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ABSTRACT

This paper reconsiders the issue of share price reactions to dividend announcements. Previous papers rely almost exclusively on a naive dividend model in which the dividend change is used as a proxy for the dividend surprise. We use the difference between the actual dividend and the analyst consensus forecast as obtained from I/B/E/S as a proxy for the dividend surprise. Using data from Germany, we find significant share price reactions after dividend announcements. Once we control for analysts' expectations, the dividend change loses explanatory power. Our results thus suggest that the naive model should be abandoned. We use panel methods to analyze the determinants of the share price reactions and find evidence in favor of the cash flow signaling hypothesis and dividend clientele effects. We further find that the price reaction to dividend surprises is related to the ownership structure of the firm. The results do not support the free cash flow hypothesis.

JEL Classification: G35, G34

Keywords: Dividend Announcements; Market Efficiency; Ownership Structure; Agency Theory

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1 Introduction

Dividend policy is one of the most intensely researched topics in corporate finance. And yet, we do not know exactly why firms pay dividends. Most existing theories imply that dividend announcements convey information and, consequently, affect share prices. A large number of empirical studies have been conducted in order to discriminate among the competing theories. The most common approach is to estimate the share price reaction to dividend announcements in an event study and then relate it to an appropriate set of explanatory variables.

If markets are efficient, share prices will only react to surprises in dividend announcements. Therefore, a model of expected dividends is required. Most previous papers use a naive model, where the change in the dividend is taken to be the dividend surprise.[1] Some papers use a dividend estimate obtained from a Lintner (1956) model,[2] derive dividend surprises from option prices,[3] or use ad hoc specifications.[4] A natural estimate of the expected dividend is the average analyst dividend forecast. While using analyst forecasts as a proxy for market expectations is a standard procedure in the earnings announcement literature (e.g., O'Brien, 1988; Battalio and Mendenhall, 2005), a similar approach has hardly been used in the dividend announcement literature.[5] This is likely due to the fact that I/B/E/S provides data on dividend forecasts only since a few years.

[1] See, e.g., Aharony and Swary (1980), Bernheim and Wantz (1995), Yoon and Starks (1995), Amihud and Murgia (1997), Gerke et al. (1997) and Gurgul et al. (2003).
[2] See, e.g., Watts (1973) and Amihud and Li (2006).
[3] Bar-Yosef and Sarig (1992).
[4] An example is Gugler and Yurtoglu (2003), who look at firms that increase dividends even though earnings decrease.
[5] We are aware of only four papers that use analyst dividend forecasts in the context of share price reactions to dividend announcements. All four papers use data from only one analyst firm (Value Line). Fuller (2003) analyzes the relation between informed trading and dividend signaling. Woolridge (1983) tests the cash flow signaling hypothesis but does not consider the free cash flow hypothesis (which had not yet been formulated at the time), nor does he analyze the relation between share price reaction and ownership structure. Leftwich and Zmijewski (1994) analyze the contemporaneous announcement of earnings and dividends. Bar-Yosef and Sarig (1992) compare Value Line forecast to an estimate of dividend surprises obtained from option prices. Ofer and Siegel (1987) and Lang and Litzenberger (1989) investigate changes in analysts' earnings forecasts following the announcement of dividend changes. They do not use data on analyst dividend forecasts, however.

In the present paper, we make three contributions to the literature. First, we model dividend surprises by relating the actual dividend announcement to the average analyst dividend forecast provided by I/B/E/S.[6] Second, we compare the performance of the naive model to that of our approach. This allows us to assess the accuracy of the naive model relative to that of an analysts' expectations–based approach. Third, in an attempt to discriminate among the major theoretical explanations of corporate dividend policy, we estimate panel models in which we relate the share price reaction after the dividend announcement to characteristics of the firm. When doing so, we classify events into good-news events and bad-news events, both according to the dividend surprise and the dividend change. Comparing the results allows us to analyze whether a classification based on our model yields different conclusions than a classification based on the naive model. We further improve on the methodology of previous papers by using a random effects panel model instead of pooled OLS.[7]

