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European Economic Review 47 (2003) 731–758

EUROPEAN
ECONOMIC
REVIEW

www.elsevier.com/locate/econbase

Corporate governance and dividend pay-out policy in Germany

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Accepted 3 October 2002

Abstract

A new explanation of why dividends may be informative is put forward in this paper. We find evidence that dividends signal the severity of the conflict between the large, controlling owner and small, outside shareholders. Accordingly, dividend change announcements provide new information about this conflict. To test the rent extraction hypothesis and discriminate it from the cash flow signaling explanation, we utilize information on the ownership and control structure of the firm. We analyze 736 dividend change announcements in Germany over the period 1992–1998 and find significantly larger negative wealth effects in the order of two percentage points for companies where the ownership and control structure makes the expropriation of minority shareholders more likely than for other firms. The rent extraction hypothesis also has implications for the levels of dividends paid. We find larger holdings of the largest owner to reduce, while larger holdings of the second largest shareholder to increase the dividend pay-out ratio. Deviations from the one-share-one-vote rule due to pyramidal and cross-ownership structures are also associated with larger negative wealth effects and lower pay-out ratios. Finally, using Lintner's (American Economic Review 46 (2) (1956) 97–113) model of dividend determination we find corroborating results. The presence of a second largest shareholder with a considerable equity stake makes a crucial difference in the governance of the firm. Our results call for better minority shareholder rights protection and increased transparency in the course of European Capital Market Reform.

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JEL classification: G35; G32

Keywords: Corporate governance; Dividend announcements; Rent extraction; Germany

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1. Introduction

In most Anglo-Saxon countries like the US or UK stock ownership is often dispersed and it is claimed that each individual shareholder has only limited incentives and ability to monitor the management. The major conflict in the governance of companies, accordingly, appears to be between powerful managers and small outside shareholders. Dividend pay-outs are seen as a means to reduce the cash flow that managers can use at their discretion (Jensen, 1986; Lang and Litzenberger, 1989).¹

Governance in most other countries functions differently. In Japan² and most of the South East Asian countries, business groups with their pyramidal and cross-ownership structures are common governance devices. In these countries legal requirements for management, often part of the controlling family, are rather weak (Claessens et al., 2000). In Continental Europe a concentrated ownership structure is the distinguishing feature and the corporate law again plays a minor role.³ Here, large shareholders have ample incentives and ability to control management, therefore, the classic manager–shareholder conflict does not appear predominant. Due to the reduction of the free-rider problem of monitoring and/or the increased alignment of incentives, large shareholders potentially add value. Many authors, however, argue that there is a conflict between the large controlling shareholder and small minority shareholders. That is, while large shareholders may increase the size of the pie, private benefits of control that are not shared by minority shareholders may also increase. Legal protection of minority shareholders is an issue in these governance systems.⁴

This paper focuses upon the large–small shareholder conflict by analyzing dividend announcements and dividend pay-out ratios in Germany. Several theories have been put forward to explain the information that dividend announcements might convey, most prominently the cash flow signaling and the free cash flow hypotheses. The cash flow signaling hypothesis asserts that managers have more information about the firm's future cash flows than do individuals outside the firm, and they have incentives to

¹ Dividend payments also force companies to go to capital markets, where the monitoring of managers can be done at lower cost, and hence give outside shareholders an opportunity to exercise some control (Easterbrook, 1984).

² See Odagiri (2000) for an analysis of business groups in Japan.

³ See the report by the European Corporate Governance Network (ECGN, 1997) and the follow-up studies of Barca and Becht (2001) and Gugler (2001). Barca and Becht (2001) find that the median largest voting block in Germany (372 firms) is 57% while only 9.9% in the UK (207 firms) and 5.4% in the USA (1,309 NYSE firms).

⁴ See, for example, Boehmer (1998), La Porta et al. (1997, 1999, 2000), Pagano and Röell (1998), Faccio et al. (2001), and Franks and Mayer (2001). A number of recent studies found rent extraction of small shareholders by larger owners. For example, Zingales (1994) obtains extraordinarily high voting premia for Italy (around 80%) and measures the average proportion of private benefits to be around 30% of firm value. His conjecture is that these private benefits of control are so large in Italy because the legal system is very ineffective in preventing exploitation of a control position. Bebchuk et al. (1999) examine common arrangements for separating control from cash flow rights, namely pyramiding, cross-ownership and dual class shares. They show that these tools are substitutes and that they have the potential to create very large agency costs.

signal that information to investors.⁵ The free cash flow hypothesis asserts that the value of the firm should increase if over-investing managers pay out more of the cash flows as dividends and invest less in negative NPV projects.⁶ The cash flow signaling hypothesis expects significant abnormal returns irrespective of the investment opportunity set of the firm, if dividend changes convey changes in future earnings to the market. The free cash flow hypothesis expects positive abnormal returns if over-investing firms increase dividends.

An alternative explanation for why dividends may be informative is put forward in this paper. We claim that dividends signal the severity of the conflict between the large, controlling owner and small, outside shareholders, and accordingly, dividend change announcements provide new information about this conflict. Large shareholders often have the discretion and the incentives to extract private benefits of control. This incentive arises because the block-holder bears only a fraction of the costs of these payments (i.e. forgone dividend payments in the proportion of his cash flow rights) but receives the full benefits.⁷ Dividend payments, however, guarantee a pro-rata pay out for both large and small shareholders. Dividends are therefore an ideal device for limiting rent extraction of minority shareholders. The large shareholder, by granting dividends to small shareholders, can signal his unwillingness to exploit them. On the other hand, dividend reductions may increase the potential for rent extraction by leaving more money at the discretionary use of the controlling owner. Accordingly, the rent extraction hypothesis expects positive abnormal returns for dividend increases, since higher dividends optimally reduce the cash on hand of the largest shareholder, and negative abnormal returns for announcements of dividend reductions, since lower dividends increase the cash that the largest shareholder can potentially expropriate.

Positive abnormal returns in case of dividend increases and negative abnormal returns in case of dividend reductions are also expected according to the cash flow signaling hypothesis, however. To test the rent extraction hypothesis and discriminate between it and the cash flow signaling explanation, we utilize information on the ownership and control structures of firms in Germany. We discriminate between firms where we do and do not expect this conflict to be severe.⁸ This analysis of firm-level ownership and control

⁵ See the models by Bhattacharya (1979), John and Williams (1985), Kalay (1980), and Miller and Rock (1985), and recent empirical tests by Yoon and Starks (1995) and Bernheim and Wantz (1995).

⁶ See Jensen (1986), Lang and Litzenberger (1989) and Dewenter and Warther (1998).

⁷ Rent extraction can come in several ways, for example, high salaries or perks for the largest shareholder, or the use of the company's assets to favor other companies owned by the largest shareholder. In a case study of an intra-group transfer in Italy (IRI sold its majority stake in Finsiel to STET, controlled by IRI as well, at above-market price), Zingales (1994) estimates a dilution of minority property rights equal to 7% of the value of the equity owned by outside shareholders. In Germany, a 75% majority is legally entitled to make a binding tender offer to minority shareholders. Wenger et al. (1996) find that such offers are below market value in 39 of the 53 cases by an average of 74%. Johnson et al. (2000) and Gugler (2001) provide several case studies of rent extraction from other countries.

⁸ Germany is particularly appropriate in this regard. First, the ownership structure is very concentrated, and second "the necessary conditions for a tax-based signaling equilibrium do not apply" in Germany, since dividends are not treated worse than capital gains by the German tax code for most investors (Amihud and Murgia, 1997, p. 401). So if one finds that dividends convey information, this must be due to reasons other than taxation. (See also McDonald, 2001.)

structures incorporates the most common arrangements for separating control from cash flow rights, namely stock pyramids and cross-ownership structures. For a sample of 226 announcements of dividend reductions over the period 1992–1998, we find significantly larger negative wealth effects in the order of two percentage points for those companies for which we expect the discretion of the controlling shareholder to be largest.

The rent extraction hypothesis also has implications for the share of profits the largest shareholder is willing to pay out to the minority shareholders. We expect that firms, for which the large–small shareholder conflict is a priori more likely to be severe, pay out less of their earnings as dividends. We test this proposition in two ways. First, we analyze dividend pay-out ratios for a panel of firms as in [La Porta et al. \(2000\)](#) and [Faccio et al. \(2001\)](#). We find that the existence of large block-holdings result in significantly lower pay-out ratios, the presence of other large block-holders curbs this effect. It appears therefore that other large shareholders exert a considerable monitoring function on the largest shareholder. Deviations from the one-share-one-vote rule due to pyramidal devices or cross-shareholdings result in lower pay-out ratios. Second, we estimate the famous [Lintner \(1956\)](#) partial adjustment model of dividends. Those firms, for which we expect that the large–small shareholder conflict is more likely, exhibit smaller dividend target pay-out ratios than other firms.

The paper is structured as follows. The next section describes the economic and legal framework within which German companies operate and the implications for dividend policy. Section 3 details our database and methodology. Section 4 presents our main results. Section 5 tests the robustness of the results and the last section concludes. Appendix A illustrates our ownership and control measures.

2. Implications of the corporate governance system in Germany on dividend policy

Like other continental European corporate governance systems, Germany's is characterized by large shareholders. Majority control gives the largest shareholder considerable power and discretion over key decisions, like dividend pay outs. Therefore, we distinguish between majority-controlled firms (the largest shareholder controls more than 50% of the voting shares) and minority-controlled firms (the largest shareholder controls less than 50% of the votes). We expect that the large–small shareholder conflict is more severe in majority-controlled firms.

