Directors' Ownership and the Performance of Small and Medium Sized Firms in the U.K.

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ABSTRACT. The primary purpose of this paper is to examine the relationship between firm performance and the proportion of shares owned by directors for a sample of small and medium sized companies in the U.K. The paper also examines, however, the impact of organisational form on firm performance. The results suggest that, in contrast to the majority of large firm studies on the subject, a curvilinear relationship is found to exist between firm performance and the percentage of equity held by the board of directors. The return on assets of firms is found to increase as director ownership increases up to a maximum at 68.2% of ownership, after which it then decreases as director ownership approaches 100% of equity. In addition, the results suggest that firms whose directors are more highly remunerated and who hold directorships in other companies are significantly more profitable. Furthermore, firms in which the owners perceive present management practices to be lacking in structure are found to have significantly lower performance.

Introduction

There has been a large body of literature, based largely on managerial and agency theories of the firm, that has examined both the empirical and theoretical effects of different ownership and control structures on firm performance. In contrast to prior studies which have almost exclusively focused their analysis on large mature firms (Lawriwsky, 1984; being the exception), the primary purpose of this paper is to examine the effect of directors' shareholdings on firm performance for a sample of small and medium sized companies in the U.K. In addition, consideration is given to the hypothesis put forward by Steer and Cable (1978) that the internal organisation of firms may affect their efficiency and hence their profitability.

The paper is organised as follows. Section I presents an analysis of previous empirical work examining the effect of ownership and control structures on firm performance. Section II discusses the data, model and variables utilised in examining the impact of both ownership and internal organisation on small firm performance. The results of the analysis are presented in Section III. Finally, Section IV presents a discussion of the main findings and provides some concluding remarks.

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I. Ownership structure and firm performance

Since Berle and Mean's (1932) hypothesis that the modern corporation is characterised by the separation of ownership and control, there has been a substantial body of empirical literature which has examined the effect of the ownership-control structure of the firm on its performance. The empirical evidence relating to the effect of ownership-control structures on performance is inconclusive with some studies finding support for the managerial hypothesis that management controlled firms are less profitable than owner controlled firms (see, for example, Monsen *et al.*, 1968;

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Larner, 1970; Radice, 1971; McEachern, 1975, 1976; Levin and Levin, 1982), and others reporting either inconclusive or inconsistent findings (see, for example, Kamerschen, 1968; Elliot, 1972; Sorenson, 1974; Demsetz and Lehn, 1985 and Murali and Welch, 1989).[1] In general, these studies employ a simple dichotomy to classify firms by control type, differentiating between owner controlled (OC) firms and management controlled (MC) firms on the basis of an arbitrary percentage ownership criteria. Firms were generally classified as being owner controlled if a dominant stock-holding interest owned a specified fraction of the firm, and as being management controlled if stockholding interest were so diverse that no single interest or coalition of interest could effectively control the firm,[2] the definition of management control being based on that proposed by Berle and Means (1932).

An area of contention within these studies concerns the classification of firms in which the managers/directors own a significant proportion of the equity. In the majority of the earlier studies (McEachern, 1975, 1976; being a notable exception), there is no distinction within the OC group between ownership by external shareholders and ownership by managers/directors — these two groups being assumed to face the same incentives to maximise shareholder wealth. Such an assumption is consistent with the Jensen and Meckling (1976) 'convergence of interest' hypothesis which contends that, as management ownership in a firm increases, performance increases as managers become less inclined to divert resources away from value maximisation. This hypothesis therefore suggests that a uniformly positive relationship exists between management ownership and firm performance. However, in contrast to the 'convergence of interest' hypothesis, Demsetz (1983) and Fama and Jensen (1983) contend that market discipline will force managers to adhere to value maximisation at very small levels of management ownership, but high levels of management ownership could lead to management 'entrenchment', as non-manager shareholders find it difficult to monitor and control the actions of such managers (i.e. managers have sufficient control to follow their own objectives without fear of discipline from other ownership interests). Hence at high levels of management ownership, performance may be affected adversely.

