

Is Ownership Really Endogenous?

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Abstract

We find for a large panel of US firms that managerial ownership is (econometrically) endogenous as Himmelberg, Hubbard and Palia (1999) found. The largest shareholder, however, affects performance exogenously. This also holds for German firms.

JEL classification: G32, L21, M21

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1 Introduction

The relation between ownership structure and performance is important for assessing the effectiveness of corporate governance. Recent panel data evidence by Himmelberg, Hubbard and Palia (1999, henceforth HHP) suggests for US corporations that managerial (insider) ownership is endogenous to performance. Two concerns however remain which the present paper address. First, managerial ownership by itself is not sufficient to fully capture a firm's ownership structure. Although ownership in the USA is usually described as being highly dispersed, there are a large number of quite sizeable share stakes. These large shareholders can be expected to have some influence on management and thus on corporate performance.¹ Second, ownership is much more stable in other corporate governance systems, like in Germany, which makes it more likely that ownership is exogenous to performance.

To tackle the first concern, we use a large panel data set of US corporations which in addition to insider ownership also includes the stakes of the largest shareholder. To assess the importance of the second concern, we test for the endogeneity of ownership for German panel data. Consistent with HHP, we find insider ownership being indeed endogenous in the USA. After using instrumental variable techniques, managerial shareholdings have no statistically significant effect on performance as measured by the return on total assets. The largest shareholder, however, still affects performance. This is also found for Germany.

The paper is organized as follows. Section 2 briefly discusses the theoretical background. Section 3 presents the data sets, the model, and the results of the regression analysis and endogeneity tests. Section 4 summarizes and concludes.

¹ Zeckhauser and Pound (1990) study large shareholders in the USA, for Europe see Gugler (2001).

2 Theoretical background

When ownership is dispersed, the incentives and the ability for direct monitoring are weak (Jensen and Meckling, 1976). Managerial ownership aligns shareholder-manager interests and corporate performance should be enhanced by managerial ownership. However, insider ownership may allow managers to become “entrenched”, which affects performance negatively (Morck et al., 1988). At low levels of shareholdings incentive alignment improves performance, in the medium range entrenchment reduces performance, and at high levels “convergence of interest” again outweighs “entrenchment”. This discussion suggests a causal impact of ownership on performance, albeit in a non-linear fashion.

However, ownership may be *determined* by the characteristics of the firm, e.g. its contracting environment, the inherent riskiness of its assets, or its performance, that is ownership may be endogenous. For example, the scope for moral hazard may be greater for managers of riskier firms so they should hold greater stakes to align incentives (Demsetz and Lehn, 1985). HHP indeed find that insider ownership is endogenous to performance, once unobserved firm heterogeneity is controlled for.

Our empirical analysis asks whether the *largest* shareholder's stake matters for the endogeneity/causality relation in *addition* to managerial ownership. Large shareholders have an incentive to monitor the firm intensely because a large portion of their wealth is directly affected by managerial decisions. Large shareholders also have the means to interfere with corporate decisions by virtue of their voting rights, or in the case of large inside shareholders by virtue of their direct influence on management decisions, or both.²

² The Economist (Nov. 21st, 2001) reports that founding families retain a surprising amount of influence on quoted companies in the USA even though their stakes are sometimes not larger than 5 or 10%. For example, the Hewlett family holding a stake of 5.2% of Hewlett-Packard (HP) voted against the merger of HP and Compaq, proposed by the management of HP, as did many other shareholders. This suggests that large shareholders are active monitors of management in the USA.

3 Empirical analysis

We utilize panel data sets of 491 listed US corporations and 167 listed German firms to test for the endogeneity of insider and large shareholder ownership. The time period is 1989 to 1997 for US firms and 1991 to 1996 for German firms. Balance sheet data for US firms are taken from the *Global Vantage Database*, for the German corporations from the *Hoppenstedt Bilanzdatenbank*. Insider ownership (*IS*) data for US firms are from *Compact Disclosure* using the *Securities and Exchange Commission's (SEC)* corporate proxy statements. Insider ownership is defined as the total number of shares held in aggregate by all officers and directors as a percentage of total shares outstanding, and is available for the US firms but not for the German firms. Percentage holdings of largest shareholders (> 5%; *LS*) of US companies are obtained from Item 12 of Form 10-K on a yearly basis. The German data originate with Commerzbank's *Wer gehört zu wem?*, Bayerische Hypotheken- und Wechselbank's *Wegweiser durch deutsche Aktiengesellschaften*, and Hoppenstedt's *Börsenführer*.³