However, as [Edwards and Weichenrieder \(1999\)](#) note, other large shareholders have an incentive to control and monitor the largest shareholder, and the ability to do so. In Germany, even when one shareholder holds more than 50% of the voting shares control may not be complete. The German two-tier board system specifies that employee representatives (“Co-determination”) and representatives of other (large) shareholders also sit on the supervisory board.⁹ Therefore, to achieve a finer partition of firms with

⁹The supervisory board appoints and controls the management board, which runs the corporation. Additionally, the German *Aktiengesetz* specifies certain minority rights depending on voting equity held. For example, a shareholder or group of shareholders owning 5% of the voting equity can demand an extraordinary shareholders' meeting. Similar company laws are in place in other Germanic legal systems, for example, in Austria and Switzerland.

respect to the possible occurrence of the large–small shareholder conflict, we distinguish between “unchecked” firms (the second largest shareholder holds less than 5% of the voting shares), and “checked” firms (at least one additional shareholder has more than 5% of the votes). We expect the large–small shareholder conflict to be more severe in “unchecked” firms. The most severe form of this conflict is expected in firms that are both unchecked *and* majority controlled.

We expect the following pattern in the data. First, for a given dividend change, the abnormal returns on dividend change announcements of majority-controlled firms should be larger than for minority-controlled firms, since the risk of expropriation is higher in majority-controlled firms. By analogy, abnormal returns on dividend change announcements for “unchecked” firms should be larger than for “checked” firms, since the existence of a second large owner potentially provides a check on the largest owner lowering the risk of expropriation.

The effects of control structures on the dividend pay-out ratio are more ambiguous. On the one hand, we expect negative effects on dividend pay outs of control structures that make the large–small shareholder conflict more likely. This is the very substance of the rent extraction hypothesis: Large shareholders abuse their power to extract rents from minority shareholders (La Porta et al., 2000). One manifestation of this conflict is reduced dividends granted to small shareholders in systems where this expropriation is possible. Alternatively, rational investors may anticipate expropriation and demand higher dividends from corporations that are more likely to expropriate them (Faccio et al., 2001). We test which effects dominate in Germany.

Salient features of the corporate governance system in Germany involve pyramiding, cross-shareholdings, and large controlling stakes of families, financial and industrial firms, and the state. Pyramiding potentially induces a wedge between cash flow and voting rights. Suppose, for example, a shareholder (X) owns α fraction of the shares of corporation A, which owns β fraction of corporation B, which in turn owns γ fraction of corporation C. Provided that X has “control”¹⁰ at each layer of the pyramid, one way to measure her voting rights in C is $VR1 = \gamma$, the last direct stake in the pyramidal chain. The fraction of her cash flow rights is only $CR1 = \alpha\beta\gamma$. With, for example, $\alpha = \beta = \gamma = 1/2$, X has the majority control of corporation C ($VR1 = 1/2$), whereas the cash flow rights $CR1$ amount just to 12.5%. The cash flow rights to voting rights ratio ($CRVR1 = CR1/VR1$) is equal to 0.25 (=12.5%/50%).

Dividends are received in proportion to cash flow rights, while control is determined by voting rights. A discrepancy between the two creates the incentive and the ability to seek other forms of compensation than *pro-rata* dividends. The likely effects on dividends of a deviation from the one-share-one-vote convention granted to corporate

¹⁰ Following La Porta et al. (2000) and Faccio et al. (2001), we say that X has control, if she owns more than 10% of the votes and is the largest shareholder in each layer. We test for the robustness of the 10% assumption by applying a 20% criterion, too. Since the results of later sections are virtually the same with the 20% criterion, we report only the results with the 10% criterion. We also calculate the Shapley value (SV) of the largest shareholder (see Leech, 1988) at each layer of the pyramid and use an SV of 0.5 as the cut-off point. Our results are not altered by this alternative definition of control. All robustness tests are available upon request.

outsiders are therefore negative. Again, there may be a countervailing effect if rational investors anticipate expropriation and demand a higher dividend as compensation.

3. The data

We examine dividend announcements and pay-out ratios from 1992 through 1998 for 266 major German companies contained in the *Standard & Poors' Global Vantage*. Stock return data are from the *Institut für Entscheidungstheorie und Unternehmensforschung* of the University of Karlsruhe. Daily stock returns are calculated as percentage changes in stock prices adjusted for splits and dividends from day $t - 1$ to t . Our measure of the market return is based on the stock index *CDAX*, a composite index, which is capitalization weighted and adjusted for cash dividends and capital changes, constructed and supplied by the *German Stock Exchange (Deutsche Börse AG)*.¹¹

Dividend announcements are gathered from the online database *Reuters*. We eliminate 465 of the original 2104 announcements, because there were no trades on the announcement day. We lose 475 additional announcements due to first differencing and missing ownership and balance sheet data. The remaining 1164 announcements consist of 226 decreases, 510 increases, and 428 announcements of unchanged dividends. For each event i in year y , we obtain the announced cash dividend in DM , DIV_{iy} , and the stock price 100 days before the announcement day, P_{iy} . The dividend yield is, then, calculated as DIV_{iy}/P_{iy} .

To study the stock price reaction to dividend announcements, we estimate the market model over 120 trading days prior to the announcement day (from day -123 to -3). For event i , the abnormal return on day t , AR_{it} , is calculated as

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i RM_t), \quad (1)$$

where R_{it} is the return on event i on day t , $\hat{\alpha}_i$ and $\hat{\beta}_i$ are the estimated parameters of the market model using the *Scholes–Williams (1977)* method, and RM_t is the return on the *CDAX* market index on day t .¹² We use two measures for abnormal wealth effects. The average 5-day cumulative abnormal return across events, $CAAR = \sum CAR_i/N$, where $CAR_i = \sum_{t=-2}^{+2} AR_{it}$ and N is the number of events, and the average abnormal return at the announcement day $AAR = \sum AR_{i0}/N$, where day 0 is the announcement day.

The data on the ownership structures have been gathered from the 1991, 1994, and 1997 editions of *Wer gehört zu wem?* a publication of the German *Commerzbank*, offering information on the identities and percentage shareholdings of owners of the German corporations. Since this data source is only available every fourth year, data

¹¹ *Stehle et al. (2000)* provide a thorough discussion of the institutional settings of the German stock exchanges.

¹² Our estimation period covers 1992–1998, which is the period of post-German unification. Long-term nominal interest rates stood at 9.5% in 1992 (Source: *OECD Economic Outlook*, December 1993), which then declined to 4.0% in 1995 and 4.5% in 1998. Using 120 trading days before the announcement to estimate the market model assumes a constant risk-free rate during the estimation period, but allows for variation in the risk-free rate across the 1992–1998 period. Additionally, we provide robustness checks in following sections using buy-and-hold returns.

for the nearest year are used for missing years, for example, the 1995 data are from the 1994 edition, and the 1996 data from the 1997 edition. This procedure is unlikely to introduce much error, since the ownership structure of German companies has been very stable. The appendix illustrates our categorization procedures using MAN AG in 1997.

4. The results

We present the results in two steps. Section 4.1 analyzes the influence of the salient corporate governance features in Germany on the dividend pay-out ratio with estimates of the Lintner (1956) model of dividends for different subgroups of firms. Section 4.2 contains the results of the event study of dividend announcements.

4.1. The dividend pay-out ratio

4.1.1. The determinants of average dividend pay-out ratios

Table 1 presents summary statistics on the variables used in the subsequent regression analysis. The average voting (cash flow) rights of the largest shareholder are 50.1% (38.6%), which gives an average *CRVR1* of 0.77 with a standard deviation of 0.31. This indicates that the deviation from one-share-one-vote due to pyramiding is quite substantial. On average, 1% of cash flow rights “buys” $1/0.77 = 1.3\%$ of the voting rights for the largest ultimate shareholder. The large standard deviation indicates that some firms rely heavily on pyramiding to leverage control with less than proportionate investment of own cash flows. On average, 2.12 layers of pyramid lie between the sample firm and the layer of ultimate owners including this layer.

Table 2 presents the results on the determinants of the dividend pay-out ratio. In addition to the corporate governance variables, the dividend pay-out ratio (defined as the ratio of the sum of common and preferred dividends to income before extraordinary items) is systematically influenced by corporate size (the logarithm of Total assets,

Table 1

Characteristics of the sample. Total number of firms: 266; No. Obs. 910; Time period: 1992–1998. Summary statistics on the dividend pay out ratio (*Pay-out*, total dividends divided by income before extraordinary items), the structure of ownership (*VR1* and *VR2*, the percentage voting rights of the largest and second largest shareholder, *CR1*, the percentage cash flow rights of the largest shareholder, *CRVR1*, the ratio of cash flow to voting rights of the largest shareholder, *CROSS*, a dummy variable indicating a controlling cross-shareholding structure in the ultimate layer of the pyramid, and *PYR*, the number of layers between the firm and the ultimate largest shareholder), Tobin’s *q* (*TQ*, the market value of the firm’s equity plus total debt divided by total assets), size (*Ln TA*, the natural logarithm of total assets in Mn. DM), and *Leverage*, the ratio of total debt to total assets are presented

	<i>Pay-out</i>	<i>VR1</i>	<i>CR1</i>	<i>VR2</i>	<i>CRVR1</i>	<i>CROSS</i>	<i>PYR</i>	<i>TQ</i>	<i>Ln TA</i>	<i>Leverage</i>
Mean	0.345	50.1	38.6	18.3	0.770	0.125	2.12	1.17	7.041	0.179
Median	0.344	50.1	37.5	10.0	1.000	0.000	2.00	0.77	6.849	0.141
SD	0.371	26.6	24.9	11.2	0.308	0.283	1.08	2.52	2.177	0.159