The above discussion suggests that previous studies which assume that director(management)-shareholders and external shareholders hold similar value maximising objectives and that firm performance will be affected positively by director ownership (should a relationship between ownership and performance exist) may be misspecified. Moreover, the majority of empirical studies which test for some relationship between firm performance and director ownership assume that the relationship is linear. However, Morck *et al.* (1988) suggested that the relationship between director ownership and performance may be non-linear as a result of the combination of Jensen and Meckling's (1976) 'convergence of interest' hypothesis and Fama and Jensen's (1983) 'entrenchment' hypothesis. In general, therefore, although increased equity positions by directors might by seen as aligning their interests with outside shareholders, it may also be the case that directors use the 'power' of increased shareholdings to improve their own compensation and perquisites. At given levels of director shareholdings, the gains directors can make through increasing compensation and perquisites probably outweigh the losses in the stock of wealth through decreased firm performance. Therefore, due to the confounding influences of the convergence of interest and entrenchment effects, it is not possible, a priori, to predict the relationship between director ownership and firm performance.

Empirical results lend some support to the above arguments. Employing Tobin's Q as a measure of performance,[3] Morck *et al.* (1988) found a positive relationship existed between director ownership and Q in the 0% to 5% ownership range, a negative and less pronounced relationship in the 5% to 25% range, and a positive but less pronounced relationship beyond the 25% ownership level. Similar findings were reported when the profit rate was used as a measure of performance. Similarly, the results of McConnell and Servaes (1990) suggest that a curvilinear relationship existed between director ownership and Q as the value of the firm first increased and then decreased as ownership becomes concentrated in the hands of directors. Similar results

were reported when the return on assets was employed as the dependent variable.

Furthermore, it also needs to be noted that the hypothesis (Demsetz and Lehn, 1985) of the structure of ownership varying systematically in ways that are consistent with value maximisation assumes that the firm is operating within the confines of an efficient capital market and that firms are able to easily adjust their ownership structures to be consistent with value maximisation. As argued by Bosworth and Jacobs (1989) this is not necessarily the case for small and medium sized firms. Directors of such firms may hold more than the profit maximising level of equity due to their inability to sell equity shares to outside parties or their desire to maintain control over the firm. More particularly,

> ownership appears to confer more than just a stream of future income flows on the owner-manager. Male owner-managers exhibit both a drive for independence and a desire to control their life and working environment (Ritchie *et al.*, 1982; Clutterbuck and Devin, 1985; Gill, 1985). Desire for control includes the control of others, and this can determine the direction and extent of the growth of the small business. (Bosworth and Jacobs, 1989, p. 24).

Consequently, it may be hypothesised that in small and medium sized firms, firm performance does not increase monotonically with increased levels of director ownership.

In addition to the arguments considered above, the attitudes of the directors towards risk and their possible effect on firm performance warrant discussion. It may be hypothesised that the relative risk aversion of a director will depend on his/her portfolio of investments. For example, the risk aversion of a director may differ if the director also holds directorships in a number of other firms, or indeed, has only a small fraction of his/her personal wealth invested in the firm. The relative risk aversion of directors may be controlled for including the number of other directorships held as a proxy variable for portfolio diversity.[4] Therefore, firms in which the directors hold directorships in other firms would be expected to be less risk averse and should yield higher profitability measures than firms in which the directors have no other business interests. It may be argued, however, that directors of firms that are performing relatively well are likely to be in demand by other firms. Hence, any finding of a positive relationship between performance and other directorships has more than one possible explanation. Nonetheless, it is important that the potential relationship between these variables is controlled for in the following analysis.

A further factor which may affect firm performance is the internal organisation of the firm. Steer and Cable (1978) argue that the internal organisation of firms is likely to affect their efficiency and hence their profitability. To examine the effect of internal organisation on firm performance, this paper focuses on organisational characteristics which may affect the ability of directors to effectively control the firm. As argued earlier (see for example, Bosworth and Jacobs, 1989), small and medium sized firm growth and performance might be hampered by the desire of the original owner(s) to retain control over a large proportion of the firm's operations. In other words, small and medium sized firm growth and consequently performance may be constrained because the firm lacks the appropriate management and control structures to successfully manage a growth in operations. These factors are controlled for in this paper by including a variable based on the lack of structured management systems present in the firm.

