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DOES OWNERSHIP MATTER? A STUDY OF GERMAN AND UK IPOS.

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ABSTRACT: This paper investigates whether ownership concentration and different types of large shareholders can account for differences in corporate profitability. Both univariate tests and multivariate tests are applied on a sample of German and UK initial public offerings (IPOs). It is particularly interesting to study German and UK IPOs for two reasons. First, comparing German and UK firms is beneficial in terms of a high cross-sectional variation of ownership, as both countries have financial markets characterised by different levels of ownership concentration. Most previous studies have suffered from a low cross-sectional variation. Second, analysing IPOs over several years adds an interesting time-series variation to the study.

The univariate study tests whether entrenchment by the initial large shareholder and a higher exposure to the disciplining role of the market for corporate control have any effects on a firm's financial performance. The multivariate study tests a dynamic model which relates current performance to past performance and ownership characteristics. We do not find any link between profitability and ownership and conclude that ownership is chosen in ways to maximise firm value.

Key words: Initial Public Offerings, ownership, control, performance

JEL classification: G32, G34

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1. Introduction

The question whether there is a link between ownership and control is not a new one. Adam Smith (1776) refers to the problem which might arise from the separation of control and ownership:

'It is in the interest of every man to live as much at his ease as he can; and if his emoluments are to be precisely the same, whether he does, or does not perform some laborious duty, it is certainly his interest, at least as interest is vulgarly understood, either to neglect it altogether, or, if he is subject to some authority which will not suffer him to do this, to perform it in as careless and slovenly a manner as that authority will permit.'

The present paper performs a study of the financial performance of British and German IPOs floated by families or individuals. As Germany and the UK have financial systems characterised by significantly different levels of ownership concentration and different control structures, they provide a rich cross-sectional variation.

It is particularly interesting to study IPOs for two major reasons. First, the period around the IPO is a period of potentially substantial changes of ownership. Before the flotation a firm's ownership in general remains very stable: Goergen (1997b) shows that 94-96 per cent of German firms are floated by their founding shareholders and 76-85 per cent of UK firms are floated by their founders. Secondly, the period following the IPO is when the ownership structure is established. A firm's ownership seems to be established after about 5-6 years as the results in Goergen (1997b) suggest.

Unlike previous studies, this one does not discriminate against small and medium-sized firms. Rather than selecting our sample from one of the annually published ranking tables, as most previous studies did, our sample is formed by the German

firms going public between 1981 and 1988. The German IPOs are then matched with UK IPOs.

Section 2 discusses previous empirical studies. Section 3 develops the hypotheses which will be tested and explains the two different methodologies used. Section 4 describes the data and measures of performance we adopt. Section 5 contains the results from our study. Finally, section 6 concludes the paper.

2. Results from previous empirical studies

This paper builds on the results by Goergen (1997b) which show that ownership by the pre-IPO shareholders six years after the flotation can be explained by factors such as the level of risk of the firm's environment and the liquidity needs of the original shareholders. In other words, we consider ownership to be endogenous.

Several studies on firm value (e.g. Morck, Shleifer and Vishny (1988)), Wruck (1989) and McConnell and Servaes (1990)) have detected a link between financial performance and ownership. However, as Loderer and Martin (1996) observe, the relationship is weak and the studies do not agree on the regions of ownership that are beneficial or detrimental to firm value. These studies, given that they are mostly based on large, widely held US companies, are characterised by a poor cross-sectional variation of ownership. Other studies that have analysed firms with a wider range of ownership concentration (e.g. Slovin and Sushka (1993)) or have questioned the direction of causality from ownership to performance (e.g. Demsetz and Lehn (1985), Kole (1996) and Loderer and Martin (1996)) have in general found no relationship at all.

3. Does ownership matter?

This section will try to detect whether ownership matters in terms of resource allocation. Do different ownership structures and different levels of ownership

concentration imply different levels of financial performance? Two different types of analysis are performed: a univariate analysis and a multivariate analysis.

3.1 Univariate analysis

We derive three conjectures from the following theoretical propositions:

- the Berle-Means (1932) thesis: widely held firms should perform (significantly) worse than concentrated firms;
- the Leland and Pyle (1977) signalling theory: insiders by selling only a small amount of the equity of their business concern in the IPO signal that they believe that their firm will perform well in the future: by extending the Leland and Pyle proposition from the IPO to seasoned equity offerings (SEOs), this would imply that the more concentrated firms should perform better than the widely dispersed firms;
- the entrenchment hypothesis (Fama and Jensen (1983)), which states that if a manager has control over his firm, he might be tempted to adopt a non-profit maximising approach, as he will not be exposed to the disciplining role of the market for corporate control: the concentrated firms are expected to perform worse than the loosely held firms.

First, we compare the financial performance of German firms remaining under family control over the six-year period following the IPO with the financial performance of UK firms that become widely held before the end of the same period. The aim of this first univariate test is to compare German firms that have the concentrated ownership of the typical listed German firm with UK firms that have the dispersed ownership of the typical listed UK firm. In other words, this first test tries to determine whether the typical German firm performs better / worse than the typical UK firm.

C1. *As listed German and UK firms are characterised by very different patterns of ownership, they should also be characterised by very different levels of performance.*

Second, we compare German and UK firms that remain under family control with widely held German and UK firms.

Essentially, this second test assumes along with the theory of ownership that firms with a similar ownership should have similar levels of profitability, independent of the fact that they may be incorporated and be operating in different countries. More precisely, this second test is a test of the entrenchment hypothesis.

C2. *Firms whose ownership remains concentrated in the hands of the original shareholders have a worse performance than firms whose owners sell out to the market.*

Finally, using an event study, we try to determine whether firms that experience a substantial reduction in ownership concentration also experience substantial changes of their financial performance.

C3. *If ownership has an influence on financial performance, then substantial reductions in ownership concentration should be followed by substantial changes in the firm's financial performance.*

3.2 Multivariate analysis

The multivariate analysis acts as an additional test, i.e. a verification of the results obtained from the previous analysis. Given that the estimated model distinguishes between share stakes held by the pre-IPO shareholders and stakes held by all other shareholders, and is a dynamic model taking into account changes of ownership, the multivariate analysis encompasses the three separate univariate tests described in the previous section.

For the multivariate analysis we estimate an equation which relates financial performance to past financial performance, past ownership by the pre-IPO shareholders and past ownership of the firm by the post-IPO shareholders.

Hence:

$$P_{i,t} = \beta_0 + \beta_1 * P_{i,t-1} + \beta_2 * OLD_{i,t-1} + \beta_3 * NEW_{i,t-1} + \beta_4 * TYPE_{i,j,t-1} + \gamma_i \quad (1)$$

where:

- $P_{i,t}$ is a measure of the financial performance of firm i during year t;
- $OLD_{i,t}$ is a measure of the ownership held by the pre-IPO shareholders at the end of year t;
- $NEW_{i,t}$ is a measure of the ownership held by the post-IPO shareholders.

We use three different measures of ownership by pre-IPO shareholders and by post-IPO shareholders:

- the largest stake held by each category, $Lold_{i,t}$ and $Lnew_{i,t}$ respectively;
- the total proportion of voting shares owned by each group, $Told_{i,t}$ and $Tnew_{i,t}$ respectively;
- a Herfindahl index of the concentration of ownership in each category, $Cold_{i,t}$ and $Cnew_{i,t}$ respectively.

- If the measure of ownership is the stake held by the largest old shareholder, i.e. $Lold_{i,t}$, and the largest new shareholder, i.e. $Lnew_{i,t}$, the dummy variables $Type_{i,j,t}$ are added to the model. They indicate the type of largest shareholder (i.e. the largest shareholder as such, independent of whether he is a pre-IPO shareholder or a post-IPO shareholder) in firm i in period t where:
  - *Family* stands for a family shareholder;
  - *Domestic* for another firm from the same country;
  - *Foreign* for a firm from another country;
  - *Bank* for a bank and
  - *Investor* for a non-bank institutional investor and

- *Charity* for a charity.[1]

- the error term $\gamma_i = \eta_i + \nu_{i,t}$, where η_i is the fixed-effects term and $\nu_{i,t}$ is the inter-temporal error term.