Table 2

Ownership structure, pyramiding and the dividend pay-out ratio. The total number of firms is 266; Time period: 1992–1998. Estimates of a single-equation model of dividend pay-out ratio as a function of the percentage holdings of the largest shareholder (VRI) (Eq. (1)) and the percentage holdings of the second largest shareholder ($VR2$) with at least 5% of voting power (Eq. (2)) are presented. Additionally, we test for the effects of a deviation from the “one-share-one-vote” paradigm induced by pyramiding by including the cash-flow-rights-to-voting-rights-ratio ($CRVR$) (Eq. (3)) of the largest ultimate shareholder. Eq. (4) estimates separate effects for the cash flow and voting rights of the largest ultimate shareholder. Eq. (5) allows for non-linearities by including the voting rights of the largest direct owner (VRI), its squared value (VRI^2), the cash flow rights of the largest ultimate owner (CR) and its squared value (CR^2). Eq. (6) tests for the impact of cross-shareholdings by including the dummy $CROSS$. We control for firm size (natural logarithm of total assets, $Ln TA$), investment opportunities as measured by Tobin's q (TQ), and for the firms' debt ratio ($Leverage = DEBT/TA$), where $DEBT$ is the sum of short- and long-term debt. We include (but do not report) a constant term, 40 2-digit industry dummies and 7 time dummies to capture the impact of business cycle fluctuations. Heteroscedasticity consistent t -values are reported below the coefficients (White, 1980)

Eq.	VRI	$VR2$	$CRVR$	VRI^2	CR	CR^2	$CROSS$	$Ln TA$	TQ	$Leverage$	Obs.	Adj. R^2
(1)	Coeff. -0.16 t -value -3.88***							-0.017 -2.91**	-0.004 -1.15	-0.38 -4.61***	910	0.27
(2)	Coeff. -0.15 t -value -3.15***	0.17 1.81*						-0.016 -2.72***	-0.003 -0.88	-0.37 -4.55***	910	0.28
(3)	Coeff. -0.14 t -value -3.19***	0.20 2.11**	0.15 4.24***					-0.013 -2.49**	-0.004 -1.01	-0.43 -5.33***	910	0.29
(4)	Coeff. -0.31 t -value -5.87***	0.17 1.98**			0.28 4.58***			-0.012 -2.50**	-0.004 -1.08	-0.46 -5.51***	910	0.30
(5)	Coeff. 0.51 t -value 2.81**			-0.74 -4.63***	-0.37 -2.19**	0.66 3.56***		-0.010 -1.77*	-0.003 -0.98	-0.45 -5.22***	910	0.31
(6)	Coeff. -0.30 t -value -5.61***	0.18 2.16**			0.24 3.52***		-0.086 -2.55***	-0.012 -2.12**	-0.004 -1.10	-0.46 -5.34***	910	0.31

*, **, *** significant at the 10%, 5%, 1% level, respectively (two-tailed test).

Ln TA , negative), investment opportunities (as measured by Tobin's q , TQ , negative, but insignificant), and leverage (the ratio of total debt to total assets, *Leverage*, negative), the average dividend pay-out behavior in the same 2-digit industry as controlled for by 40 industry dummies, as well as by the state of the business cycle as accounted for by a set of year dummies.¹³ The industry and time dummies are always significant at the 1% level, but are not reported. We have 910 firm-year observations. The R^2 's are between 0.3 and 0.4.

From Eq. (1), the voting rights of the largest shareholder ($VR1$) have a significant negative influence on the dividend pay-out ratio. Eq. (2) incorporates our hypotheses about the second largest shareholder and includes $VR2$. The coefficient on this variable is positive and significant (at the 10% level) underlining the monitoring function of the second largest shareholder.

Eq. (3) includes the cash-flow-right-to-voting-right-ratio of the largest ultimate shareholder, $CRVR1$. A deviation from one-share-one-vote significantly reduces the dividend pay-out ratio:¹⁴ The smaller this ratio is, the larger is the incentive of the large and controlling shareholder to seek compensation other than through pro-rata dividends. The coefficient estimate of 0.15 implies that a move from one-share-one-vote ($CRVR1 = 1$) to the sample mean ($CRVR1 = 0.77$) reduces the dividend pay-out ratio by almost 10%. The inclusion of $CRVR1$ does not render $VR1$ insignificant, indicating that the extent of voting rights is important for the ability of the largest shareholder to exert control and possibly to extract rents, independent of the influence of $CRVR1$. The inclusion of $CRVR1$ makes $VR2$ significant at the 5% level.

Eq. (4) partitions $CRVR1$ into voting rights ($VR1$) and cash flow rights ($CR1$) of the largest ultimate shareholder. The results conform to our expectations. $VR1$ is more negative than in Eq. (3) and significant. $CR1$ aligns the interests of the largest shareholder with those of the other shareholders. The higher $CR1$ is, ceteris paribus, the larger the dividends granted to all shareholders.

Eq. (5) tests for possible non-linear effects of $VR1$ and $CR1$ by also including squared values of $VR1$ and $CR1$ ($VR1SQ$ and $CR1SQ$). The influence of $VR1$ has an inverted U-shape: The dividend pay-out ratio first increases with the voting rights of the largest shareholder and reaches a maximum at $VR1 = 34.4\%$. Thereafter, the dividend pay-out ratio starts to fall. The influence of $CR1$ is U-shaped. The minimum-level dividends is obtained with $CR1 = 28.0\%$. One explanation is as follows: Initially a rise in $VR1$ benefits all shareholders: The direct monitoring ability of the largest shareholder increases and managerial discretion is curbed. Managers must disgorge more cash. As $VR1$ rises further and since it increases faster than $CR1$, incentives for profits diversion are created and the dividend pay-out ratio is negatively influenced. At a $VR1$ between 30% and 40%, control of the largest shareholder suffices to determine a firm's decision, and the forgone private benefits of control begin to outweigh the benefits of dividend

¹³ The results did not change when we use the dividend-to-cash flow ratio as the dependent variable. We also tried total investment outlays of the firm to account for investment opportunities instead of Tobin's q as well as performed instrumental variable regressions with the lagged values of investment instrumenting for current investment. The results implied a negative effect of investment spending on dividend pay-out ratios consistent with the results reported in Table 2.

¹⁴ Note that an increase in $CRVR1$ indicates less deviation from one-share-one-vote.

payments for the largest shareholder. The dividend pay-out ratio starts to fall. Incentive alignment brought about by a higher *CR1* increases dividends, however.

Cross-shareholdings are often alleged to insulate managers from effective control, particularly from (hostile) takeovers. *CROSS*, the dummy variable equal to one if the firm is ultimately controlled via a cross-shareholding structure and zero otherwise, assumes a negative and significant coefficient in Eq. (6). This indicates that the firms ultimately controlled by cross-shareholdings pay out 8–9% less than their industry peers. This confirms the manager insulating effects of cross-shareholdings.

One problem with ultimate ownership and derived variables like the *CRVR1* ratio is that they may be measured with considerable error. As the example of *MAN AG* in Appendix A reveals (which is, however, a rather extreme example in this respect), we sometimes had to make additional assumptions and consult supplementary sources to determine where ultimate control resides. One variable directly related to the deviation of cash flow from voting rights that is measured with considerably less error is *PYR*, the number of layers of the pyramid “above” the sample firm (including the layer of the sample firm). Indeed, the simple correlation coefficient between *CRVR1* and *PYR* is -0.70 ($p=0.000$). The lower down the firm in the corporate pyramid, the larger is the deviation of cash flow from voting rights. To reduce possible measurement error even further, we employ *PYR1*, a dummy variable equal to one if the firm is controlled via a pyramidal structure, and zero otherwise, in a regression-like Eq. (3) in Table 2. If we instrument *CRVR1* with *PYR1*, the coefficient on *CRVR1* rises to 0.185 ($t=3.12$). This implies that it is likely that possible measurement error in *CRVR1* biases its coefficient towards zero. If we include *PYR1* instead of *CRVR1* the coefficient on *PYR1* is -0.078 ($t=4.15$). This implies that firms controlled via a pyramidal structure pay out 7–8% less than firms that are directly controlled ($PYR=1$), confirming the results obtained with *CRVR1*.

One problem with taking dividends as the dependent variable is that for many firm years dividends are zero. Indeed, they were zero in nearly 30% of the firm years. To address this concern, we first estimated the equations in Table 2 by using Tobit regression techniques explicitly accounting for censoring from below at zero. The results did not change substantially, however. Second, we excluded zero observations from the panel and reestimated the equations of Table 2. In terms of significance levels, the results were even *stronger* than those reported. Third, instead of including industry dummies, we estimated all equations accounting for firm fixed effects. All results on the corporate governance variables remain. Tobin’s q changed sign but was insignificant. This might indicate that investment opportunities were fairly constant over the estimation period, and firm-specific intercepts partially accounted for these. We conclude therefore that explicitly taking into account dividend omissions and time-invariant differences in firm-level dividend pay-out ratios does not change our results.

Another problem with regressions like those reported in Table 2 may be the possible endogeneity of ownership and performance. Ownership may be *determined* by the characteristics of the firm, for example, its contracting environment, the inherent riskiness of its assets, or its performance. Himmelberg et al. (1999) indeed find that insider ownership is endogenous to performance, once unobserved firm heterogeneity is controlled for. Several arguments defend our approach, though. First, while ownership

and average performance measures like the return on total assets may be endogenous, it appears much less likely that ownership and dividend pay-out policy, the focus of this paper, are endogenous. The *share* of profits being paid out is certainly *determined* by managerial or in our case by large shareholder decision making. It is even less plausible that dividend announcements which we will study below trigger the selling or purchase of large share blocks of the largest or second largest shareholder. Second, we observe remarkable stability of large shareholders over time in Germany. The between firm variation in the large shareholder variables is much larger than the within firm component, while the opposite is true for the dividend pay-out ratio. Therefore, it is unlikely that pay-out ratios determine large shareholdings.¹⁵ Third, we reestimated the equations in Table 2 instrumenting the ownership variables with firm size measures (total assets and total sales), average profitability (return on total assets), and beta risk (yearly estimates of beta). The coefficient estimates as well as their significance levels are close to those reported in Table 2. Moreover, Hausman specification tests take on *p*-values between 0.42 and 0.62, indicating no endogeneity of ownership. We, therefore, believe that our main results are robust to concerns of endogeneity.

