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## OWNERSHIP CONCENTRATION AND SHARE VALUATION: EVIDENCE FROM GERMANY

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by

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## **Ownership Concentration and Share Valuation: Evidence from Germany**

### Abstract

Concentrated ownership of large listed companies is widespread throughout the world, and Germany is typical in this respect. This paper proposes a method of distinguishing empirically between the beneficial and harmful effects of ownership concentration, and applies it to German data. The results show that, for most types of largest shareholder, the beneficial effects on minority shareholders of increased ownership (greater monitoring of management, and reduced incentives to exploit minority shareholders due to greater cash-flow rights) outweigh the harmful effect (greater private benefits of control due to greater control rights).

Keywords: Ownership structure, firm performance

JEL Classification: G30, G32

## **1. Introduction**

Large public companies in the USA and UK are typically regarded as having many owners, each of which holds only a tiny fraction of the company's equity capital. Such dispersion of shareholding is seen as creating two serious problems for the governance of large companies: a separation between ownership (by dispersed shareholders) and control (by the company's management), and little or no incentive for shareholders to monitor management. The result, it is claimed, is that the managers of large public companies can pursue their own objectives at the expense of the shareholders.

One possible solution to the problems created by dispersed shareholdings in large public companies is to concentrate share ownership in the hands of a few large shareholders (Shleifer and Vishny 1997). A large shareholder will partially internalise the benefits of monitoring management, and thus limit the extent to which managers can act in their own interest at shareholders' expense (Shleifer and Vishny 1986). However, concentrated share ownership has costs as well as benefits. One cost is that large shareholders may bear excessive risk due to inadequate diversification. A second is that a large shareholder may use his or her voting power to exploit other shareholders by inducing management to divert profits from minority shareholders, e.g. by trading with other companies owned by the large shareholder at prices which are advantageous for the large shareholder. Evidence of such private benefits of control obtained by large shareholders at the expense of minority shareholders has been provided for the USA by Barclay and Holderness (1989), for Sweden by Bergström and Rydqvist (1990), and for Italy by Zingales (1994). The extent to which a large shareholder imposes costs on the company by attempting to obtain private benefits of control will depend on the extent to which his or her control rights in the company diverge from his or her cash-flow rights. Other things equal, the higher are the cash-flow rights of a large shareholder, the more closely are his or her interests aligned with those of the other shareholders, and hence the lower are the large shareholder's

incentives to pursue costly policies which divert profits from minority shareholders (Jensen and Meckling 1976).

In this paper we provide evidence on the relative importance of these different effects of share ownership concentration for a sample of large German public companies. The purpose of the paper is twofold. First, it proposes a method whereby the effects of the control rights of the largest shareholder can be empirically disentangled from the effects of this shareholder's cash-flow rights. Disentangling these two effects also makes it possible to estimate the effects of monitoring by large shareholders. Second, this paper provides evidence concerning the relationship between ownership concentration and share valuation in Germany. As La Porta et al. (1998) note, 'dispersed ownership in large public companies is simply a myth...the finance textbook model of management faced by multitudes of dispersed shareholders is an exception and not the rule'. They find that, for their sample of 45 countries, the mean (median) ownership of the three largest shareholders in the ten largest publicly-traded private non-financial domestic companies in each country is 46 (45) per cent. There are only four countries in their sample – Japan, Taiwan, the UK and the USA – for which the mean ownership of the three largest shareholders is 20 per cent or less. Concentrated ownership of large listed companies is thus the normal state of affairs for the world as a whole. In this respect, Germany is close to the world average: La Porta et al. find that the mean (median) ownership of the three largest shareholders in Germany is 48 (50) per cent. Evidence about the effects of ownership concentration on share valuation in Germany is thus relevant for understanding the role of large shareholders in corporate governance more generally.

The paper analyses a sample of large German companies, all of which have some shareholders who do not own controlling blocks of shares. Hence it is reasonable to suppose that the value of shares in these companies is determined by marginal shareholders' evaluation of the cash-flow returns they receive from such shareholdings. The paper shows that, in Germany,

greater holdings by the largest shareholder raise the value of corporate equity via monitoring and convergence-of-interest effects, but also lower the value of shares because of the increased ability of the largest shareholder to obtain private benefits of control at the expense of minority shareholders. Greater holdings by the second-largest shareholder also tend to raise the value of shares in large German firms, which may be due either to the effects of monitoring of management by the second-largest shareholder, or to the effects of monitoring the behaviour of the largest shareholder, thereby reducing the consumption of private benefits of control. The results show that, although largest shareholders are able to gain private benefits of control at minority shareholders' expense, the net effect of equal increases in both the control and cash-flow rights of the largest shareholder is typically beneficial for minority shareholders because the convergence-of-interest effect outweighs the effect of greater private benefits of control. Depending on the type of shareholder, a change from completely dispersed ownership of a large company to ownership by a single shareholder can double the value of the company's shares, which provides striking evidence of the costs created by the lack of monitoring of management in German firms with dispersed share ownership.

The relevant features of corporate governance in listed German companies are discussed in Section 2 of the paper. Section 3 formulates a simple model of the effects of ownership concentration on the returns to minority shareholders, which is used as the basis of the regression model and the estimation of the various effects of ownership concentration on share valuation. The data are described in Section 4, and the empirical results are presented in Section 5. Section 6 concludes.

## 2. Large shareholders' control of corporate behaviour in Germany

Franks and Mayer (1995) found that, in 1990, nearly 85% of the 170 largest listed companies in Germany had a single shareholder with an ownership stake of at least 25% of the share capital.<sup>1</sup> In our sample of 102 large listed German corporations (which is discussed more fully in section 4), 72 had a largest shareholder with more than 25% of the voting equity. These figures would appear to suggest that for a majority of large listed German corporations, the largest shareholder is in a position of complete control over the firm, and can, by appointing and dismissing senior management, ensure that the corporation is operated exactly in accordance with his or her wishes.<sup>2</sup>

However, the role and composition of the supervisory board, and the legal rights of minority shareholders, imply that in Germany even a shareholder owning just over 50% of the voting shares in a listed company may not have complete control of its management. The German *Aktiengesetz* (Stock Corporation Act) specifies that the main function of the supervisory board, which all listed corporations are required to have, is the control of management. Responsibility for the operation of the corporation rests with the management board, members of which cannot also be members of the supervisory board. The management board is appointed and dismissed by the supervisory board, not by the shareholder meeting. If a corporation has more than 2,000 employees, one-half of its supervisory board members must be elected by its employees; and the other half is elected by its shareholders.<sup>3</sup> For such corporations, the chairman of the supervisory board, who is elected either by a two-thirds majority or, if such a majority cannot be achieved, by

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<sup>1</sup> The corresponding figure for the UK was 16%.