A final but related influence that needs to be allowed for is the relationship between firm performance and directors' remuneration. There is now an expanding literature which has examined the linkages between managerial compensation and firm performance. For example, Abowd (1990) reported results which suggest that increasing the sensitivity of managers' rewards in the current period to current performance, increases performance in the next period. In contrast, Crystal (1990) could find no significant relationship to exist between performance and managerial compensation. Although, the existing evidence may be somewhat inconclusive (see Milgrom and Roberts, 1992), the potential importance of managerial compensation for firm performance is such as to warrant its inclusion in the empirical analysis of this paper.

In summary, the above discussion suggests that a number of factors need to be taken into

consideration when empirically analysing the effects of directors' ownership on firm performance. First, there is the need to allow for the relationship between performance and ownership to be non-linear in form. Second, the relationship between firm performance and the relative diversity of the directors' portfolios should be part of the analysis. Third, the possible effects of a firm's internal organisation on firm performance need to be considered. Finally, some allowance needs to be made for the relationship between directors' remuneration and firm performance.

II. Sample, variables and empirical method

(i) *Sample*

To ensure that data of the appropriate type is available, the sample used in this paper consists of 72 small and medium sized companies in the U.K., derived from a database of 104 companies which was compiled as part of an ESRC sponsored programme on Managerial Labour Markets. The database contains data on a sample of USM companies and a sample of private companies, matched in terms of sector, age and location. The database consists of face to face interview data, collected by means of a structured questionnaire, with the firms' owners (predominantly the original founders of the firm) and managers over a six to nine month period in 1988/89. This particular database was chosen as the basis for the sample because the mix of private and USM companies allows the ownership issue to be investigated and it contains data pertaining to the characteristics of each firm's internal organisation.

The financial data used in this paper span the period 1986 to 1988 and were extracted from each firm's annual accounts on microfiche obtained from Companies House. However, the final sample was reduced to 72 firms due to missing data (this reduction was due mainly to missing accounts or to the filing of modified accounts in which there is no requirement to state the profit for the year). Thus, although the sample may initially be considered to be small, the final sample size reflects the costs and difficulties of collecting data appropriate to testing the issues discussed above.

(ii) *Variables*

(a) *Dependent variable*

The definition of performance used in this paper is the rate of return on capital employed. There is a large body of empirical studies which suggest that small and medium sized firms use relatively large amounts of short-term debt to finance investment (see, for example, Fazzari *et al.*, 1988 and Keasey and McGuinness, 1990). These findings suggest that, when focusing on small and medium sized firms, the measurement of capital employed utilised should include short-term debt, as its exclusion may overstate the returns on capital earned by such firms. Hence this paper utilises the return on total assets as its dependent variable (RTA). In terms of the numerator of RTA, profit is defined as accounting profit before interest payments, tax and directors' remuneration.[5] Directors' remuneration is not deducted from profit because, as shown by Watson (1991), the remuneration paid to directors' may be more a reflection of tax considerations and as a means of dealing with the potential costs of firm insolvency, rather than as a payment for entrepreneurial and managerial inputs.

(b) *Independent variables*

Owner control variables. Several variables were constructed to measure the significance and nature of the relationship between firm performance and directors' ownership. The basic unit of measurement is the proportion of shares in the firm owned by directors (DC) in 1986, the beginning of the period under consideration. In order to test the hypothesis that the relationship is curvilinear, a second form of the variable DC^2 (the square of the proportion of shares owned by directors) is included in parts of the analysis. In line with the earlier studies, dummy variables were also derived to classify firms in to one of two groups, dependent on the proportion of equity owned by directors. However, to meet Lawriwsky's (1984) criticism that the majority of studies have not established the sensitivity of their results to alternative definitions of control, the present study uses a variety of percentage point definitions of owner-

ship. The cut-off points used to create the ownership dummy variables were 10%, 20%, through to 90% equity ownership by the directors, which created the dummy variables DIR10, DIR20, through to DIR90 respectively. The form of these variables is detailed in Figure 1.

