

**Corporate Governance Rules  
and the Value of Control -  
A Study of German Dual-Class Shares**

**By**

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# Corporate governance rules and the value of control - study of German dual-class shares

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## Abstract

The paper uses a dataset of German dual-class shares during 1988-1997 to study the relationship between corporate governance rules and the price differential between voting and non-voting stock. In a first step the paper discusses how mechanisms to separate control from cash-flow rights relate to the value of control. Secondly the paper studies the impact of a new takeover regulation which was adopted in Germany in 1995 and introduced the mandatory bid rule. The paper analyses how minority voting and non-voting shareholders participate in transfers of corporate control under the alternative regulatory structures pre- and post- 1995. It is further shown that a mandatory bid requirement reduces the potential control value of voting stock by restricting the ratio of control to cash-flow rights.

*JEL Classification:* G32, G34

*Keywords:* voting premium, corporate governance rules, transfers of corporate control, panel data.

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## Non-technical summary

The paper investigates the determinants of the voting premium, the price differential between voting and non-voting shares in Germany during 1988-1997. It shows that the price differential results from two factors: the value of controlled assets per unit invested in voting stock and the way in which minority voting and non-voting shareholders participate in transfers of control. Both factors are influenced by the existing regulation of corporate governance. The paper studies how a change in corporate governance rules in Germany in 1995 affects the voting premium through these two channels.

Germany introduced the mandatory bid rule through a voluntary Takeover Code in October 1995. The paper focuses on this regulatory change from two different points of view: first, it examines the effect on the voting premium as a result of an individual acceptance decision of the Code and second, it analyses the overall change in the payoff to minority voting and non-voting shareholders in corporate control transactions. First, the paper shows how non-voting stock, debt and a pyramiding structure of subsidiaries increase the amount of controlled assets without diluting control rights. Acceptance of the Code reduces the extent to which a pyramiding structure of subsidiaries can be used to increase the control value of voting stock and therefore has a negative effect on the voting premium. Second, in the absence of the mandatory bid rule shareholders of voting and non-voting stock experience identical payoffs when a majority block changes hands. The existence of a majority shareholder tends to preclude any superior payoff for voting minority shareholders. Under the mandatory bid rule, however, voting minority shareholders can participate in a sale-of-control transaction on the same terms as the controlling blockholder. Regressions of the voting premium on majority-control support this hypothesis and show that the coefficient estimate is negative during the pre- 1995 period and positive after 1995.

# 1 Introduction

Ownership of common stock confers control rights over a company. In practice this control manifests itself in the right to vote at a shareholders' meeting about corporate matters such as the distribution of profits or the appointment of the management board. The value of this voting right is usually measured by the price differential between voting and non-voting stock. A series of empirical studies on the differential pricing of voting and non-voting shares has shown that voting rights are generally worth between 5 percent and 20 percent of the value of common stock<sup>1</sup>. Germany does not differ sharply from this range, with an average premium of 26.34% between 1988 and 1997. This paper employs a data set on German dual-class shares during the ten-year period 1988-1997 to furnish evidence on the determinants of the voting premium. The paper contributes to the existing literature on the voting premium in two ways. First, it systematically lists mechanisms used to separate cash-flow from control rights and relates them to the voting premium. Second, it analyses how the voting premium depends on the institutional framework of corporate governance. Germany introduced a new voluntary takeover regulation in 1995. The paper both analyses the change in the control value of signatory companies and shows how the structural break affects the way in which minority shareholders participate in transfers of control.

The paper argues that the value of the voting right results from two factors: the value of control benefits the voting right confers and the probability that the voting right is crucial for a transfer of control. It seems reasonable to assume that the value of control benefits rises with the amount of assets under control. In a fully equity financed firm the value of assets equals the value of its equity. There are several ways in which one might detach the equity position from the amount of controlled assets, i.e., to increase private control benefits without enhancing the amount of outstanding equity. The generic principle is to recruit investors who commit capital but do not share in the control of the company. This article considers three means of separating control from cash-flow rights: debt, non-voting preference shares, and a pyramiding structure of subsidiaries. The paper analyses how these variables relate to the observed price differential between voting and non-voting stock.

Apart from the amount of control benefits the voting right confers to a potential new controller, it is decisive whether an atomistic shareholder is pivotal for a transfer of control to a new shareholder. Atomistic investors are relevant for the analysis because the price differential between voting and non-voting shares reflects the value of control to the marginal investor who is unlikely to be a controlling shareholder. Since control benefits are exclusively consumed by the party in control, the price difference has to reflect the price a potential aspirant for control would be willing to pay to atomistic shareholders to establish control over the company. Whether small shareholders are able to capture a share of this price largely depends on the practice of control transfers, the prevalent ownership structure and corporate governance regulation. In the US and other economies

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<sup>1</sup>In the US the premium averages 5.4 % (Lease, McConnell, and Mikkelson [1983]), in the UK 13.3% (Megginson [1990]), and in Switzerland about 20% (Horner [1988]). Exceptions are Israel, where the premium amounts to 45.5 % (Levy [1982]) and Italy where Zingales [1994] reports a premium of 82 %.

with an Anglo-Saxon system of corporate governance ownership is usually dispersed and competition for control intense (see Allen and Gale [1995]). This is the institutional setting of studies on the voting premium carried out by Zingales [1994, 1995a], Rydqvist [1996] and Nicodano [1997]. In these studies voting rights are valuable because they can make a difference to the outcome of a control contest. Outside shareholders may be able to extract some of the winner's private benefits of control and sell their shares at a price higher than their post-takeover price. The intensity of competition in the market for corporate control is therefore the key determinant for the voting premium in these models. Given the paucity of competition for corporate control in Germany (Franks and Mayer [1993]), this paper casts transfers of corporate control in an alternative institutional framework where control can also be acquired through negotiated sales of share stakes. Even if control is contested minority common stockholders will not fare better than preference shareholders under a change in control. The incumbent controller will bargain exclusively with the outside control aspirants about his controlling interest. Small voting shareholders are only pivotal for a transfer in control if there is no controlling incumbent blockholder and control is contested.

This changes under a regulatory regime which imposes the mandatory bid rule on transfers of control. In 1995 Germany experienced a regulatory change through the launch of a voluntary Takeover Code, which obliges its signatories to adhere to the mandatory bid rule. The mandatory bid rule stipulates that a party which purchases a controlling interest of another listed company's voting equity is obliged to make an offer to the remaining target shareholders at a price not smaller than the price paid for the controlling block. So even if there is no competition for control, can small ordinary shareholders capture a share of private control benefits. This is the case if the negotiated takeover price is higher than the value of security benefits under the new controlling party. As opposed to the regulatory structure before 1995, a controlling incumbent blockholder is a prerequisite for a potential differential payoff in favour of small voting shareholders in a transfer of control. The empirical study in this paper provides supporting evidence for this hypothesis and shows that majority control carries a significant and positive effect during 1995-1997, and a negative one during 1988-1994.

Since acceptance of the Code is voluntary, it is also possible to analyse how the value of the voting right changes in response to an individual compliance decision. Adherence to the Code implies that subsidiaries are likely to be acquired with a higher fractional equity ownership than necessary for control. This reduces the extent to which the value of control can be enlarged through a pyramiding structure with less than fully controlled subsidiaries. The maximum separation of control and cash-flow rights is no longer likely to be attainable. The empirical results lend support to this hypothesis: the voting premium is significantly smaller for companies which signed the Takeover Code.

The paper proceeds as follows. The first part discusses the institutional background of preference shares in Germany. Besides the discussion of their economic significance, the different dividend regimes of preference shares are analysed. In the second section we present the data set of German companies with dual-class shares. The third part discusses the theoretical rationales for the determinants of the voting premium. First, factors proxying for the value of corporate control are derived and put to an empirical

examination. Secondly, the paper analyses how minority shareholders participate in the different modes of corporate governance in Germany pre- and post- 1995. A subsequent empirical study seeks to capture how the determinants of the voting premium changed between the two subperiods 1988-1994 and 1995-1997. Finally the effect on an individual compliance decision with the Takeover Code is examined.

## 1.1 Institutional background of preference shares in Germany

Preference shares without voting rights are subject of legal stipulation since 1937. The legal treatment of preference shares remained virtually unchanged in the reform of German corporation law in 1965, with the only exception that the maximum allowable preference share capital was increased from one third to one half of the share capital. As a compensation for the lacking voting right the law prescribes a priority dividend for preference shares. Apart from this legal precept, statutory provisions can endow preference shares with additional dividend privileges.

### 1.1.1 Dividend rights

**Legal provisions** According to § 139 I AktG the dividend privilege must consist in a priority dividend which is paid to preference shareholders before profit is distributed to holders of ordinary shares. The preference shareholders thus assume an intermediary position between debtholders whose claims are senior to those of preference shareholders and holders of ordinary shares. The priority dividend is cumulative, i.e., if it is not or not fully paid in one year, it has to be paid at the expense of profits of subsequent years with the same priority vis-a-vis ordinary shares, and together with the current priority dividend. The cumulative preferred dividend constitutes a material precept of profit distribution: if the company shows accounting profits, they have to be distributed to satisfy current and postponed dividend priorities (Bezzemberger [1990]).