A more general and simple model will also be estimated where ownership is expressed as the proportion of voting shares that are widely held, $Wh_{i,t}$ (obtained by taking the difference between 100 per cent and the sum of all known stakes in the firm). In other words, $Wh_{i,t}$, $Told_{i,t}$ and $Tnew_{i,t}$ add up to 100 per cent whereas $Lold_{i,t}$ and $Lnew_{i,t}$ only refer to the largest shareholder in each category and do in general not add up to 100 per cent.

Concerning the general specification of the model, we regress present financial performance on past financial performance and past ownership. Present performance is regressed on past ownership rather than present ownership, as we believe that it takes time for changes in ownership patterns to affect financial profitability. After a change of control, the new controlling shareholder needs time to understand how the firm works and to devise and put in place new management strategies and procedures. Finally, as we will see in section 5.1.2, Geroski and Jacquemin (1988) show that imposing the restriction that profitability in t depends only on profitability in t-1, and not also on the profitability of earlier periods (e.g. t-2, t-3), is a valid restriction for German and UK firms.

All the dynamic panel data models were estimated using OLS as well as GMM (Generalised Method of Moments) in differences (GMM(diff)) and GMM system (GMM(sys)). Dynamic OLS models provide biased and inconsistent estimates if there are unobserved fixed effects as the error term will be correlated with the

[1] In order to prevent perfect multicollinearity in the model, the penultimate type of shareholder dummy, *Investor,* is omitted in the models estimated on the size-matched sample (there were no charities exercising the role of largest shareholder) and the last type of shareholder dummy, *Charity,* is omitted from the industry-matched model.

explanatory variables. In this case the coefficient on the lagged dependent variable will suffer from an upward bias.

Arellano and Bond (1991) suggest a procedure which consists in first-differencing the model and then applying the Generalised Method of Moments (GMM(diff)), using lagged levels of the dependent variable and the independent variables as instruments. By taking first differences, the fixed error term η_i is eliminated. Given that the shocks $v_{i,t}$ are not serially correlated, we can use the lagged levels dated t-2 and earlier of the dependent variable and the independent variables as instruments to obtain a consistent estimator. The advantage of the Arellano and Bond technique over other methods such as the widely used Anderson and Hsiao (1982) procedure is its efficient use of available instruments.

Blundell and Bond (1995) have shown that GMM(diff) performs poorly, if the autoregressive parameter is moderately large and the number of time series observations is moderately small. In other words if there are no fixed effects (or few fixed effects), then the lagged levels of the series are weak instruments and GMM(diff) provides a downward-biased estimate of β_1, the coefficient on the lagged dependent variable.

GMM(sys) uses a system of equations, i.e. the lagged differences of the dependent variable and the independent variables as instruments for equations in levels as well as lagged levels of the dependent variable and the independent variables for equations in first differences. Blundell and Bond (1995) show that, using Monte Carlo simulations, GMM(sys) provides efficiency gains where GMM(diff) performs poorly.[2]

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[2] All the models were estimated using the most recent version, the 1996 version of the Arellano and Bond (1988) DPD programme written in GAUSS.

4. Data description and measures of performance used

4.1 The data

The sample of German IPOs used in this paper is identical to the sample used in Goergen (1997b). Our period of study covers 1981 to 1988. During that period there was a total of 98 IPOs on the official and secondary markets in Germany. We have consistent and reliable ownership data for 86 of these IPOs. We focus on the 62 firms (out of the 86 firms) floated by families or individuals.

Given that during 1981 to 1988, there was a total of 764 UK IPOs on the official market and on the USM, not all UK IPOs could be taken into consideration in this study. The 62 German IPOs were therefore matched with UK IPOs of the same market capitalisation (adjusted for inflation) to obtain a first sample and were also matched by industry to obtain a second sample.

Accounting data were obtained from the IPO prospectuses, company reports, Extel Financial Company Research CD-roms as well as from Datastream and the EXTEL microfiches for the UK. Share price data were taken from the *Karlsruher Kapitalmarktdatenbank (KKMD)* for Germany and from the London Share Price Database ((LSPD) for the UK. If the firms published consolidated accounting figures from the year of the IPO the consolidated figures were used rather than the unconsolidated figures.

4.2 Measures of performance

We use three different measures of financial performance. The first two measures use accounting data. Although German accounting data have often been accused of being meaningless, Harris, Lang and Möller (1994) find that there is a similar relationship between 18-month stock returns and annual earnings for German firms as there is for US firms between 1982 and 1991.

The first measure is entirely based on accounting figures. It is the annual cash flow defined as the published profit gross of depreciation, interest, taxes and changes in provisions divided by the sum of equity and debt of the firm.

The second measure is the same cash flow figure but divided by the market value of equity and the book value of debt. This measure is similar to the measure used by Healy, Palepu and Ruback (1992). Compared to our first measure of return, the advantage of this second measure is that given that it is not based on the book value of assets it excludes the effects of different policies of depreciation, of interest charges and interest receivable and taxes. Therefore, this measure does not depend on the capital structure of the firm.

As some German firms have two classes of shares, with only one of them listed on the stock exchange (normally the non-voting preference shares), we used the stock price of the quoted class of property rights as an estimation of the value of the unquoted class. We are aware that this might introduce a downward bias in the calculated rate of return for the German companies.[3]

As German accounting is not subject to standards as rigorous as those in the UK, it was not possible to calculate ratios such as a profit margin defined by operating profit over sales. The sales figure can indeed include VAT and council taxes for some firms. Furthermore, some firms change the definition of sales figure over years. Also the sales figure is sometimes net of sales costs and in these cases sales costs are not separately stated elsewhere in the company report.

We therefore reasoned that it would be wise to use a third measure of performance which would not be based on accounting data. The third measure is the annual cumulative abnormal returns (CARs) calculated from the end of month share prices.

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[3] This rough estimation is still better than using the book value for the unlisted class. Indeed, using the book value would double the value of the ratio for firms such as Henkel KGaA.

The CARs were calculated by using the market model with $\beta=1$ and $\alpha=0$. For each country two different stock market indices were used in order to check the robustness of the results to different approximations of the market portfolio. For Germany we alternatively used the DAX Index (Deutscher Aktienindex) and the FAZ Index (Frankfurter Allgemeine Zeitung Index) whereas for the UK we used both the FT-SE 100 Index and the FT-All Share Index.

For the German IPOs the two latter measures of performance might be subject to a difference in valuation due to takeover legislation. In Germany it is possible to take control over a listed concern without having to make an offer for the entire equity. Changes of control of firms with a concentrated ownership are normally arranged off the stock market by transferring the existing controlling stake to the new shareholder, without involving the minority shareholders. As a consequence, the market price does not include the same takeover premium as it does in the UK.

5. Discussion of the results

5.1 Results from the univariate analysis

We first discuss the results from the univariate analysis. The discussion of the results is organised in three parts corresponding to the three conjectures established in section 3.1. Second, we discuss the findings from the multivariate test. Finally, given the results from the second test, we perform an additional test.

5.1.1 Results from the univariate analysis

5.1.1.1 Comparison of the financial performance of concentrated German firms and widely held UK firms

This section tests the validity of conjecture one, i.e. it compares the German firms that remain under family control over the seven years following the IPO with the UK firms that become widely held. The aim of this first univariate test is to detect whether the

two systems of capital markets, which are characterised by contrasting ownership structures, are also characterised by different levels of financial performance.

We consider that a firm becomes widely held if none of its shareholders holds more than 25 per cent of the voting shares after a certain time and until the end of the period of study at least. We are aware that this threshold is arbitrary in the case of the UK, but using a threshold has the advantage of being clear-cut and avoids dealing with more ambiguous definitions that are subject to difficulties of interpretation. Morck, Shleifer and Vishny's (1988) findings somehow justify our choice as they show that shareholdings of at least 25 per cent are controlling shareholdings. Firms that become widely held, but are eventually taken over are excluded from this first test.

25 UK firms are widely held according to the above definition. Nine of these firms already had a dispersed ownership immediately after the flotation. The remaining 16 firms became widely held immediately after the IPO or gradually during the subsequent years.

We define a firm as remaining under family control, if the initial family shareholder has the largest stake in the firm over the period of study, given that his stake exceeds at least 25 per cent of the voting equity at any time.

Table 1 contains the descriptive statistics for the first measure of financial performance, the ratio of cash flow defined as the published profit gross of depreciation, interest, taxes and changes in provisions over the book values of debt and equity. Panel B and panel C of table 1 shows that for this first measure of financial return the difference in performance between German and UK IPOs is not statistically different from zero at any reasonable level of confidence. This is both true for each of the individual years and for the whole period.

