments in their human capital. Second, that the firm-specific fraction of investments in human capital is non-separable to and thus determined by the firm-specific fraction of physical assets in the firm.

Informed by the analysis, a testable hypothesis to predict employee share ownership takes the following form: *other things equal, the firm-specific fraction of investments in employee human capital is positively correlated with the likelihood of employee share ownership.*

The fact that it is very difficult to find empirical measures of the firm-specific fraction of investments in employee human capital cannot easily escape attention. However, while firm-specificity in the investments in human capital is central in our analysis to make the case for employee ownership, the “non-separability” between the firm-specific fraction of investments in employee human capital and physical capital in our analysis makes it possible to circumvent these measurement difficulties. Given “non-separability”, a more general measure of firm-specificity would suffice. A more testable form of the hypothesis to predict partial employee ownership is the following: *Other things equal, the degree of firm-specificity in a firm is positively correlated with the likelihood of employee share ownership (in the form of ESOP).*

We also hypothesise that both measurement uncertainty and environment

uncertainty may explain ESO. Measurement uncertainty suggests that it is costly to observe and verify the utilisation of human capital or effort. The problem is likely to be more acute in the case of firm-specific human capital. As a result, the employee on fixed wages tends to under utilise his/her human capital or shirk. Employee share ownership can be used as an institutional arrangement to economise on the measurement cost component of transaction costs by effecting a greater degree of incentive compatibility between the employer and employees. Environmental uncertainty suggests that the state of nature (e.g. the demand conditions of a product) is difficult to predict. One implication is that environment uncertainty discourages the supply of specific capital, both human and non-human, from the external market. The reason is that the specific capital is difficult to re-deploy. If the efficient gains from specific capital usage are large enough to justify the additional (governance) cost, firms would produce it internally. Internal investment/production may come in the form of vertical integration for firm-specific physical capital and employee ownership for firm-specific human capital. Thus our hypothesis implies that ESO may function as an institutional arrangement to economise on measurement and environment uncertainties when firm-specific human capital is present.

The transaction cost framework also predicts that the frequency of transactions makes the firm more willing to internally produce and maintain efficiency enhancing specific assets. Because the governance cost of producing and maintaining specific assets is greater than that of producing and maintaining general purpose assets, the efficiency gain from using specific assets must be large enough to justify the additional governance cost. Since the efficiency gain resulting from using specific assets is likely to be greater in frequent transactions than infrequent one, firms are more likely to adopt institutional arrangements such as ESO, designed to produce and maintain

specific assets in frequent transactions than infrequent ones. Thus, we hypothesise that partial employee ownership may function as an institutional arrangement to economise on the frequency of transaction.

Thus, the operational version of the hypothesis is as follows: *within firms, specific human capital, environment uncertainty, measurement uncertainty, frequency of transaction can predict the presence of employee share ownership (in the form of ESOPS).*

#### **4. ESOPs in the UK.**

Partial employee ownership is nothing new. Economic historians have shown that various employee ownership schemes were introduced in Britain during the late nineteenth century (Hatton, 1988), although these schemes in general covered only about 0.5% of the British labour force (Wilson, 1992). In the latter half of the 1980s, however, a new form of employee ownership emerged in the UK. The Employee Share Ownership Plan (ESOP) differs from other forms of employee share schemes in that the scale of employee ownership is usually considerably larger and thus the ESOP structure facilitates a greater degree of active involvement and residual control. Most ESOPs take what is known as the 'case-law' form, and are based on trust and profit sharing legislation. Initially, equity is held in an Employee Benefits Trust before transfer to a Profit Sharing Trust. These transfers are financed by profits, and the shares are distributed to employees (on a nominal or no cost basis) in accordance with the 1978 Finance Act. These payments out of profits are used by the Employee Benefits Trust to repay the loan taken out to finance the purchase equity at the outset. The other form of ESOP in the UK is known as a 'statutory' ESOP as it was established by legislation in the 1989 Finance Act (as amended). In this case a single

trust - an Employee Share Ownership Trust (ESOT) or Qualifying Employee Share Trust (QUEST) - acquires, holds and distributes equity to employees. To secure Inland Revenue approval and access to tax concessions it is necessary for at least half of the trustees (a majority prior to 1994) to be elected by a majority of the workforce.