Apart from dividend rights, holders of preference shares are equipped with a contingent voting right. The voting right enters into force if the priority dividend  $m_i$  has not been fully paid during one year and the arrears not been fully repaid during the following year together with the full priority for that year. For example, if in year  $t$  preference shareholders obtain no dividend, they gain the voting right at the AGM in  $t + 2$  if in year  $t + 1$  a dividend of less than  $2m_i$  is paid.

**Statutory amendments** Besides these compulsory characteristics, the corporate charter can specify the size and additional features of the dividend rights of preference shares. All German preference shares currently participate beyond their priority dividend in the distribution of profits. Very often the corporate charter grants an additional dividend to preference shares in excess of the amount distributed to ordinary shares. The current dividend regimes of preference shares can broadly be classified into three categories depending on the relation of priority and excess dividends: (a) no additional dividend: after payment of the priority dividend  $m_i$ , ordinary shares receive the same amount, and the remainder is equally split between the two categories; in this case, the priority dividend only constitutes a differential dividend in case of insufficient profits where ordinary

shares receive less than  $m_i$ ; (b) constant additional dividend: after payment of the priority dividend  $m_i$ , ordinary shares receive the same amount, after which profit is distributed such that preference shares always receive an excess dividend  $x_i$  with respect to ordinary shares; (c) variable additional dividend: same as (b), except that the additional dividend  $x_{ki}$  varies according to the dividend ordinary shares receive,  $d_{it}^v$ , i.e., the sequence  $(x_{ki})_{k=1,\dots,l}$  determines the additional dividend for growing  $d_{it}^v$ . Table I summarizes the three dividend regimes and their empirical relevance. The most common dividend regime is a combination of a minimum and an additional dividend. In eight companies does the additional payment vary according to the amount distributed to ordinary shares. Five of the eight preference shares with a varying additional dividend carry a progressive dividend scheme where  $x_{ki} < x_{k+1,i}$ , in the remaining three cases the additional dividend decreases the higher the dividend distributed to ordinary shares, i.e.  $x_{ki} > x_{k+1,i}$  (see also Table A.IV). The additional dividend never exceeds the priority dividend. In category II the additional dividend equals on average 2.1% of the stock's nominal value, i.e., less than half of the average minimum dividend of 5%. In roughly 20% of dual-class shares no additional dividend is paid, which is compensated through a higher priority dividend of 5.8% on average.

### 1.1.2 Economic significance and relative performance of dual-class shares

Although the first preference shares were introduced in Germany in the late 1930s, they only reached practical significance during the economic upswing in the eighties. In 1980 only 6.3% or 29 out of listed companies on German stock exchanges were preference shares; the number increased to 17% or 90 listed companies in 1989. Table A.I. depicts that by the end of 1997 a total of 110 listed companies had preference shares outstanding, of which 71 list both ordinary and preference shares. A substantial increase in the number of companies with dual-class shares occurred during 1990, as Table A.II. shows. Fourteen companies entered the sample either through an initial public offering with dual-class shares or through a listing of a formerly unlisted class. The number of companies with dual-class shares has remained relatively constant over the subsequent seven years.

Figures 1 and 2 show cumulative return indices for both preference and ordinary shares during the 1988-1997 period. The indices include only return observations for companies in which both classes of shares were simultaneously listed, i.e., at each point in time the two return indices for the two classes of shares include the same number of companies. If only one of the two classes of shares is listed, the company is excluded from the index. The shares enter the index portfolios with an equal weight. In Figure 1 the return index only encompasses the capital gains of the two classes of shares, i.e.,

$$I_t^{nv,v} = \prod_{t=t_0}^T \frac{1}{N} \sum_{i=1}^N (1 + r_{it}^{nv,v})$$

where  $r_{it}^{nv,v} = (P_{it}^{nv,v} - P_{it-1}^{nv,v})/P_{it-1}^{nv,v}$ . It is striking that ordinary shares underperform preference shares in terms of capital gains by nearly 21% even though they are already disadvantaged in terms of dividend payments. The return indices in Figure 2 include dividends and are calculated as above but with  $r_{it}^{nv,v} = (P_{it}^{nv,v} - P_{it-1}^{nv,v} + d_{it}^{nv,v})/P_{it-1}^{nv,v}$ . The inclusion of dividend payments widens the return gap between the two classes of

shares. The graph shows that preference shares outperform ordinary shares by 46% over the sample period. The difference between the buy-and-hold returns of the preference share portfolio and the ordinary share portfolio is significantly different from zero at the 99.99% confidence level for both return specifications.

## 1.2 Data and summary statistics

### 1.2.1 Data

The sample consists of all German companies with both ordinary and non-voting preference shares traded on the German stock exchanges in the official list, the regulated and the free market during 1988 to 1997. Firms are only included in the sample if they have bearer ordinary and preference shares outstanding, companies with registered shares in either of the two categories are excluded from the sample. Table A.V. describes the data and documents its sources. The data on the ownership structure is obtained from ‘Hoppenstedt Aktienführer’, which lists the main holders of ordinary and preference shares of companies listed on the official list, the regulated market and of companies with the most liquid shares in the free market. The handbook is published yearly and its deadline for publication is 30 September of each year. Also, with the introduction of the ‘Wertpapierhandelsgesetz’ (WpHG) in 1995 shareholdings of voting stock higher than 5%, 25%, 50%, and 75% have to be reported to the supervisory board, the ‘Bundesaufsichtsamt für den Wertpapierhandel’, within seven days after exceeding or falling short of one of these thresholds (§ 21 WpHG). As a transitory regulation the law required to report all of the existing significant shareholdings at the day of the annual shareholders’ meeting after 1 April 1995 (§ 41 WpHG). Since shareholders have responded with significant delay to the disclosure requirement<sup>2</sup>, the data cannot be used to reconstruct the exact time of ownership changes during 1995 and 1996. But the data was used to cross-check the ownership structure as of the end of September in each year. The ownership data is used as presented by ‘Hoppenstedt Aktienführer’, with slight alterations with respect to shareholders which are majority owned by the same parent company. Whenever a company is majority controlled by a holding company, the shareholdings of the subsidiary are fused with the shareholdings of the holding companies in the dual-class company. For example, in 1996 Colonia Versicherungs AG features two main shareholders: Vinci BV with a holding of 46% and Kölner Verwaltungsgesellschaft für Versicherungswerte with 30% of voting stock. Since the latter company is a subsidiary of Vinci BV, we classify Colonia as majority-controlled.

The voting premium is calculated with the averages of the shareprices of the ten first trading days in October each year. According to the listing history of dual-class shares the sample would have to consist of 627 observations (Table A. II.) and 88 companies during October 1988 to October 1997. The shareprices could, however, only be retrieved for 601 companies years and 84 companies. The shareprices are taken from ‘Datastream’ and are adjusted for stock splits, etc. Share prices and dividend payments are adjusted if

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<sup>2</sup>In 1995, the Bundesaufsichtsamt für den Wertpapierhandel received 1100 notifications according to § 41 (200 according to § 21), in 1996 the number of firm-time notifications was still 1080 (500 according to § 21). Only in 1997 did the number of § 41 notifications reduce to merely 6 (360 according to § 21).



the par value of voting and non-voting shares differs. The voting premium  $VP_{it}$  is defined as

$$VP_{it} = \frac{P_{it}^v - P_{it}^{nv}}{P_{it}^{nv}} \quad (1)$$

where  $P_{it}^v$  ( $P_{it}^{nv}$ ) is the price of a voting (non-voting preference) share of company  $i$ . Table II shows that the average premium in the sample is 26.34%, Kötizer Leder exhibits the minimum premium of -57.3% in October 1991 and Hartmann & Braun the maximum premium of 280.9% in October 1988. Therefore the voting premium is comparable with the level found in Canada (23.3%) and Switzerland (27%). It is, however, higher than the level observed in the US (5%), Sweden (12%), and the United Kingdom (13.3 %), but significantly smaller than levels observed in Israel (45.5%) and Italy (81%).

### 1.2.2 Dividend payments

Table A.III shows the percentage of cases in which preference and ordinary shareholders received differential and identical dividend payments respectively during 1988-1997. A differential dividend payment in favour of preference shares can occur in three cases: (1) preference shares obtain an additional dividend with respect to ordinary shares,  $d_{it}^{nv} = d_{it}^v + x_{it}$ , if the dividend to ordinary shares exceeds the minimum dividend,  $d_{it}^v > m_i$ ; (2) the minimum dividend is paid to preference shares,  $d_{it}^{nv} = m_i$ , but there is insufficient profit for ordinary shares to obtain an identical amount,  $d_{it}^v < m_i$ ; and (3) preference shares obtain cumulated minimum dividend payments for more than one year,  $d_{it}^{nv} = \sum_t m_i$ , but there is insufficient profit for ordinary shares to obtain an identical amount,  $d_{it}^v < \sum_t m_i$ . The first case occurs most frequently, in 64% of the company years. In these cases the additional dividend constitutes a differential dividend yield of only 0.74%. In the less common cases where dividend arrears of one or more years are paid out, the differential dividend yield in favor of preference shares rises to 1.5% and 3.5% respectively. Both classes of shares receive the same dividends if (1) there is insufficient profit to distribute any dividends,  $d_{it}^v = d_{it}^{nv} = 0$ , and (2) if there is no statutory provision for an additional dividend and the dividend to ordinary shares exceeds the minimum dividend,  $d_{it}^{nv} = d_{it}^{nv} \geq m_i$ . Identical dividends to both classes of shares are paid in 28% of company years, whereby 12% result from the absence of an additional dividend and 16% from dividend omissions. The voting right which emerges after two years of unpaid minimum dividend was effective in 11% of the company years in the sample (Table II).