4.1.2. The Lintner (1956) model

Many economists believe that dividends are determined according to the famous Lintner (1956) model. Through interviews, Lintner found that managers were particularly wary of dividend cuts as this is a bad signal not only about firm long-run earnings but also about the quality of the managers themselves. According to this model, dividends are the result of a partial adjustment process towards a target ratio. Specifically, changes in dividends are determined by the difference between last year's dividends and this year's target pay-out level which is assumed to be a fixed proportion of earnings, i.e.

$$\begin{aligned}
 D_{iy}^* &= \tau \Pi_{iy}, \\
 \Delta D_{iy} &= \gamma + \alpha(\tau \Pi_{iy} - D_{iy-1}) + \varepsilon_{iy} \quad \text{or} \\
 D_{iy} &= \gamma + \alpha \tau \Pi_{iy} + (1 - \alpha) D_{iy-1} + \varepsilon_{iy},
 \end{aligned} \tag{2}$$

where D_{iy}^* is the target pay-out of firm i in year y , τ the target pay-out ratio, Π_{iy} are current earnings, ΔD_{iy} changes in dividend payments from $y - 1$ to y , γ a constant term, α speed of adjustment coefficient, D_{iy-1} lagged dividends, and ε_{iy} the error term.

The key statistic for us is τ , the target pay-out ratio. A larger value of τ indicates that minority shareholders can force managers to disgorge more cash. To test this proposition, we interact Π_{iy} and D_{iy-1} , respectively, with three dummy variables indicating (1) majority control and the presence of a second large shareholder, (2) majority control and the absence of a second large shareholder, and (3) minority control. For each of these mutually exclusive groups of firms, τ is calculated.

Financial constraints or pecking order effects may, however, affect the dividend pay-out decision, and our inferences with respect to the rent extraction hypothesis. For example, if majority-controlled firms are more likely to be financially constrained

¹⁵ For a related argument, see Zhou (2001).

or have steeply rising cost of external capital schedules (say, because asymmetry of information is higher), we would also expect a lower optimal target pay-out ratio. One way to account for financial constraints in an equation like (2) is to allow for different smoothing, $(1 - \alpha)$, and impact, $\alpha\tau$, effects between periods of rising ($\Delta\Pi_{iy} > 0$) and declining earnings ($\Delta\Pi_{iy} < 0$). If internal finance is cheaper than external funds, managers will rationally reduce dividends relatively quickly in bad times to not cut investment, and will increase them relatively slowly in good times to build up financial slack. We test this proposition by interacting Π_{iy} and D_{iy-1} with a dummy variable equal to one if the firm experienced an earnings drop from $y - 1$ to period y , for each of our three groups of firms.¹⁶ Table 3 presents the results.

“Majority-controlled and unchecked” firms have the smallest target pay-out ratio (0.12), while “majority-controlled and checked” firms have the largest target pay-out ratio (0.40). Minority-controlled firms lie in between (0.25).¹⁷ This implies that minority shareholders with large stakes press successfully for dividends to be paid out, consistent with the rent extraction hypothesis. While our results suggest that financial constraints or pecking order effects may be important for some firms, estimated target pay-out ratios for “majority-controlled and checked” firms remain highest in periods of falling profits. This pattern is once again what the rent extraction hypothesis predicts. We next turn to the analysis of dividend announcements.

4.2. Dividend announcements

4.2.1. The effects of direct ownership

The sample for which all the relevant data are available consists of 510 events of dividend increases and 226 dividend reductions over the 1992–1998 period. Table 4 presents detailed summary statistics on firm characteristics of majority- versus minority-controlled firms, “checked” versus “unchecked” firms, and “checked” versus “unchecked” firms for the subsample of majority-controlled firms.

Generally, the ownership variables $VR1$ and $VR2$ are similar for all sub-samples in Table 4. By construction, the control power of the largest shareholder is highest in “unchecked” majority-controlled firms, as the largest shareholder in these firms on average holds around 70% of the equity, with no other large shareholders as countervailing powers. Majority-controlled firms have slightly higher Tobin’s q ratios (although the differences from the other firms are not significant),¹⁸ are smaller and have higher dividend yields. Firms that decrease their dividends have lower Tobin’s q ratios than firms that increase their dividends. One explanation is the rent extraction hypothesis: Theory expects that low q firms should increase their dividends to reduce free cash flow, however, large shareholders may prevent this from happening.

¹⁶ See Nakamura (1989), Nakamura and Nakamura (1985), and Sembenelli (1993) for estimates using a related procedure for Japanese, US and Italian firms.

¹⁷ This is consistent with the findings of Gugler (2002) for Austria.

¹⁸ Edwards and Weichenrieder (1999) found for German listed companies that while the largest shareholder does obtain private benefits of control at the expense of minority shareholders, the net effect on the value of the firm as measured by Tobin’s q is positive via increased monitoring intensity. Our results are consistent with theirs.

Table 3

Lintner (1956) model estimates. Estimates of the Lintner (1956) model for (1) majority-controlled and “unchecked” firms, (2) majority-controlled and “checked” firms and (3) minority-controlled firms are presented. Majority-controlled firms are those where the largest shareholder controls more than 50% of the voting shares. Minority-controlled firms are those where the largest shareholder controls less than 50% of the votes. “Unchecked” firms are those for which there is no second largest shareholder holding more than 5% of the voting shares. “Checked” firms have at least one additional shareholder with more than 5% of the votes. We also allow for different smoothing, $(1 - \alpha)$, and impact, $\alpha\tau$, effects between periods of rising and declining profits. The lower part of the table calculates target pay-out ratios. We include (but do not report) a constant term, 40 2-digit industry dummies and 7 time dummies to capture the impact of business cycle fluctuations. Heteroscedasticity consistent t -values are reported using the White (1980) procedure

	Coef	t -value	Coef	t -value
Majority-controlled and “unchecked” firms:				
$\alpha\tau$	0.084***	7.11		
$\alpha\tau$ for $\Delta\Pi_{iy} > 0$			0.069***	5.79
Diff. of $\alpha\tau$ for $\Delta\Pi_{iy} < 0$			0.118***	6.87
$(1 - \alpha)$	0.289***	12.59		
$(1 - \alpha)$ for $\Delta\Pi_{iy} > 0$			0.224***	4.70
Diff. of $(1 - \alpha)$ for $\Delta\Pi_{iy} < 0$			0.006	0.12
Majority-controlled and “checked” firms:				
$\alpha\tau$	0.379***	13.89		
$\alpha\tau$ for $\Delta\Pi_{iy} > 0$			0.152***	4.46
Diff. of $\alpha\tau$ for $\Delta\Pi_{iy} < 0$			0.131***	3.59
$(1 - \alpha)$	0.047**	2.46		
$(1 - \alpha)$ for $\Delta\Pi_{iy} > 0$			0.746***	11.14
Diff. of $(1 - \alpha)$ for $\Delta\Pi_{iy} < 0$			-0.751***	10.73
Minority-controlled firms:				
$\alpha\tau$	0.113***	13.15		
$\alpha\tau$ for $\Delta\Pi_{iy} > 0$			0.112***	10.94
Diff. of $\alpha\tau$ for $\Delta\Pi_{iy} < 0$			-0.016	1.30
$(1 - \alpha)$	0.538***	25.33		
$(1 - \alpha)$ for $\Delta\Pi_{iy} > 0$			0.561***	17.78
Diff. of $(1 - \alpha)$ for $\Delta\Pi_{iy} < 0$			-0.017	0.51
Obs.	1.605		1.605	
Adj. R^2	0.836		0.839	
Target pay-out ratio (τ):	Majority-controlled and “unchecked”	Majority-controlled and “checked”	Minority-controlled	
Overall	0.118	0.397	0.245	
Periods of rising profits	0.089	0.600	0.256	
Periods of falling profits	0.242	0.282	0.212	

*, **, *** significant at the 10%, 5%, 1% level, respectively (two-tailed test).

The results on the event study in Table 5 are consistent with the rent extraction hypothesis. For dividend increase announcements, we find significantly positive reactions of stock prices. The $CAAR$ is about 1.0% and the AAR slightly lower. In five out of the six cases, the $CAARs$ and $AARs$ are larger for the sub-samples where

Table 4

Characteristics of the sample for the event study. Total number of firms: 266; Time period: 1992–1998. Summary statistics on the structure of ownership, Tobin's q , size, the dividend yield DIV/P , for majority-versus minority-controlled firms, "checked" versus "unchecked" firms, and "checked" versus "unchecked" firms only for the sub-sample of majority-controlled firms are presented. $VR1$ and $VR2$ are the percentage voting rights of the largest, respectively, second largest shareholder, Tobin's q is defined as the market value of the firm's equity plus total debt divided by total assets, market value of the firm is market value of equity plus the value of outstanding debt and it is expressed in million DM, dividend yield, DIV/P , is total dividends divided by the stock price 100 days before the announcement day

	Number of events	$VR1$ (%)	$VR2$ (%)	Tobin's q	Market Value (Mn. DM)	DIV/P (%)
<i>Dividend increases</i>						
All firms	510	48.7	18.1	1.07	5,055	2.2
Majority-controlled firms	255	70.6	17.7	1.10	2,746	2.6
Minority-controlled firms	255	27.5	18.2	1.04	7,291	1.9
"Unchecked" firms	234	58.4	3.0	1.04	3,973	2.2
"Checked" firms	276	40.8	18.9	1.10	5,936	2.2
Majority-controlled and "unchecked" firms	153	77.1	1.6	1.14	2,477	2.7
Majority-controlled and "checked" firms	102	60.7	18.1	1.04	3,152	2.4
<i>Dividend decreases</i>						
All firms	226	50.5	18.9	0.82	2,571	2.1
Majority-controlled firms	144	68.5	19.7	0.92	599	2.2
Minority-controlled firms	82	26.1	18.2	0.69	5,231	1.8
"unchecked" firms	125	58.2	2.6	0.89	2,565	2.1
"Checked" firms	101	42.6	19.6	0.75	2,577	2.1
Majority-controlled and "unchecked" firms	50	75.2	0.0	0.95	620	2.3
Majority-controlled and "checked" firms	94	58.3	19.7	0.88	567	1.9

we expect the danger of expropriation to be larger, although none is significantly different.