<sup>2</sup> Although the largest shareholder owns more than 50% of the voting shares in only 46 of the companies in our sample, a largest shareholder holding more than 25% of the voting equity typically has a very high probability of winning majority support in a contested vote of all shareholders (Leech and Leahy 1991).

<sup>3</sup> The shareholder representatives on the supervisory board are elected, usually for the legal maximum of five years, at a general meeting of the corporation's shareholders, which must be held at least once a year. The election procedure involves a simple majority vote on the entire group of shareholder representatives. This group is usually proposed jointly by the corporation's management board and its supervisory board, but amendments to the group can be proposed by a shareholder or group of shareholders holding 10% of the voting equity.

the shareholder representatives alone, can cast a second vote to break ties in supervisory board decisions. Thus, while in principle a shareholder owning just over 50% of the voting equity can achieve full control of the company's management, in practice this requires that all shareholder representatives on the supervisory board vote as this shareholder wishes, and that the casting vote of the supervisory board chairman is used in the event of opposition by the employee representatives. Such a situation is unlikely, because of the unfavourable publicity which would be attracted by unanimous opposition by the employee representatives. It is made more unlikely by the legal rights of minority shareholders, to which we now turn.

Certain decisions concerning a corporation have to be made by a vote at the shareholders' general meeting, rather than by the management board, and some of these, such as changes in the corporation's statutes, increases or decreases in equity capital, and mergers or liquidations, usually require a 75% majority. Hence a shareholder or group of shareholders owning 25% of the voting equity can block these decisions. A shareholder or group of shareholders owning 10% of the voting equity can put any proposal to a vote at the shareholders' meeting, including an amendment to the group of shareholder representatives nominated for election to the supervisory board, as well as a vote of no confidence in particular members of the management or supervisory board. Shareholders representing either 10% or DM 2 million of the equity capital can also go to court to request a special audit, to which the court must agree if there is any evidence suggesting cause for concern. Finally, a shareholder or group of shareholders owning 5% of the voting equity can demand an extraordinary shareholders' meeting.

A number of special legal provisions apply in the case where the dominant shareholder in a corporation (as defined in the *Aktiengesetz*) is another corporation.<sup>4</sup> These provisions may also apply to individuals or families who are dominant shareholders if the individual or family owns a

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<sup>4</sup> §17 of the *Aktiengesetz* defines a dominant shareholder as one holding more than 50% of the voting equity. The relevant provisions are set out in §§311-318 of the *Aktiengesetz*.



firm which deals with the corporation in question. Unfavourable contracts may not be imposed on the corporation by its dominant shareholder unless there is adequate compensation. The management board of the corporation is required to produce a report on business carried out with the dominant shareholder which specifies the compensation paid for any unfavourable contracts. This report is checked by both an auditor and the supervisory board of the corporation, and the results of these checks are reported to the shareholder's general meeting. Shareholders representing either 5% or DM 1 million of the equity capital have the right to go to court to appeal against a conclusion of adequate compensation for unfavourable contracts.

Sufficiently large groups of minority shareholders therefore have legal rights which enable them to subject actions of the large shareholder to scrutiny both by votes at the shareholders' meeting and by the appointment of special auditors. This feature of the German corporate governance system, together with the role played by the supervisory board, make it plausible to suppose that the degree of control of a large shareholder in a listed German corporation over its behaviour, and thus his or her ability to enjoy private benefits of control, does not reach a maximum once such a shareholder owns just over 50% of the voting equity. Rather, a large shareholder's degree of control is likely to increase until the proportion of voting equity held exceeds 75% (at which point minority shareholders can no longer block any decisions), and may even increase as the proportion of voting equity owned exceeds 90% or 95% (as the other rights of minority shareholders disappear). The legal provisions applying to majority corporate shareholders may mean that they are more limited in their degree of control over the behaviour of the corporations which they own than are other types of large shareholders.

### **3. A model of equity value and the ownership of the largest shareholder**

In this section we develop a simple static model of the relationship between the equity value of a company and the ownership stake of its largest shareholder. The value of corporate

equity is assumed to be determined by the minority shareholders in the company, whose only benefit from the ownership of shares is the dividends they receive,<sup>5</sup> and who are assumed to anticipate correctly the costs and benefits to them of owning shares in a company in which the largest shareholder may exert some control over its actions.

The gross profits  $\alpha$  of a company are assumed to depend on a vector of firm and industry characteristics,  $J$ , and on the extent to which its management is subject to monitoring by shareholders. We suppose that the amount of shareholder monitoring,  $M$ , depends separately on both the fraction of the company's voting equity owned by the largest shareholder,  $k$ , and the fraction of the total payments to shareholders to which the largest shareholder is entitled,  $\alpha$ . These two fractions are commonly referred to in the literature as the control rights and the cash-flow rights of the largest shareholder. These two fractions may differ if a corporation's equity includes both voting and non-voting shares, or if minority shareholders do not vote at the shareholders' general meeting.  $M$  is assumed to depend separately on  $k$  and  $\alpha$  because the extent of monitoring of management by the largest shareholder is the result of two factors. Monitoring is costly for the largest shareholder, so the higher is  $\alpha$  the greater are the benefits of monitoring for the largest shareholder, and hence the greater is the extent of such monitoring. Given the effort expended by the largest shareholder on monitoring, the effect on management depends on the largest shareholder's ability to dismiss a poorly-performing management, and this will be greater the higher is  $k$ . It is also possible that some minority shareholders may own a sufficiently large fraction of the corporation's equity to provide them with incentives to monitor the management. We therefore allow for the possibility that  $M$  depends on the fraction of voting equity owned by the second-largest shareholder,  $z$ .

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<sup>5</sup> An extension to a dynamic framework which would allow for capital gains is straightforward.

Thus we assume that

$$\pi = \pi[M(k, \alpha, z), J] \quad (1)$$

with partial derivatives  $\pi_M > 0, M_k \geq 0, M_\alpha \geq 0, M_z \geq 0$ . The partial derivatives of  $M$  are assumed to be non-negative rather than strictly positive to allow for the possibility that, at certain values of the arguments of  $M$ , marginal changes in  $k, \alpha$ , or  $z$  do not affect the extent of monitoring.