### 1.2.3 Further summary statistics

Table II presents other general characteristics of this sample. The concentration of ownership in German dual-class companies is reflected by the fact that 73% are majority controlled, and a substantial 27.5% are controlled with a qualified majority of 75%. These characteristics are in line with the general ownership structure of German publicly traded companies, of which 70% are majority-controlled (Hoffmann-Burchardi [1999]). The maximum number of blockholders (with shareholdings higher than 5%) is five. Blockholdings of preference shares are less frequent, but do exist. The average size of preference share stakes owned by the largest voting stockholder (higher than 5%) is 5%.

As in Italy, preference shares are prevalent in both large companies and small and mid-sized companies, and not concentrated among small companies like in the US (Zingales [1995]). Dual-class share companies with a large market capitalization are BMW and VW (car manufacturers), RWE (electricity), MAN (manufacturing) and SAP (software), which are all constituents of the DAX 30, the index encompassing the 30 largest German companies in terms of market capitalization and daily stock turnover. About 24% of dual-class share companies are a member of either the DAX 30 or the MDAX, which comprises the 70 next largest companies with respect to market value and trading volume. The liquidity of the two share classes decides which of the two classes is included in the index. In 11.3% of dual-class share companies preference shares are members of the indices since they are more liquid than ordinary shares. Examples of companies with preference shares as index members are Escada, Fresenius, RWE, and GEA.

## 2 Rationales for the source of the voting premium

The market prices of ordinary and preference shares reflect the value of the shares to the marginal investor. Since it is unlikely that the marginal investor is a controlling shareholder, the shareprices reflect the value of the shares to the small shareholder uninvolved in the control of the company. The voting premium therefore has to reflect the potential future control value associated with an ordinary share. The voting right becomes valuable if it becomes indispensable to a new control structure of the company. The value of corporate control itself depends on the amount of private benefits the controlling shareholder derives with a given capital investment. The value of a voting right of an atomistic shareholder is thus the result of two factors: (a) the (future) amount of *private control benefits* the voting share confers and (b) the probability that the voting share becomes *crucial in a transfer of corporate control*.

### 2.1 The value of control benefits

The literature on corporate control issues (see Grossman and Hart [1988], Harris and Raviv [1988] and Zingales [1995b]) has long emphasized the importance of private benefits of control. Examples for these benefits which are exclusively consumed by the party in control are excessive salaries, self-dealing or synergies favouring other branches of business of the controller. Given the nature of control benefits it seems reasonable to assume that these benefits are proportional to the total amount of assets under control (Nicodano [1997]). The larger the amount of controlled assets, the greater is the social prestige, and the more abundant are the opportunities to divert profits and consume perquisites. The smaller the capital investment to attain a given level of control benefits, i.e., the smaller the required equity stake to grant control over a given amount of assets, the higher the ‘rate of return’ from control. The ratio of controlled assets to the capital investment required for corporate control is termed the ‘private benefit multiplier’ (PBM). There are several mechanisms by which to separate control from cash-flow rights. The general principle is to increase the proportion of investors who are willing to commit capital but abstain from control rights.

**Debt** Debtholders are the classic example of investors who refrain from exercising control in favour of fixed schedules of interest rate payments in the future. If  $B$  denotes the amount of debt outstanding and  $S$  the firm's voting equity, then the private benefit multiplier of debt is given by  $(B + S)/S$ . As opposed to equityholders, bondholders only gain control of the firm's assets if the firm value shrinks below the value of debt and equityholders file for bankruptcy. Whereas low levels of leverage unequivocally raise the PBM, an increasing debt ratio increases the likelihood of bankruptcy and therefore the probability of a shift in control to bondholders. One would therefore expect increasing returns to control at moderate levels of gearing, and decreasing returns at high debt to equity ratios. This paper uses the capital gearing ratio to proxy for the increase in private control benefits due to debt issuance<sup>3</sup>. In this sample the capital gearing ratio averages 38.6% and varies between 3.2% and 172%, where the latter figure arises because of a negative equity value.

**Non-voting stock** A similar instrument to separate control from cash-flow rights are non-voting preference shares, a hybrid security with elements of both debt and equity claims. Preference shares usually carry a higher dividend right than ordinary voting stock as a compensation for the lacking voting rights. The amount of preferred shares outstanding,  $S^{nv}$ , has a similar effect on the PBM, namely  $(S^{nv} + S)/S$ . The limits to the multiplier effect are determined by the respective national corporation law, which usually provides for a maximum percentage of non-voting to voting stock. In Germany companies are only allowed to issue 50% of their equity as non-voting stock<sup>4</sup>. Table II shows that on average the voting share capital corresponds to about 70% of total share capital in the sample of German dual-class shares during 1988-1997. Since the difference between ordinary and non-voting preference shares serves as a measure for the value of corporate control, the voting premium should be higher the larger the fraction of non-voting equity.

**Pyramiding** As Nicodano [1997] first pointed out in the context of the voting premium, a third way of increasing the amount of assets under control with a fixed equity investment is the creation of a pyramiding structure of subsidiaries. Consider a fully integrated company  $A$  with its assets entirely financed by voting equity  $S_1$ . The majority shareholder of company  $A$  decides to acquire control of another fully equity-financed company  $B$  with an equity position of  $S_2$ . The investor has two options of how to arrange a new control structure. We assume that a percentage equity investment of  $\bar{x}_{j,j+1}$  is necessary for control. The subscript  $j, j + 1$  denotes a controlling stake of a layer  $j$  company in a subordinate layer  $j + 1$  company and  $j = 0$  stands for the ultimate holding company or investor<sup>5</sup>. First the investor could acquire a fraction  $\bar{x}_{01}$  of equity  $S_2$  thus controlling

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<sup>3</sup>Because of the possibility of negative equity values in accounting we use  $B/(B + S)$  instead of  $(B + S)/S$ . The former ratio stays positive even for moderate levels of negative equity positions (i.e., as long as  $-E < B$ , which is satisfied in this sample). The discontinuity of  $(B + S)/S$  at very high levels of debt (where the ratio changes from a very large positive to a negative value) does not appropriately capture the multiplier effect. The use of  $(B + S)/S$  as its squared value would be even more questionable.

<sup>4</sup>See Rydqvist (1992) for a detailed overview of the significance and regulation of non-voting shares in different countries.

<sup>5</sup>This notation implies that a subordinate company  $j + 1$  cannot own a stake in a company of the same level  $j + 1$  or of a higher hierarchical layer  $j$ . In fact, the data on the subsidiary structure of the sample companies only specifies these hierarchical interlacings.

$S_1 + S_2$  with a corresponding equity investment of  $\bar{x}_{01}(S_1 + S_2)$ . Alternatively company  $A$  could acquire a controlling interest of  $\bar{x}_{12}S_2$ . Company  $A$  would then hold the amount of original assets  $S_1$  plus an equity stake of  $\bar{x}_{12}S_2$ . Whereas the amount of controlled assets remains unchanged, the control of the integrated business group  $A$  and  $B$  now only requires an equity investment of  $\bar{x}_{01}(S_1 + \bar{x}_{12}S_2)$  as opposed to  $\bar{x}_{01}(S_1 + S_2)$ . The ratio of controlled assets to equity participation increases from  $1/\bar{x}_{01}$  to  $(S_1 + S_2)/[\bar{x}_{01}(S_1 + \bar{x}_{12}S_2)]$ . The key to the increase in the PBM are external investors on the level of the subsidiary who commit capital but do not share the control of the company. The multiplier effect for alternative control structures where each subsidiary is controlled through a fractional equity investment of  $\bar{x}_{j,j+1}$  generalizes to

$$\widetilde{PBM} = \frac{\sum_{i=0}^{m-1} \sum_{k=1}^{K_{i+1}} S_k^{i+1}}{\sum_{i=0}^{m-1} \prod_{j=0}^i \bar{x}_{j,j+1} \sum_{k=1}^{K_{i+1}} S_k^{i+1}}$$

where  $m$  stands for the number of layers of the holding structure and  $K_{i+1}$  denotes the number of subsidiaries on a specific layer  $i$ . The stronger the vertical structure of the business group, i.e., the longer the chain of subsidiaries owning subsidiaries, the higher the PBM. It can be shown that  $\partial \widetilde{PBM} / \partial S_{k_0}^{i_0+2} > \partial \widetilde{PBM} / \partial S_{k_0}^{i_0+1}$  (see Appendix), i.e., the more real assets are placed in higher-order hierarchical layers instead of horizontal ones, the higher the leverage to private benefits of control. If the company chooses a higher equity participation than  $\bar{x}_{j,j+1}$ , the multiplier effect will shrink, i.e.,  $\partial \widetilde{PBM} / \partial x_{j,j+1} < 0$ .