The growth of British ESOPs, or the lack of it, has been more evolutionary in that it had not been promoted specifically for tax reasons. Indeed, the “statutory ESOP” in the form of Finance Act 1989 was criticised because of its “lack of meaningful tax incentives” and inflexibility for “imaginative tax planning” (Cornford, 1990). Moreover, the qualification requirements for statutory ESOPS (as outlined above) are often viewed by employers as giving too great a decision-making role to employees. Yet, for employees, it is this very link between share schemes and decision making which is its strength and may be enough to motivate them to make firm specific investments in human capital. Notwithstanding these issues ESOPs provide a low-cost, low-risk method for employees to acquire substantial portions of equity and control in their employer. Consequently, it is of interest to examine the characteristics of those British firms that do establish ESOPs as against those that do not.

## 5. Methodology and Data.

Given our hypotheses that the presence of firm-specific assets, uncertainty and the frequency of transactions would increase the likelihood of firms having an ESOP, we estimate the following logistic model:

$$\frac{P(ESOP)}{1 - P(ESOP)} = a + b_1(Firm-Specificity) + b_2(Uncertainty) + b_3(Frequency) + b_4(Structural Variables). \quad (1)$$

Where  $P(ESOP)$  equals the probability that the firm operates an ESOP (i.e.  $ESOP=1$ )<sup>22</sup>; *firm-specificity* is a vector of variables reflecting an enterprises use of firm-specific capital; *uncertainty* includes various measures which gauge the level of internal and external uncertainty faced by the firm; *frequency* is a measure of the extent of repeated relationships the firm deals with; while the vector *structural variables* includes a number of control variables which might be expected to impinge on the dependent variable. In line with our hypotheses, the coefficients,  $b_1$ ,  $b_2$ , and  $b_3$  are expected to be positive and statistically significant. It is not clear, ex ante, how the coefficients accounting for structural differences ( $b_4$ ) would influence the likelihood of ESOP.

As explained in Section 3, it is not possible to obtain direct measures of the firm-specific fraction of investments in human capital in a firm. However, our conceptual analysis reveals that the firm-specific fraction of human capital investments is non-separable to firm-specific fraction of physical assets in the firm and thus the two respective fractions are highly and positively correlated<sup>33</sup>. Thus, measures of tangible firm-specificity are adequate to test our hypothesis (Section 3). These measures are obtained from a number of proxies related to the production process. The proxies are: whether the product line is customised; whether the product is idiosyncratic or different; whether the product is technical in nature; and the portion of *job* (as opposed to *batch* and *flow*) type of production used. The varying degrees of specificity are thus obtained either by semantic differences from 1 to 5 (from strongly disagree to strongly agree) as in the first three measures or by an actual figure in the latter measure.

In addition to firm-specificity, we posit that the uncertainties faced by the firm would exacerbate the potential opportunistic hazards that drive the need for employee ownership to protect investments in employee human capital. We use two different measures of uncertainty: internal and external uncertainty. The proxy for the measurement of internal uncertainty takes the form of quality uncertainty: the degree of difficulty (as felt by the management) in inspecting the quality of the company's product. The proxy for external/market uncertainty takes the form of the fast changing nature of the product line (as felt by the management). The varying degrees of uncertainties are obtained by semantic differences from 1 to 5 (from strongly disagree to strongly agree).

The frequency with which similar transactions occur also emphasize the importance of investments in relationships, many of which will be firm specific. We posit that the need for relationship investments may be positively correlated with the need to invest in firm-specific human capital and thus is positively linked to partial employee ownership. We use the portion of repeated business as the proxy for the frequency of transaction.