In addition to variables representing the proportion of shares owned by directors, a variable

DEPENDENT VARIABLE	DESCRIPTION	EXPECTED SIGN
RTA	Return on total assets defined as accounting profit before interest and tax and directors' remuneration divided by total assets.	
OWNERSHIP VARIABLES		
DC	Proportion of shares owned by directors.	+
DC2	Square of the proportion of shares owned by directors.	−
DIRx	Dummy variable coded 1 if the directors' shareholdings amount to x% or more of total shares, 0 otherwise (where x is 10%, 20% . . . , 90% respectively).	+
OTHDIR	Dummy variable coded 1 if one or more directorships in other firms are held by the directors and 0 if the sample firm is the only directorship held.	+
ORGANISATIONAL VARIABLES		
STRUCMAN	Dummy variable coded 1 if the owner felt that potential growth was constrained by the need to introduce structured management, 0 otherwise.	−
DIRREM	Directors' remuneration divided by total assets.	+
CONTROL VARIABLES		
SIZE	Total assets averaged over the period 1986 to 1988.	+
DEBT	Ratio of short and long-term debt and short-term creditors to total assets averaged over the period 1986 to 1988.	+
SECURE	Dummy variable coded 1 if the firm has a secured loan, 0 otherwise.	+
GROWTH	Growth in total assets measured over the period 1986 to 1988.	+
IND	Industry classification dummy coded 1 if the firm belongs to the electricals, engineering, textiles, oil, gas or miscellaneous industrials classifications, and 0 otherwise.	+
AGE	Firm's age in 1986 in years.	+

Fig. 1. Description of variables.

OTHDIR was created to represent the other directorships held by the directors of the sample firms. OTHDIR is a dummy variable coded 1 if 1 or more directorships in other firms are held by the directors and 0 if the sample firm is the only directorship held. This is included as a proxy of the diversification of the portfolios of the directors and, for the reasons outlined in Section I, is expected to be positively related to firm performance.

Organisational characteristic and directors' remuneration variables. As noted in Section I, it is hypothesised that the firm's internal organisation may affect the performance of the firm via its impact on the ability of directors to pursue their own objectives. In order to capture the impact of internal organisation on firm performance, a dummy variable STRUCMAN was created, based on information obtained from interviews with the firm owners. Owners were asked to describe the degree to which they perceived that the need to introduce structured management was a critical factor inhibiting potential growth. This factor was described as being critical, very important, of some importance, of minor importance or irrelevant. STRUCMAN was coded 1 if owners perceived the need to introduce structured management as being a critical or important factor inhibiting growth and 0 otherwise. It is hypothesised that firms inhibited by a lack of structured management will be unable to operate efficiently and will be less profitable than other firms. Hence STRUCMAN is expected to be negatively related to firm performance.

In line with arguments presented in the first section of this paper, the variable DIRREM is used to capture the relationships between firm performance and directors' remuneration. This variable is defined as directors' remuneration scaled by total assets. The scaling by total assets is to capture the relative impact of directors' remuneration on firm performance defined as the return on total assets. Following the theoretical literature on agency (see, for example, section 2 in the excellent text by Honkapohja, 1989), firm performance is hypothesised to be positively related to the directors' remuneration variable.

Control variables. Given the existing empirical literature on ownership and firm performance, several independent variables are included in the analysis to control for other factors which may be important determinants of the return on total assets. The control variable DEBT is the ratio of total debt to total assets and is included to capture the argument that higher levels of risk should be accompanied by higher returns. Similarly, the secured loan variable (SECURE) is included to reflect another dimension of risk; namely, that firms with secured loans need to earn higher returns to ensure that they are able to meet debt repayments. The variables firm age (AGE) and industry (IND) are also included to capture the risk/return relationship. Younger firm are argued to be more at risk because of their relative lack of business experience and relatively weak market position and IND is included to reflect the position that certain industries might be argued to be more risky than others. The growth in total assets variable (GROWTH) is included to reflect the possibility that faster growing firms generate higher returns and firm size (SIZE) is included to control for any possible size effects. These variables are described and signed in relation to the returns dependent variable (RTA) in Figure 1.

(iii) *Empirical method*

The empirical analysis consists of a series of OLS regressions of the dependent variable RTA on the ownership, organisational characteristics and control variables. Due to the skewness of the distributions of the continuous variables GROWTH and AGE, the natural log forms of these variables are used in the analysis. In view of the possibility of the existence of heteroskedasticity, the Halbert-White correction technique was employed. This technique calculates standard errors which are robust in the presence of unknown heteroskedasticity.[6] Furthermore, the correlation matrix in appendix 1 indicates that multicollinearity does not appear to be a problem with the present data and variables.