The largest shareholder may have some degree of control over the actions of the corporation, and hence some ability to exploit minority shareholders. To model this, we assume that the largest shareholder can, at a cost, divert some part of gross profits away from other shareholders. These diverted profits,  $T$ , not only reduce the profits available for dividends, but are also assumed to involve an additional cost to the firm.<sup>6</sup> This diversion cost,  $C$ , can be thought of as the cost of managerial effort needed to conceal transactions and justify activities which only benefit the largest shareholder, or as the cost to the firm of operating in a way which allows the largest shareholder to divert profits, rather than in the most efficient way.  $C$  is assumed to be a positive and convex function of  $T$ , and also to depend on  $k, z$ , and the size of the firm's equity,  $E$ . We assume that the diversion cost function is homogeneous of degree one in  $T$  and  $E$ , so that there are constant returns to scale in diversion, given constant ownership structure.

Dividends paid equal profits less the diversions to the largest shareholder and the costs of these diversions:

$$D = \pi[M(k, \alpha, z), J] - T - C(T, k, z, E) \quad (2)$$

To use this model as a basis for empirical testing, it is helpful to divide both sides of (2) by the firm's equity capital to obtain

$$D/E = \pi[M(k, \alpha, z), J]/E - T/E - C(T, k, z, E)/E \quad (3)$$

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<sup>6</sup> The assumption that diversion of profits is inefficient is standard in the literature on the private benefits of control, e.g. Pagano and Röell (1998).

The assumption that  $C$  is homogeneous of degree one in  $T$  and  $E$  means that  $C(T, k, z, E) = C(t, k, z, 1) \cdot E$ , where  $t \equiv T / E$ . Define  $c(t, k, z) \equiv C(t, k, z, 1)$ . The properties of the function  $c(t, k, z)$ , which gives diversion costs as a proportion of equity capital, are central to our model. We assume that  $c(t, k, z)$  has the following properties.

$$c(0, k, z) = 0, c_k \leq 0, c_z \geq 0 \quad (4)$$

$$c_t \geq 0, c_{tt} > 0, c_{tk} \leq 0, c_{tz} \geq 0 \quad (5)$$

The assumptions in (4) state, respectively, that diversion costs are zero when there is no diversion, the total cost of diverting profits does not rise as the largest shareholder's control of votes increases, and the total cost of diversion does not fall as the votes controlled by the second-largest shareholder increase. The latter two assumptions reflect the idea that it is easier for the largest shareholder to divert profits if his or her control of votes increases, but harder to do so as the control of votes by the second-largest shareholder increases, since this increases the incentives for the second-largest shareholder to monitor the company's actions. The effects are assumed to be non-positive and non-negative respectively because of the possibilities that at some sufficiently high value of votes controlled by the largest shareholder further increases have no effect on the total cost of diversion, and that there is no effect on the total cost of diversion if the votes controlled by the second-largest shareholder are sufficiently low.

The assumptions in (5) concern the marginal cost of profit diversion by the largest shareholder. This is assumed to be non-negative, and increasing in diversion. The marginal cost of diversion is also assumed not to rise as the largest shareholder's control of votes increases, and not to fall as the votes controlled by the second-largest shareholder increase. These latter two assumptions reflect the same considerations as those underlying the corresponding assumptions concerning the total cost of diversion in (4), and the effects are assumed to be non-positive and non-negative respectively for the same reasons.

Equation (3) can now be rewritten as

$$q = \pi[M(k, \alpha, z), J] / E - t - c(t, k, z) \quad (6)$$

where  $q \equiv D / E$ . If the largest shareholder is entitled to the fraction  $\alpha$  of the firm's payments to shareholders, then his or her benefit from owning the firm, expressed as a proportion of  $E$ , is equal to

$$\Omega / E = \alpha q + t \quad (7)$$

The largest shareholder is assumed to choose  $t$  to maximise  $\Omega / E$  taking  $k$ ,  $\alpha$ ,  $z$ , and  $E$  as exogenous. The justification for taking the ownership variables as exogenous in the empirical analysis is discussed in section 5.<sup>7</sup> Using (6) in (7), and assuming an interior solution, the first-order condition gives

$$1 = \alpha(1 + c_t(t^*, k, z)) \quad (8)$$

Intuitively, an additional unit of diverted profits benefits the largest shareholder by one, but reduces dividends received by  $\alpha$  plus his or her share of the marginal diversion cost. At the optimal choice of  $t$ ,  $t^*$ , the marginal benefit and cost of diversion must be equal. From (5) and (8), it is clear that exogenous changes in  $k$ ,  $\alpha$ , and  $z$  alter  $t^*$  as follows:

$$t_k^* = -\frac{c_{tk}}{c_{tt}} \geq 0, t_\alpha^* = -\frac{1}{\alpha^2 c_{tt}} < 0, t_z^* = -\frac{c_{tz}}{c_{tt}} \leq 0 \quad (9)$$

The effect of an exogenous increase in the largest shareholder's control rights on dividends as a proportion of equity capital is given by differentiating (6), using (9):

$$\frac{\partial q}{\partial k} = [(\pi_M M_k) / E] - (1 + c_t)t_k^* - c_k \quad (10)$$

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<sup>7</sup> For theories of optimal ownership structures see Demsetz (1983), Pagano and Röell (1998) and Zwiebel (1995).

The overall effect of increased control rights is thus unclear. The first term on the right-hand side of (10) represents the effect of increased control rights on gross profits via increased monitoring, and is non-negative. The second term represents the effect of increased control rights on diverted profits, and this has a non-positive effect on dividends as a proportion of equity capital. The third term represents the effect of increased control rights on the costs of diverting profits, and this has a non-negative effect on dividends as a proportion of equity capital. If empirical estimates show that  $\partial q / \partial k < 0$ , at least for a range of values of  $k$ , this is consistent with the second term (the greater diversion effect) outweighing the other two effects, so that the net effect of increased control rights for the largest shareholder is harmful to minority shareholders over this range.

The effect of an exogenous increase in the largest shareholder's cash-flow rights on dividends as a proportion of equity capital is

$$\frac{\partial q}{\partial \alpha} = [(\pi_M M_\alpha) / E] - (1 + c_t) t_\alpha^* \quad (11)$$

Both effects of higher cash-flow rights tend to increase dividends as a proportion of equity capital, by increasing monitoring of management and by raising the cost to the largest shareholder of diverting profits.

Finally, the effect of an exogenous increase in the holding of the second-largest shareholder is

$$\frac{\partial q}{\partial z} = [(\pi_M M_z) / E] - (1 + c_t) t_z^* - c_z \quad (12)$$

Thus the effect of increases in the holding of the second-largest shareholder is also unclear. Such increases may have a non-negative effect on dividends as a proportion of equity capital by increasing monitoring of management (the first term on the right-hand side of (12)) and reducing the diversion of profits by the largest shareholder (the second term). But they also increase the cost of profit diversion, and this has a non-positive effect (the third term). Empirical evidence that

$\partial q / \partial z > 0$  would be consistent with the net effect of greater holdings by the second-largest shareholder benefitting minority shareholders, although it is not possible to identify how much of such a beneficial effect would be due to monitoring management and how much to increasing the costs of profit diversion by the largest shareholder.