There is also information in the survey (see Table 1) regarding a number of structural differences of these firms along different dimensions. They include firm type, industry type, legal status, ownership concentration, and the total number of employees in a firm. We use measures (defined in Data Appendix) to adjust these structural differences and use the total number of employees as a proxy for size.

All the variables above are hypothesised to explain the likelihood of having an ESOP in a firm. To account for the difference in scale, all continuous variables are standardised by subtracting the variable's mean and then dividing by the standard deviation. Thus, the standardised variables have a mean of zero and a standard

deviation of one, making the magnitudes of coefficients comparable.

### *Data*

Data for this study is from 655 firms that responded to a mail survey on trade credit practice conducted by the authors in late 1994, constituting a useable response rate of 18%<sup>44</sup>. The survey collected detailed data on the firm itself; its ownership and governance structure, the size and composition of the labour force, product and market characteristics, supplier relationships, and credit management issues. The firms mailed were a randomly selected stratified sample of manufacturing companies originally drawn from the UK FAME database<sup>558</sup>. The companies selected all operated in a single primary product category, which facilitates the analysis of the relationship between product characteristics and aspects of organisational design. Holding companies and large companies with diverse product profiles were deliberately excluded from the sample. As a check, respondents were asked to identify their primary product and confirm the percentage of sales it represented. The mean percentage of turnover from the primary product category was 85% with the median being 95%. Excluding observations with missing data leaves a useable sample of 638 companies for this study. Of these 638 companies, 34 (5.3%) are set up with an employee benefit trust or ESOPS (Table 1).

Most responses related to private limited companies (81%), 16% to Publicly Listed Companies. The remaining companies were wholly owned subsidiaries, partnerships or overseas companies. Almost half of the companies (47%) had a majority stake held by current directors, with a further 7% having the current directors holding a significant minority stake. The median number of employees in the sample

was 100, with a maximum of 9,500 and a minimum of 4. Seventy one percent of firms had less than 200 employees. Over a third of firms were involved in the metal engineering industries, with other substantial shares being in paper, publishing & packaging; chemicals and petroleum; and in materials production (e.g. glass, ceramics, bricks).

## 6. Results

The results from the logistic model are presented in Table 2. The unrestricted model includes both testing (firm specificity, uncertainty and frequency of transaction) and structural variables. The restricted model includes structural variables only. Since the coefficients of non-testing variables retain the same sign in both models, multicollinearity is not overly high. The chi-square statistic of 87.182 rejects the hypothesis that the testing and structural variables together are not statistically different from zero. The Likelihood Ratio index of 0.7 indicates good fit. Both the chi-square and likelihood ratio index indicate robustness of the model.

We further check the robustness of the testing variable specification using the likelihood ratio test for statistical significance and Akaike (1974) Information Criterion (AIC) for predictive effectiveness. The likelihood ratio test statistic is  $c = -178.348 + 205.047 = 26.7$ . The critical value of Chi-Square distribution with 7 degrees of freedom at 0.01 level is 18.48, rejecting the hypothesis that testing variables are not jointly significant. The value of AIC for the model with testing variables is 230.348. The value of AIC for the model without the testing variables is 243.047. As the smaller AIC is preferred, the model with our testing variables is more predictive

With regard to our main hypothesis, the coefficients of three out of the four measures of firm-specificity are positive and statistically significant. The *job type*

*production* coefficient is positive and statistically significant at the 5% significance level. This result suggests that the more personal the production process (job as opposed to batch or flow productions), the higher the likelihood of ESOP. The *customised product* coefficient is positive and statistically significant at 10%. This result suggests that the more customised the product line, the higher the likelihood of ESOP. The *idiosyncratic product* coefficient is also positive and statistically significant at 10%. This result suggests that the more customised the product, the higher the likelihood of ESOP. The *technical product* coefficient, however, is positive but not statistically significant, implying that more technical or hi-tech products do not necessarily lead to partial employee ownership.