All our predictions with regard to the influence of control structure on the wealth effects of dividend announcements are fulfilled for the subsample of dividend decreases. Strikingly, the $CAARs$ and $AARs$ of majority-controlled firms, "unchecked" firms and "majority-controlled and unchecked firms" are all negative and significant. The magnitude of negative wealth effects rises monotonically from around -1.0% to -1.9% when one moves from majority control to "unchecked" majority control. Crucial in determining these wealth effects is the presence of other large shareholders as a countervailing balance to the largest owner. In firms where there is a second large shareholder with more than 5% of the equity, $CAARs$ and $AARs$ are indistinguishable from zero when dividends are reduced. The cumulative effects are always significantly different between the control categories when dividends are reduced. The largest difference,

Table 5

Abnormal returns for dividend changes in Germany. Total number of firms: 266; Time period: 1992–1998. Cumulative average abnormal returns measured over the event window -2 to $+2$ relative to the announcement date (*CAAR*) and average abnormal returns (*AAR*) on day 0, and differences in them of majority-versus minority-controlled firms, “checked” versus “unchecked” firms, and “checked” versus “unchecked” firms only for the subsample of majority-controlled firms are presented. *T*-values for the tests are in parentheses

	No. cases	<i>CAAR</i> (%) (<i>t</i> -value)	Difference (%) (<i>t</i> -value)	<i>AAR</i> (%) (<i>t</i> -value)	Difference (%) (<i>t</i> -value)
<i>Dividend increases</i>					
Majority-controlled firms	255	0.97 (4.89)***	0.06	0.75 (4.96)***	0.20
Minority-controlled firms	255	0.91 (3.84)***	(0.20)	0.54 (2.71)***	(0.80)
“Unchecked” firms	234	0.91 (3.82)***	−0.05	0.67 (3.61)***	0.05
“Checked” firms	276	0.96 (4.79)***	(−0.14)	0.62 (3.58)***	(0.23)
Majority-controlled and “unchecked” firms	153	1.06 (4.09)***	0.15	0.82 (3.70)***	0.16
Majority-controlled and “checked” firms	102	0.91 (3.22)**	(0.38)	0.65 (3.51)***	(0.54)
<i>Dividend decreases</i>					
Majority-controlled firms	144	−1.07 (−2.39)**	−1.25	−1.10 (−2.59)**	−0.82
Minority-controlled firms	82	0.18 (0.32)	(−0.69)*	−0.27 (−0.87)	(−1.44)
“Unchecked” firms	125	−1.44 (−3.00)***	−1.82	−1.34 (−3.19)***	−1.32
“Checked” firms	101	0.39 (0.74)	(−2.56)**	−0.02 (−0.08)	(−2.35)**
Majority-controlled and “unchecked” firms	50	−1.87 (−3.15)	−2.28	−1.68 (−3.04)***	−1.87
Majority-controlled and “checked” firms	94	0.40 (0.60)	(2.40)**	0.18 (0.35)	(−2.09)**

*, **, *** significant at the 10%, 5%, 1% level, respectively (two-tailed test).

−2.28% ($t = -2.4$), is between “checked” and “unchecked” majority-controlled firms. This pattern in the data is predicted by the rent extraction hypothesis.

One problem facing event studies is that only the *unexpected* component of dividends should matter for price to change. Especially dividend increases may be totally expected. For example, the *CDAX* market index nearly tripled during the 7 year period 1992–1998, and only dropped slightly in the recession year 1993. Thus, it appears much more likely that market participants expected rising dividends on

Table 6

Abnormal returns for unexpected dividend increases in Germany. Time period: 1992–1998. Cumulative average abnormal returns measured over the event window -2 to $+2$ relative to the announcement date (*CAAR*) and average abnormal returns (*AAR*) on day 0, and differences in them of majority- versus minority-controlled firms, “checked” versus “unchecked” firms, and “checked” versus “unchecked” firms only for the subsample of majority-controlled firms are presented. We additionally restrict the sample to those firm-years where profits before interest and taxes *decreased* from the year before the announcement to the year of the announcement. *T*-values for the tests are in parentheses

	No. cases	<i>CAAR</i> (%) (<i>t</i> -value)	Difference (%) (<i>t</i> -value)	<i>AAR</i> (%) (<i>t</i> -value)	Difference (%) (<i>t</i> -value)
<i>Dividend increases and $\Delta\Pi_{iy} < 0$</i>					
Majority-controlled firms	103	2.32 (4.39)***	2.27 (3.00)**	0.65 (2.26)**	0.56 (1.20)
Minority-controlled firms	66	-0.04 (0.84)		0.09 (0.31)	
“Unchecked” firms	84	0.63 (1.50)	0.22 (0.43)	0.52 (1.22)	(0.21)
“Checked” firms	85	0.41 (1.33)		0.31 (1.18)	(0.45)
Majority-controlled and “unchecked” firms	65	1.00 (1.86)*	0.21 (0.10)	0.70 (1.50)	0.06 (0.44)
Majority-controlled and “checked” firms	38	0.80 (1.51)		0.64 (1.71)*	

*, **, *** significant at the 10%, 5%, 1% level, respectively (two-tailed test).

average during this period.¹⁹ Any partial anticipation of dividend announcements will lead to underestimation of the true value change.²⁰ Our findings of insignificant differences for dividend increases across control categories may therefore be due to the fact that dividend increases were expected, on average.

To explore this issue further, we restrict the sample of dividend increases to those firms that experienced an earnings *drop* in the year of the dividend increase announcement relative to the year before the announcement. The drop in profits should make a dividend increase less likely and therefore increase the unexpected component of such an announcement. The results are presented in Table 6.

Consistent with the rent extraction hypothesis, the *CAAR* of majority-controlled firms that increased their dividends *in spite of* profit declines is 2.32% ($t = 4.39$), while the *CAAR* for minority-controlled firms is insignificant. The difference between majority- and minority-controlled firms is 2.27% ($t = 3.00$). Investors favor pay outs of firms

¹⁹ In the recession year 1993 (real GDP growth rate -1.2% , Source: *Monatsbericht Deutsche Bundesbank*) cuts in dividends may have been expected. Indeed, with nearly 20%, the unconditional probability of a dividend cut was largest in 1993.

²⁰ If market participants expect a dividend change announcement with probability $p > 0$ then the measured announcement effect equals the true value effect times $(1 - p)$. That is, there is a bias towards zero.

where potential expropriation is likely over pay outs of firms where this danger is less. While the results on the other splits are consistent with the rent extraction hypothesis, in that all differences in *CAARs* or *AARs* are in the predicted direction, none of the differences is statistically significant.²¹

One additional point is worth mentioning. While the pattern of wealth effects for dividend increases is consistent with the rent extraction hypothesis, the results on dividend cuts are generally stronger. One reason may be that the information on the large–small shareholder conflict conveyed to the market by dividend increases is *intrinsically* less valuable than for dividend cuts. This might be due not only to expectations of rising dividends in rising stock markets, but to reputation formation effects. Gomes (2000) builds a model that explains why, even without any explicit corporate governance mechanisms protecting minority shareholders, controlling shareholders can implicitly commit not to expropriate them. This commitment is credible, since if the largest shareholder starts expropriation investors will discount the stock price accordingly, decreasing future revenues from share sales. This implies in our context that a favorable dividend pay-out policy to minority shareholders (i.e. rising dividends) builds up the reputation needed for profitable future share sales. This reputation formation is likely to last for several periods and each additional dividend increase announcement conveys the information that the largest shareholder still abstains from expropriation. A dividend cut, on the other hand, conveys the information that it is more profitable for the largest shareholder to let the stock price fall, presumably because private benefits of control more than outweigh the discounted current and future wealth losses from the share price decline. Thus, it is not surprising that we find most support for the rent extraction hypothesis for dividend cuts.

The logic of our hypotheses further implies that the more concentrated the voting rights of the largest shareholder (*VR1*) the more positive (negative) will be the stock price reaction in case of dividend increases (decreases). *VR2* should have opposite effects. The estimated regressions below additionally include as controls the change in dividends as a percent of price 100 trading days before the announcement $\Delta DIV/P = (DIV_{iy} - DIV_{iy-1})/P_{iy}$, and a dummy variable indicating whether the firm has a Tobin's *q* below one (*TQ1*). The change in dividends in relation to price accounts for the magnitude of the dividend increase or decrease, respectively. Tobin's *q* proxies for investment opportunities. Lang and Litzenberger (1989) hypothesize and find positive abnormal returns for over-investing firms (*TQ1* = 1) that increase their dividends. Alternatively, market reaction to announcements of dividend decreases of *TQ1* = 1 firms should be negative. Industry dummies at the 2-digit level and time dummies are also included. Industry-specific effects account for differences in the unexpected components of dividend innovations specific to a particular industry. Time dummies should capture differential news value dependent on the state of the business cycle. *F*-tests indicate that industry and time effects are significant at the 5% level.

²¹ When we restrict the sample even further and include only firms lower down a corporate pyramid the difference in *CAARs* of majority- versus minority-controlled firms is 3.21% ($t = 3.54$), further supporting the rent extraction hypothesis of dividends.

The results for *CARs* for dividend increases are (omitting the coefficients on the industry and time dummies):

$$CAR = -0.007 + 0.018 VR1 + 0.0079 VR2 + 0.55 \Delta DIV/P + 0.002 TQ1$$

(*t* =) (0.29) (1.89)* (0.35) (5.74)*** (0.36)

$$N = 510, \text{ Adj. } R^2 = 0.18.$$

When we restrict the sample to those events where dividends were increased despite an earnings drop, the results are

$$CAR = -0.007 + 0.029 VR1 + 0.047 VR2 + 0.51 \Delta DIV/P + 0.010 TQ1$$

(*t* =) (0.36) (2.16)** (0.35) (5.03)*** (1.88)*

$$N = 169, \text{ Adj. } R^2 = 0.29.$$

For dividend decrease announcements we obtain the following results:

$$CAR = 0.008 - 0.049 VR1 + 0.067 VR2 - 0.10 \Delta DIV/P - 0.032 TQ1$$

(*t* =) (0.26) (2.34)** (1.88)* (0.65) (2.12)**

$$N = 226, \text{ Adj. } R^2 = 0.10.$$

Again, the results are strongest for dividend decrease announcements. For this sub-sample, the *CAR* falls significantly with the voting rights of the largest shareholder (*VR1*), and rises with the voting rights of the second largest shareholder (*VR2*, significant at the 10% level). This is true even when we control for industry and year fixed effects, as well as for the amount of dividend reductions, $\Delta DIV/P$, and investment opportunities as measured by *TQ1*. Consistent with Lang and Litzenberger (1989), we find that firms that cut their dividends in spite of having poor investment opportunities as measured by a Tobin's *q* lower than one experience a *CAR* that is 3.3% lower on average than for other firms cutting dividends.