On the assumption that share values in Germany are determined by minority shareholders solely on the basis of the returns they receive from owning shares, the simple model developed in this section can be used as the basis for our empirical investigation of the effects of concentrated ownership on share valuation. According to equation (10), an estimated negative marginal effect of increases in the control rights of the largest shareholder will provide evidence of the existence of private benefits of control, although the precise magnitude of these private benefits cannot be identified. The estimated marginal effect of increases in the cash-flow rights of the largest shareholder is expected to be positive according to equation (11). According to equation (12), an estimated positive marginal effect of increases in the votes controlled by the second-largest shareholder will provide evidence that this shareholder does not collude with the largest shareholder to exploit minority shareholders, but rather benefits such shareholders by monitoring the actions of both management and the largest shareholder.

It is clear from equations (10) and (11) that the magnitude of any marginal effects of increases in the largest shareholder's control and cash-flow rights which operate via greater monitoring of management cannot be identified from estimates of the marginal effects of such increases on share values. However, the following argument suggests a way of estimating the total effect of greater monitoring of management which results from increased ownership by the largest shareholder. If the ownership of a company is completely dispersed, then even the largest shareholder owns such a tiny fraction of the voting equity that it is not possible for him or her to divert any profits from other shareholders, but there will be no monitoring of management by shareholders. If all the shares in a company, both voting and non-voting, are owned by the largest

shareholder, then no profits will be diverted, since all profits accrue to the largest shareholder anyway, and the largest shareholder will have the correct incentives to undertake efficient monitoring of management, since he or she internalise all the benefits of so doing.<sup>8</sup> In the former case, the equity value of a company reflects the absence of both profit diversion and monitoring of management, while in the latter case it reflects the absence of profit diversion and the presence of efficient monitoring of management. Hence the difference between the value of equity in these two cases, other things equal, provides an estimate of the value of efficient monitoring of management relative to no monitoring of management.

A final point to be noted before turning to the empirical part of the paper is that equations (10)-(12) suggest the possibility of a non-linear relationship between share values and the ownership of the largest and second-largest shareholders. The marginal effects of these variables may differ at different parameter values. This possibility is given careful attention in the econometric estimation.

#### **4. Data**

The data we use consists of a sample of 102 listed corporations, taken from Nibler (1998). Nibler collected very detailed data on the equity voting rights in 158 of the largest 200 non-financial German firms in 1992 (measured by turnover), as well as data on some accounting variables and a number of other characteristics of these firms. For most firms, Nibler measured the equity voting rights exercised by different owners at the 1991 shareholders' general meeting: for a small number of firms this information was not available for 1991 and so was taken from

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<sup>8</sup> To obtain the result that no profits are diverted in these two cases from our model, it is necessary to make additional assumptions about the marginal cost of profit diversion. The optimal choice of diversion by the largest shareholder will be zero for a firm with completely dispersed ownership if the marginal cost of diversion at zero diversion becomes large as  $k$  becomes small. For a firm in which  $k=\alpha=1$ , the optimal choice of diversion will be zero if the marginal cost of diversion at zero diversion is zero, but subsequently increases with diversion.



either the 1990 or 1992 general meeting.<sup>9</sup> One of the criteria used by Nibler to select the 158 firms in his sample was that there should have been no significant changes in a firm's ownership structure over the period 1988-1992, so the use of 1990 or 1992 information in a small number of cases does not introduce any errors.

Since our concern is with the effects of concentrated ownership on the market value of shares, we had to eliminate the unlisted firms from Nibler's sample of 158, which resulted in a sample of 102 companies. For these corporations we supplemented Nibler's data by collecting information on the cash-flow rights of the largest shareholder, the ratio of market value of equity to book value of equity, and some additional balance-sheet ratios. The cash-flow rights of the largest shareholder were measured as the fraction of total dividends paid in 1991 received by this shareholder. We obtained this figure using the proportions of voting and non-voting equity which were owned by the largest shareholder, and the dividend paid to voting and non-voting shares, in 1991.<sup>10</sup>

The ratio of the market value of equity (on 31-12-91) to the book value of equity is used as an approximation to Tobin's Q.<sup>11</sup> An alternative measure, which is frequently used in the literature, is the market capitalization of debt and equity divided by the face value of debt and equity. There is both a theoretical and a practical reason why we exclude debt in both the numerator and the denominator of our Q measure. The practical reason is that only a tiny portion of German firms' debt is traded and therefore most of this debt lacks a market price. The theoretical reason is that we are interested in firm performance from a minority shareholder's

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<sup>9</sup> Information on shareholder participation is not published in business reports, but can only be obtained from local register courts (*Handelsregister*) at the headquarters of the various firms.

<sup>10</sup> In Germany non-voting shares typically receive a slightly higher dividend than voting shares.

<sup>11</sup> The correct measure of Tobin's Q would have the replacement cost of the firm's equity capital in the denominator, but this is unavailable for German corporations. In Germany all assets are valued at historic cost in companies' balance sheets, and upward revaluation is not permitted. The issues which are raised by the fact that our measure of Q has the book value of equity capital in the denominator are discussed more fully in the next section.

point of view. Given a firm's risk characteristics, the appropriate measure of expected return on equity for such a shareholder is the capitalization value per unit of equity capital used in the firm.

For eight of the corporations in our sample, only non-voting shares were listed: for these firms the total market value of equity was calculated by using the price of non-voting shares for all shares. In the following section, results are reported for both the full sample of 102 companies and a smaller sample which excludes these eight firms: in general, the results do not depend on which of these samples is used.

The size of our sample of listed non-financial corporations may appear rather small, at 102. But in 1991 the total number of listed corporations in Germany was only 563. Listed corporations account for a much smaller proportion of total economic activity in Germany than in the USA or the UK. Edwards and Fischer (1994, pp. 86-7) estimate that in 1986 listed corporations accounted for about 11% of total turnover in Germany compared to about 30% of total turnover in the UK. In 1989 the market value of listed corporations in Germany was about 25% of GDP in Germany compared to about 69% of GDP in the USA (Sinn and Sinn 1992, p. 114). Our sample, which contains most of the largest listed non-financial German corporations, therefore accounts for a large proportion of the economic activity carried out by listed corporations in Germany in 1991.

Table 1 gives information about various aspects of the sample. The figures shown for our measure of  $Q$  must be interpreted in the light of the fact that the denominator is the book value of equity, which is likely to be a considerable underestimate of the replacement cost of the equity capital.