In our analysis, we use data from Germany. German data have several advantages. Since German firms pay dividends once a year, changes in dividends potentially convey more information than changes in quarterly dividends. The German corporate governance system is characterized by concentrated share ownership (Franks and Mayer, 2001; Becht and Boehmer, 2001; Andres, 2008) and weak minority shareholder protection (La Porta et al., 2000). Given these characteristics conflicts between large and small shareholders may be relevant for the payout policy of German firms, and for the market reaction to dividend announcements. Therefore, the ownership structure and other specific features are taken into account in our empirical analysis.[8]

[6] Brown et al. (2008) have shown that I/B/E/S dividend forecasts are an accurate estimate of the actual dividend as evidenced by a low forecast error.
[7] An alternative to panel estimation is the Fama and MacBeth (1973) procedure, which is used by Amihud and Li (2006).
[8] Some of the institutional features of the German market warrant a closer discussion, which we will return to when we describe our data.

The two most popular theories explaining dividend policy are the cash flow signaling hypothesis (Bhattacharya, 1979; Miller and Rock, 1985) and the free cash flow hypothesis (Easterbrook, 1984; Jensen, 1986). The cash flow signaling hypothesis states that managers use dividend announcements to signal their private information regarding the future cash flows of the firm. The driving forces behind the free cash flow hypothesis are informational asymmetries and conflicts of interest between managers and shareholders. Whereas these conflicts may be prevalent in countries with relatively dispersed ownership such as the U.S., they may be less important in countries with concentrated ownership such as Germany.

In firms with concentrated ownership managers are limited in their ability to act at their own discretion. Large shareholders have both the incentive and the ability to curb managerial freedom to dispose of free cash flows. Therefore, the monitoring function of large shareholders makes the classical manager-shareholder conflict less severe. However, conflicts of interest between large and small shareholders may arise instead (La Porta et al., 2000). In such a setting, a dividend increase may be interpreted as a signal by which large shareholders commit not to expropriate minority shareholders. This is the rent extraction hypothesis first formulated by Gugler and Yurtoglu (2003). It complements (rather than substitutes) the cash flow signaling and free cash flow hypotheses.

Our results can be summarized as follows. We find that the accuracy of the naive approach is low when compared to our approach of measuring the dividend surprise by the error in analysts' expectations. Out of more than 500 dividend increases in our sample, less than half actually constitute a positive surprise. The remaining dividend increases either constitute no-news events (that is, the dividend increase had been anticipated) or even negative surprises (analysts had forecasted a larger dividend increase). The results for unchanged dividends and dividend decreases are less pronounced but point in the same direction. As one would expect in an efficient market, share prices react to the surprise in the dividend announcement, not to the dividend change per se. When we regress the cumulative abnormal return after a dividend announcement on the dividend change and our measure of the dividend surprise, we find that the dividend surprise is highly significant while the dividend change is insignificant. We thus conclude that our approach of measuring the dividend surprise by the error in analysts' expectations outperforms the naive model.

These results still hold when we control for the surprise in earnings announcements, which are often made together with dividend announcements. Interestingly, we find that dividend announcements are, if anything, *more* informative than earnings announcements. Our regressions aimed at discriminating among competing theoretical explanations of dividend policy confirm the importance of using dividend surprises instead of dividend changes. We find that classifying dividend announcements into positive and negative announcements according to the dividend surprise yields results that are different from those obtained from a classification by dividend changes. Our regression results provide support for the cash flow signaling hypothesis and dividend clientele effects. We further find that the price reaction to dividend surprises is related to the ownership structure of the firm in a non-linear way. Our results do not support the free cash flow hypothesis. This is in line with our argument that manager-shareholder conflicts are less important in a country with concentrated ownership.

Our results have important implications for future research on payout policy. They imply that, whenever data on analyst dividend forecasts are available, the naive constant dividend model should be abandoned in favor of an estimate of dividend surprises that is based on analyst forecasts. Our finding that dividend surprises are, if anything, more informative than earnings surprises suggests that both variables should be used jointly whenever a firm announces earnings and dividends simultaneously.