In order to determine the multiplier effect on the value of control for a company with a *given* structure of subsidiaries, it is simply necessary to add the equity position of each subsidiary taking account of the fact that equity positions of subsidiary companies have to be subtracted from the amount of controlled assets. The following formula is applied to determine the degree of control leverage:

$$PBM = \frac{\sum_{i=0}^{m-1} \sum_{k=1}^{K_{i+1}} S_k^{i+1} - \sum_{i=1}^{m-1} \sum_{k=1}^{K_{i+1}} x_{i,i+1}^k S_k^{i+1}}{x_{01} S_1^1} \quad \text{where } x_{i,i+1}^k > \bar{x}. \quad (2)$$

In contrast to  $\widetilde{PBM}$  which determines the multiplier effect of alternative hypothetical control structures, the basis for the calculation of the actual  $PBM$  is the equity capital of the respective holding companies which already incorporates the equity positions of its subsidiaries. The numerator of  $PBM$ , which captures the amount of controlled assets, therefore removes the double counting of equity participations and real assets. Control of the holding structure implies control of the ultimate holding company which is achieved through an equity investment of  $x_{01}S_1^1$ . In a sense, the formula for the de facto multiplier ‘reverses’ the procedure by which the hypothetical  $\widetilde{PBM}$  is constructed. The formula also allows for different ownership fractions  $x_{i,i+1}^k$  of subsidiaries as long as they exceed the necessary control quota,  $\bar{x}$ . If a subsidiary is entirely controlled by a holding company, i.e.,  $x_{i,i+1}^k = 1$ , it is excluded from the PBM calculation, since its net contribution to the PBM is zero. Given the above considerations the voting premium should be higher the larger the extent of a corporate hierarchical structure.

The data on the holding structure of the dual-class companies in the sample is taken from ‘Hoppenstedt Aktienführer’. The stock exchange guide lists all significant shareholdings of companies up to the third hierarchical layer of holdings with their respective

equity positions and quota of shareholding. Whenever the equity position in a subsidiary is denominated in a foreign currency it is converted to DM with an exchange rate at 30 September of each year. The total equity position of each subsidiary is stated in nominal terms, since the equity holding is consolidated at its nominal value in the balance sheet of the holding company. In order to remain consistent in terms of nominal valuation the equity position of the holding company is also included with its nominal value implying that the market-to-book ratio remains stable across the holding structure. A controlling interest of a company is assumed to exist if a company owns more than 25%, respectively 50% of another company's stock. This threshold of 25%, the so-called 'blocking minority' ('Sperrminorität'), is chosen because several major corporate decisions, changes of the corporate charter such as increases or decreases of share capital or a merger, require a 75% majority of voting shareholders. A 50% majority conveys de facto control over a company, since it is sufficient for AGM decisions of a more operative nature like dividend payments, the discharge of the management board and the election of members of the supervisory board. In this sample the average ratio of control to cash-flow rights equals 1.41 if we assume control is accomplished with a higher than 25% shareholding. This means that a nominal equity participation of 1 DM in a dual-class company grants on average control rights over equity with a nominal value of 1.41 DM. The ratio decreases to 1.172 if we require a 50% shareholding for control. The ratio equals one for companies with no or only fully owned subsidiaries. Heidelberger Zement exhibits the maximum 'control leverage' with a control cash-flow ratio of 5.997.

The above considerations suggest that the voting premium should positively depend on the multiplier mechanisms for private benefits of control. In particular we derive the following hypotheses:

**Hypothesis 1** *Both the private benefit multiplier due to pyramiding and the ratio of non-voting equity to overall equity should be positively correlated with the voting premium.*

**Hypothesis 2** *The amount of capital gearing should have a non-linear effect on the voting premium. For low levels of leverage the price differential between voting and non-voting stock should rise, for higher levels of leverage the relation should reverse because of an increasing risk of control change to debt claimants.*

**Econometric specification** We include the ratio of preferred equity to total equity,  $NV_{it}$ , and the degree of control leverage according to [2],  $PY_{it}$ , as explanatory variables. In order to capture the potential non-linearity of capital gearing we include both capital gearing,  $CG_{it}$ , and its squared value as independent variables. Apart from the variables proxying for the control value of voting stock we have to take account of the dividend privilege of preference shares and potential liquidity differences between the two classes of stock. As the comparative analysis of dividend payments to preference and ordinary shares has shown (Table A.III) the maximum differential dividend yield arises in years in which dividend arrears are paid to preference shareholders. We therefore include a dummy variable,  $DA_{it}$ , which is equal to one in years in which preference shares obtain a cumulative dividend payment for former dividend omissions and zero otherwise. The

dummy variable  $DI_{it}$  takes account of the contrarian case, in which both preference and ordinary shares receive an identical nonzero dividend. In addition, we include the dummy variable  $VR_{it}$  if the voting right of preference shares is effective, i.e., after two years of dividend omissions. In order to control for liquidity differences we use a dummy variable,  $IX_{it}$ , for companies in which the preference share as opposed to the ordinary share is a member of one of the main stock exchange indices, of the DAX or MDAX. Since the more liquid class is chosen as index constituent, this ensures that we truly control for liquidity differences<sup>6</sup>. An alternative, the ratio of daily turnover of the two share classes, is less reliable because of the regional structure of the German Stock Exchange. Datastream mainly provides the turnover data from the Frankfurt Stock Exchange, ignoring the other 7 exchanges where the shares could also be traded. In addition, turnover data only exists for a small subsample of the dual-class shares. We therefore obtain the following empirical specification:

$$VP_{it} = \beta_0 + \beta_1 PYR_{it} + \beta_2 CG_{it} + \beta_3 (CG_{it})^2 + \beta_4 NV_{it} + \beta_5 DA_{it} + \beta_6 DI_{it} + \beta_7 VR_{it} + \beta_8 IX_{it} + \mu_i + \varepsilon_{it} \quad (3)$$

The econometric analysis consists of a fixed effects panel data model with heteroskedasticity and serial correlation consistent standard errors<sup>7</sup> (Arellano [1990, 1993]). The fixed effects model seems an appropriate specification since the paper focuses on the specific set of German dual-class shares during 1988-1997 and not on a randomly drawn sample from a large population (Baltagi [1995]). Furthermore there are no time-invariant variables which would warrant a random-effects model. For a formal comparison of the random and fixed effects model the Hausman test is performed. This paper uses the forward orthogonal deviations operator (Arellano and Bover [1995] and Arellano [1993]) to obtain robust standard errors<sup>8</sup>. The transformed system is also the basis for an extended model which is used to obtain the Hausman test statistic which is robust to heteroskedasticity and serial correlation of arbitrary forms (Arellano [1993]). Table III presents the results of the estimation under alternative specifications. Specification I and II include variables proxying for the degree of control leverage and differences in dividend rights. They only differ in the definition of the private benefit multiplier due to subsidiaries. Whereas specification I assumes a 25% shareholding as the critical level to confer control, specification II requires majority control. The two regressions show that the ratio of controlled equity to invested equity increases the value of the voting right and therefore the voting premium. This finding provides supportive evidence for Hypothesis 1. Both the economic and statistical significance are superior if only shareholdings of more than 50% are included in the private benefit multiplier. This suggests that majority control implies a higher control value than a qualified minority holding of 25%. On average, a 1% increase in the private benefit multiplier of pyramiding results in an 8% increase in the voting

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<sup>6</sup> One might also argue that inclusion in an index increases demand for a stock from index funds. In case of a downward sloping demand curve this translates into a higher valuation of the stock (Shleifer [1986]).

<sup>7</sup> Heteroskedasticity consistent estimation leads to a fairly sizeable change in the estimated standard errors of the slopes (especially for the coefficient estimate of  $IX_{it}$ ), whereas a further correction for serial correlation changes the standard errors only slightly.

<sup>8</sup> The constant term is eliminated by transforming the data with the forward orthogonal deviations operator.

premium. The result can be interpreted in line with the finding of Megginson [1990] that subsidiaries exhibit a smaller voting premium than the sample average. In the light of this paper's rationale, the finding might result from the fact that subsidiaries exhibit a lower degree of control leverage than holding companies. The impact of capital gearing,  $CG_{it}$ , on the voting premium shows the expected behaviour and supports Hypothesis 2: for levels of gearing below 41.27% the voting premium increases in II, for higher levels the premium decreases. Contrary to the above conjectures, the ratio of non-voting stock to total equity is negatively correlated with the voting premium, though the coefficient estimate is insignificant. An explanation for this result might be an enhanced liquidity of preference shares which accompanies a higher fraction of nonvoting stock. The higher liquidity increases the value of nonvoting stock and reduces the voting premium.

The differential dividend payments to voting and non-voting stock have both an economically and statistically significant impact on the voting premium. If dividend arrears of more than one year are paid to preference shareholders, the voting premium decreases on average by about 27%, i.e., the preference shares appreciate on average about 7% relative to ordinary shares. This is a substantial increase given that the average differential dividend only equals 3.5% in these company years. In years where the voting right is effective, i.e., where dividend arrears of at least two years are accumulated, the voting premium is on average 13.8% lower. For company years in which voting stock is put on par with non-voting stock in terms dividends, the voting premium is on average 8% higher. Almost as economically significant as payments of dividend arrears is membership in a stock market index,  $IX_{it}$ . If the preference share is a member of the DAX or MDAX, i.e., it is more liquid than the ordinary share, the price differential is about 27% lower on average (specification III and IV). An indication that the ratio of non-voting stock to total equity might proxy for liquidity instead of control value gives the comparison of I and III. The standard errors of the coefficient estimate are higher in III than in I confirming the correlation between  $NV_{it}$  and  $IX_{it}$ . The Hausman test for specifications I and II does not reject the hypothesis of no correlation between individual effects  $\mu_i$  and regressors. Therefore the coefficients from the fixed and random effects model (not reported) do not differ systematically. For specifications III and IV the Hausman tests comes closer to rejection of the null hypothesis of no correlation between individual effects and regressors. The difference between the coefficient estimates of the fixed and random effects model (not reported) is restricted to the ratio of non-voting stock and the dummy variable for an identical dividend to preference and ordinary shares,  $DI_{it}$ . The standard errors of the random effects model are substantially smaller than the standard errors of the fixed effects model (except for the dividend dummy variables) suggesting a rather low power for the test. The fixed effects estimator seems more appropriate, since despite the low power, the hypothesis of no correlation is rejected at the 10% significance level. The random effects model is therefore likely to suffer from inconsistency due to omitted variables.