For dividend increases, the coefficient on *VR1* has the predicted positive sign and is significant at the 10% level for the sample including all dividend increases, and significant at the 5% level when we restrict the sample to dividend increases of firms that experienced earnings drops. The coefficient on *VR2* is insignificant.

It appears therefore that the corporate governance structure of the firm matters particularly when times are bad and dividends are cut. It is precisely this situation when the effects of the largest and the presence of a second large shareholder are most pronounced. Corporate governance is not so important in a situation when the firm wants to build up a reputation and dividends are rising, as evidenced by the insignificant effects of *VR2*.

It should be mentioned that we performed a number of robustness tests on the above regressions. First, the results on *ARs* are similar. Other factors like size (as measured by the logarithm of total assets) and risk (as measured by the standard deviation

of monthly stock returns) did not significantly influence *CARs* and *ARs*, and did not change the results on *VR1* and *VR2*. We also tried the total amount spent on investment to account for investment opportunities instead of the Tobin's *q* dummy, as well as instrumented investment by lagged investment, with no change in the results.

4.2.2. The effects of ultimate ownership

So far, we have tested for the effects of the largest shareholder on the *CAR* and the *AR* of dividend announcements by considering only direct ownership. One virtue of using direct ownership is that it is rather straightforward to calculate, and problems due to errors in measurement are likely to be minor. Recent research on corporate governance in Europe has, however, shown that ultimate owners at the top of corporate pyramids play a key role in the firm's decision process.²² In addition, especially in Germany, cross-shareholdings are common. In what follows, we analyze ultimate owners at the top of the pyramid.

Panel A of Table 7 exhibits summary statistics on *CRVR1*, the cash-flow-right-to-voting-right-ratio of the largest ultimate shareholder, and *PYR*, the number of hierarchical layers between the sample firm and their ultimate owners including the layer of ultimate owners (see Appendix A for a detailed example explaining these concepts). We classify firms by largest ultimate shareholders into categories of ultimate owners, namely Family, State, Financial firm, Foreign firm, and *CROSS*.

Families are the most important ultimate control category (59.4%). Interestingly, the state is also very important ultimately controlling (still) around 17% of the sample firms. The category *CROSS* consists mostly of the *Allianz-Münchener Rückversicherungs* cross-shareholdings of insurance companies. If one, therefore, attributes the 12.5% firms of *CROSS* to the Financial firm category, Financial firms ultimately control 19.1% of our sample firms.²³ The category Foreign firms is of minor importance for the control of German firms. Family-controlled firms exhibit the largest *CRVR1*, i.e. the least deviation from one-share-one-vote. Firms controlled via cross-shareholdings have a particularly large deviation from the one-share-one-vote paradigm. For ultimately family-controlled firms *PYR* is only 1.6, i.e. families control their firms rather directly, on average.

Pyramiding may exacerbate rent extraction of minority shareholders. Intra-group transfers, transfer pricing and the like can result in group profits accumulating in those firms of the group where the controlling shareholder has the largest cash flow rights (see, for example, Barca, 1997; Bebchuk et al., 1999; Johnson et al., 2000; and Faccio et al., 2001).

The next step is to look at the effects of pyramiding on *CAAR* and *AAR*. Panel B of Table 7 divides the sample where *PYR* > 1 into majority-controlled versus

²² See, for example, Becht (1999), Becht and Röell (1999), Bianco and Casavola (1999), Faccio et al. (2001), Renneboog (2000), Barca and Becht (2001), Franks and Mayer (2001), Gugler (2001), and Franks et al. (2002).

²³ *Salomon Smith Barney*, a bank, estimates that corporate cross-shareholdings in Europe account for 10% of stockmarket value, however, with a decreasing trend (*The Economist*, 29th April, 2000). In Germany, the abolition of a capital-gains tax on the difference between a stake's book value and its usually much higher market value will most likely lead to more sales of equity stakes by financial institutions.

Table 7

Abnormal returns for dividend decreases and the influence of pyramiding in Germany. Total number of firms: 266; Time period: 1992–1998)

Panel A. Summary statistics on pyramiding (*PYR*) and the cash-flow-right-to-voting-right-ratio (*CRVR1*) by ultimate control categories

This panel presents summary statistics on the average number of pyramidal layers *above* the sample firm (*PYR*), and the average *CRVR1*, i.e. the ratio of the cash flow rights of the largest shareholder to her/his voting rights. Voting rights are the sum of the percentage direct holdings of the largest shareholder in the sample firm. Cash flow rights are defined as the multiplicative chain of direct holdings of the largest ultimate shareholder. *CROSS* indicates ultimate control by cross-shareholdings.

Ultimate control	Percentage of observations	<i>CRVR1</i>	<i>PYR</i>
Family	59.7	0.89	1.61
State	16.7	0.73	2.60
Financial firm	4.8	0.86	2.77
Foreign firm	6.6	0.84	2.31
<i>CROSS</i>	12.5	0.34	3.26
<i>All</i>	100.0	0.77	2.12

Panel B. Abnormal returns for dividend decreases *only for firms that are controlled in a pyramid*

This panel presents cumulative average abnormal returns measured over the event window -2 to $+2$ relative to the announcement date (*CAAR*) and average abnormal returns (*AAR*) on day 0, and differences in them of majority- versus minority-controlled firms, “checked” versus “unchecked” firms, and “checked” versus “unchecked” firms only for the subsample of majority-controlled firms, and *only for firms that are controlled by a pyramid* (*PYR* > 1). *T*-values for the tests are in parentheses.

	No. cases	<i>CAAR</i> (%) (<i>t</i> -value)	Difference (%) (<i>t</i> -value)	<i>AAR</i> (%) (<i>t</i> -value)	Difference (%) (<i>t</i> -value)
<i>Dividend decreases</i>					
Majority-controlled firms	91	-1.13 (-1.68)*	-1.22 (-1.18)	-1.17 (-1.72)*	-0.79 (-0.92)
Minority-controlled firms	51	0.08 (0.12)		-0.38 (-1.18)	
“Unchecked” firms	75	-1.89 (-2.65)***	-2.53	-1.74 (-2.48)**	(-1.87) (-2.25)**
“Checked” firms	67	0.63 (0.97)	(-2.59)**	0.13 (0.34)	
Majority-controlled and “unchecked” firms	59	-2.19 (-2.48)**	-2.99	-2.06 (-2.25)**	-2.77
Majority-controlled and “checked” firms	32	0.80 (0.84)	(-2.15)**	0.71 (0.91)	(-1.92)**

*, **, *** significant at the 10%, 5%, 1% level, respectively (two-tailed test).

minority-controlled firms, “unchecked” versus “checked” firms, and “majority controlled and unchecked firms” versus “majority-controlled and checked firms.”

We find the largest negative market reaction to a dividend reduction announcement for those firms that are (1) majority controlled, (2) “unchecked,” and (3) in a pyramidal structure. The difference from firms that have the same attributes with the exception of being “checked” amounts to 3 percentage points for the *CAAR*. This difference is significant at the 5% level ($t = 2.15$), which is remarkable given the small number of observations. It appears, therefore, that the single most important corporate governance device to prevent rent extraction is whether or not there are other shareholders with enough power and incentive to check the largest shareholder.²⁴

5. Additional robustness tests

5.1. The sensitivity to alternative excess return measures

Most event studies employ the linear market model that we used in this paper. Relying on simulation evidence by Brown and Warner (1980, 1985), several papers have used simpler non-regression market-adjusted returns models. We repeat our calculations with buy-and-hold excess returns. We define the buy-and-hold excess return for event i over the same 5-day event window that is used for the *CARs* in the following way:

$$BH5_{it} = \prod_{t=-2}^{+2} (1 + R_{it}) - \prod_{t=-2}^{+2} (1 + RM_t),$$

where R_{it} is again the return on event i on day t and RM_t is the rate of return on the CDAX market index on day t . The 1 day buy-and-hold excess return (*BH1*) is defined by analogy.

Using *BH5* instead of *CAR*, the differential stock price reaction to dividend decreases is now -1.22% between majority- and minority-controlled firms, -2.01% between “checked” and “unchecked” firms, and -2.89% between “majority-controlled and unchecked” firms and “majority controlled and checked” firms, all the differences being larger in absolute value than with *CAR* and significant at 5% level or better. The differences across control classes using *BH1* are all significant at the conventional levels.

5.2. Definition of control

Our cut-off point for control was voting rights of 50% or more. This cut-off point seemed to be the most plausible one. It can be argued, however, that control can be

²⁴ Since we do not have unambiguous hypotheses about the effects of the identities of owners on dividend pay outs, we do not create extra tables for these results. Our results can be summarized as follows, though: For announcements of dividend increases we do not find significant differences in market reaction between categories of ultimate controllers (we use the same categories as in Panel A of Table 7). For announcements of dividend decreases we find the largest negative reactions for ultimately state- and foreign-controlled firms. The differences from the other firms are statistically significant at the 5% level.

achieved with less than 50% of the voting rights. In particular, firms with otherwise no large owners could be controlled by, say, 20–30%.