Table 1: Performance of German firms remaining under family control and UK firms that become widely held using the ratio of cash flow to book values of equity and debt as a performance measure

(1) The measure of performance is cash flow gross of depreciation, interest, taxes and changes in provisions divided by the book values of equity and debt. (2) The German firms are all the firms that remained under the control of their initial family shareholder over the whole period. The controlling shareholder is defined as the largest shareholder of the firm, holding at least 25 per cent of the voting equity. The UK firms are all the firms that were or became widely held during the period and then remained widely held at least until the end of the period. A firm is defined as being widely held, if none of its shareholders owns more than 25 per cent of its voting equity.

Panel A: Mean, median, minimum, maximum and sample size								
	IPO	**IPO+1**	**IPO+2**	**IPO+3**	**IPO+4**	**IPO+5**	**IPO+6**	**Total period**
Germany								
Mean	20.3	19.3	18.8	17.8	16.5	15.0	16.1	17.0
Median	18.4	18.7	18.1	16.5	16.0	15.2	17.1	15.8
Mini-mum	9.5	3.1	-6.1	5.1	3.6	-20.3	-24.3	-11.8
Maxi-mum	53.5	39.5	40.2	40.2	44.1	38.5	36.9	39.1
Sample size	27	31	33	35	36	34	25	36
UK								
Mean	22.7	18.1	19.4	15.2	15.1	10.8	11.9	15.8
Median	23.0	18.0	18.5	17.1	15.8	14.2	14.4	15.5
Mini-mum	11.1	-26.5	3.6	-7.1	-69.6	-51.9	-29.4	-3.6
Maxi-mum	39.6	48.4	41.2	30.5	101.6	27.4	26.9	26.6
Sample size	13	25	26	25	23	21	21	26
Panel B: t-statistics for the difference in means								
	-0.800	0.386	-0.278	1.102	0.293	1.121	1.097	0.595
Panel C: Wilcoxon-Mann-Whitney p-value								
	0.161	0.933	0.827	0.713	0.855	0.564	0.175	0.440

Source: IPO prospectuses, company reports, Datastream, Extel Financial and LSE microfiches.

Table 2 displays the values and the descriptive statistics for the second measure of performance, the ratio of the cash flow gross of depreciation, interest, taxes and changes in provisions over the market value of equity and the book value of debt. Again, there is no significant difference between the performance of the two samples both for of the individual years and for the entire period of study.

Table 2: Performance of German firms remaining under family control and UK firms that become widely held using the ratio of cash flow to market value of equity and book value of debt as a performance measure

(1) The measure of performance is cash flow gross of depreciation, interest, taxes and changes in provisions divided by the market value of equity and the book value of debt. (2) The German firms are all the firms that remained under the control of their initial family shareholder over the whole period. The controlling shareholder is defined as the largest shareholder of the firm, holding at least 25 per cent of the voting equity. The UK firms are all the firms that were or became widely held during the period and then remained widely held at least until the end of the period. A firm is defined as being widely held, if none of its shareholders owns more than 25 per cent of its voting equity.

	IPO	IPO+1	IPO+2	IPO+3	IPO+4	IPO+5	IPO+6	Total period
Panel A: Mean, median, minimum, maximum and sample size								
Germany								
Mean	11.3	11.1	11.2	10.8	10.3	9.8	11.1	10.5
Median	11.2	9.8	11.8	9.7	9.7	11.4	10.4	10.8
Mini-mum	4.3	2.0	-4.6	1.8	3.0	-19.2	-20.2	-10.9
Maxi-mum	23.1	20.9	24.1	25.5	20.6	28.7	32.1	23.7
Sample size	27	31	33	35	36	34	25	36
UK								
Mean	11.6	9.6	13.2	10.0	8.9	7.2	7.5	9.7
Median	11.7	11.8	13.1	10.6	11.6	9.3	8.8	10.7
Mini-mum	4.2	-17.7	3.0	-6.2	-52.8	-29.8	-23.8	-3.6
Maxi-mum	15.8	19.7	22.7	22.3	66.8	27.0	18.7	17.5
Sample size	13	25	26	25	23	21	21	26
Panel B: t-statistics for the difference in means								
	-0.166	0.952	-1.372	0.508	0.392	1.037	1.270	0.649
Panel C: Wilcoxon-Mann-Whitney p-value								
	0.479	0.735	0.169	0.927	0.489	0.211	0.205	0.484

Source: IPO prospectuses, company reports, Datastream, Extel Financial, LSE microfiches, LSPD and Saling.

Table 3 contains the descriptive statistics for the third performance index, the annual cumulative abnormal returns. There is some evidence that German firms that remain family-controlled perform better two years (at the one per cent level of confidence for the two-tailed parametric and non-parametric tests) after the flotation. However, in year five UK firms tend to perform better (at the five per cent level for the t-test and at the ten per cent level for the Wilcoxon-Mann-Whitney test). If one looks at the aggregate data (last column of table 3), there is no evidence that either the German IPOs or the UK IPOs perform consistently better.

Furthermore, different stock indices such as the DAX Index and the FT-SE 100 Index and different pairings of German and UK indices used for the calculation of the cumulative abnormal returns do not produce different results.

Again one cannot reject the null hypothesis of an identical performance for both samples over the whole period of analysis.

Table 3: Performance of German firms remaining under family control and UK firms that become widely held using the cumulative abnormal returns as a performance measure

*(1) The measure of performance is the cumulative abnormal return. The cumulative abnormal returns were obtained by using a market model with parameter values of β =1 and α =0. The market indices used are the FAZ Index for Germany and the FT-All Share Index for the UK. (2) The German firms are all the firms that remained under the control of their initial family shareholder over the whole period. The controlling shareholder is defined as the largest shareholder of the firm, holding at least 25 per cent of the voting equity. The UK firms are all the firms that were or became widely held during the period and then remained widely held at least until the end of the period. A firm is defined as being widely held, if none of its shareholders owns more than 25 per cent of its voting equity. (3) * Significant at the one per cent level for the two-tailed test. ** Significant at the five per cent level for the two-tailed test.*

Panel A: Mean, median, minimum, maximum and sample size								
	IPO	**IPO+1**	**IPO+2**	**IPO+3**	**IPO+4**	**IPO+5**	**IPO+6**	**Total period**
Germany								
Mean	6.4	-2.0	15.1	-2.4	-10.8	-10.7	-1.8	-6.2
Median	3.7	-2.8	11.3	-4.4	-5.8	-7.8	9.5	-6.7
Mini-mum	-71.5	-79.3	-28.7	-59.3	-125.4	-110.3	-272.9	-382.1
Maxi-mum	99.5	98.0	85.9	82.7	41.9	106.4	99.1	265.5
Sample size	37	37	37	37	37	37	37	37
UK								
Mean	1.1	-15.2	-14.1	-17.6	2.7	14.1	-10.1	-39.3
Median	0.2	-10.0	-17.3	-19.5	-1.8	5.0	-5.9	-25.4
Mini-mum	-70.0	-135.9	-101.3	-134.6	-76.9	-109.4	-93.8	-246.0
Maxi-mum	87.3	88.0	153.0	83.4	88.8	175.9	62.8	128.2
Sample size	29	29	29	29	28	26	25	29
Panel B: t-statistics for the difference in means								
	0.645	1.284	2.995*	1.574	-1.484	-1.993**	0.605	1.315
Panel C: Wilcoxon-Mann-Whitney p-value								
	0.684	0.304	0.001	0.146	0.277	0.091	0.162	0.212

Source: IPO prospectuses, company reports, Datastream, Extel Financial, LSE microfiches, LSPD and Saling.

Tables 1 and 2 suggest that there may be a possible time trend in the average performance of widely held UK firms. The first performance measure (table 1), the

ratio of the cash flow to book values of equity and debt, drops gradually from 23 to 12 per cent. For the second measure of performance (table 2), a time trend also seems to be present, but is less pronounced. There is no time trend in the profitability of the German firms in either case. There is no time trend, neither for the German firms nor the UK firms, if financial performance is measured by the cumulative abnormal return (table 3).

Given that by definition some of the UK firms start off being concentrated and become widely held after a few years only, and that all the UK firms necessarily have a dispersed ownership in year six, one could argue that if the Berle-Means (1932) thesis is true, as more and more firms get loosely held, the lower the average profitability should fall.