## 2.2 Corporate governance in Germany

Apart from the potential control value with which an ordinary share is vested, it is decisive whether the voting right of an atomistic shareholder is relevant for a transfer in corporate control. The corporate governance framework and the corporate ownership structure

together determine the mode of corporate control transfers across different countries. In Germany negotiated sales of share stakes and acquisition of shares in the open market have been the predominant mechanism for corporate control transactions (Franks and Mayer [1997]). Public tender offers, though subject of general guidelines issued by the 'Börsensachverständigenkommission' (Stock Exchange Commission) in 1979 have never achieved any practical significance except for going-private transactions prior to 1995.

Contrary to the Anglo-Saxon practice, the German market for corporate control is characterized by a paucity of hostile takeovers. Edwards and Fischer (1994) indirectly attribute the rarity of hostile takeovers to the difficulty of replacing incumbent management after a change in ownership structure. The management board can only be dismissed by a majority vote of the supervisory board. Members of the supervisory board in turn can only be replaced before the end of their five-year appointment with a 75% majority vote of shareholders. Edwards and Fischer (1994) argue that the widespread existence of higher than 25% blockholdings can render it imperatively costly for potential raiders to acquire the necessary 75% majority. In addition, political influence of trade unions and management of target companies can undermine takeover attempts in Germany. In the hostile acquisition attempt of Thyssen by Krupp in 1997, it was mainly political pressure which thwarted the takeover bid. The CEO of Thyssen, Dieter Vogel, successfully recruited support from the head of the federal state of North-Rhine Westphalia to avert the takeover bid and launch merger talks instead.

### 2.3 Corporate control transfers and minority shareholders

In the following section the wealth implications of a corporate control transaction for minority shareholders are derived under the two different regulatory scenarios in Germany pre- and post 1995. The cardinal difference between the two regulatory scenarios is the protection of minority shareholders through a mandatory bid requirement. It is crucial whether the respective regulatory guidelines provide for a mandatory tender offer to the minority voting shareholders if a shareholding passes a certain threshold (mandatory bid rule) or whether the acquirer can purchase a controlling interest without consideration to minority shareholders (market rule). The mandatory bid rule (MBR) implies the principle of non-partiality or non-differentiated bids, since it requires that all target shareholders be offered a price not lower than the price at which the initial equity position was acquired.

The following set-up will be used to study the implications of the corporate governance regimes pre- and post- 1995. Assume that there are two contenders for the corporate control of a company. Each of the two parties produces a certain cash-flow  $Y_i$  and derives private benefits of control  $B_i$ , where  $i = 1, 2$ . While private benefits are only enjoyed by the party in control, the cash flow is divided equally among shareholders according to their fractional equity ownership. There is symmetric information between the parties and investors about  $Y_i$  and  $B_i$ . For means of simplicity we assume that both contenders intend to acquire 100% of the voting equity<sup>9</sup>. The total number of shares (voting and non-voting stock) of the company equals  $N$ , of which  $N^v$  are voting and  $N^{nv}$  non-voting shares respectively.

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<sup>9</sup>Similar results can be obtained if both contenders only acquire a controlling interest of  $\bar{x}$  per cent of voting stock and the offer is allocated pro rata.



### **2.3.1 Practice of control changes in Germany prior to 1995**

Corporate governance in Germany prior to 1995 was characterized by a moderate protection of minority shareholders. In contrast to corporate governance rules in the UK, there was no requirement to submit a public tender offer to all shareholders after a shift in majority control (market rule). In the following we will consider the payoffs to both minority voting and nonvoting shareholders if control is acquired: (a) through a sale-of-control transaction, and (b) by way of share purchases in the open market.

**Negotiated block sales** In this case contender 1 is an incumbent blockholder who has a controlling interest of

voting and nonvoting shareholders are therefore

$$\Pi^v = \max\{Y_2/N, (Y_1/N + B_1/N^v)\} \quad (6)$$

$$\Pi^{nv} = Y_2/N. \quad (7)$$

If  $Y_2/N < (Y_1/N + B_1/N^v)$ , a differential payment results in favour of voting shares. In Germany, however, the relevance of this scenario is limited, since competition for control is moderate and takeover battles similar to the Anglo-Saxon model are virtually unknown.

### Proxies for the likelihood of differential payoff to voting and non-voting stock

The above analysis has shown that voting shares only receive a superior payment in a transfer of control if there is no blockholder with a controlling interest and control is contested. Both in Zingales [1994, 1995a] and Rydqvist [1996] the probability of a contested acquisition is proxied by the existing ownership structure of a company. To capture the likelihood with which small shareholders become pivotal in a potential takeover contest Zingales [1994, 1995a] used the (Relative) Shapley value (Milnor and Shapley [1978]). Other proxies used for ownership stability are the size of the largest shareholder (Rydqvist [1996]) or a dummy variable for majority control (Zingales [1994]). For the purposes of this paper we include dummy variables for majority control and qualified majority control, i.e., an equity ownership of more than 75%, to capture the possibility of contested control. The latter variable is particularly important in the German context, since a 75% majority is de facto required to replace the incumbent management (see 2.2).

**Hypothesis 3** *Market rule: In the pre- 1995 period the voting premium is (weakly) negatively correlated with majority-control.*

Not only ownership concentration of voting shares, but also the ownership structure of preference shares could affect the voting premium. Bergström and Rydqvist [1992] analyse a scenario where the outside contestant wants to acquire 100% of *both* voting and non-voting shares. Because in this set-up both non-voting and voting stock are pivotal to private benefits of control, but the bidder can price discriminate between the two classes, it is possible that a premium is paid to non-voting stock. The premium is large if there is a small percentage of non-voting stock outstanding and most of this is concentrated in the hands of the incumbent blockholder. Another rationale is put forward by Megginson [1990] who applies the Jensen and Meckling [1976] argument to the differential treatment of voting and non-voting shareholders. He uses the amount of inside ownership of non-voting stock as a proxy for management's disincentive to discriminate against non-voting shareholders. One might similarly argue that the incumbent blockholder is more inclined to undertake actions in favour of non-voting shareholders (e.g. early reimbursement of dividend arrears, conversion of preference into ordinary shares) the more non-voting stock he owns. In order to take account of these potential effects we include the amount of holdings in non-voting stock of the largest shareholder in the company.

**Hypothesis 4** *The percentage ownership of preference shares by the largest holder of voting stock has a negative impact on the voting premium.*

### 2.3.2 Regulatory shift in 1995

In 1995 the structure of corporate governance regulation in Germany experienced an important change. Parallel to initiatives of the EU Commission to draft an EU Takeover Directive the German stock exchange commission introduced a voluntary Takeover Code. Modelled after the UK City Code the Takeover Code stipulates that a public tender offer has to be made to all target shareholders after a share package of more than 50%<sup>10</sup> has been newly acquired (mandatory bid rule). The acceptance of the Code is voluntary and only imposes a private contractual obligation upon the signatories. Even though the Code is based on a private initiative of the Stock Exchange and industry representatives it increases the probability that a corporate control transfer involves the mandatory bid rule. This is given more weight by a joint declaration of German banks not to accompany any raider which has not signed the Takeover Code.

**Negotiated block sale.** Under the mandatory bid rule atomistic shareholders have the right to participate in the sale on the same terms as the selling blockholder. As opposed to the market rule, a transfer of control only occurs if  $(B_2 - B_1)/N^v > (Y_1 - Y_2)/N$ , since the acquirer has to make the same offer to all voting shareholders. Despite decreasing the likelihood of a control transfer the mandatory bid rule introduces the possibility of a superior payoff to voting minority shareholders. The incumbent and the control aspirant play a Nash-bargaining game. The incumbent carries a relative bargaining power  $\theta$  (where  $0 \leq \theta \leq 1$ ) with respect to the contender who has the reciprocal bargaining power of  $(1 - \theta)$ . The transaction price will therefore be a weighted average of the contender's reservation value of  $B_2/N^v + Y_2/N$  per voting share and the incumbent's reservation value of  $B_1/N^v + Y_1/N$  per voting share. The payoff for minority holders of ordinary shares equals

$$\Pi^v = \max\{Y_2/N, \theta[B_2/N^v + Y_2/N] + (1 - \theta)[B_1/N^v + Y_1/N]\}, \quad (8)$$

$$\Pi^{nv} = Y_2/N \quad (9)$$

i.e., they can either decide to tender their shares and receive  $\theta[B_2/N^v + Y_2/N] + (1 - \theta)[B_1/N^v + Y_1/N]$  or to remain a minority shareholder with a payoff of  $Y_2/N$ . Holders of preference shares are exempted from the mandatory bid rule (Übernahmekommission [1996]) and will therefore only obtain  $Y_2/N$ , i.e., the level of security benefits under the new management. Clearly, in this case atomistic holders of ordinary shares are better off than holders of non-voting stock. A nonzero probability that a potential raider abides by the Takeover Code is sufficient to raise the value of voting above non-voting stock.