As for most samples constructed to consider the performance of firms, it has to be accepted that the present sample of small and medium sized firms may suffer from survivor basis: namely, those firms who report low profits may have been taken over or failed and disappeared from the

sample. For the present study, however, the presence of a survivor bias is likely to strengthen the testing of the hypothesis of interest — if performance is related to ownership and the poorly performing firms are not incorporated into the sample because of their demise, then the full strength of the relationship will not be captured in the data. Therefore, any relationship between performance and ownership found to be significant for the present sample is likely to be strengthened when tested on samples not suffering from survivor bias.

The analysis begins by first describing the distribution of the variables. This is then followed by a number of stages of multivariate analysis. The first stage examines the relationship between directors' ownership and firm performance, testing the hypothesis that a positive (and implicitly linear) relationship exists between the two variables. Secondly, the hypothesis (supported by the results of McConnell and Servaes, 1990) that the relationship between directors' ownership and firm performance is curvilinear in form is investigated. The third and fourth stages of analysis further explore the potential non-linearities between firm performance and directors' ownership, by respectively, piecewise fitting a regression function around a given break point and by the use of dummy variables to denote differing levels of director ownership.

III. Empirical results

(a) *Univariate statistics*

To provide a background to the empirical results, Table 1 presents summary statistics for the variables shown in Figure 1. The statistics for the return on total assets (RTA) variable indicates that across the sample as a whole, firms earned approximately a 18% return with the maximum and minimum of the range equalling 63% and −27% respectively. Given the operating and financing environments facing small and medium sized firm, these statistics do not indicate anything unusual about the present sample. The directors' ownership variable (DC) shows that the mean proportion of shares owned by directors for the firms in this sample is approximately 61%. The maximum and minimum values of 100% and 3.4%

TABLE 1
Summary statistics

Continuous variables

	Mean	Standard deviation	Maximum	Minimum
RTA	0.184	0.157	0.628	−0.272
DC	0.609	0.327	1.000	0.034
Size*	6876.378	8281.212	47899.330	28.330
DirRem	0.061	0.061	0.299	0.000
Growth	1.393	1.519	7.160	−0.470
Debt	0.598	0.1765	1.180	0.120
Age	9.972	5.189	34.000	2.000

Dummy variables

	Coded 0	Coded 1
Secure	29	43
Othdir	9	63
Strucman	35	37
Ind	35	37

* in £000'S

for this variable support the notion that the sample offers a wide range of ownership structures. In terms of the mean level of directors' ownership, the present sample is radically different from the samples employed by Morck *et al.* (1988) and McConnell and Servaes (1990) which had average directors' ownership of 10.6% and 11.84% respectively. Given the small size and unquoted status of the firms employed in this sample, such a difference in average directors' ownership is be to expected. The closed nature of small and medium sized firms and the fact that there is no obvious means to attract large numbers of external shareholders leads most firms of this type to have relatively high directors' ownership.

Examination of the remaining univariate statistics shown in Table 1 indicates that the sample has most of the characteristics to be expected of a set of small and medium sized firms.

(b) *Multivariate statistics*

The first stage of the analysis examines the relationship between firm performance and directors' ownership by regressing RTA against DC and the other explanatory/control variables described in Figure 1. As shown by the results presented in

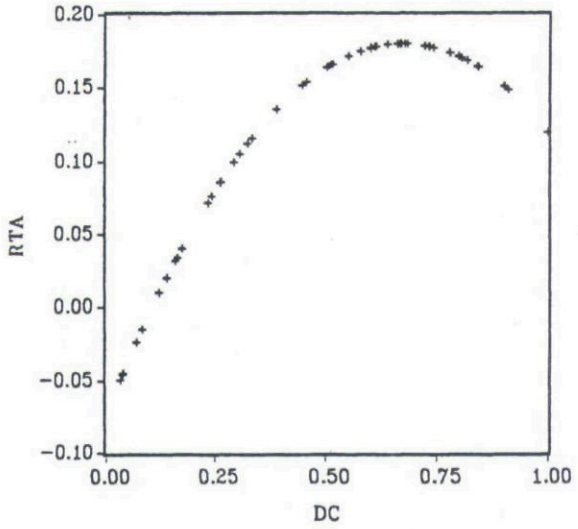

Fig. 2. Relationship between performance and directors' ownership.