To test for the sensitivity of our results to the definition of control, we repeat the mean comparison tests presented in Table 5 using cut-off points of 25%, 30% and 40% for $VR1$. The results are both qualitatively and quantitatively very similar to those obtained with the 50% criterion. The difference in the $CARs$ and the ARs of “majority-controlled and unchecked” firms versus “majority-controlled and checked” firms ranges from -2.13% to -2.52% and is significant at the 1% level whatever cut-off point is chosen. The operational definition of control does not appear to alter our conclusions, therefore.

While the majority of empirical studies have investigated the impact of ownership concentration using rules of thumb similar to us, some authors have addressed the distribution of voting power based on probabilistic voting assumptions (Leech, 1988). This approach is particularly suited for countries characterized by a dispersed ownership structure like the USA and UK, much less so for Germany with a highly concentrated ownership structure. Nevertheless, we check the robustness of our results calculating Shapley values (SV) using the methodology described by Crespi and Renneboog (2001), who treat the problem of “atomistic” shareholders by scaling the sum of the large share blocks to 100%. For nearly 85% of our sample, the largest shareholder has an SV of 1. For the remaining cases, we observe a clustering of SVs of the largest shareholder around 0.3. We divide the cash flow rights of the largest shareholder by its SV to arrive at an alternative measure of $CRVR1$. This method leaves the inference from our reported tests in Table 2 unchanged.

5.3. Do the identities of owners play a role?

The identity of the ultimate owner of a corporation could have a direct influence on the dividend policy. The wealth of an individual or a family as a large block holder is directly affected by the chosen dividend pay-out policy. Things become more complicated if the state or a financial firm are ultimate owners, since these are also agents and the notion of cash flow rights becomes blurred.

To check whether the identities of owners matter for dividend pay-out ratios, we use dummy variables to identify ultimate owners who can be an individual (or family), a state body, a financial firm, a foreign firm, or a cross-shareholding structure. We interact these dummies with the levels and squares of their cash flow and voting rights, and use the same set of control variables as in Table 2. The adjusted R^2 of the regression is about 5% higher than its simpler counterpart presented in Table 2 (Eq. (5)). For family-controlled firms, we find the same pattern as for the whole sample: A U-shaped relationship between the dividend pay-out ratio and $CR1$ (minimum at 40.2%), and an inverted U-shaped relationship between the dividend pay-out ratio and $VR1$ (maximum at 47.8%). From the remaining categories of owners, only the voting rights of public sector bodies are significant in both level and squared form implying increasing dividends for $VR1$ below 39.7% and decreasing dividends after this point.

These additional estimates suggest that for firms ultimately controlled by families the negative effects of a deviation of cash flow from control rights are more pronounced

than for other types of ultimate owners. This is expected since the notion of cash flow rights attributed to an owner is best defined for families or individuals. The notion is less clear-cut if agents like the state or other firms are involved.

6. Conclusions

Dividends have always been a bit of a puzzle in the theory of the firm. In the neo-classical world of [Miller and Modigliani \(1961\)](#) “dividends do not matter”. Why then are dividends paid? There have been a number of theories explaining dividends and/or the wealth effects of dividend changes, most prominently the cash flow signaling and free cash flow hypotheses, which have been widely tested for Anglo-Saxon corporate governance regimes. Institutional differences in most other countries, such as in Germany, make these two hypotheses less likely explanations of dividend policy, however. A necessary condition for the free cash flow hypothesis to apply is that managers have considerable discretion. However, ownership is highly concentrated in Germany, which leaves little room for managers to exercise discretion.

In this paper we propose a new explanation for the effects of dividend announcements on share prices, an explanation that takes into account the rent extraction property of dividends. In countries characterized by high ownership concentration, the conflict between large and controlling owners and small outside shareholders is one of the main issues in corporate governance. An increase in dividends reduces the funds at the discretion of the controlling shareholder and increases the market value of the firm. A decrease in dividends potentially implies more severe rent extraction and expropriation of small shareholders.

We hypothesized and found significant differences in abnormal returns to dividend changes between firms where this conflict is likely to be at work and firms where it is not. The market reacts more negatively when large uncontrolled shareholders reduce the dividends they are willing to pay out to minority shareholders. In “majority-controlled and unchecked” companies, the stock price reaction is more negative compared to “majority-controlled and checked” companies. This points to a considerable monitoring function of large shareholders other than the largest shareholder. We find the worst market reaction in (1) majority-controlled firms that are (2) “unchecked” and (3) operate in a pyramid or group of companies. The abnormal adverse effects are estimated to range between 2% and 3% of equity values.

The results obtained from an analysis of the dividend pay-out ratios of German firms are also consistent with the rent extraction hypothesis. Larger holdings of the largest owner reduce the dividend pay-out ratio, while larger holdings of the second largest shareholder increase it. Deviations from the one-share-one-vote rule due to pyramidal and cross-ownership structures are associated with lower pay-out ratios. Lintner-type target pay-out ratios confirm our results.

Our results are consistent with those obtained by [La Porta et al. \(2000\)](#) and [Faccio et al. \(2001\)](#) for corporations that are loosely affiliated to groups. These authors find that “managers do not do it on their own” ([Allen and Michaely, 2001](#)). Accordingly, large shareholders grant lower dividends to minority owners if they can. Our

analysis, however, goes beyond these papers in that we explicitly analyze the effects of the presence of a second large shareholder and pyramiding on the dividend pay-out decision, as well as consistently explain dividend announcement wealth effects by the corporate governance structure of the firm.

Large shareholders may be beneficial, because they have superior incentives and ability to monitor corporate managers. Concentrated ownership, however, has its own agency problems. Large shareholders have the incentive and ability to expropriate small, outside shareholders and extract rents. We find that this fundamental trade-off turns negative when times are bad and dividends are cut. To arrive at more efficient capital markets in Europe, better minority shareholder rights protection and increased transparency are called for.

Acknowledgements

We greatly benefited from the suggestions of Dennis C. Mueller, Josef Zechner, Bob Chirinko, Hiroyuki Odagiri, Helmut Dietl, Alfred Haid, Ernst Maug, Ajit Singh, Richard Stehle, Neil Stoughton and the seminar participants at the Corporate Governance Meeting in Berlin (25–26 November 2000) hosted by DIW, at the ERC METU Conference in Economics (13–16 September 2000) in Ankara, at the EEA 2001 meeting in Lausanne, at the EFA 2001 meeting in Barcelona, and at the Finance Seminars at the Humboldt University, Berlin, and University of Magdeburg. Support by the OeNB Jubilaeumsfondsprojekt No. 8090 is gratefully acknowledged.

Appendix A. The ownership structure of MAN AG

Our example to illustrate the ownership and control measures is MAN AG. MAN AG is the 10th largest German company as measured by employees (63,000 in 1997) and around the 20th largest company as measured by market capitalization (7.9 Billion DM). It was founded in 1840 and its main 2-digit industry is the transportation equipment industry (2-digit SIC code of 37). The Group, comprising of a total of 192 companies worldwide, is active in commercial vehicles, printing machines, diesel engines, turbo machines, and in gearing units business areas.

As can be seen from Fig. 1, the largest direct shareholder of MAN AG is Regina VerwaltungsgesmbH with 25.8% of the voting and cash flow rights. Allianz AG holds a 2.7% and Münchener Rückversicherungs AG a 2.1% stake, directly. The rest of the equity capital is owned by German and non-German investment funds and by dispersed shareholders. Regina VerwaltungsgesmbH in turn is owned and controlled by the four companies Allianz AG, Münchener Rückversicherungs AG, Allianz Lebensversicherungs AG and Commerzbank AG, with each owning a quarter of the equity. Given this ownership structure it is not obvious a priori who controls Regina VerwaltungsgesmbH. Given, however, the cross-shareholdings of 25% of Allianz AG and Münchener Rückversicherungs AG in each other, and their holdings of 46.45% and 44.4%, respectively, in Allianz Lebensversicherungs AG it appears clear that Allianz AG and

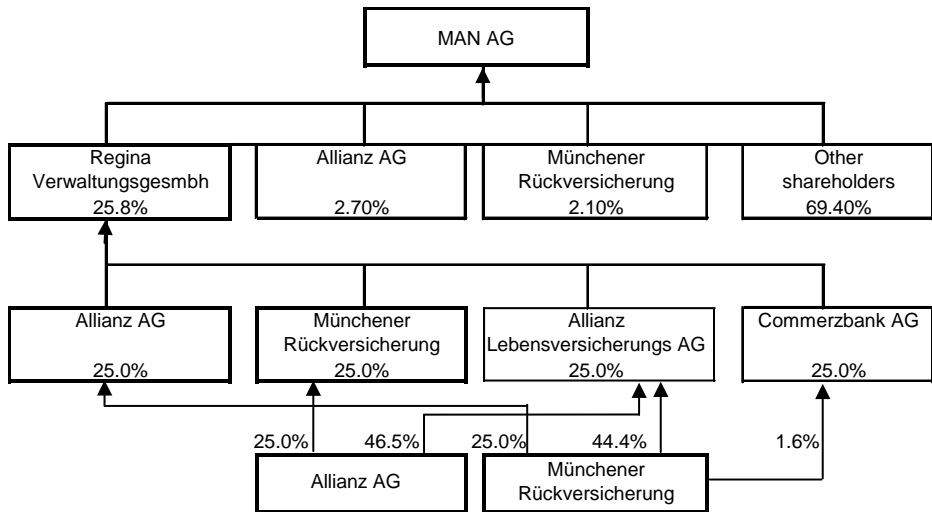


Fig. 1. The ownership structure of MAN AG.

Münchener Rückversicherungs AG jointly control Regina Verwaltungsgesmbh. (There is also a minor 1.6% stake of Münchener Rückversicherungs AG in Commerzbank AG.)