Table 1: Sample statistics for key variables

	Mean	Median	Standard deviation	Maximum	Minimum
Ratio of market to book value of equity (Q)	2.02	1.67	1.13	5.87	0.56
Attendance at shareholder meeting (per cent)	78.5	82.2	18.7	100	26.7
Proportion of voting equity owned by largest shareholder (SH1)	46.30	47.0	29.79	100	0
Effective proportion of voting equity controlled by largest shareholder (SH1EFF)	54.84	55.06	29.06	100	0
Cash flow rights of largest shareholder (SH1CF)	40.20	35.59	25.58	99.8	0
Proportion of voting equity owned by second-largest shareholder (SH2)	8.34	5.00	10.39	49	0
Effective proportion of voting equity controlled by second-largest shareholder (SH2EFF)	10.11	6.35	11.95	49	0

A largest shareholder was identified for 98 of the 102 corporations: the smallest proportion of the voting equity owned by the largest shareholder which could be identified was 3.09%. Thus there were only four corporations in which ownership was so dispersed that a largest shareholder could not be identified. In these four cases the holding of the largest shareholder was assumed to be zero. Any errors introduced by this assumption are small. A second-largest shareholder was identified for 55 of the corporations, and the smallest proportion of the voting equity owned by the second-largest shareholder which could be identified was 2.23%. Of the 47 cases in which the holding of the second-largest shareholder was zero, 7 corresponded to corporations in which the largest shareholder owned 100% of the voting equity, and 40 to cases in

which a second-largest shareholder could not be identified, and so the holding was assumed to be zero. Again, any errors introduced by this assumption are small.

Table 1 gives information on two alternative measures of the largest shareholder's control rights. One is the proportion of equity voting rights actually exercised by the largest shareholder at the annual shareholder meeting (SH1EFF). The other is the proportion of the voting equity owned by the largest shareholder (SH1). Correspondingly, the holding of the second-largest shareholder is measured either as the proportion of equity voting rights actually exercised by the second-largest shareholder at the annual shareholder meeting (SH2EFF), or as the proportion of the voting equity owned by the second-largest shareholder (SH2).

The data in our sample are consistent with other studies, which have shown that ownership in large German listed corporations is much more concentrated than in equivalent US or UK firms. The mean (median) proportion of the voting equity owned by the largest shareholder in the corporations in our sample is 46.30% (47.0%). When account is taken of the fact that, on average, the attendance at the shareholders' general meeting was such that only 78.5% of the voting equity was represented, the control rights of the largest shareholder become even stronger. Grossing up the proportion of the voting equity owned by the largest shareholder by the fraction of the voting equity actually represented at the meeting gives a figure of 54.84% (55.06%) for the mean (median) proportion of votes cast at the shareholders' meeting by the largest shareholder (SH1EFF).<sup>12</sup>

The mean (median) proportion of the largest shareholder's cash-flow rights is 40.20% (35.59%). It should be noted that the maximum value of the largest shareholder's cash-flow rights in the sample is 99.8%: all corporations in the sample therefore have some minority shareholders.

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<sup>12</sup> Note that in Germany a voting shareholder, or his or her proxy, must be physically present at the general meeting: voting by mail is not allowed.

The correlation between our measures of the largest shareholder's control and cash-flow rights is high (the coefficient between SH1 and SH1CF being 0.908, and that between SH1EFF and SH1CF being 0.876). Allowing for the difference between voting and non-voting equity, and attendance at shareholders' meetings, does not therefore produce much difference between control and cash-flow rights.

As has been noted, a largest shareholder could not be identified for four of the corporations in our sample. For the other 98 corporations, the largest shareholder was an individual or family in 39 cases; a German non-bank enterprise in 26 cases; a foreign firm in 12 cases; a German bank in 13 cases; and a German public sector body in 8 cases. We will return to the empirical implications of these different types of largest shareholder in the next section.

## **5. Results**

The specification of the regression model which we estimate is based on the theoretical analysis of section 3. The dependent variable is the ratio of the market value of the total equity of a corporation to the book value of its equity capital, which we define as  $Q$ . Our main interest centres on the effects of the control and cash-flow rights of the largest shareholder, and the holding of the second-largest shareholder, on  $Q$ . We use SH1CF as a measure of the largest shareholder's cash-flow rights, and either SH1EFF and SH2EFF or SH1 and SH2 as alternative measures of the control rights of the largest and second-largest shareholders. As the discussion of equations (10)-(12) in section 3 showed, the effect of increases in the largest shareholder's cash-flow rights is expected to be non-negative, but the expected sign of increases in the largest shareholder's control rights is ambiguous, and so too is the expected sign of increases in the holding of the second-largest shareholder. Since there are no reasons to expect the marginal effects of these variables to be constant at all values of the variables, in each case these measures are included in the regression equation in squared as well as level form.

When the largest shareholder in a corporation is an individual or a family, there is a clear relationship between the wealth of the shareholder and the market value of the corporation's equity. This is not obviously the case when the largest shareholder is an organisation controlled by agents. There may be no direct link between the interests of the agents who run the organisation and the value of the corporation's equity. If the incentives of the agents who control largest shareholders of this type are not linked to the value of the corporation's equity, then there may be little incentive for such shareholders to devote effort to monitoring management, and hence the effects on  $Q$  of increases in the largest shareholder's control and cash-flow rights which operate via increased monitoring may be much weaker. The effect of greater control rights may also differ between different types of largest shareholder for another reason. If the largest shareholder in a firm is another enterprise, then it is possible that business relationships between the firm and its largest shareholder provide a particularly advantageous way for this shareholder to divert profits from minority shareholders. The special legal provisions applying to shareholders owning more than 50% of the voting equity which are themselves corporations may, however, limit such possibilities. To test whether there were differences in the effects of increased control and cash-flow rights associated with ownership by different types of largest shareholder, we use interactive variables to identify whether the largest shareholder is an individual or family, a non-bank enterprise, a bank, a public-sector body, or a foreign firm.