**Share purchases in open market.** If there is no controlling blockholder and no competition for control, owners of preference and ordinary shares will both obtain the level of cash-flow under the new controlling party,  $Y_2/N$ . In the absence of competition this will also be the price paid in the mandatory tender offer since this will be the price paid for the last shares acquired when surpassing the critical threshold level of 50%. If there

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<sup>10</sup> Following severe criticism regarding the laxity of its stipulations the Takeover Commission has reduced the threshold for the mandatory tender offer to 30%. The new regulations came into effect on 1st January 1998 after the sampling period of this data set.

is more than one contender for control the payoffs equal  $\Pi^v$  and  $\Pi^{nv}$  given by [6] and [7] respectively. In the case of dispersed ownership the mandatory bid rule therefore does not affect the payoffs to minority voting and nonvoting shareholders.

### **Proxies for the likelihood of differential payoff to voting and non-voting stock**

Table IV contrasts the possible differential payoffs to minority voting and non-voting shareholders under the two regulatory regimes, market and mandatory bid rule, and with respect to the two mechanisms for control transfers, sale of share stakes and open share purchases. Under the mandatory bid rule transfers of control through a block trade will always involve the participation of holders of ordinary shares and may lead to a premium in favour of voting stock. The existence of a majority blockholding is thus a prerequisite for participating in the bargaining surplus in a transfer of control. The mandatory bid rule has, however, no effect on the differential payoff to voting and non-voting shareholders under dispersed ownership and uncontested purchases in the open market. The difference to the pre- 1995 scenario (market rule) consists of the new possibility for voting shareholders to receive a differential payment in a sale-of-control transaction. Given the low level of competitiveness in the German market for corporate control, we would expect this effect to outweigh any superior payoff through contested open market purchases.

**Hypothesis 5** *Mandatory bid rule: During the post- 1995 period the presence of a majority owner is positively related to the voting premium.*

**Econometric Specification** The econometric set-up is based on specification [3], but

that the coefficient estimates are small and not significant for simple majority ownership highlights the presumption that competition for control is less pronounced in Germany than in the Anglo-Saxon capital markets. Anticipation of the new corporate governance rules might also have blurred the effects of majority control prior to 1995. A third possible explanation for this finding might be the instability of ownership structure over time. Current majority control might not be a good proxy for possible competition for control, since the majority position might easily dissolve in the near future or vice versa. Franks and Mayer [1997] report that in the 5 year period 1989-1994 about 4% of companies with concentrated ownership became widely held, and for 8% the reverse was true. The difference in the coefficient estimates for simple and qualified majority control in I and II highlights the value of a qualified minority block of 25% which can be used to block statutory changes. The small economic and statistical significance of simple majority control suggests that there might still be competition for a 25% block of votes. Only a qualified majority of more than 75% thwarts competition for control and results in a statistically significant 7% decrease in the voting premium. The Hausman test highlights that the random effects estimator (not reported) seems equally applicable for I and II, since the hypothesis of no correlation between individual effects and regressor cannot be rejected.

Majority control gains in economic and statistical significance in the post 1995 period

between the coefficient estimates of the fixed and random effects model (not reported) is large, although there is no change in the signs of the coefficient estimates. The random effects coefficient estimates for majority control, capital gearing and index membership of preference shares are only half in absolute size compared to those of the fixed effects estimator. The coefficient estimate of the voting right dummy, however, becomes more than twice as large as in the fixed effects model. The standard errors of the random effects model are substantially smaller than the standard errors of the fixed effects model suggesting a rather low power for the test. The fact that the hypothesis of no systematic variation between the two estimators is nevertheless significantly rejected, points to serious inconsistency of the random effects estimates. This finding is corroborated by a correlation of  $-0.68$  between the individual firm-specific effects and the linear function of regressors,  $Corr(u_i, \bar{x}_i \hat{\beta})$ , in the regression for simple majority control and of  $-0.61$  in the regression for qualified majority control.

### **2.3.3 Effect of acceptance of Takeover Code on voting premium of signatory**

The previous paragraph highlighted how the mandatory bid rule changes the value of atomistic voting stock if the company becomes the target of a change in control. The effect of the Code on the voting premium manifested itself in the likelihood that the self-regulatory initiative of the expert commission provoked a regulatory change in the practice of corporate control. This structural change should be reflected in the differing time series coefficients of the variables proxying for the likelihood by which atomistic voting shares are involved in a transfer of control.

The endogeneity of the acceptance decision of the Takeover Code allows the testing of the impact on the voting premium of the signatory in both a time series and cross-sectional dimension. If a company decides to sign the Takeover Code it is obliged to adhere to the mandatory bid rule in the role of a potential bidder. This means that it is likely that the company has to acquire more than  $\bar{x}\%$  of the target's equity to establish control. As analysed under [2.1], any fractional equity ownership in excess of

We include the dummy variable ‘ $TC_{it}$ ’ equal to one if the company signed the Code and zero otherwise in the econometric specification. The regression makes use of the full sample of observations during 1988-1997. Because of the period-specific effects of the ownership variables we omit the dummy variables for majority control.

$$VP_{it} = \beta_0 + \beta_1 TC_{it} + \beta_2 ON_{it} + \beta_3 CG_{it} + \beta_4 (CG_{it})^2 + \beta_5 NV_{it} + \beta_6 DA_{it} + \beta_7 DI_{it} + \beta_8 VR_{it} + \beta_9 IX_{it} + \mu_i + \varepsilon_{it} \quad (11)$$

The econometric results in Table IV provide evidence in favour of Hypothesis 6. The coefficient estimate for the dummy variable ‘ $TC_{it}$ ’ carries a negative coefficient estimate, which is statistically significant at the 99.99% significance level. The acceptance of the Code is on average associated with a substantial 14.6% decline in the voting premium. This result lends further indirect support to the multiplier effect of pyramiding analysed in section [2.1]. It also provides an additional explanation for the outperformance of preference shares (see Figure 1 and 2). Returns to preference shares start to exceed returns to ordinary shares between 1994 and 1995. The underperformance of ordinary shares thus coincides with the introduction of the Takeover Code and might at least partially result from lower expected control benefits. Because of the voluntary nature of the Code one might suspect that unobservable characteristics of the acceptance decision are correlated with unobservable factors of the voting premium, resulting in an inconsistent estimate for  $TC_{it}$ <sup>12</sup>. This objection can be refuted on two accounts. First, the dummy variable  $TC_{it}$  is only semi-endogenous in the sense that companies could decide about acceptance only since the introduction of the Code in 1995, i.e., the non-acceptance during 1988-1994 must be considered exogenous. Second, we construct an instrumental variable (IV) estimator for the acceptance decision in order to analyse a potential inconsistency resulting from the endogeneity during the 1995-1997 period. Hoffmann-Burchardi [1999] shows that companies which are constituents of major stock market indices and companies in industries with a high overall acceptance rate have been more inclined to sign the Code. On the other hand, companies with a controlling blockholder were found to be more reluctant to accept the Code. The future acquisition activity is negatively, but insignificantly related to the acceptance decision. Using membership in the DAX or MDAX, the percentage of acceptance per industry, and the presence of controlling shareholder together with the other exogenous variables in [11] we construct an IV estimator for  $TC_{it}$  during 1995-1997. We find that the coefficient estimate of the nonlinear IV estimator equals  $-15.34\%$  and is still significant at the 99% confidence level. The difference in the coefficient estimates between the IV estimator and the OLS estimator is very small pointing to only minor inconsistency of the OLS estimates. If it all, taking account of the partial endogeneity of the acceptance decision strengthens rather than impairs the empirical support in favour of Hypothesis 6. The fact that the coefficient estimate for index membership of preference shares becomes insignificant could result from collinearity between Code acceptance and index membership. The Hausman test statistic indicates no systematic difference between the fixed and random effects estimator for this specification.

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<sup>12</sup> One might argue that private information of the management about future takeover activity detains management to sign the Takeover Code. At the same time, management makes use of this information by buying voting stock and by short-selling non-voting stock thus increasing the voting premium.

### 3 Conclusion

The paper has investigated the determinants of the voting premium, the price differential between voting and non-voting shares. It shows that the price differential is a reflection of the value of controlled assets per unit invested in voting stock and the way in which minority voting and non-voting shareholders participate in transfers of control. Both factors are influenced by the existing regulation of corporate governance. The paper studies how a change in corporate governance rules in Germany in 1995 affects the voting premium through these two channels. The German stock exchange introduced a voluntary Takeover Code in 1995 which contains the mandatory bid rule. The mandatory bid rule stipulates that a party which purchases a controlling interest of another listed company's voting equity is obliged to make an offer to the remaining target shareholders.

In a first step, the paper shows how mechanisms to separate control from cash-flow rights translate into a higher voting premium. Non-voting stock, debt and a pyramiding structure of subsidiaries are all instruments that increase the available capital stock without diluting control rights. The amount of controlled assets increases per unit of voting stock. In a second step the article seeks to cast light on the relationship between takeover regulation and the voting premium. The paper focuses on the regulatory change from two different points of view: first, the effect on the voting premium as a result of an individual acceptance decision and second, the overall change in the payoff to minority voting and non-voting shareholders in corporate control transactions.