Who ultimately controls MAN AG? We chose Allianz AG to be the largest ultimate and controlling shareholder of MAN AG because (1) it has most of the voting and cash flow rights in each layer of the pyramid and (2) the CEO of Allianz AG is one of the two Deputy Chairmen of the supervisory board of MAN AG (the Chairman is the former CEO of MAN AG; the second Deputy Chairman is elected by the group employees, “Co-determination”). The voting rights of Allianz AG in MAN AG are $2.7\% + 25.8\% = 28.5\%$ (*VR1*) under the assumption that it controls the voting rights attached to the Regina stake. The cash flow rights are 2.7% (direct stake) + $25\% \times 2.1\%$ (indirect via Münchener Rückversicherungs AG) + $25\% \times 25.8\%$ (indirect via Regina Verwaltungsgesmbh) + $25\% \times 25\% \times 25.8\%$ (indirect via Münchener Rückversicherungs AG and Regina Verwaltungsgesmbh) + $46.45\% \times 25\% \times 25.8\%$ (indirect via Allianz Lebensversicherungs AG and Regina Verwaltungsgesmbh) + $25\% \times 44.4\% \times 25\% \times 25.8\%$ (indirect via Münchener Rückversicherungs AG, Allianz Lebensversicherungs AG and Regina Verwaltungsgesmbh), which equals 15.0% (*CR1*). This gives a cash-flow-rights-to-voting-rights-ratio (*CRVR1*) of $15.0\%/28.5\% = 0.52$.

Since the 25% cross-shareholdings of Allianz AG and Münchener Rückversicherungs AG are the largest stakes in this layer (Bayrische Vereinsbank AG, Deutsche Bank AG and Dresdner Bank AG each own 10% of Allianz AG, the rest is dispersed ownership), this is also the ultimate ownership level. We therefore classify MAN AG as controlled by a cross-shareholding structure (*CROSS* = 1) and the number of layers of the pyramid is three (*PYR* = 3). We would say that MAN AG is minority controlled, since there is no single direct shareholder holding more than 50% of the equity. We would further

say that MAN AG is an “unchecked” firm, since there is no second largest shareholder in layer one holding more than 5% of the equity. In this example, the continuous variable $VR2$ is set equal to zero, because Allianz AG would then be misclassified as the second largest shareholder. Although in this case one could argue that Münchener Rückversicherungs AG is a check on Allianz AG. It may, however, also be that Allianz and Münchener Rück collude closely. MAN AG was chosen as our example because it highlights all our concepts used (cross-shareholdings, deviation of one-share-one-vote due to pyramiding, etc.). The shareholding and control structures of most of the other companies in our sample is, fortunately, fairly clear.

References

- Allen, F., Michaely, R., 2001. Payout policy. The Wharton School, University of Pennsylvania, 01-21.
- Amihud, Y., Murgia, M., 1997. Dividends, taxes, and signaling: Evidence from Germany. *Journal of Finance* 52, 397–408.
- Barca, F., 1997. Alternative models of control: Efficiency, accessibility and market failures. In: Roemer, J.E. (Ed.), *Property Relations, Incentives and Welfare*. Proceedings of a conference held in Barcelona, Spain. St. Martin's Press, New York; Macmillan Press Ltd., London.
- Barca, F., Becht, M., 2001. *The Control of Corporate Europe*. Oxford University Press, Oxford.
- Bebchuk, L., Kraakman, R., Triantis, G., 1999. Stock pyramids, cross-ownership, and dual class equity: The creation and agency costs of separating control from cash flow rights. NBER WP 6951.
- Becht, M., 1999. European corporate governance: Trading off liquidity against control. *European Economic Review* 43, 1071–1083.
- Becht, M., Röell, A., 1999. Blockholdings in Europe: An international comparison. *European Economic Review* 43, 1049–1056.
- Bernheim, B.D., Wantz, A., 1995. A tax based test of the dividend signaling hypothesis. *American Economic Review* 85, 532–551.
- Bhattacharya, S., 1979. Imperfect information, dividend policy, and the bird in the hand fallacy. *Bell Journal of Economics* 10, 259–270.
- Bianco, M., Casavola, P., 1999. Italian corporate governance: Effects on financial structure and firm performance. *European Economic Review* 43, 1057–1069.
- Boehmer, E., 1998. Who controls Germany? An empirical assessment. WP, Humboldt University.
- Brown, S., Warner, J.B., 1980. Measuring security price performance. *Journal of Financial Economics* 8, 205–258.
- Brown, S., Warner, J.B., 1985. Using daily stock returns: The case of event studies. *Journal of Financial Economics* 14, 3–31.
- Claessens, S., Djankov, S., Lang, L.H.P., 2000. The separation of ownership and control in East Asian corporations. *Journal of Financial Economics* 58, 81–112.
- Crespi, C.R., Renneboog, L., 2001. United we stand: Corporate monitoring by shareholder coalitions in the UK, Mimeo.
- Dewenter, K.L., Warther, V.A., 1998. Dividends, asymmetric information and agency conflicts: Evidence from a comparison of the dividend policies of Japanese and U.S. firms. *Journal of Finance* 53, 879–904.
- Easterbrook, F.H., 1984. Two agency explanations of dividends. *American Economic Review* 74, 650–659.
- ECGN, 1997. Preliminary Report to the European Commission: The separation of ownership and control: A survey of 7 European countries. www.ecgn.ulb.ac.be/ecgn/eprelimreport.htm.
- Edwards, S.S.J., Weichenrieder, A.J., 1999. Ownership concentration and share valuation: Evidence from Germany. CESifo, Munich, WP 193.
- Faccio, M., Lang, L.H.P., Young, L., 2001. Dividends and expropriation. *American Economic Review* 91, 54–78.
- Franks, J., Mayer, C., 2001. Ownership and control of German corporations. *Review of Financial Studies* 14, 943–977.

- Franks, J., Mayer, C., Renneboog, L., 2002. Who disciplines the management of poorly performing companies? *Journal of Financial Intermediation*, in preparation.
- Gomes, A., 2000. Going public without governance: Managerial reputation effects. *Journal of Finance* 55, 615–646.
- Gugler, K. (Ed.), 2001. *Corporate Governance and Economic Performance*. Oxford University Press, Oxford.
- Gugler, K., 2002. Corporate governance, dividend pay-out policy, and the interrelation between dividends, R&D, and capital investment. *Journal of Banking and Finance*, in preparation.
- Himmelberg, C.P., Hubbard, R.G., Palia, D., 1999. Understanding the determinants of managerial ownership and the link between ownership and performance. *Journal of Financial Economics* 53, 353–384.
- Jensen, M.C., 1986. Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review, Papers and Proceedings* 76, 323–329.
- John, K., Williams, J., 1985. Dividends, dilution, and taxes: A signaling equilibrium. *Journal of Finance* 40, 1053–1070.
- Johnson, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2000. Tunnelling. *American Economic Review, Papers and Proceedings* 90, 22–27.
- Kalay, A., 1980. Signaling, information content, and the reluctance to cut dividends. *Journal of Financial and Quantitative Analysis* 15, 855–869.
- Lang, L.H.P., Litzengerger, R.H., 1989. Dividend announcements. *Journal of Financial Economics* 24, 181–191.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 1997. Legal determinants of external finance. *Journal of Finance* 52, 1131–1150.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 1999. Corporate ownership around the world. *Journal of Finance* 54, 471–517.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 2000. Agency problems and dividend policies around the world. *Journal of Finance* 55, 1–33.
- Leech, D., 1988. The relationship between shareholding concentration and shareholder voting power in British companies: A study of the application of power indices for simple games. *Management Science* 34, 509–527.
- Lintner, J., 1956. Distribution of incomes of corporations among dividends, retained earnings and taxes. *American Economic Review* 46 (2), 97–113.
- McDonald, R.L., 2001. Cross-border investing with tax arbitrage: The case of German dividend tax credits. *Review of Financial Studies* 14, 617–657.
- Miller, M.H., Modigliani, F., 1961. Dividend policy, growth, and the valuation of shares. *Journal of Business* 34, 411–433.
- Miller, M.H., Rock, K., 1985. Dividend policy under asymmetric information. *Journal of Finance* 40, 1031–1051.
- Nakamura, M., 1989. Asymmetry in the dividend behavior of US and Japanese firms. *Managerial and Decision Economics* 10, 261–274.
- Nakamura, A., Nakamura, M., 1985. Rational expectations and the firm's dividend behavior. *Review of Economics and Statistics* 67 (4), 606–615.
- Odagiri, H., 2000. *Growth through Competition, Competition through Growth*. Oxford University Press, Oxford.
- Pagano, M., Röell, A., 1998. The choice of stock ownership structure: Agency costs, monitoring, and the decision to go public. *Quarterly Journal of Economics* 113, 187–225.
- Renneboog, L., 2000. Ownership, managerial control and the governance of companies listed on the Brussels stock exchange. *Journal of Banking and Finance* 24, 1959–1995.
- Scholes, M., Williams, J., 1977. Estimating beta from non-synchronous data. *Journal of Financial Economics* 5, 309–327.
- Sembenelli, A., 1993. Signalling, financial hierarchy and agency theory as explanations for dividend behaviour: Evidence from Italian firm data. *Managerial and Decision Economics* 14, 37–45.
- Stehle, R., Ehrhardt, O., Przyborowsky, R., 2000. Long-run stock performance of German initial public offerings and seasoned equity issues. *European Financial Management* 6, 173–196.
- The Economist, 2000. Cross about holdings. In: *A Survey of European Business*. 29th April–5th May, pp. 14–15.

- Wenger, E., Hecker, R., Knoesel, J., 1996. Abfindungsregeln und Minderheitenschutz bei börsennotierten Kapitalgesellschaften. Working paper, University of Würzburg.
- White, H., 1980. A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica* 48, 817–838.
- Yoon, P.S., Starks, L.T., 1995. Signaling, investment opportunities, and dividend announcements. *Review of Financial Studies* 8, 995–1018.
- Zhou, X., 2001. Understanding the determination of managerial ownership and its relationship to firm performance: Comment. *Journal of Financial Economics* 62, 559–571.
- Zingales, L., 1994. The value of the voting right: A study of the Milan stock exchange. *Review of Financial Studies* 7, 125–148.