Evidence from the firm-specificity variables, therefore, appears to imply that an ESOP is likely to operate in firms with idiosyncratic production processes, customised product lines, and idiosyncratic products. This evidence strongly supports our hypothesis that likelihood of partial employee ownership is positively correlated with the firm-specificity of the non-human assets and of their non-separable human assets.

The coefficients of the two measures of uncertainty are both positive and statistically significant. The coefficient on the *internal* measure of uncertainty is positive and statistically significant at 1%. This suggests that a higher likelihood of ESOP is induced by internal quality uncertainty. The *external* uncertainty coefficient is also positive and statistically significant at 1%. It is noted that measurement uncertainty is as important as external/market uncertainty in inducing partial employee ownership. This result suggests the importance of measurement uncertainty in relation to partial employee ownership and is consistent with the idea that institutional arrangements are used to minimise measurement cost (Alchian and Demsetz, 1972).

Evidence relating to our hypothesis regarding the frequency of transactions is less strong. The coefficient on the frequency variable is positive as hypothesised, but only statistically significant at the 87% level. Thus we cannot say with any confidence that this element of our conceptual framework has any bearing on the use of ESOPs.

Finally, the adjustments for structural differences in firm type, industry type, legal status, ownership concentration, and size do not appear to have a strong impact on the likelihood of ESOP. Firms with current directors owning substantial shares seem to have a lower likelihood of ESOP. While partnership and proprietorship do not seem to influence the likelihood of ESOP, limited companies, relative to public companies (the omitted category), seem to reduce it. One explanation may be that limited companies, partnerships, or proprietorships may not want to go to the trouble to set up statutory ESOP. Private arrangements may accomplish the same objective and incur less transaction cost. Also, the industry differences do not seem to affect the likelihood of ESOP except in the metal engineering industry) which, relative to the omitted industry (retail/wholesale/services), significantly reduces it.

## **7. Conclusion.**

In this paper, we develop a conceptual analysis to make the case for an important and overlooked function of partial employee ownership: to safeguard the firm-specific part of investments in employee human capital. The analysis reveals that employee share ownership is more likely to be observed in a firm that depends on and encourages employees to make firm-specific investments in their human capital. The evidence from a group of British firms is consistent with this hypothesis. Indeed, both conceptually and empirically, our results are broadly consistent with the idea that institutional arrangements such as ESOPs can be analysed as transaction cost

minimising choices to govern specific transactions by providing economising degrees of ex ante incentive compatibility and ex post contractual safeguard.

These findings need to be set aside the current approach to employee share ownership in the UK. Recent legislation (Finance Act 2000) has very much promoted the use of employee share ownership on the tried and tested motivational and hence productivity enhancing role of employee ownership (see Inland Revenue). However, in the current economic environment, in which human capital and skills formation are paramount, it is evident that property rights have a larger and more fundamental role to play. Firstly, enabling firms to build and sustain their competitive advantage by rewarding and protecting employees who, along with shareholders, make firm-specific investments. Secondly, at a macro economic level, by contributing towards the maintenance and development of a countries skill base and competitive position. As such, the evidence reported here offers new insights into the spread of ESO in developed countries and in so doing further strengthens the case for promoting wider share ownership amongst employees.

## Appendix: Definition of Variables

Variable	Definition
Specificity	
<i>idiosyncratic product</i>	The product we sell is essentially different in terms of physical properties to other product on the market (1, strongly disagree/5, strongly agree)
<i>customised product</i>	Our product line can be best described as customised (1, strongly disagree/5, strongly agree)
<i>technical product</i>	Our product line is technical in nature (1, strongly disagree/5, strongly agree)
<i>job type production output</i>	What proportion (from 1 to 100) of output is accounted for by job type production?
Uncertainty	
Internal difficulty measuring quality	The quality of our product line is difficult to determine by inspection only (1, strongly disagree/5, strongly agree)
External Product line fast changing	Our product line can be described as fast changing (1, strongly disagree/5, strongly agree)
Frequency	
<i>repeated business</i>	The proportion (from 1 to 100) of our sales that represent repeated business is: 1 (0); 2 (1-20); 3 (21-40); 4 (41-60); 5 (61-80); 6 (81-100).
Legal Status	
<i>Limited</i>	= 1, if the company is registered as a limited company, 0 otherwise.
<i>Partnership/Proprietorship</i>	=1, if the company is registered partnership or proprietorship, 0 otherwise.