First, acceptance of the Code affects the premium  $t$



to a positive sign from the first to the second subperiod. This reflects the change in the way in which minority voting and non-voting shareholders participate in corporate control transactions under the new regulatory structure.

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## 5 Tables and Figures

TABLE I  
DIVIDEND REGIMES OF PREFERENCE SHARES

The table juxtaposes the different dividend regimes of preference shares with and without additional dividends. The priority dividend is denoted by  $m_i$ , the excess dividend by  $x_i$  and the dividend to ordinary shares by  $d_{it}^v$ .

Payoff for preference shares $d_{it}^{nv}$	Number of firms	Average dividend in % of par value	
I Dividend regime with no additional dividend $d_{it}^{nv} = (m_i   d_{it}^v \leq m_i) + (d_{it}^v   d_{it}^v > m_i)$	16	$\bar{m} = 5.8$	$\bar{x} = 0$
Dividend regimes with additional dividend			
II $d_{it}^{nv} = (m_i   d_{it}^v \leq m_i) + (d_{it}^v + x_i   d_{it}^v > m_i)$	62	$\bar{m} = 5.0$	$\bar{x} = 2.1$
III $d_{it}^{nv} = (m_i   d_{it}^v \leq m_i) + \sum_{k=1}^l (d_{it}^v + x_{ki}   d_{ki}^v \geq d_{it}^v > d_{k-1,i}^v)$ where $d_{0i}^v \equiv m_i$	8	$\bar{m} = 5.0$	$x_{ki} \in [1; 4]$

## FIGURES I AND II

Figure 1 and 2 show cumulative return indices for both preference and ordinary shares during the 1988-1997 period. The indices include only return observations for companies in which both classes of shares were simultaneously listed, i.e., at each point in time the two return indices for the two classes of shares include the same number of companies. If only one of the two classes of shares is listed, the company is excluded from the index. The shares enter the index portfolios with an equal weight. In Figure 1 the return index only encompasses the capital gains of the two classes of shares, i.e.,

$$I_t^{nv,v} = \prod_{t=t_0}^T \frac{1}{N} \sum_{i=1}^N (1 + r_{it}^{nv,v})$$

where  $r_{it}^{nv,v} = (P_{it}^{nv,v} - P_{it-1}^{nv,v})/P_{it-1}^{nv,v}$ . The return indices in Figure 2 are calculated as above but include dividend payments, i.e.,  $r_{it}^{nv,v} = (P_{it}^{nv,v} - P_{it-1}^{nv,v} + d_{it}^{nv,v})/P_{it-1}^{nv,v}$ .

### FIGURE I

### FIGURE II

TABLE II  
SUMMARY STATISTICS

Variable		Mean	SD	Min	Max	Obs
Voting premium	<i>VP</i>	0.263	0.456	-0.573	2.809	601
Simple majority control	<i>SM</i>	0.730	0.444	0.000	1.000	764
Qualified majority control	<i>QM</i>	0.275	0.447	0.000	1.000	764
Blockholding of preferred stock of largest voting stockholder	<i>ON</i>	0.049	0.167	0.000	0.980	763
Capital gearing	<i>CG</i>	0.386	0.263	0.000	1.720	684
Control/Cash-flow with $\bar{x}_{i,i+1} > 0.25$	<i>PY</i> <sub>0.25</sub>	1.410	0.704	1.000	5.997	332
Control/Cash-flow with $\bar{x}_{i,i+1} > 0.5$	<i>PY</i> <sub>0.5</sub>	1.172	0.428	1.000	5.896	332
Ratio of preferred to total equity	<i>NV</i>	0.283	0.177	0.000	0.500	796
Acceptance of Takeover Code	<i>TC</i>	0.077	0.267	0.000	1.000	880
Preferred member of M(DAX)	<i>IX</i>	0.113	0.316	0.000	1.000	880
Payment of dividend arrears	<i>DA</i>	0.056	0.230	0.000	1.000	625
Equal nonzero dividend to preferred and ordinary stock	<i>DI</i>	0.115	0.320	0.000	1.000	625
Voting right effective	<i>VR</i>	0.109	0.312	0.000	1.000	705

TABLE III

SOURCES OF PRIVATE BENEFIT MULTIPLIERS FOR SUBPERIOD 1991-1994

The table presents the coefficient estimates of a fixed-effects panel data model for the voting premium in the subperiod 1991-1994. The standard errors are robust to heteroskedasticity and autocorrelation of arbitrary forms. The *p-values* are reported below the coefficient estimates in parentheses. The Hausman test, also robust to heteroskedasticity and autocorrelation, is obtained as a Wald test in an extended model as suggested by Arellano [1993]. The first set of explanatory variables capital gearing *CG*, nonvoting stock *NV* and the private benefit multiplier due to pyramiding *PY* is designed to capture the degree to which a company has exploited means to separate control from cash-flow rights. Two dummy variables take account of differences in dividend payments between the two classes of stock: *DA* equals one if the preference share is paid dividend arrears of more than one year, and zero otherwise, and *DI* equals one if preference and ordinary shares receive the same nonzero dividend, and zero otherwise. The specification also includes the dummy variable *VR* for the years in which the voting right of preference shares is effective. In order to capture liquidity differences between the two classes of stock we include a dummy variable *IX* if the preference share is a member of a stock market index.

		I	II	III	IV
Capital Gearing	<i>CG</i>	0.975 (0.053)	1.016 (0.045)	0.975 (0.054)	1.016 (0.046)
	$(CG)^2$	-1.160 (0.019)	-1.231 (0.013)	-1.160 (0.019)	-1.233 (0.013)
Nonvoting stock	<i>NV</i>	-1.226 (0.076)	-1.254 (0.168)	-1.225 (0.180)	-1.255 (0.169)
Pyramiding					
$\bar{x} = 0.25$	$PY_{0.25}$	0.045 (0.076)		0.046 (0.072)	
$\bar{x} = 0.5$	$PY_{0.5}$		0.082 (0.005)		0.084 (0.004)
Dividends					
$d_{it}^{nv} = \sum m_i$	<i>DA</i>	-0.266 (0.068)	-0.292 (0.044)	-0.266 (0.069)	-0.294 (0.044)
$d_{it}^{nv} = d_{it}^v > 0$	<i>DI</i>	0.079 (0.000)	0.096 (0.000)	0.079 (0.000)	0.097 (0.000)
Voting right	<i>VR</i>	-0.138 (0.051)	-0.132 (0.054)	-0.137 (0.051)	-0.132 (0.056)
Liquidity	<i>IX</i>			-0.270 (0.000)	-0.290 (0.000)
Obs		208	208	208	208
R <sup>2</sup> (in %)		15.30	16.67	16.02	17.50
Prob>F		0.000	0.000	0.000	0.000
Hausman test		1.32	1.37	1.73	1.84
Prob>F		0.242	0.221	0.093	0.072

TABLE IV

POSSIBLE DIFFERENTIAL PAYOFF TO MINORITY ORDINARY AND PREFERENCE SHAREHOLDERS  
UNDER DIFFERENT TAKEOVER REGULATIONS

Possible differential payoff under	Type of control transfer			
	sale of share stake		open market purchases	
	uncontested	contested	uncontested	contested
Market Rule	no	no	no	yes
Mandatory Bid Rule	yes	yes	no	yes



TABLE V  
IMPACT OF THE TAKEOVER CODE ON THE VOTING PREMIUM

The table presents the coefficient estimates of a fixed-effects panel data model for the voting premium in the subperiods 1988-1994, 1995-1997 and for the full sample 1988-1997. The standard errors are robust to heteroskedasticity and autocorrelation of arbitrary forms. The *p-values* are reported below the coefficient estimates in parentheses. The Hausman test, also robust to heteroskedasticity and autocorrelation, is obtained as a Wald test in an extended model as suggested by Arellano [1993]. The first two sets of specifications (I-IV) are designed to demonstrate the changing role of minority voting and non-voting shareholders in transfers of control before and after the introduction of the mandatory bid rule in 1995. In addition to the specifications of Table III, the regressions include variables of ownership structure, simple majority control  $SM$  ( $x_0^v > 0.5$ ) and qualified majority control  $QM$  ( $x_0^v > 0.75$ ), and the percentage holding of non-voting stock by largest voting stockholder ( $x_0^{nv}$ ). Specification V encompasses observations of the full sample period and includes a dummy variable for companies which signed the Takeover Code.