Table 2, the overall regression explains approximately 36% of the variation in the dependent variable and it contains four variables which are significant at acceptable levels of confidence. Of the four significant variables, there is evidence of a positive relationship between RTA and directors' ownership DC but the relationship is only significant at the 10% level using a two tailed test. The other variables significant in the regression results reported in Table 2 are OTHDIR and DIRREM at the 5% level of confidence and STRUCMAN at the 10% level of confidence. The positive coefficient on the OTHDIR variable indicates that firms where directors hold directorships in other organisations have higher returns on total assets. The results also indicate that there is a significant positive relationship between firm performance and directors' remuneration (DIRREM). The negative coefficient on the STRUCMAN variable indicates that firms which perceive they lack structured management have on average a lower level of performance.

The second stage of the analysis involves testing whether a curvilinear relationship exists between firm performance and directors' shareholdings. The regression results shown in Table 3 indicate that allowing for the possibility of a curvilinear relationship between performance and directors' ownership improves the general explanatory power (as measured by R^2) of the equation. The results also present strong evidence of a curvilinear relationship between firm performance and directors' ownership, as the coefficient on the DC variable is positive and significant at the 1% level whilst the (smaller) coefficient on DC^2 is negative and

TABLE 2
OLS regression estimates — linear form

Dependent variable = RTA

Variable	Estimated coefficient	Standard error	*t*-Statistic
DC	0.1220	0.0647	1.8856*
Othdir	0.1122	0.0506	2.2176**
Size	1.208E-6	2.118E-6	0.5704
Debt	−0.0319	0.1123	−0.2839
Secure	−0.0203	0.0282	−0.7190
LG (Growth)	0.0663	0.0446	1.4865
Ind	−0.0153	0.0340	−0.4502
LG (Age)	0.0022	0.0339	0.0861
Strucman	−0.0547	0.0289	−1.8894
DirRem	1.1636	0.3225	3.6084**
Constant	−0.0525	0.1129	−0.4653

$\bar{R}^2 = 0.3607$ $F = 5.0064$

(Hetroskedasticity-consistent covariance matrix)

* Significant at 0.1 level of confidence.
** Significant at 0.05 levels of confidence.

TABLE 3
OLS regression estimates — curvilinear form

Dependent variable = RTA

Variable	Estimated coefficient	Standard error	*t*-Statistic
DC	0.6207	0.2122	2.9245**
DC^2	−0.4551	0.1783	−2.5527**
Othdir	0.1065	0.0460	2.3135**
Size	1.093E-6	1.995E-6	0.5480
Debt	−0.0170	0.1103	−0.1539
Secure	−0.0338	0.0271	−1.2435
LG (Growth)	0.0509	0.0431	1.1816
Ind	−0.0116	0.0342	−0.3380
LG (Age)	−0.0035	0.0247	−0.1403
Strucman	−0.0574	0.0266	−2.1558**
DirRem	1.3283	0.3149	4.2180**
Constant	−0.1222	0.1183	−1.0330

$\bar{R}^2 = 0.4153$ $F = 5.5851$

(Hetroskedasticity-consistent covariance matrix)

* Significant at 0.1 level of confidence.
** Significant at 0.05 levels of confidence.

significant at the 1% level. These findings suggest that the return on total assets first increases and then decreases as directors' ownership increases — the estimated equation is graphed in Figure 2. At directors' ownership levels below 68.2%, the positive effect of directors' ownership dominates any negative effects, but beyond ownership levels of 68.2%, the negative effect dominates. Under this stage of analysis the OTHDIR, DIRREM and STRUCMAN variables remain significant.