We include a number of other independent variables in the regression equation to allow for other possible effects on the relationship between the market and book values of equity. The liabilities of German corporations comprise debt (short- and long-term as well as trade credits), pension provisions, and other provisions. These three variables, each expressed as a proportion of total balance-sheet financing, are included in the regression equation. There are two possible

reasons why the debt ratio may affect Q. One is that debt is favourably treated by the tax system.<sup>13</sup> The other is that a high proportion of debt finance has been argued to exert favourable effects on managerial effort and the consumption of private benefits of control (Jensen and Meckling 1976, Jensen 1986), although it is not clear that this necessarily leads to an increase in the market value of equity relative to its book value.<sup>14</sup> The reason for including the pension provision ratio and the other provision ratio (OTHRATIO) is related to the possible problems which arise from the use of the book value of equity in the denominator of our measure of Q. In Germany, both sets of liabilities may potentially benefit the shareholders in a company. Pension provisions are a cheap source of investment finance for the owners of a corporation, while other provisions are regarded as being a valuable vehicle for creative accounting and income smoothing.<sup>15</sup> German corporations have greater opportunities to manipulate their provisions than do firms in many other countries. An important reason for this is the fact that in Germany provisions are allowed even if there is no liability to outsiders. For example, provisions may be built up for deferred maintenance (*Aufwandsrückstellungen*). This ability of German firms to make extensive use of provisions is likely to result in a downward bias in the book value of equity capital, and a corresponding upward bias in our measure of Q.<sup>16</sup> To allow for differential use of provisions by different corporations, and hence differences in the bias in our measure of Q, we included the other provision ratio as a regressor.

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<sup>13</sup> The relative tax advantage of debt over retained profits as a source of finance is greater the lower the personal tax rate of the investor. Since personal investors with a small investment in a firm may face lower personal tax rates than large shareholders, it is possible that firms use a higher proportion of debt finance the more dispersed is their ownership structure.

<sup>14</sup> The standard argument is that these favourable incentive effects of debt lead to increases in the total market value of the firm relative to its total book value.

<sup>15</sup> See Fischer and Haller (1993).

<sup>16</sup> A striking illustration of the extent of the downward bias in the book value of equity was provided by Daimler-Benz in the mid-1990s when for the first time it produced its annual report according to both US general agreed accounting practice (GAAP) and German rules (HGB). The reduction of provisions and similar items required by GAAP increased total equity by 23.6% of HGB equity (Pilhofer 1997, pp. 168-9).

Firm-specific risk is an obvious possible factor affecting Q. We therefore include a measure of beta calculated from 1990 data on weekly price returns and the FAZ index to measure the idiosyncratic risk of each company.

Each corporation was categorised as primarily operating in one of thirteen different industries, and thus thirteen industry dummy variables were included to allow for possible systematic industry effects on Q.<sup>17</sup> A possible way in which there may be systematic industry effects that deserves special mention is the argument that ownership structure may depend on the firm's industry (Demsetz and Lehn 1985): if Qs within an industry are highly correlated, failure to include industry dummy variables in the regression might lead to a spurious relationship between Q and ownership. The inclusion of industry dummies also corrects for cyclical variations in share prices which have an industry-specific component.

Finally we include the turnover of each company as a measure of size. This variable is included to control for a possible spurious relationship between Q and ownership which may arise because it is easier to own a large fraction of a smaller firm, while size and Q may be negatively correlated.

The stability of large ownership stakes in German firms over long periods allows us to argue that the ownership variables can be treated as exogenous in our regressions. As was noted in section 4, all firms in the sample had no significant changes in ownership over the period 1988-1992. In addition, it was possible to establish that 60 of the firms had the same largest shareholder in 1991 as they had had in 1979. A Chow breakpoint test does not reject the null hypothesis that, for all four equations in Table 2, the regression coefficients are the same for these 60 firms and the other 42 firms. Thus there is no evidence that the OLS regression results differ between those firms with stable ownership structure over the twelve years preceding the time at

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<sup>17</sup> Since each industry has its own dummy variable, the regression equation does not include a constant term.



which Q is measured, and those for which it is only known that ownership structure was stable over the preceding four years. In our view, this provides a good justification for treating the ownership variables as exogenous.

For eight of the 102 companies in our sample the total market value of equity had to be calculated using the price of non-voting shares, since only non-voting shares were listed. To ensure that the results obtained are not sensitive to the use of this method of estimating the total market value of equity, we estimate regressions on both the full sample of 102 firms and a sample of 94 firms which excludes the eight companies without listed voting shares.

We begin our empirical analysis by estimating two alternative versions of a general regression model, one of which uses SH1EFF and SH2EFF as regressors, the other SH1 and SH2. In all other respects the two alternative versions of the general regression model are identical. This general model includes the variables set out above, with interactive variables to identify the control rights and cash-flow rights of different types of largest shareholder, and the ownership variables being included in both level and squared form to allow for possible non-constant marginal effects. We then impose a number of zero restrictions on the coefficients of these two alternative versions of the general model, all of which are acceptable at the 0.01 level according to a Wald test. The results obtained after imposition of the zero restrictions for the sample of 102 companies are shown as equations (2.1) and (2.2) in Table 2, and those for the sample of 94 companies are shown as equations (2.3) and (2.4).

Before discussing the results, it should be noted that the regression equations reported in Table 2 have been subjected to tests of model stability based on recursive residuals obtained by estimating the regression equations successively on observations arranged in descending order of SH1EFF or SH1 respectively. The reason for carrying out such tests is that the theoretical analysis in section 3 suggests that the marginal effects of the control and cash-flow rights of the largest

shareholder, and the control rights of the second-largest shareholder, may differ at different values. Although squared as well as level terms were included in the regressions to allow for these possible non-linearities, it is possible that a quadratic form fails to capture them adequately, and hence it is important to test whether the regression coefficients are the same for all firms. Tests based on recursive residuals are appropriate because the situation is one in which there is uncertainty about the point at which a possible structural change in the regression equation may occur. For all four regressions in Table 2, neither the CUSUM nor the CUSUMSQ tests of the stability of the regression model over all observations reject the null hypothesis that the regression coefficients are the same for all firms.

We now turn to the results shown in Table 2. The estimates reported in Table 2 were obtained using OLS and the White heteroscedasticity-consistent estimator of the covariance matrix, since tests indicated that the disturbances were heteroscedastic.

The first point to make about the results shown in Table 2 is that the acceptability of the zero restrictions required to obtain equations (2.1)-(2.4) from the general regression model means that there is no evidence that  $Q$  is influenced by the variables which were thereby excluded. In particular, there is no evidence that the effects of the largest shareholder's control rights differ across different types of shareholder, since all the relevant interactive variables could be excluded. Likewise, there is no evidence of any non-linearity in the effects of the largest shareholder's cash-flow rights, since all the relevant squared terms could be excluded.