Time period	1988-1994		1995-1997		Full sample	
	I	II	III	IV	V	
Ownership						
$x_0^v > 0.5$	$SM$	-0.006 (0.894)		0.328 (0.043)		
$x_0^v > 0.75$	$QM$		-0.070 (0.053)	0.289 (0.025)		
$x_0^{nv}$	$ON$	-1.318 (0.008)	-1.333 (0.007)	-0.613 (0.000)	-0.861 (0.000)	-0.269 (0.025)
Takeover Code	$TC$				-0.146 (0.000)	
Capital Gearing	$CG$	0.429 (0.025)	0.335 (0.067)	0.945 (0.037)	0.846 (0.034)	0.470 (0.005)
	$(CG)^2$	-0.624 (0.000)	-0.559 (0.001)	-1.063 (0.013)	-0.911 (0.018)	-0.561 (0.002)
Non-voting stock	$NV$	-0.841 (0.089)	-1.073 (0.035)	0.007 (0.994)	0.399 (0.709)	-0.462 (0.142)
Dividends						
$d_{it}^{nv} = \sum m_i$	$DA$	-0.227 (0.048)	-0.233 (0.042)	-0.054 (0.338)	-0.038 (0.544)	-0.124 (0.054)
$d_{it}^{nv} = d_{it}^v > 0$	$DI$	0.104 (0.024)	0.118 (0.020)	0.039 (0.699)	0.033 (0.661)	0.057 (0.284)
Voting Right	$VR$	-0.037 (0.646)	-0.046 (0.589)	-0.049 (0.599)	-0.054 (0.563)	-0.183 (0.001)
Liquidity	$IX$	-0.122 (0.286)	-0.123 (0.296)	-0.214 (0.000)	-0.210 (0.000)	-0.011 (0.844)
Obs		286	286	181	181	490
R <sup>2</sup> (in %)		11.79	13.36	31.86	42.40	23.57
Prob>F		0.000	0.000	0.000	0.000	0.000
Hausman test		1.09	1.27	4.26	6.66	1.27
Prob>F		0.373	0.252	0.000	0.000	0.2531

# A Appendix

## A.1 Annotations to multiplier effects

**Effect of vertical versus horizontal concatenation of subsidiaries:** The derivative of  $\widetilde{PBM}$  with respect to the equity position of a given subsidiary  $S_{k_0}^{i_0+1}$  equals

$$\frac{\partial \widetilde{PBM}}{\partial S_{k_0}^{i_0+1}} = \frac{\sum_{i=0}^{m-1} \prod_{j=0}^i \bar{x}_{j,j+1} \sum_{k=1}^{K_{i+1}} S_k^{i+1} - \prod_{j=0}^{i_0} \bar{x}_{j,j+1} \sum_{i=0}^{m-1} \sum_{k=1}^{K_{i+1}} S_k^{i+1}}{D^2}$$

where  $D^2$  corresponds to the denominator of the derivative. Correspondingly,

$$\frac{\partial \widetilde{PBM}}{\partial S_{k_0}^{i_0+2}} = \frac{\sum_{i=0}^{m-1} \prod_{j=0}^i \bar{x}_{j,j+1} \sum_{k=1}^{K_{i+1}} S_k^{i+1} - \bar{x}_{i_0+1, i_0+2} \prod_{j=0}^{i_0} \bar{x}_{j,j+1} \sum_{i=0}^{m-1} \sum_{k=1}^{K_{i+1}} S_k^{i+1}}{D^2}$$

It can be easily seen that  $\partial \widetilde{PBM} / \partial S_{k_0}^{i_0+2} > \partial \widetilde{PBM} / \partial S_{k_0}^{i_0+1}$ . ■

## A.2 Annotations to Data

TABLE A.I.

TIME SERIES OF GERMAN DUAL-CLASS SHARE COMPANIES FROM 1988-1997

The table provides an overview of the number of dual-class share companies in Germany during 1988-1997. It lists the entries and exits of companies to and from dual class share companies during the sample period. The abbreviations in the 'Type' column denote the respective modes of entry and exit: Companies *enter* the sample of dual-class shares if previously unlisted ordinary shares are introduced on the stock exchange (LO), previously unlisted preference shares are introduced on the stock exchange (LP) or in case of an initial public offering with both classes of shares (LO/LP). Companies *exit* the sample if the company is fully acquired by another company and both classes of shares are delisted (TO) or preference shares are converted into ordinary shares (CV).

Date	N mber	Entry	Type	Exit	Type
31/12/87	40	-		-	
31/12/88	40	BMW	LP	Massa	CV
		Bluthardt	LO/LP		
		Hugo Boss	LO		
		GEA	LO/LP		
		Hertel	LO		
		VK Mühlen	LP		
		Westag & Getalit	LP		
31/12/89	46	B.U.S. Berzelius	LO/LP		
		Deutsche Beteiligungs-AG	LO		
		Hornblower Fischer	LO/LP		
		Kunert	LO		
		Macrotron	LP		
		MLP	LO		
		NAK Stoffe	LP		
		Nordstern Allg. Vers.	LP		
		Pegasus Beteiligungen	LO/LP		
		SAP	LP		
		Sartorius	LO/LP		
		SEMA Group Systems	LO		
		Sixt	LO		
		Südzucker	LP		
31/12/90	60	Glunz	LO		
		Heidelberger Zement	LP		
		KIH	LO		
		Kntirr-Mechanik	LO		
		New-York Hbg. Gummi	LP		
		Pongs & Zahn	LP		
		Rhön-Klinikum	LO		
		SPAR Handels-AG	LO		
31/12/91	68				

... CONTINUATION TABLE A.I.

TIME SERIES OF GERMAN DUAL-CLASS SHARE COMPANIES FROM 1988-1997

Date	Number	Entry	Type	Exit	Type
31/12/91	68	F. Reichelt Walter Bau	LP LO/LP	Wanderer Werke	CV
31/12/92	69	Heilit & Woerner	LO/LP	Friedrich Deckel Hartmann & Braun YMOS	TO TO CV
31/12/93	67	Adolf Ahlers Ehlebracht Fröhlich Bau Wella	LP LP LP LO		
31/12/94	71	Moenus NORDAG	LP LO/LP	Deutsche Babcock NAK Stoffe	CV CV
31/12/95	71	Metro 1 Compudent Biotest FMC Gerry Weber Vogt Electronic	LP LO LO LP LO LO	Asko Deutsche Beteiligungen Kaufhof Lufthansa Stuttgarter Hofbräu Tarkett Pegulan FAG Kugelfischer	TO CV TO CV CV CV CV
31/12/96	70	Deinböck Fresenius Henkel Möbel Walther	LO/LP LO LO LO	Bluthardt Leffers VK Mühlen	CV CV/TO CV
31/12/97	71				

TABLE A.II.

NUMBER OF DUAL-CLASS SAMPLE COMPANIES DURING TRADING DAYS IN 1988-1997

Time	Number of dual-class shares traded	Time	Number of dual-class shares traded
3-14/10/88	40	1-14/10/93	68
2-13/10/89	41	3-14/10/94	71
1-12/10/90	59	2-13/10/95	71
1-14/10/91	68	1-14/10/96	69
1-14/10/92	69	1-14/10/97	71
		Total	627

TABLE A.III.

TIME SERIES OF DIVIDEND PAYMENTS TO PREFERENCE SHARES FROM 1988-1997

The table shows the percentage of cases in each year during the sample period 1988-1997 in which voting and non-voting preference shares received differential and identical dividends respectively. The dividend payment to preference shares can exceed the dividend payment to ordinary shares in three cases: 1. preference shares obtain an additional dividend with respect to ordinary shares,  $d_{it}^{nv} = d_{it}^v + x_{it}$ , if the dividend to ordinary shares exceeds the minimum dividend,  $d_{it}^v \geq m_i$ ; 2. preference shares obtain the cumulated minimum dividend arrears for more than one year,  $d_{it}^{nv} = \sum_t m_i$ , but there is insufficient profit for ordinary shares to obtain an identical amount, i.e.  $d_{it}^v < \sum_t m_i$ . 3. the minimum dividend is paid to preference shares,  $d_{it}^{nv} = m_i$ , but there is insufficient profit for ordinary shares to obtain an identical amount,  $d_{it}^v < m_{it}$ . Both classes of shares receive the same dividends if 1. there is insufficient profit to distribute any dividends ( $d_{it}^v = d_{it}^{nv} = 0$ ), and 2. if there is no statutory provision for an additional dividend and the dividend to ordinary shares exceeds the minimum dividend, i.e.  $d_{it}^v = d_{it}^{nv} \geq m_i$ . The last row shows the average differential dividend yield in favor of preference shares in the different cases.

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TABLE A.IV.

## REGIMES FOR VARYING ADDITIONAL DIVIDENDS

The table shows the structure of varying additional dividend regimes. The additional dividend can either decrease with the dividend paid on ordinary shares (I. degressive additional dividend) or increase (II. progressive additional dividend).

Code	Name	Nominal share value	Minimum dividend (in % of par value)
(I) Degressive additional dividend: $x_{ki} > x_{k+1i}$			
KSB3	KSB	50	0.04
	$(0.02 \mid 0.04 < d_{it}^v \leq 0.1) + (0.015 \mid 0.1 < d_{it}^v \leq 0.14) + (0.01$		

TABLE A.V.  
DATA DESCRIPTION AND SOURCES

Variable	Description	Source
Voting premium	Percentage discount of ordinary shares over preference shares	Datastream International
Majority control	Dummy=1 if firm is majority controlled, 0 otherwise	Hoppenstedt Aktienführer 1989-1998
Qualified majority	Dummy=1 if firm is controlled with a qualified majority of 75%, 0 otherwise	Hoppenstedt Aktienführer 1989-1998
Blockholding of preferreds	Percentage shareholding of preferred shares by largest shareholder of ordinary shares	Hoppenstedt Aktienführer 1989-1998
Capital gearing	Ratio of debt over total assets	Annual reports Hoppenstedt Aktienführer 1989-1998 Datastream International
Control/Cash-flow with $\bar{x} > 0.25$	Ratio of total equity under control to equity investment in holding company (Ass.: control in a subsidiary is achieved with a share stake of more than 25%)	Hoppenstedt Aktienführer 1992-1995
Control/Cash-flow with	Ratio of total equity under control to	Hoppenstedt