The third stage of the analysis further explores the non-linearity of the relationship between firm performance and directors' ownership by the use of piecewise regression techniques, allowing the coefficient on the *DC* variable to change at 68.2% of directors' ownership. To capture the potential non-linearity an additional two variables were created based on the proportion of directors' ownership:

DIR (0−68.2)
= directors' ownership (*DC*) if *DC* < 0.682
= 0.682 if DC > = 0.682

DIR (68.2−100)
= 0 if *DC* < 0.682
= *DC* − 0.682 if *DC* > = 0.682

For example, when directors' ownership is equal to 0.50, DIR (0−68.2) is equal to 0.50 and DIR (68.2−100) is equal to 0. When directors' ownership is equal to 0.75, DIR (0−68.2) is equal to 0.682 and DIR (68.2−100) is equal to 0.068. Therefore, taken together, the values of DIR (0−68.2) and DIR (68.2−100) sum to the proportion of shares owned by the directors. The results obtained when employing the piecewise variables in place of DC are presented in Table 4. The significance of the directors' ownership variables and the maintained R^2 reinforces the suggestion that the relationship between firm performance (RTA) and directors' ownership is indeed non-linear.

As a final check on the results obtained above, the fourth stage of analysis follows the lead of the majority of previous studies by employing dummy variables to denote different ownership structures. The large number of regressions for this stage of the analysis, however, preclude the results being tabulated.[7] In terms of the analysis, nine dummy

TABLE 4
OLS regression estimates — piecewise form

Dependent variable = RTA

Variable	Estimated coefficient	Standard error	*t*-Statistic
DC(0−68.2)	0.3059	0.0918	3.3323**
DC(68.2−100)	−0.2700	0.1470	−1.8374*
Othdir	0.1140	0.0451	2.5299**
Size	1.036E-6	1.929E-6	0.5374
Debt	−0.0280	0.1111	−0.2519
Secure	−0.0374	0.0273	−1.3665
LG (Growth)	0.0495	0.0434	1.1424
Ind	−0.0119	0.0335	−0.3547
LG (Age)	−0.0075	0.0252	−0.2972
Strucman	−0.0547	0.0265	−2.0606**
DirRem	1.3707	0.3204	4.2781**
Constant	−0.0791	0.1104	−0.7168

$\bar{R}^2 = 0.4263$ $F = 5.7980$

(Hetroskedasticity-consistent covariance matrix)

* Significant at 0.1 level of confidence.
** Significant at 0.05 levels of confidence.

variables were created (DIR10, DIR20, etc., up to DIR90). RTA was regressed against each of the ownership dummy variables. The coefficients on the variables DIR10 through to DIR60 were all positive and significant to at least the 10% level (employing two-tailed tests of significance). The coefficients of DIR70 and DIR80 were positive but insignificant, whilst the coefficient of DIR90 was negative but insignificant. Thus, in general these results reinforce those obtained under stages two and three of the analysis. However, whilst the use of several dummy variables denoting differing levels of ownership provide some insight into the relationship between directors' ownership and firm performance, they provide a somewhat incomplete picture. Given that the majority of previous studies have based their analysis on the use of a single ownership dummy without theoretical guidance or sensitivity analysis (Lawriwsky, 1984), the results of the analysis presented here suggest that any examination of the relationship between firm performance and ownership need to investigate the *form* of the relationship.

Overall, the results suggest that a significant curvilinear relationship exists between firm performance and directors' ownership for small and medium sized firms. In addition, the performance

of small and medium sized firms is positively related to the presence of directors holding directorships in other firms and to directors achieving relatively higher levels of remuneration.[8] Finally, there is evidence to suggest that firms in which the owners perceive present management practices to be lacking in structure are found to have significantly lower performance.

IV. Discussion and conclusions

This paper has investigated the relationship between firm performance and directors' ownership for a sample of small and medium sized firms. In contrast to the majority of previous studies which have studied the relationship between performance and ownership based on the assumption that any relationship found to exist will be linear in form, this paper has sought to investigate in detail the nature of the hypothesised relationship between firm performance and directors' ownership. The results of this study suggest that the nature of the relationship between firm performance and directors' ownership is more complex than the linear form implicitly assumed in the majority of prior studies. In line with the work of McConnell and Servaes (1990), the analysis has suggested that the relationship is curvilinear in nature, with the return on assets increasing as directors' ownership increases up to a level of ownership of 68.2% and thereafter the return on assets decreases as directors' ownership increases up to 100%. Such findings are supported by a number of stages of analysis.