However, by analysing the underlying performance data, we can say that the time trend is caused by the firm with the lowest performance in each year (the firms whose performance is listed under minimum). If these firms are dropped, the time trend disappears. Furthermore, by analysing the ownership of these firms, we could not detect a common ownership issue (e.g. a substantial drop in ownership concentration).

To summarise, our results are not consistent with conjecture one. The German and UK capital markets, which are characterised by different patterns of ownership, are not characterised by different levels of financial performance.

5.1.1.2 Comparison of the financial performance of concentrated firms and widely held firms

In this section, we compare the performance of concentrated companies with widely held companies, i.e. we investigate whether conjecture two is valid. The difference with the previous section is that here we compare all concentrated firms - whether German or UK firms - with all dispersed firms.

Our concentrated firms are all the firms that remain under family control as defined in the previous section. We also use the same definition for the widely held firms as the one used in the previous section. Although a number of UK firms fall under the former category, none of the German firms falls under the latter.

Tables 4, 5 and 6 report the results for this second univariate test. Table 4 shows that if we adopt the ratio of cash flow to the sum of the book values of debt and equity as a measure of financial profitability, we cannot reject the null hypothesis that there is no difference between the performance of concentrated firms and loosely held firms. This is true for each individual year, for the total period of analysis, and is also true whatever type of statistical test we use.

Table 4: Performance of all the firms remaining under family control and all the firms that become widely held using the ratio of cash flow to book values of equity and debt as a performance measure

(1) The measure of performance is cash flow gross of depreciation, interest, taxes and changes in provisions divided by the book values of equity and debt. (2) The firms in panel A are all the German and UK firms that remained under the control of their initial family shareholder over the whole period. The controlling shareholder is defined as the largest shareholder of the firm, holding at least 25 per cent of the voting equity. The firms in panel B are all the German and UK firms that were or became widely held during the period and then remained widely held at least until the end of the period. A firm is defined as being widely held, if none of its shareholders owns more than 25 per cent of its voting equity.

Panel A: Mean, median, minimum, maximum and sample size								
	IPO	**IPO+1**	**IPO+2**	**IPO+3**	**IPO+4**	**IPO+5**	**IPO+6**	**Total period**
Firms with no change of control								
Mean	21.5	19.8	17.9	16.9	15.2	14.7	13.7	16.4
Median	19.4	19.0	17.9	16.5	14.7	15.7	16.8	16.3
Mini-mum	3.6	1.5	-12.3	-14.1	-9.3	-28.8	-24.3	-11.8
Maxi-mum	53.5	44.5	40.2	43.2	44.1	38.5	36.9	39.1
Sample size	47	54	58	61	61	58	49	62
Firms experiencing a separation of ownership and control								
Mean	22.7	18.1	19.4	15.2	15.1	10.8	11.9	15.8
Median	23.0	18.0	18.5	17.1	15.8	14.2	14.4	15.5
Mini-mum	11.1	-26.5	3.6	-7.1	-69.6	-51.9	-29.4	-3.6
Maxi-mum	39.6	48.4	41.2	30.5	101.6	27.4	26.9	26.6
Sample size	13	25	26	25	23	21	21	26
Panel B: t-statistics for the difference in means								
	-0.400	0.652	-0.678	0.705	0.048	1.178	0.524	0.320
Panel C: Wilcoxon-Mann-Whitney p-value								
	0.435	0.866	0.663	0.920	0.655	0.602	0.408	0.641

Source: IPO prospectuses, company reports, Datastream, Extel Financial and LSE microfiches.

If we use the ratio of cash flow to the sum of the market value of equity and the book value of equity (table 5), we arrive at the same conclusion: the performance of German and UK firms remaining under family control is not significantly different from the performance of firms experiencing a separation of ownership and control.

Table 5: Performance of all the firms remaining under family control and all the firms that become widely held using the ratio of cash flow to market value of equity and book value of debt as a performance measure

(1) The measure of performance is cash flow gross of depreciation, interest, taxes and changes in provisions divided by the market value of equity and the book value of debt. (2) The firms in panel A are all the German and UK firms that remained under the control of their initial family shareholder over the whole period. The controlling shareholder is defined as the largest shareholder of the firm, holding at least 25 per cent of the voting equity. The firms in panel B are all the German and UK firms that were or became widely held during the period and then remained widely held at least until the end of the period. A firm is defined as being widely held, if none of its shareholders owns more than 25 per cent of its voting equity.

Panel A: Mean, median, minimum, maximum and sample size								
	IPO	**IPO+1**	**IPO+2**	**IPO+3**	**IPO+4**	**IPO+5**	**IPO+6**	**Total period**
Firms with no change of control								
Mean	11.2	11.0	11.3	10.8	9.8	9.0	8.6	10.1
Median	11.2	10.4	11.4	10.9	9.7	9.7	9.5	11.1
Mini-mum	3.2	3.0	-4.6	-2.9	-11.4	-50.6	-20.2	-10.9
Maxi-mum	23.1	20.9	24.1	25.5	21.4	28.7	32.1	23.7
Sample size	47	54	57	59	60	57	49	59
Firms experiencing a separation of ownership and control								
Mean	11.6	9.6	13.2	10.0	8.9	7.2	7.5	9.7
Median	11.7	11.8	13.1	10.6	11.6	9.3	8.8	10.7
Mini-mum	4.2	-17.7	3.0	-6.2	-52.8	-29.8	-23.8	-3.6
Maxi-mum	15.8	19.7	22.7	22.3	66.8	27.0	18.7	17.5
Sample size	13	25	26	25	23	21	21	26
Panel B: t-statistics for the difference in means								
	-0.289	1.066	-1.418	0.563	0.289	0.653	0.442	0.367
Panel C: Wilcoxon-Mann-Whitney p-value								
	0.499	0.768	0.166	0.934	0.393	0.524	0.620	0.800

Source: IPO prospectuses, company reports, Datastream, Extel Financial, LSE microfiches, LSPD and Saling.

Finally, if the cumulative abnormal returns are used to evaluate the profitability of the two samples (table 6), there is some weak evidence for year two and year three after the flotation at the ten per cent level of confidence that companies with a widespread shareholder structure perform worse than companies that are still closely held. However, there is no evidence that firms with no change of control perform significantly better / worse than dispersed firms over the whole period using either type of statistical test.

Our findings therefore do not confirm conjecture two, stating that firms that do not experience a change of control after the flotation suffer from management entrenchment and should have a financial profitability which is lower than the one of firms that become exposed to the disciplining role of the market for corporate control.

Table 6: Performance of all the firms remaining under family control and all the firms that become widely held using the cumulative abnormal returns as a performance measure

*(1) The measure of performance is the cumulative abnormal return. The cumulative abnormal returns were obtained by using a market model with parameter values of β =1 and α =0. The market indices used are the FAZ Index for Germany and the FT-All Share Index for the UK. (2) The firms in panel A are all the German and UK firms that remained under the control of their initial family shareholder over the whole period. The controlling shareholder is defined as the largest shareholder of the firm, holding at least 25 per cent of the voting equity. The firms in panel B are all the German and UK firms that were or became widely held during the period and then remained widely held at least until the end of the period. A firm is defined as being widely held, if none of its shareholders owns more than 25 per cent of its voting equity. (3) * Significant at the one per cent level for the two-tailed test. ** Significant at the five per cent level for the two-tailed test. *** Significant at the ten per cent level for the two-tailed test.*

Panel A: Mean, median, minimum, maximum and sample size								
	IPO	**IPO+1**	**IPO+2**	**IPO+3**	**IPO+4**	**IPO+5**	**IPO+6**	**Total period**
Firms with no change of control								
Mean	5.2	-9.3	2.8	0.5	-4.8	2.2	-6.6	-9.7
Median	0.7	-8.9	3.9	-1.4	-3.0	1.4	0.0	-15.7
Mini-mum	-74.4	-94.1	-103.3	-87.9	-125.4	-110.3	-272.9	-397.5
Maxi-mum	124.4	98.0	93.8	89.2	216.4	117.7	99.1	330.4
Sample size	66	66	66	65	65	65	63	66
Firms experiencing a separation of ownership and control								
Mean	1.1	-15.2	-14.1	-17.6	2.7	14.1	-10.1	-39.3
Median	0.2	-10.0	-17.3	-19.5	-1.8	5.0	-5.9	-25.4
Mini-mum	-70.0	-135.9	-101.3	-134.6	-76.9	-109.4	-93.8	-246.0
Maxi-mum	87.3	88.0	153.0	83.4	88.8	175.9	62.8	128.2
Sample size	29	29	29	29	28	26	25	29
Panel B: t-statistics for the difference in means								
	0.478	0.646	1.810***	2.020**	-0.676	-1.035	0.304	1.123
Panel C: Wilcoxon-Mann-Whitney p-value								
	0.880	0.753	0.033	0.077	0.309	0.418	0.488	0.316

Source: IPO prospectuses, company reports, Datastream, Extel Financial, LSE microfiches, LSPD and Saling.