Ownership	
<i>Director share holdings</i>	= 1, if the current company directors hold majority or substantial minority shares, 0 otherwise.
<i>Firm Size</i>	Total number of employees is used as the proxy for size.
Company Type	
<i>raw material supplier</i>	= 1 if the company is a raw material supplier, 0 otherwise.
<i>intermediate producer</i>	= 1 if the company is an intermediate producer, 0 otherwise.
<i>final producer</i>	= 1 if the company is a final producer, 0 otherwise.
<i>retailer</i>	= 1 if the company is a retailer, 0 otherwise.
<i>wholesaler</i>	= 1 if the company is a wholesaler, 0 otherwise.
<i>commercial services</i>	= 1 if the company is commercial service company, 0 otherwise.
Industry Type	
<i>primary industries</i>	= 1 if the company is in Primary Industries, 0 otherwise.
<i>food &amp; drink</i>	= 1 if the company is in Food & Drink, 0 otherwise.
<i>chemical &amp; petrol</i>	= 1 if the company is in Chemical & Petrol, 0 otherwise.
<i>metal engineering</i>	= 1 if the company is Metal Engineering, 0 otherwise.
<i>textile and leather</i>	= 1 if the company is in Textile & Leather, 0 otherwise.

<i>timber/bricks</i>	= 1 if the company is in Timber/Bricks, 0 otherwise.
<i>paper/print/publishing</i>	= 1 if the company is in Paper/Print/Publishing, 0 otherwise.
<i>construction</i>	= 1 if the company is in Construction, 0 otherwise.

TABLE 1  
Descriptive Statistics of the Sample of 638 Companies

Variable	Percentage
ESOP	
<i>Companies with ESOP:</i>	5.3
<i>Companies without ESOP:</i>	94.7
 Organisational Characteristics	
Legal Status	
<i>Public Company</i>	16.1
<i>Private Company</i>	81.1
<i>Partnership or Proprietorship</i>	2.8
Ownership	
<i>Firms with current directors holding majority shares</i>	47.0
<i>Firms with current director holding significant minority shares</i>	7.0
 Company Characteristics	
<i>Raw Material Supplier</i>	4.9
<i>Intermediate Producer</i>	28.5
<i>Final Producer</i>	52.7
<i>Wholesaler</i>	4.7
<i>Retailer</i>	2.7
<i>Commercial Services</i>	4.9
<i>Consumer Services</i>	1.7
 Industry Characteristics	
<i>Primary Industries</i>	1.2
<i>Food &amp; Drink</i>	5.6
<i>Chemicals &amp; Petroleum</i>	11.1
<i>Metal Engineering</i>	34.6
<i>Textiles &amp; Leather</i>	9.0
<i>Timber &amp; Bricks</i>	10.2
<i>Paper Print Publishing</i>	11.4
<i>Construction</i>	2.9
<i>Wholesales &amp; Retail</i>	7.1
<i>Services</i>	6.9

**TABLE 2**  
Maximum Likelihood Estimated Coefficients of ESOP Logistic Response Model based on 638  
companies  
(Independent Variable = BESOP)