These results are consistent with those of McConnell and Servaes in the form of the relationship found to exist. However, they contrast with McConnell and Servaes in that the maximum return on assets is estimated to be obtained at ownership levels of 68.2%, whereas the McConnell and Servaes study found value to be maximised at less than 40%. The McConnell and Servaes findings are also consistent with the model derived by Stulz (1988) which predicts a curvilinear relationship to exist between firm value and management ownership. In addition the Stulz model predicts that value of the firm will be maximised prior to the 50% level of management ownership. However, as argued previously, such findings are based on the assumption that firms are able to adjust their ownership structures to be consistent with value maximisation, which may not be the case for small and medium sized firms. The finding that those firms which feel constrained by the need to introduce structured management systems are less profitable than others suggests that such firms may not be operating at their most profitable. Therefore, the lack of ability or willingness to delegate decisions to lower management may be a factor which constrains firms with a high level of director ownership from operating to their full potential. In addition, the results suggest that there is a positive relationship between firm performance and the holding of other directorships. However, it is not possible to establish the causality of this relationship. Finally, the results suggest that a positive relationship exists between firm performance and directors' remuneration.

In spite of the strong empirical results, a shortcoming of this study is that it has focused on the shareholdings of directors, without considering the distribution of external shareholdings. As argued by Cubbin and Leech (1983), such an approach takes no account of the difference in shareholding dispersion between firms. Further work in this area would need to consider the impact of other large shareholders on firm performance. In addition, the proxy used for internal organisation is a preliminary attempt to empirically capture internal organisation and further work may profit from examining the use of alternative methods of empirically measuring internal organisation in small and medium sized firms.

Notes

[1] For an extensive review of this literature, see Hunt (1986).

[2] For example, Monsen *et al.* defined as OC those firms in which one party owned at least 10% of the voting stock and there was evidence of active control or one party owned at least 20% of voting stock. MC firms were defined as those firms in which no single party owned more than 5% of the voting stock.

[3] Defined as the ratio of the firm's market value to the replacement cost of its physical assets.

[4] Whilst this solution cannot possibly account for the diversity of portfolios on an individual director basis, in aggregate, it may help to overcome some of the problems associated from viewing risk from the standpoint of the individual (closed) firm.

[5] It should also be noted that the use of accounting numbers to examine performance is fraught with difficulties (see, for

example, Williamson, 1967; Salmon and Smith, 1979). However, given that the sample consists of firms for which market values are obviously unavailable, it is necessary to employ accounting numbers to obtain a measure of firm performance.

[6] White (1980).

[7] These regressions are available on request from the authors.

[8] It must be noted that, as suggested in Section 1, the positive relationship between performance and other directorships may be due to the directors of high performing firms being more likely to obtain directorships in other firms, hence reversing the line of causation.

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Appendix 1

APPENDIX 1
Correlation matrix

	RTA	DC	DC^2	Othdir	Size	Debt	Secure	LG (Growth)	Ind	LG (Age)	Struc-man	DirRem
RTA	1.000	0.373*	0.321*	0.200	−0.052	−0.026	−0.177	0.232	−0.225	0.035	−0.123	0.476**
DC		1.000	0.973**	−0.084	−0.244	−0.101	−0.105	−0.043	−0.319*	−0.032	0.224	0.414**
DC^2			1.000	−0.104	−0.282	−0.086	−0.146	−0.093	−0.284	−0.031	0.206	0.458**
Othdir				1.000	0.174	0.067	−0.054	0.086	0.137	0.227	−0.200	−0.178
Size					1.000	−0.136	0.091	0.282	−0.189	0.003	−0.076	−0.410**
Debt						1.000	0.190	0.340*	−0.085	−0.221	0.186	−0.020
Secure							1.000	0.076	0.051	−0.113	0.108	−0.152
LG (Growth)								1.000	−0.373*	−0.255	0.071	−0.044
Ind									1.000	0.198	−0.112	−0.107
LG (Age)										1.000	−0.059	0.058
Strucman											1.000	0.088
DirRem												1.000

* denotes significance at 0.01 using a two-tailed test.
** denotes significance at 0.001 using a two-tailed test.