5.1.1.3 Substantial reductions in ownership concentration: comparing the performance prior to the change with the performance after the change

We define firms with a substantial reduction in ownership concentration as firms that have one shareholder holding at least 50 per cent of the voting equity immediately before the IPO (maybe also during subsequent years) and where the largest stake, owned by any shareholder, drops below 25 per cent after a certain time. These are the firms that should experience a separation of ownership and control. In other words, these are the firms that were highly concentrated before the flotation and end up being highly exposed to takeovers. Nine UK firms are in this category, but no German firm had a substantial reduction in ownership concentration. Two of these firms were eventually taken over. Performance data are omitted from the year of the takeover for these firms (for one of the two firms performance data were available after the takeover, as the takeover was not a full takeover).[4] We define the year of the substantial change as the first year where the highest stake in the firm has decreased below the 25 per cent of the total voting capital.

Basically, this section is a test of the validity of conjecture three, which states that substantial reductions in ownership concentration should be followed by substantial changes in profitability.

Table 7 reports both the performance before the substantial change and the performance after the change. As the change occurs in a different year relative to the IPO for the different firms, the length of the period before and after the change may vary for each firm.

[4] Data on UK firms that are fully taken over are generally not available after the takeover.

Table 7: Firms with a substantial reduction in ownership concentration. Tests of significance for the difference in means between pre-change performance and post-change performance

(1) We define firms with a substantial reduction in ownership concentration as firms that have one shareholder holding at least 50 per cent of the voting equity immediately before the IPO and where the largest stake, owned by any shareholder, drops below 25 per cent after a certain time. Firms can be subsequently taken over, but performance data from the year of the takeover are omitted. Nine UK firms experienced a substantial change of ownership. (2) CF1 is the average of the annual cash flow gross of depreciation, interest, taxes and changes in provisions divided by the book values of debt and equity. CF2 is the average of the same cash flow, but divided by the market value of equity and the book value of debt. CAR is the average annual cumulative abnormal return. The cumulative abnormal returns were obtained by using a market model with parameter values of $\beta = 1$ and $\alpha = 0$. The market indices used are the FAZ Index for Germany and the FT-All Share Index for the UK.

	Average performance				
	before the change	**after the change**	**t-statistic for difference in means**	**Wilcoxon signed-rank test**	
CF1	13.4	11.2	0.193	11	-10
CF2	7.5	10.5	-0.473	6	-13
CAR	-2.7	-29.2	1.251	28	-8

Source: IPO prospectuses, company reports, Datastream, Extel Financial, LSE microfiches, LSPD and Saling.

Both the results from the t-test and the Wilcoxon signed-rank test in table 7 suggest that using any of the three measures of profitability, the average financial performance before the substantial reduction in ownership concentration is not significantly different from the average performance after the reduction. We therefore have to reject conjecture three.

5.1.1.4 Univariate analysis: conclusion

Summarising the results obtained from the univariate analysis, we can say that there is no evidence that there is a link between current performance and past ownership. Neither do German firms with the typical ownership of German quoted firms perform differently from UK firms with the typical ownership of UK quoted firms, nor can we accept the entrenchment thesis. Finally, our event study shows that firms with major changes of their ownership, do not experience major changes in their financial profitability.

5.1.2 Results from the multivariate analysis

The aim of the present section is to perform further and more sophisticated tests, based on dynamic panel data, to detect whether present performance is a function of past performance and ownership.

By running an AR(1) process separately for each of the three estimation techniques, OLS, GMM(diff) and GMM(sys), we found that the coefficient on the lagged dependent variable generally exceeds 0.6. The value for the coefficient is highest under OLS, but there is no major difference between the values provided by GMM(diff) and GMM(sys). The results reported here are the estimates obtained from OLS and from GMM(sys).

Also, each model was estimated separately for each of the three different measures of profitability. The results were slightly more significant for the first measure of performance, the ratio of cash flow to book values of equity and debt, although the conclusions did not differ widely from model to model. We only report the estimation results for the first measure of performance here.

Tables 8, 9, 10 and 11 are all organised in the same way. Columns (1) and (2) contain the results from the OLS estimation using the sample matched by size and the sample matched by industry respectively. Columns (3) and (4) report the estimates from the GMM(sys) estimation for the size-matched sample and the industry-matched sample respectively. The instruments were determined by the Sargan test. The Sargan test is a test of over-identifying restrictions. It is asymptotically distributed as a $\chi^2(k)$, with k degrees off freedom, under the null hypothesis of valid instruments.

The OLS and GMM(sys) models are estimated using a differential intercept COUNTRY - which is set to one, if firm i is German and set to zero otherwise - and

differential slope coefficients - marked by a capital letter D - which measure the differential effect of the variables for the German firms.[5]

All models include four industry dummies (see Goergen (1997b) for a discussion of the four industrial groups) and six time dummies. The time dummies refer to the year of the IPO, e.g. one year after the IPO, two years after the IPO, etc. The models were also estimated in an alternative way, with time dummies referring to the actual calendar year: 1982, 1983, etc., the rationale being that the historic calendar years take into account the changing state of the economy as a whole. This did not influence the results. Likewise, the models were also rerun using 21 industry dummies instead of four only. Again, the results were not affected in any significant way.

A first look at all four tables shows that the value of the coefficient on the lagged financial performance ranges from 0.55 to 0.75 for the size-matched sample and from 0.42 to 0.54 for the industry-matched sample with an average value of 0.62 and 0.47 respectively. A recent study on the sensitivity of corporate profitability to aggregate demand shocks by Machin and Van Reenen (1993) uses the ratio of trading profits - gross of interest and depreciation - to sales as the measure of profitability. The sample consists of 709 large UK listed firms over the period 1975 to 1986. The estimation technique used is GMM(diff). Although their measure of performance is different from ours, they find that profit in period t-1 explains between 0.438 and 0.480 of profit in period t.

Geroski and Jacquemin (1988) analyse the profitability persistence of large European firms. Using the Within Groups OLS (WGOLS) technique, they estimate the

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[5] Given that fixed effects are eliminated by taking first differences in the case of GMM(diff), the models estimated with GMM(diff) do not include an intercept or differential intercept.

following model for 51 UK firms over the period 1949 to 1977 and for 28 German firms over the period 1961 to 1981:[6]

$$p(t) = \lambda_0 + \lambda_1 * p(t-1) + \lambda_2 * p(t-2) + ... + v(t).$$

They find that the restriction $\lambda_2 = \lambda_3 = 0$ is accepted for 82 per cent of the UK firms and 79 per cent of the German firms. The values they find for λ_1 are 0.488 for the UK and 0.410 for Germany, and 0.520 and 0.461 respectively if the results are 'corrected' for small sample bias using the Johnston (1972) procedure. Although their results are not substantially different from ours, the reader should keep in mind that these results might be suffering from a downward bias due to the use of the WGOLS estimation procedure.

To summarise, our findings on the persistence of performance are similar to the findings obtained by previous studies.

Table 8 reports the results for the least sophisticated model, that containing the proportion of dispersed shares in each year t, with no distinction between shares owned by pre-IPO shareholders and post-IPO shareholders. The results from the estimation using the size-matched sample (columns (1) and (3)) might suggest that widely held UK firms have a better performance than concentrated UK firms. However, the coefficient on Wh for the sample matched by industry is not significantly different from zero and also has the opposite sign.

There is no evidence that widely held UK firms perform better than all the German firms. For example, the average values for the ratio of cash flow over book values of equity and debt for the size-matched sample for Germany and the UK are 17.7 and 15.8 per cent respectively (table 1 of Goergen (1997b)). The average over the period for the proportion of widely held shares for Germany and the UK are 24.7 and 38.7

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[6] The reader should refer to Geroski and Jacquemin (1988) for more details on the parameters λ_0, λ_1 and λ_2.

per cent respectively (see column 3 of table 4.4 in Goergen (1997a)). Inserting these average values in the estimated model (1), we obtain a predicted performance of 18.6 per cent for Germany and 16.3 per cent for the UK.