The remainder of the paper is organized as follows. The next section develops our hypotheses. Section 3 describes our sample selection procedure and presents descriptive statistics. Section

4 presents the event study results and Section 5 provides the results of our multivariate panel regressions. Section 6 concludes.

2 Hypotheses

It is a stylized fact that dividend announcements convey information to market participants. However, in an informationally efficient market, only the unexpected part of the dividend announcement is informative. Thus, every analysis of the share price reaction to dividend announcements must rely on a model for expected dividends. The large majority of previous empirical studies use a naive model that considers dividend changes as dividend surprises. This model is based on the implicit assumption that market participants expect unchanged dividends. Although models of payout policy, such as Lintner (1956) or Fama and Babiak (1968), suggest that firms smooth their dividends, the very same models predict that earnings changes translate into dividend changes. If firms pay dividends each quarter, the expected dividend change is typically small. In this case, the previous dividend may be a reasonable proxy for the market's expectations of the next dividend. However, when firms pay dividends only once a year (as is the case in Germany and many other countries), this is much less likely to be the case. In our analysis we therefore use the average of analysts' forecasted dividends as provided by I/B/E/S as a proxy for the market expectations. We believe that the resulting estimate of the dividend surprise outperforms the naive model. This yields our first hypothesis:

H1: Share prices react to the dividend surprise, defined as the difference between the actual dividend announcement and the average analyst forecast as provided by I/B/E/S. The dividend change (defined as the actual dividend announcement minus the previous dividend) has no explanatory power for the share price reaction once we control for the dividend surprise.

We sort all dividend announcements into three categories based on our dividend surprise measure. If the difference between the actual dividend announcement and the mean analyst forecast is larger than +5% (smaller than -5%) the announcement is classified as good news (bad news). If the actual announcement is within ±5% of the analyst forecast, we classify the announcement as no news. This procedure follows Campbell et al. (1997).[9] In our implementation of the naive model, we classify dividend changes of more than +5% (more than -5%) as dividend increases (dividend decreases). Dividend changes of less than 5% are treated as unchanged dividends. Note that there may be cases in which an unchanged dividend or even a dividend increase is bad news. This will be the case whenever market participants expected an even higher dividend increase.

Dividend and earnings announcements are often made simultaneously. In our panel model we deal with this by including the earnings surprise (defined as the difference between the actual earnings figure and analysts' expectations obtained from I/B/E/S) as a control variable. This specification allows us to test whether the dividend surprise or the earnings surprise is more informative.

Our first hypothesis states that share prices react to the dividend surprise. However, the magnitude of the dividend surprise is not the only determinant of the share price reaction. The cash flow signaling hypothesis, the free cash flow hypothesis, the monitoring hypothesis and the rent extraction hypothesis all argue that dividends serve as signaling and / or monitoring devices and they all predict that the magnitude of the price reaction to a dividend announcement will depend on certain characteristics of the firm.

The cash flow signaling hypothesis states that managers (or large shareholders who effectively control managers) use dividends to signal their private information regarding the

[9] Campbell et al. (1997) analyze the impact that earnings announcements have on the firm's stock price. They also employ three categories but they classify an announcement as good (bad) news if the deviation of the actual earnings from the expected earnings is larger than 2.5% (smaller than -2.5%). As a robustness test, we reclassify all observations based on the 2.5% threshold. All regression results are qualitatively similar.

future cash flows of the firm (Bhattacharya, 1979; Miller and Rock, 1985). Signaling information to (small) investors via dividend announcements is of greater importance for smaller firms because smaller firms are usually not adequately covered by financial analysts, resulting in a larger degree of information asymmetries. Therefore, we hypothesize:

H2: The informational role of dividend announcements is more important in smaller firms, which are covered by fewer analysts. Hence, the magnitude of the share price reaction is decreasing in firm size and the number of analysts following the firm.