Our empirical model is

$$\begin{aligned}
 ROA_{it} = & a_{i(j)} + \lambda_t + b_1 LS_{it} + b_2 (LS_{it})^2 + b_3 (LS_{it})^3 + b_4 IS_{it} + b_5 (IS_{it})^2 + b_6 (IS_{it})^3 + \\
 & + b_7 SIZE_{it} + b_8 GROW_{it} + b_9 CAP_{it} + b_{10} CS_{it-1} + \varepsilon_{it}
 \end{aligned}
 \tag{1}$$

where subscripts i , j and t identify firms, 3-digit industries, and time periods, respectively; ε is the *iid* regression error. The return on total assets (*ROA*) is defined as net profits plus depreciation and interest payments divided by total assets. To control for non-linearities in the performance-ownership relationship, respective power functions of *LS* and *IS* are included. Further explanatory variables are firm size (log of total assets), firm growth (*GROW*, annual change in the log of turnover), capital intensity (*CAP*, tangible assets scaled by employees) and capital structure (*CS*, total debt scaled by total assets). To reduce possible simultaneity lagged values of *CS* are

³ See Lehmann and Weigand (2000) for a detailed description of the German data.

used. Fixed firm (a_i) or industry effects (a_j) and fixed time-specific effects (λ_t) are controlled for.

Table 1 shows that the average (median) stake of the largest shareholder in US firms is 17.0% (12.0%), the average (median) insider holdings amount to 13.0% (6.2%). More than 70% of US firms have at least one large shareholder with a stake larger than 10%. Clearly, large shareholding is an important corporate governance device in the USA. Ownership concentration in Germany is enormous with the average largest shareholder holding more than 70% of the equity. Although higher in the USA, *ROA* is quite similar for both data sets.

Table 2 summarizes the Within-OLS and Within-IV coefficient estimates for equation (1). Results and F-test statistics are presented for both the fixed firm and fixed industry effects specifications.⁴ As instruments in the Within-IV regressions we use the ownership variables lagged by one period plus all other exogenous variables. The Within-IV estimates in the table refer to the specification in which we assume for the US firms both *LS* and *IS* to be endogenous (for Germany *LS* to be endogenous). We present the Wu-Hausman tests of endogeneity for this specification as well as for the specifications in which we test either *LS* or *IS* to be endogenous.

For the USA in both specifications, we can reject exogeneity of all six ownership variables at the 0.001 level of significance, and at the 0.053 level for the insider ownership variables alone. However, we cannot reject exogeneity of the *LS* variables alone. Largest shareholders in the USA significantly affect performance even if we control for fixed firm effects and estimate by Within-IV. In the fixed industry effects specification, we reject exogeneity of the insider ownership variables at the 0.101 level of significance. It appears, therefore, that insider ownership is responsible for any findings of endogeneity.

⁴ Zhou (2001) questions using fixed firm effects when examining the relation between managerial ownership and performance. We report both fixed firm and industry effects estimates.

For Germany, we cannot reject exogeneity of the largest shareholders for both specifications. The *LS* variables significantly affect performance in the industry effects specification, but are insignificant in the fixed firm effects regressions. Given the stable shareholding structure in Germany, this is to be expected, since fixed firm effects almost completely wash out within firm variation in the *LS* variables.

The point estimates of the *LS* coefficients imply that increases in the stake of the largest shareholder increase *ROA* until a stake size of 18.9% in the USA and 27.8% in Germany. Performance deteriorates for further stake increases until 39.9% and 83.3%, respectively, before performance picks up again thereafter. This implies that only 21.5% of US large shareholders decrease firm performance, while this percentage is 55.3% for Germany.

4 Conclusions

This paper addresses two questions. First, is the ownership of large shareholders also endogenous as HHP show for aggregate insider ownership? Second, are there differences across systems of governance concerning the endogeneity of ownership?

Based on a large panel data set of listed US and German corporations, we find that total insider holdings are at least in part endogenously determined in the USA. However, large shareholders affect firm performance separately and exogenously, as is the case in the German system of corporate governance where large shareholders are ubiquitous. Our results suggest that large shareholders must not be neglected when drawing inferences as to the effects of ownership structure on firm performance.