The sign of the differential slope coefficient on Wh_D might suggest that there is a weak inverse effect for Germany. However, by running the model separately for each country no relation between performance and ownership could be found for the German firms.

Table 8: Performance model with the pure accounting rate of return and proportion of widely held voting shares

(a) $CF1_{i,t}$ is the dependent variable in each model. It is the cash flow adjusted for depreciation, interest, taxes and changes in provisions divided by the book values of equity and debt. Country is the differential intercept, Country being set to one if firm i is German. $Wh_{i,t}$ is the percentage of the voting equity that is widely dispersed. Variable names marked with a D are the differential slope coefficients for German firms. (b) Models (1) and (3) are estimated using the size-matched sample. Models (2) and (4) are estimated using the industry-matched sample. (c) Each model contains time dummies and industry dummies. (d) m_1 and m_2 are test for the absence of first order and second order correlation in the residuals respectively. These test statistics are asymptotically distributed as N(0,1) under the null of no serial correlation. (e) The Sargan test statistic is a test of the over-identifying restrictions, asymptotically distributed as $\chi^2(k)$ under the null of valid instruments, with k degrees of freedom reported in parentheses. (f) Models(3) and (4) are linear systems of first-differenced and levels equations. The instruments are levels of CF1, CF1_D, Wh and Wh_D dated t-2 to t-3 for the differenced equations and first differences dated t-1 for the levels equations. (g) P-values, based on standard-errors asymptotically robust to heteroskedasticity, are reported in parentheses.

	OLS in levels		**GMM(sys)**	
Variables	**(1)**	**(2)**	**(3)**	**(4)**
Constant	0.008 (0.732)	0.120 (0.000)	0.009 (0.822)	0.228 (0.002)
Country	0.071 (0.012)	-0.053 (0.073)	0.203 (0.005)	-0.118 (0.317)
$CF1_{i,t-1}$	0.593 (0.000)	0.423 (0.000)	0.567 (0.000)	0.473 (0.001)
$CF1\_D_{i,t-1}$	0.067 (0.570)	0.233 (0.014)	-0.232 (0.242)	-0.094 (0.670)
$Wh_{i,t-1}$	0.158 (0.000)	-0.076 (0.173)	0.123 (0.065)	-0.308 (0.171)
$Wh\_D_{i,t-1}$	-0.197 (0.000)	0.052 (0.434)	-0.404 (0.033)	0.212 (0.486)
m_1	-0.500	0.399	-4.193	-3.511
m_2	0.861	-0.260	1.009	-0.499
Sargan test (d.f.)	-	-	38 (39)	34 (39)
Observations	343	403	265	311

Table 9 contains the results for the model which explains performance by lagged performance, the lagged largest stake held by the pre-IPO shareholders, $Lold_{i,t}$, and the lagged largest stake held by the post-IPO shareholders, $Lnew_{i,t}$. The coefficients on the dummy variables indicating the type of the largest shareholder are not significantly different from zero, except for model (2). The OLS estimates from the sample matched by market capitalisation (column (1)) suggest vaguely that the less

concentrated a UK firm is (i.e. the smaller the largest stake held by the pre-IPO shareholders and the smaller the largest stake held by the post-IPO shareholders) the better will be its performance in the following period. There appears to be no effect for German firms. However, the estimated slope coefficients obtained by running the models under GMM(sys) for either sample or running the model under OLS for the industry-matched sample are not significantly different from zero. Furthermore, neither the signs nor the magnitude of the coefficients on the different ownership variables are stable from model to model and within the same sample.

Table 10 reports the estimation results for the total proportion of voting shares held by the old shareholders and the new shareholders respectively. By definition, subtracting Told and Tnew from one gives the value for Wh, the total proportion of widely held shares (table 8). The results are not very conclusive, as the signs and magnitudes of the coefficients on the ownership variables change from model to model (see e.g. Told). Looking back at the two previous tables, the impression here is that it is a spurious phenomenon rather than a real relation between profitability and ownership concentration.

Table 11 displays the results for the models containing the Herfindahl ownership concentration indices. Apart from the differential slope coefficient on the variable Cold in model (1) (just significant at the five per cent level) none of the slope coefficients relating to ownership is significantly different from zero. Again, there is no consistency in the signs and magnitudes of the coefficients on the ownership measures, even for a same sample (see e.g. the values for the coefficient on Cold columns (1) and (3))

Given that a large part of the shareholders' equity of some German firms comprises non-voting shares and that our measures of ownership do only refer to ownership of ordinary shares, i.e. voting shares, all the models were rerun including a temporal dummy variable, which was set to one if firm i had non-voting preference shares

listed in period t. Essentially, the result was that the differential slope coefficient on the ownership variable for the German firms was still of a different sign than the general slope coefficient on the associated ownership variable, but that the absolute values of both coefficients were even closer than before.

We also ran all the models using a quadratic form for ownership similar to the one used by McConnell and Servaes (1990). The result was that either the conclusions did not change substantially (e.g. for the models with the largest stakes held by both categories of shareholders) or the coefficients were not significantly different from zero any more (e.g. for the model with Wh).

Summarising the results from tables 8, 9, 10 and 11, we can conclude that there does not seem to be any strong evidence that current profitability depends on past ownership. Although some of the coefficients on the ownership variables were significantly different from zero at the ten per cent level, the significance, the signs as well as the magnitude of the coefficients were not stable from model to model. Our findings are so far similar to those by Loderer and Martin (1996) who also detected 'faint traces' of a link between performance and ownership.

Furthermore, from the total of 48 models that were estimated, in only 17 models at least one of the ownership coefficients was significantly different from zero at the ten per cent level of confidence. If we adopt the stricter level of confidence of five per cent, in only nine models there was a significant ownership coefficient. The large majority of our results does therefore not provide any support for a relation between present performance and past ownership.

Table 9: Performance model with the pure accounting rate of return and largest pre-IPO shareholder and largest post-IPO shareholder

(a) $CF1_{i,t}$ is the dependent variable in each model. It is the cash flow adjusted for depreciation, interest, taxes and changes in provisions divided by the book values of equity and debt. Country is the differential intercept, Country being set to one if firm i is German. $Lold_{i,t}$ and $Lnew_{i,t}$ are the percentage of the voting equity held by the largest pre-IPO shareholder and the largest post-IPO shareholder respectively. Variable names marked with a D are the differential slope coefficients for German firms. (b) Models (1) and (3) are estimated using the size-matched sample. Models (2) and (4) are estimated using the industry-matched sample. (c) Each model contains time dummies and industry dummies. (d) m_1 and m_2 are test for the absence of first order and second order correlation in the residuals respectively. These test statistics are asymptotically distributed as N(0,1) under the null of no serial correlation. (e) The Sargan test statistic is a test of the over-identifying restrictions, asymptotically distributed as $\chi^2(k)$ under the null of valid instruments, with k degrees of freedom reported in parentheses. (f) Models (3) and (4) are linear systems of first-differenced and levels equations. The instruments are levels of CF1, CF1_D, Lold, Lold_D, Lnew and Lnew_D dated t-2 / t-2 to t-3 for the differenced equations and first differences dated t-1 for the levels equations. (g) P-values, based on standard-errors asymptotically robust to heteroskedasticity, are reported in parentheses.