Table 2: Effects of ownership structure on share valuation

Regressor	Equation (2.1)	Equation (2.2)	Equation (2.3)	Equation (2.4)
SH1EFF	-0.0337** (0.0141)	-	-0.0306** (0.0143)	-
(SH1EFF) <sup>2</sup>	0.0001 (0.0001)	-	0.00006 (0.0003)	-
SH2EFF	0.0437** (0.0198)	-	0.0300 (0.0229)	-
(SH2EFF) <sup>2</sup>	-0.0006 (0.0005)	-	-0.0002 (0.0008)	-
SH1	-	-0.0428** (0.0198)	-	-0.0416** (0.0202)
(SH1) <sup>2</sup>	-	0.00024* (0.00014)	-	0.00016 (0.00017)
SH2	-	0.0644*** (0.0190)	-	0.0498** (0.0245)
(SH2) <sup>2</sup>	-	-0.00101** (0.00045)	-	-0.00051 (0.00085)
SH1CF	0.0381*** (0.0108)	0.0391*** (0.0133)	0.0415*** (0.0104)	0.0449*** (0.0143)
SH1CF x non-bank enterprise dummy	-0.0147*** (0.0047)	-0.0155*** (0.0049)	-0.0132*** (0.0050)	-0.0149*** (0.0054)
SH1CF x public-sector body dummy	-0.0239*** (0.0070)	-0.0243*** (0.0072)	-0.0238*** (0.0072)	-0.0256*** (0.0072)
OTHRATIO	4.3942*** (1.4406)	4.5688*** (1.4566)	4.5868*** (1.4334)	4.8932*** (1.4641)
R <sup>2</sup>	0.545	0.541	0.573	0.563
Adjusted R <sup>2</sup>	0.433	0.427	0.456	0.443
Number of observations	102	102	94	94

Notes.

1. Figures in parentheses are White heteroscedasticity-consistent standard errors.

2. \* indicates significance at the 0.10 level, \*\* indicates significance at the 0.05 level, and \*\*\* indicates significance at the 0.01 level.

3. All equations also included 13 industry dummy variables, the estimated coefficients of which are not reported.

In almost all respects, the results in Table 2 are very similar across equations (2.1)-(2.4). The coefficient of OTHRATIO, which measures the fraction of other provisions in a firm's total balance sheet financing, is positive and significant in all equations. This is consistent with our expectation that firms making relatively large use of provisions to build up hidden reserves will have relatively large downward biases in their book value of equity capital, and hence a relatively high ratio of market to book value of equity, since these provisions are unlikely to result in lower share values.

In all four equations, the estimated coefficient of SH1CF is positive and significant, while the estimated coefficients of the two interactive variables for SH1CF, which identify cases where the largest shareholder is a non-bank enterprise or a public-sector body, are negative and significant. As equation (11) in section 3 shows, our theoretical model predicts that increases in the largest shareholder's cash-flow rights should result in higher values of  $Q$ , since a greater holding of the corporation's total equity by the largest shareholder leads to increased monitoring, and also aligns his or her interests more closely with those of the minority shareholders, thus reducing profit diversion. The results are consistent with this prediction, with the exception of those largest shareholders which are public-sector bodies. The effect of increased cash-flow rights for those largest shareholders which are not non-bank enterprises or public-sector bodies is given by the positive coefficient of SH1CF. The negative coefficients of the interactive variables for the cash-flow rights of non-bank enterprises and public-sector bodies show that this effect is weaker for these two types of largest shareholder than for the others. The sum of the coefficients for SH1CF and the respective interactive variable gives the estimated effect of increased cash-flow rights for non-bank enterprise and public-sector largest shareholders. For non-banks this effect is positive and significant at the 0.05 level in all four equations. However, for public sector bodies this effect is not significantly different from zero, even at the 0.10 level, in any of the four equations.

Evaluated at the sample mean values, the estimated elasticity of  $Q$  with respect to the cash-flow rights of the largest shareholder, when this shareholder is not a non-bank enterprise or a public-sector body, varies from 0.83 to 0.93 across the four equations, in all cases significant at the 0.01 level. For largest shareholders which are non-bank enterprises, the estimated elasticity ranges from 0.33 to 0.42, in all cases significant at the 0.05 level. For public-sector body largest shareholders, the estimated elasticity ranges from 0.32 to 0.43, but it is never significant. A possible explanation for these differences in the effects of increased cash-flow rights by different types of largest shareholder is that the agents running largest shareholders which are non-bank enterprises and public-sector bodies have weaker incentives to monitor a company's management because their wealth is less closely tied to the equity value of the company. If correct, this explanation raises the question why largest shareholders which are banks and foreign firms, also organisations run by agents, do not suffer from similar incentive problems. This is a matter which requires further research.

The one respect in which the results are not consistent across all four equations concerns the estimated effects of the proportion of the voting equity owned by the largest and second-largest shareholders. In equations (2.1), (2.3), and (2.4), there is no evidence of non-linearity in the effects of the control rights of the largest and second-largest shareholders: the relevant squared variables in these equations are not individually significant, and Wald tests show that they can jointly be excluded from the respective equations. However in equation (2.2) there is evidence of non-linearity in the effects of SH1 and SH2: the relevant squared variables are individually significant at the 0.10 and 0.05 levels respectively, and a Wald test rejects the null hypothesis that they can jointly be excluded from the equation at the 0.05 level.

Despite the difference between equation (2.2) and the other three equations in the estimated relationship between  $Q$  and the voting equity owned by the largest two shareholders, all four equations in Table 2 give similar estimates of the elasticities of  $Q$  with respect to the control

rights of the largest and second-largest shareholders. Evaluated at the sample mean values, the estimated elasticity with respect to the control rights of the largest shareholder ranges from -0.47 to -0.61, while the estimated elasticity with respect to the control rights of the second-largest shareholder ranges from 0.13 to 0.20. All these estimated elasticities are significant at the 0.05 level, with the exception of the estimated elasticity of  $Q$  with respect to the largest shareholder's control rights from equation (2.2): at -0.47, this is only significant at the 0.058 level.