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Table 1**Summary statistics**

Variable	USA	Germany
Largest shareholding		
Mean	0.1701	0.7199
Median	0.1204	0.7660
Insider shareholdings		
Mean	0.1304	
Median	0.0626	
Return on total assets		
Mean	0.1123	0.1059
Median	0.1205	0.1030
log Total assets (firm size)		
Mean	6.3839	6.3468
Median	6.2202	6.0333
Change in log turnover (firm growth)		
Mean	0.0482	0.0413
Median	0.0549	0.0119
Total assets / employees (capital intensity)		
Mean	190.10	212.06
Median	118.74	169.11
Debt / total assets (capital structure)		
Mean	0.2405	0.6506
Median	0.2213	0.6650
Number of firms	491	167

Total assets are in million US \$ for US firms and in million DM for German firms.

Table 2
Panel regression estimates of the ROA equation

Dependent variable: ROA				
Explanatory variable	USA		Germany	
	firm effects	industry effects	firm effects	industry effects
	Regression coefficients (absolute t-statistics)			
	Within-OLS			
	Within-IV			
Largest shareholding	0.0228 (0.23) 0.7726 (1.79) *	0.1132 (1.82) * 0.2561 (2.81) ***	0.0430 (0.27) - 0.1900 (0.69)	0.1969 (2.39) ** 0.1709 (1.96) ***
(Largest shareholding) ²	- 0.4600 (1.31) - 2.9780 (2.08) **	- 0.4340 (2.29) ** - 0.8080 (3.01) ***	- 0.1260 (0.43) - 0.2580 (0.50)	- 0.4800 (2.82) *** - 0.4100 (2.26) **
(Largest shareholding) ³	0.8280 (2.47) ** 3.3800 (2.56) **	0.4190 (2.74) *** 0.6840 (3.30) ***	0.0632 (0.38) - 0.1210 (0.42)	0.2880 (2.86) *** 0.2460 (2.27) **
Insider shareholding	- 0.1576 (1.76) * - 0.4919 (1.09)	- 0.0687 (1.18) - 0.0723 (0.69)		
(Insider shareholding) ²	0.5840 (2.09) ** 1.2630 (0.74)	0.1650 (0.83) - 2.8400 (0.07)		
(Insider shareholding) ³	- 0.0484 (2.13) ** - 0.8880 (0.48)	- 0.0484 (2.13) ** - 0.2450 (0.55)		
Firm size	- 0.0218 (4.11) *** - 0.0125 (1.78) *	0.0045 (4.04) *** 0.0050 (3.59) ***	- 0.0109 (1.52) - 0.0096 (1.28)	- 0.0024 (1.57) - 0.0020 (1.34)
Firm growth	0.0873 (11.6) *** 0.0816 (8.48) ***	0.0979 (12.1) *** 0.1006 (11.2) ***	- 0.0001 (0.10) - 0.0001 (0.11)	0.0009 (0.48) 0.0009 (0.47)
Capital intensity	6.26×10^{-6} (0.89) 7.21×10^{-6} (1.01)	$- 4.35 \times 10^{-6}$ (0.70) $- 2.03 \times 10^{-6}$ (0.31)	- 0.0289 (2.98) *** - 0.0274 (2.78) ***	- 0.0315 (2.50) ** - 0.0314 (2.50) ***
Capital structure (t-1)	0.0369 (2.58) ** 0.0327 (1.67) *	- 0.0248 (2.80) *** - 0.0396 (3.61) ***	- 0.0191 (1.06) - 0.0195 (1.07)	- 0.0858 (5.67) *** - 0.0863 (5.70) ***
Number of firms	491		167	
Number of industries	109		24	
Number of observations	2,703		828	
Adj. R squared	0.4320	0.2084	0.7023	0.1531
Firm effects (F-stat.)	4.24 *** 4.35 ***		11.27 *** 11.22 ***	
Industry effects (F-stat.)		4.27 *** 4.22 ***		4.05 *** 4.04 ***
Wu-Hausman [chi2 p-val.]				
all LS and IS variables	0.0000	0.0096		
all IS variables	0.0527	0.1097		
all LS variables	0.8058	0.8985	0.9997	0.9707

*** / ** / * significant at the 0.01 / 0.05 / 0.10 error level respectively.