	OLS in levels		**GMM(sys)**	
Variables	**(1)**	**(2)**	**(3)**	**(4)**
Constant	0.096 (0.001)	0.158 (0.001)	0.115 (0.427)	0.208 (0.267)
Country	-0.049 (0.128)	-0.055 (0.080)	-0.111 (0.368)	-0.006 (0.975)
$CF1_{i,t-1}$	0.638 (0.000)	0.418 (0.000)	0.747 (0.000)	0.544 (0.008)
$CF1\_D_{i,t-1}$	0.014 (0.919)	0.230 (0.031)	-0.290 (0.108)	-0.028 (0.913)
$Lold_{i,t-1}$	-0.067 (0.184)	0.016 (0.741)	-0.157 (0.424)	0.241 (0.621)
$Lold\_D_{i,t-1}$	0.108 (0.037)	0.018 (0.715)	0.268 (0.225)	-0.106 (0.798)
$Lnew_{i,t-1}$	-0.093 (0.017)	-0.091 (0.096)	-0.119 (0.277)	-0.195 (0.343)
$Lnew\_D_{i,t-1}$	0.085 (0.040)	0.068 (0.216)	0.206 (0.154)	0.151 (0.584)
$Family_{i,t-1}$	-0.004 (0.868)	-0.065 (0.143)	0.015 (0.873)	-0.201 (0.421)
$Domestic_{i,t-1}$	-0.016 (0.503)	-0.073 (0.014)	0.062 (0.651)	-0.248 (0.361)
$Foreign_{i,t-1}$	0.033 (0.242)	-0.027 (0.288)	0.027 (0.866)	-0.067 (0.603)
$Bank_{i,t-1}$	0.013 (0.262)	-0.078 (0.105)	0.233 (0.174)	-0.616 (0.232)
$Investor_{i,t-1}$	-	-0.060 (0.137)	-	-0.129 (0.784)
m_1	-0.647	0.399	-4.647	-2.992
m_2	0.891	-0.226	1.366	-0.272
Sargan test (d.f.)	-	-	38 (37)	52 (54)
Observations	341	403	264	311

Table 10: Performance model with the pure accounting rate of return and stakes held by all pre-IPO shareholders and post-IPO shareholders

(a) $CF1_{i,t}$ is the dependent variable in each model. It is the cash flow adjusted for depreciation, interest, taxes and changes in provisions divided by the book values of equity and debt. Country is the differential intercept, Country being set to one if firm i is German. $Told_{i,t}$ and $Tnew_{i,t}$ are the total percentage of the voting equity held by the pre-IPO shareholders and the post-IPO shareholders respectively. Variable names marked with a D are the differential slope coefficients for German firms. (b) Models (1) and (3) are estimated using the size-matched sample. Models (2) and (4) are estimated using the industry-matched sample. (c) Each model contains time dummies and industry dummies. (d) m_1 and m_2 are test for the absence of first order and second order correlation in the residuals respectively. These test statistics are asymptotically distributed as N(0,1) under the null of no serial correlation. (e) The Sargan test statistic is a test of the over-identifying restrictions, asymptotically distributed as $\chi^2(k)$ under the null of valid instruments, with k degrees of freedom reported in parentheses. (f) Models(3) and (4) are linear systems of first-differenced and levels equations. The instruments are levels of CF1, CF1_D, Told, Told_D, Tnew and Tnew_D dated t-2 to t-4 / t-3 for the differenced equations and first differences dated t-1 for the levels equations. (g) P-values, based on standard-errors asymptotically robust to heteroskedasticity, are reported in parentheses.

	OLS in levels		**GMM(sys)**	
Variables	**(1)**	**(2)**	**(3)**	**(4)**
Constant	0.166 (0.000)	0.044 (0.181)	0.158 (0.004)	-0.135 (0.294)
Country	-0.123 (0.001)	-0.001 (0.977)	-0.173 (0.136)	0.161 (0.332)
$CF1_{i,t-1}$	0.595 (0.000)	0.418 (0.000)	0.554 (0.000)	0.502 (0.000)
$CF1\_D_{i,t-1}$	0.059 (0.619)	0.231 (0.025)	-0.160 (0.310)	-0.087 (0.638)
$Told_{i,t-1}$	-0.162 (0.000)	0.077 (0.064)	-0.123 (0.260)	0.312 (0.030)
$Told\_D_{i,t-1}$	0.200 (0.000)	-0.052 (0.284)	0.304 (0.074)	-0.194 (0.331)
$Tnew_{i,t-1}$	-0.153 (0.000)	0.057 (0.413)	-0.143 (0.008)	0.338 (0.122)
$Tnew\_D_{i,t-1}$	0.172 (0.000)	-0.048 (0.551)	0.301 (0.027)	-0.271 (0.296)
m_1	-0.533	0.409	-4.298	-3.772
m_2	0.808	-0.266	1.130	-0.455
Sargan test (d.f.)	-	-	58 (71)	49 (59)
Observations	343	403	265	311

Table 11: Performance model with the pure accounting rate of return and the concentration ratios

(a) $CF1_{i,t}$ is the dependent variable in each model. It is the cash flow adjusted for depreciation, interest, taxes and changes in provisions divided by the book values of equity and debt. Country is the differential intercept, Country being set to one if firm i is German. $Cold_{i,t}$ and $Cnew_{i,t}$ are Herfindahl indexes of the voting equity held by the pre-IPO shareholders and the post-IPO shareholders respectively. Variable names marked with a D are the differential slope coefficients for German firms. (b) Models (1) and (3) are estimated using the size-matched sample. Models (2) and (4) are estimated using the industry-matched sample. (c) Each model contains time dummies and industry dummies. (d) m_1 and m_2 are test for the absence of first order and second order correlation in the residuals respectively. These test statistics are asymptotically distributed as N(0,1) under the null of no serial correlation. (e) The Sargan test statistic is a test of the over-identifying restrictions, asymptotically distributed as $\chi^2(k)$ under the null of valid instruments, with k degrees of freedom reported in parentheses. (f) Model (3) is a linear system of first-differenced and levels equations. The instruments are levels of CF1, CF1_D, Cold, Cold_D, Cnew and Cnew_D dated t-2 / The instruments are levels of CF1, CF1_D, Lold, Lold_D, Lnew and Lnew_D dated t-2 to t-3 for the differenced equations and first differences dated t-1 for the levels equations. (g) P-values, based on standard-errors asymptotically robust to heteroskedasticity, are reported in parentheses.

	OLS in levels		**GMM(sys)**	
Variables	**(1)**	**(2)**	**(3)**	**(4)**
Constant	0.078 (0.002)	0.088 (0.000)	0.064 (0.244)	0.029 (0.753)
Country	-0.021 (0.419)	-0.038 (0.130)	0.023 (0.745)	0.028 (0.771)
$CF1_{i,t-1}$	0.658 (0.000)	0.430 (0.000)	0.580 (0.000)	0.522 (0.001)
$CF1\_D_{i,t-1}$	-0.006 (0.965)	0.222 (0.037)	-0.208 (0.270)	-0.082 (0.719)
$Cold_{i,t-1}$	-0.094 (0.108)	0.028 (0.608)	0.105 (0.714)	0.194 (0.568)
$Cold\_D_{i,t-1}$	0.119 (0.047)	-0.006 (0.920)	-0.048 (0.867)	-0.108 (0.742)
$Cnew_{i,t-1}$	-0.012 (0.551)	-0.003 (0.953)	0.039 (0.646)	0.072 (0.718)
$Cnew\_D_{i,t-1}$	0.023 (0.570)	0.019 (0.714)	-0.010 (0.939)	-0.044 (0.838)
m_1	-0.692	0.207	-4.408	-3.390
m_2	0.915	-0.285	1.308	-0.347
Sargan test (d.f.)	-	-	65 (71)	60 (59)
Observations	340	399	263	307

In order to be more sure that there is no link between financial performance and ownership concentration - link which might not have been picked up by our models - we will perform two further tests in the next section. These tests are based on pairings

by market capitalisation and / or industry and may therefore be better at taking account of different firm and industry characteristics.

5.1.3 A pairing analysis

There are two aims to this section. The first one is to detect whether UK firms, which are exposed to the market for corporate control, an external device for the correction of management failure, perform better than German firms, which are not normally exposed to the market for corporate control. Adams (1994) suggests that even German companies with a dispersed ownership are not exposed to the market for corporate control, but are controlled by a complex system of cross-shareholdings set up between Deutsche Bank, Dresdner Bank, Commerzbank, Bayerische Hypotheken- und Wechsel-Bank, Münchener Rückversicherungs-AG, Allianz Holding and Bayerische Vereinsbank.

This test differs from the first univariate tests (see sections 3.1 and 5.1.1) in the sense that we match the German IPOs with UK IPOs of a similar size to obtain a first sample and also match the German IPOs with UK IPOs operating in the same industry to obtain a second sample. It is also different from the first univariate test in the way that we test whether capital markets characterised by different correction mechanisms of managerial failure are also characterised by different levels of corporate performance.