According to equation (10) of section 3, a negative effect of increased control rights for the largest shareholder implies that the harmful effect on minority shareholders through greater profit diversion by the largest shareholder outweighs any favourable effect of increased monitoring or reduced costs of profit diversion. Hence the results in Table 2 provide clear evidence that increases in the largest shareholder's control rights are associated with greater consumption of private benefits of control, and overall are harmful for minority shareholders.<sup>18</sup>

According to equation (12) of section 3, a positive effect of increases in the proportion of voting equity owned by the second-largest shareholder implies that the beneficial aspects of greater monitoring of management and limitation of profit diversion by the largest shareholder outweigh any harmful effect of increased costs of profit diversion. All four equations in Table 2 yield an estimate of the elasticity of  $Q$  with respect to the control rights of the second-largest shareholder at the sample mean values which is positive (ranging from 0.13 to 0.20) and significant at the 0.05 level. However there are some differences between the equations in the estimated form of this relationship. Equations (2.3) and (2.4) imply, respectively, that  $Q$  increases with the second-largest shareholder's control rights until these reach 70.56% and 48.48%, but in

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<sup>18</sup> Given the presence of a quadratic term in the regression equations, the question arises whether increases in the voting rights of the largest shareholder lower  $Q$  over the entire range from 0 to 100%. Equations (2.1), (2.3), and (2.4) imply that such increases lower  $Q$  over this entire range, although in each of these equations the point estimate of the value of the largest shareholder's control rights at which  $Q$  begins to rise is very poorly determined. Equation (2.2) implies that such increases cease to have a negative effect on  $Q$  after SH1 reaches 88.3%. This point estimate is significantly different from zero, but not significantly different from 100%.

both cases these point estimates are very poorly determined. Equations (2.1) and (2.2), however, imply that the values of SH2EFF and SH2 at which Q begins to fall are 34.50% and 31.85% respectively. These estimates are both significantly different from zero. The latter is also significantly different from 50%, while the former is not.<sup>19</sup> Thus, while for equations (2.1), (2.3), and (2.4) we cannot reject the hypothesis that the net effect of greater control rights for the second-largest shareholder is beneficial for minority shareholders over the entire relevant range, equation (2.2) suggests that this effect is only beneficial over some range of values: as SH2 becomes relatively large, further increases reduce Q. This may reflect increased costs of profit diversion, or it may be that there is more scope for collusion between the second-largest and largest shareholders at the expense of minority shareholders as the control rights of the former become large. However, given that equation (2.2) is the only one of the four equations in Table 2 which provides any evidence of non-linearities in the relationship between Q and the voting rights of the largest two shareholders, it would be unwise to place too much weight on this particular result.

As was noted in section 3, any marginal effects of increases in the largest shareholder's control and cash-flow rights which operate via greater monitoring of management cannot be identified from the estimated effects of increases in these rights on Q. However, it is possible to obtain an estimate of the total effect of increased ownership by the largest shareholder which operates through greater monitoring of management on the basis of the argument discussed at the end of section 3. The regression equations in Table 2 can be used to estimate the value of Q when the largest shareholder has all the control and cash-flow rights in a firm, and the value of Q when the control and cash-flow rights of the largest shareholder are zero. If the argument that there is no diversion of profits from minority shareholders in either of these two extreme cases is accepted, any difference in the estimated value of Q will reflect the effects of the change from no monitoring of management (under dispersed ownership) to efficient monitoring of management

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<sup>19</sup> Note that, by definition, SH2EFF and SH2 cannot exceed 50%.

(when the largest shareholder owns all the shares in a company, both voting and non-voting). Note that our estimates of the relationship between Q and the ownership of the largest shareholder are made on the basis of a sample of companies all of which have minority shareholders, so the predicted value of Q when a largest shareholder owns all the equity of a corporation represents the value that would be placed on such a firm by a hypothetical minority shareholder. The estimated changes in the value of Q thus reflect the change in the value to minority shareholders of the firm's equity as a result of efficient monitoring: they do not include any component which are reflecting the strategic value a shareholder owning all of the equity might place on the firm.

Table 3: Estimated proportional increase in Q when ownership changes from complete dispersion to full ownership by a single shareholder

Type of shareholder	Based on equation (2.1)	Based on equation (2.2)	Based on equation (2.3)	Based on equation (2.4)
Non-bank enterprise	20.40 (29.79)	32.66 (35.18)	23.72 (31.78)	28.38 (39.15)
Public-sector body	-33.14 (39.39)	-24.22 (47.56)	-37.99 (40.85)	-41.98 (50.79)
All others	106.23*** (31.67)	133.71*** (37.75)	101.04*** (31.74)	126.41*** (39.16)

Notes.

1. Figures in parentheses are White heteroscedasticity-consistent standard errors.
2. \*\*\* indicates significance at the 0.01 level.

Table 3 shows the estimated proportional changes in Q obtained from equations (2.1)-(2.4) when either SH1 or SH1EFF, together with SH1CF, increase from 0 to 100, with SH2 or SH2EFF (as appropriate) equal to zero, and all other variables at their sample mean values. Since there is evidence in Table 2 of differences between different types of largest shareholder, Table 3 gives corresponding estimates for each shareholder type. The results from all four equations are broadly consistent. Q is estimated to increase by between 20% and 33% when ownership changes from complete dispersion to full ownership by a single non-bank enterprise, and to decrease by



between 24% and 42% for the corresponding change to full ownership by a public-sector body, but neither change is significantly different from zero. However, for all other types of shareholder, the ownership change leads to an estimated rise in Q of 101-134%, which is highly significant. For these types of shareholder, therefore, the evidence suggests that a change from completely dispersed ownership to full ownership by a single shareholder has substantial effects on the extent of monitoring of management, which leads to an approximate doubling of the value of corporate equity. The implied estimate of the value of efficient monitoring of management by these types of shareholder relative to no monitoring of management is very large.

## **6. Conclusion**

The paper argues that it is possible to distinguish empirically the different effects of increased ownership by the largest shareholder in a listed company. This approach is used to show that, in Germany, higher control rights of the largest shareholder lower the market value of firms' equity, which implies that the largest shareholder in a listed company does obtain private benefits of control at the expense of minority shareholders. However, increases in ownership by the largest shareholder can also increase monitoring of the management, and higher cash-flow rights of the largest shareholder may lower his or her incentives to divert profits from minority shareholders. The evidence in the paper shows that, for most types of largest shareholders, these beneficial effects of increased ownership dominate the harmful effect on minority shareholders. However, if the largest shareholder is a non-bank enterprise or a public-sector body, the evidence does not show this to be the case. Understanding the reasons for the differences between the effects of ownership by different types of largest shareholder is clearly an important question for future research.

Increases in the control rights of the second-largest shareholder also increase the share value of German companies. Although it is not possible to identify the exact mechanism by which

this effect operates, it is plausible to suppose that the ability of the largest shareholder to obtain private benefits of control is limited by increases in the control rights of the second-largest shareholder.

Germany is typical of the world as a whole as far as concentrated ownership of large listed companies is concerned, and hence the empirical results of this paper are potentially important for understanding why concentrated ownership is so widespread. Minority shareholders who invest in companies with high ownership concentration thereby expose themselves to possible exploitation by large shareholders. The evidence for Germany shows that, although the largest shareholders do obtain private benefits of control, in the majority of cases these costs of ownership concentration, which are associated with the control rights of ownership, are outweighed by the benefits, which are associated with the cash-flow rights of ownership. The approach developed in this paper can be used to investigate whether the benefits of concentrated ownership outweigh the costs in other countries.

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