Variable	Unrestricted Model		Restricted Model	
<b>Specificity</b>				
<i>idiosyncratic product</i>	0.3819	(1.76)*		
<i>customised product</i>	0.3863	(1.82)*		
<i>technical product</i>	0.1855	(0.77)		
<i>job type production</i>	0.4970	(2.16)**		
<b>Uncertainty</b>				
<b>Internal</b>				
<i>difficulty measuring quality</i>	0.5247	(2.50)***		
<b>External</b>				
<i>product line fast changing</i>	0.5298	(2.60)***		
<b>Frequency</b>				
<i>repeated business</i>	0.3772	(1.51)		
<b>Legal Status</b>				
<i>limited</i>	-2.6265	(-4.40)***	-2.0036	(-5.01)***
<i>partnership/proprietorship</i> (0.46)	-0.3258	(-0.37)	-0.3665	
<b>Ownership</b>				
<i>director share holdings</i>	-0.8679	(1.84)*	-0.8549	(1.97)**
<i>firm size</i>	-0.1745	(-0.71)	-0.0607	(0.28)
<b>Company Type</b>				
<i>raw material supplier</i>	-0.0292	(-0.02)	-0.1445	(0.13)
<i>intermediate producer</i>	-1.0456	(-1.06)	-0.4009	(-0.45)
<i>final producer</i>	-0.8770	(-0.93)	-0.2943	(0.35)
<i>retailer</i>	-8.9814	(-0.14)	-7.9189	(-0.21)
<i>wholesaler</i>	1.5600	(1.38)	1.0760	(1.07)
<i>commercial services</i>	-10.657	(-0.25)	-8.0985	(-0.29)
<b>Industry Type</b>				
<i>primary industries</i>	-8.2505	(-0.09)	-7.7494	(-0.14)
<i>food &amp; drink</i>	-0.1552	(-0.16)	-0.4709	(-0.52)
<i>chemical &amp; petrol</i>	-0.5395	(-0.75)	-0.4506	(-0.68)
<i>metal engineering</i>	-1.0118	(-1.69)*	-1.0854	(-1.81)*
<i>textile &amp; leather</i>	-1.1823	(-1.23)	-1.4356	(-1.62)
<i>timber/bricks</i>	-8.7532	(-0.03)	-7.8747	(-0.41)
<i>paper/print/publishing</i>	0.4603	(0.65)	0.2756	(0.44)
<i>construction</i>	0.2659	(0.24)	0.1790	(0.18)
Constant (0.34)	0.0584	(0.05)	-0.3069	
Chi-Square	87.182*** (25 df)			
Likelihood Ratio Index	0.70			
-2 Log Likelihood	178.348		205.047	

Akaike's Information Criterion 230.348

243.047

$-2[\text{Log Likelihood (Unrestricted)} - \text{Log likelihood (Restricted)}] = 26.70^{***} (7 \text{ df})$

Notes:

Omitted groups for industry type (retail/wholesale/services industry); company type (consumer services companies) and legal status (publicly quoted companies).

\*\*\*, \*\*, and \* denote statistically significant at the 1%, 5% and 10% level respectively; *t*-ratios in parentheses.

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## Notes

<sup>1</sup> In a related study, Pisano (1990) asks why firms may rely on equity linkage to support certain transactions. He argues that partial ownership will dominate contractual governance when a transaction involves specific capital and uncertainty. He finds evidence from the biotechnology industry to support his argument. Our argument is broadly similar.

<sup>2 2</sup> See, e.g., Pindyck and Rubinfeld (1991) for descriptions of the logistic model

<sup>3 3</sup> See, e.g., Teece (1982), Masten (1984), and Masten et al (1989).

<sup>4 4</sup> The response rate was as expected given the detailed nature of the questionnaire survey. However, a response rate of 18% requires that tests for non-response bias should be undertaken. The comprehensive data-base from which the sample frame was drawn allowed thorough tests to be completed. Two tests were carried out. The first involved tests for differences in the sample characteristics between early respondents (returned questionnaires within one month) and later respondents (returned > 1 month). No significant differences were found. The second test involved t-tests on the full sample of respondents and non-respondents in four areas: size (e.g. total assets, employees, turnover); profitability (ROCE, ROTA); working capital structure (debtor days, creditor days) and age. There were no differences in the means of these variables at 5% significance. Pearson's chi square was used to test for geographical and industry bias and differences in legal status.

5 5 Separate samples were drawn from the firms in each manufacturing SIC code and random selections from these were combined to form the mailing file.