C4. *As even German firms with a low concentration of ownership do not seem to be exposed to the market for corporate control in the same way as UK firms, we should expect that German firms perform worse than their UK counterparts.*

Goergen (1997b) reports that some UK firms remain concentrated long time after the flotation and are therefore similar to most German firms. Therefore, the second aim of this section is to determine whether widely held UK firms, the firms with the

highest exposure to the market for corporate control, have a significantly higher profitability than concentrated UK firms.

C5. *In the UK, only widely held firms are exposed to the disciplining role of the market for corporate control. They should therefore perform significantly better than concentrated UK firms.*

5.1.3.1 Pairing German firms with UK firms

This section tests the validity of conjecture four. It performs an additional test to the univariate analysis of section 5.1.1 and the dynamic panel data analysis of section 5.1.2. It tests the effect of the exposure to different mechanisms for the correction of managerial failure on financial performance rather than the effect of different ownership patterns on financial performance.

The German IPOs are matched by market capitalisation with UK IPOs to obtain a first pairing and matched by industrial sector to obtain a second pairing (see Goergen (1997b) for a detailed discussion of the matching criteria). The advantage of this analysis compared to the two previous types of univariate and multivariate tests is that the present test controls for size or for industry in a more extensive way than the two previous analyses which either ignored size and industry entirely (univariate tests) or used aggregate industry groups (multivariate tests) rather than the two-digit groups used here.

Table 12 contains the results from the pairing. Panel A reports the differences in the average performance between the German firms and the UK firms matched by market capitalisation, whereas panel B reports the same differences for the sample matched by industrial sector.

Table 12: Tests of significance of the differences between the means of performance of German and UK samples matched by size or industry

*(1) The German IPOs are paired in panel A with UK IPOs of a similar market capitalisation (in 1985 pounds sterling) and paired in panel B with UK IPOs operating in the same industry. (2) CF1 is the average over the seven years after the IPO of the annual cash flow gross of depreciation, interest, taxes and changes in provisions divided by the book values of debt and equity. CF2 is the average of the same cash flow, but divided by the market value of equity and the book value of debt. CAR is the average annual cumulative abnormal return. The cumulative abnormal returns were obtained by using a market model with parameter values of $\beta = 1$ and $\alpha = 0$. The market indices used are the FAZ Index for Germany and the FT-All Share Index for the UK. (3) ** Significant at the five per cent level for the two-tailed test.*

	Difference between German and UK mean (%)	t-statistic	Wilcoxon signed-rank test	
Panel A: Pairings matched by size				
CF1	2.03	0.874	484	-296
CF2	2.08	1.747	486	-180**
CAR	7.18	2.152**	929	-449**
Panel B: Pairings matched by industry				
CF1	0.64	0.364	537	-453
CF2	0.73	0.667	612	-379
CAR	-1.34	-0.372	784	-869

Source: IPO prospectuses, company reports, Datastream, Extel Financial, LSE microfiches, LSPD and Saling.

As on average UK firms going public tend to be smaller than their German counterparts (see Goergen (1997b)), the UK sample in panel A of table 12 comprises a large number of firms with an above-average size.

Panel A indicates that German firms may have a slightly higher performance than UK firms of a similar size. This is true if we use the cumulative abnormal returns as a measure of performance (both the parametric and the non-parametric test reject the null hypothesis at the five per cent level), and is also true to some extent if we use the cash flow divided by the sum of the market value of equity and the book value of debt (at the five per cent level for the distribution-free test).

The differences between means for the firms paired by industry (panel B of table 12) are however not significantly different from zero at any sensible level of confidence. This is true both for the parametric test and the non-parametric test.

To summarise, this test does not confirm conjecture four, i.e. that the generally higher exposure of UK firms to the market for corporate control implies that UK firms have a better financial profitability than German firms.

5.1.3.2 Pairing widely held UK firms with closely held UK firms

One should expect that closely held UK firms do not differ substantially from closely held German firms in terms of their exposure to the market for corporate control. However, if one argues that in the UK badly performing managers are generally disciplined by the market for corporate control (rather than by a large shareholder as it is supposed to be the case in Germany), one should expect that closely held UK firms, given that they are not (or less) exposed to the prevailing system of managerial correction, should perform less well than widely held UK firms. In other words, this is a test of conjecture five.

We use the same definition of a widely held firm as the one adopted in section 5.1.1.1. We define all other firms as closely held firms. We start with all the UK firms from the two UK samples from Goergen (1997b). The firms are this time matched both by market capitalisation (in 1985 pounds sterling) and by industry. For the matching by size, the criterion was that the difference in market capitalisation between the larger firm and the smaller firm over the market capitalisation of the larger firm should not exceed 33.3 per cent. The industry matching was done by matching each closely held firm with a widely held firm in exactly the same two-digit group. Seventeen firms could be matched using these two matching criteria.

Table 13 shows the difference in means for the pairing as well as the test statistics for the parametric test and the distribution-free test. There is no significant difference in

the means of UK firms with concentrated ownership and UK firms with widespread ownership whatever the measure of performance. None of the test statistics from the parametric and non-parametric tests fall into the critical region of the rejection of the null hypothesis.

Table 13: Tests of significance of the differences between the means of performance of closely held UK firms and widely held UK firms

(1) The closely held UK firms are paired with widely held UK firms by market capitalisation (in 1985 pounds sterling) and by industry (using the two-digit LSE classification). (2) CF1 is the average over the seven-year period after the IPO of the annual cash flow gross of depreciation, interest, taxes and changes in provisions divided by the book values of debt and equity. CF2 is the average of the same cash flow, but normalised by the market value of equity and the book value of debt. CAR is the average annual cumulative abnormal return. The cumulative abnormal returns were obtained by using a market model with parameter values of $\beta = 1$ and $\alpha = 0$. The market indices used are the FAZ Index for Germany and the FT-All Share Index for the UK.

	Difference between closely held and widely held mean (%)	t-statistic	Wilcoxon signed-rank test	
CF1	1.78	0.313	28	-38
CF2	0.32	0.131	22	-23
CAR	-4.71	-0.662	50	-70

Source: IPO prospectuses, company reports, Datastream, Extel Financial, LSE microfiches, LSPD and Saling.

We can therefore conclude that widely held UK firms do not perform significantly better than closely held UK firms. We reject conjecture five.

6. Conclusion

In this paper, we tried to detect whether there is a relationship between current performance and past ownership concentration. We tested the validity of the following five different conjectures.

Conjecture one states that as listed German and UK companies are characterised by very different patterns of ownership, they should also be characterised by very different levels of performance. Our findings do not confirm this first conjecture.

If conjecture two is true, firms that do not experience a change of control after the IPO should have a worse financial performance than firms that become exposed to the market of corporate control. However, our results reject this second conjecture.

Using an event study, we checked whether significant reductions in shareholder concentration cause significant changes in performance. We had to reject the third conjecture.

The evidence from the multivariate test also suggests that there is no relationship between profitability and ownership. Although it is evident for the German firms that there is no relationship between performance and ownership, there seems to be a weak relationship in 17 out of 48 estimations for the UK firms, a weak relationship which was also found by Loderer and Martin (1996). We believe that there is no genuine relationship, as neither the magnitudes of the coefficients on the ownership variables nor their signs are stable from specification to specification and from sample to sample. Even within the same sample, the sign of the coefficient on an ownership variable is not necessarily stable.

Moreover, the validity of conjecture four, i.e. whether German firms underperform compared to UK firms given the generally lower exposure of the former to the disciplining function of the market for corporate control, was not confirmed by our findings.

Finally, the profitability of closely held UK firms was compared with the profitability of closely held UK firms of a similar market capitalisation and in the same industry group. The conjecture is that given that widely held UK corporations have a high exposure to the market for corporate control, they should perform significantly better than closely held UK firms that do not have a high exposure to the disciplining role of the market for corporate control. Again, the differences in means were not significantly different from zero using both parametric and distribution-free tests and conjecture five had to be rejected.

All these various analyses, both univariate and multivariate suggest that the financial performance of firms does not depend on their ownership patterns. As the findings from Goergen (1997b) suggest, ownership is determined by the characteristics of the firm. We can therefore conclude with Demsetz and Lehn (1985) that ownership of a firm is normally chosen in a way to maximise a firm's value. Our results confirm the results found by Holderness and Sheehan (1988), Bergström and Rydqvist (1990), Denis and Denis (1994), Kole (1996) and Loderer and Martin (1996) who also found no evidence that larger stock holdings lead either to a better performance or to the expropriation of minority shareholders.

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