This hypothesis has been confirmed by, among others, Eddy and Seifert (1988), Yoon and Starks (1995) and Amihud and Li (2006) for the U.S. market. Using German data, Gugler and Yurtoglu (2003) do not find a statistically significant relationship between firm size and dividend announcement returns. We employ the number of analysts covering a firm as our proxy for the degree of informational asymmetries. Alternatively, we use firm size, measured by the logarithm of the market value of equity 14 days prior to the dividend announcement. Because these two variables are highly correlated, we do not include them simultaneously.

The free cash flow hypothesis is based on the presumption that managers will invest cash available to them even when there are no investment opportunities with positive net present value (Easterbrook, 1984; Jensen, 1986). Dividend payments decrease the level of free cash flow and can therefore serve to mitigate the overinvestment problem. Consequently, when firms with ample free cash flow and / or poor investment opportunities (as indicated by Tobin's Q) increase their dividend payout, this signals lower agency costs.

H3a: Firms with higher free cash flows experience a larger price appreciation (drop) after a positive (negative) dividend surprise.

H3b: Firms with poor investment opportunities as measured by Tobin’s Q experience a larger price appreciation (drop) after a positive (negative) dividend surprise.

Lang and Litzenberger (1989) were the first to test the free cash hypothesis using data from the U.S. market. Their results support the hypothesis. Gugler and Yurtoglu (2003) use data from Germany and confirm the results of Lang and Litzenberger. The evidence is far from unanimous, however. Yoon and Starks (1995), using a larger U.S. sample than Lang and Litzenberger (1989), find no evidence to support the free cash flow hypothesis. They argue that the stronger price appreciation after dividend increases of firms with Q less than unity is due to the characteristics of these firms. They show that firms with Q less than unity are smaller, have a higher dividend change and exhibit a higher dividend yield. After controlling for these characteristics, they find no systematic relation between the price reaction to dividend announcements and Tobin's Q. We also include these control variables in our panel regressions. We further include the firm's leverage ratio as a control variable because debt also mitigates the overinvestment problem associated with free cash flow and can be regarded as a substitute for high payout levels.

The free cash flow hypothesis is based on the agency conflict between managers and shareholders. Blockholders have strong incentives to monitor managers. Therefore, the existence of a large shareholder may alleviate the classical agency problem. However, in firms with powerful blockholders, additional conflicts of interest may emerge between large and small shareholders as the former may have an incentive to expropriate the latter, for example by tunneling (Bebchuk, 1999). In line with this argument, several studies indicate a non-linear impact of block-ownership on firms' agency costs (Morck et al., 1988; McConnell and Servaes, 1990; Miguel et al., 2004). These non-linearities imply that, to a certain point, monitoring by large blockholders reduces agency costs by aligning the incentives of managers and shareholders. This suggests that there will be less need to use dividends to signal reduced agency conflicts. However, higher levels of control open up the possibility for large shareholders to abuse their position by acting in their own interest rather than in the interest of all shareholders (Shleifer and Vishny, 1997). As dividends are distributed among shareholders in proportion to their cash flow rights, an increase in dividends reduces the resources that large shareholders can potentially divert. Consequently, a dividend increase signals a reduction of potential agency conflicts between small and large shareholders. This is the rent extraction hypothesis first formulated by Gugler and Yurtoglu (2003).

Combining the previous arguments yields the prediction of a non-linear relation between ownership concentration and the share price reaction to dividend announcements. At low levels of ownership concentration the monitoring effect dominates. An increase in ownership concentration aligns the incentives of managers and shareholders. Consequently there is less need to use dividends to signal lower agency costs. At high levels of ownership concentration the rent extraction effect kicks in. Potential conflicts of interest between small and large shareholders become important, and dividends can be used as a device to signal that large shareholders abstain from expropriating minority shareholders. We thus expect a j-shaped or u-shaped relation between ownership concentration and the share price reaction to dividend announcements. Higher ownership concentration results in a smaller price reaction, but at a decreasing rate. The relation becomes positive when the rent extraction effect becomes stronger than the monitoring effect.

H4: The relation between ownership concentration and the share price reaction to dividend announcements is non-linear and follows a j-shape or u-shape.

Common measures of the ownership structure are the shares of the voting rights held by the largest and the second largest shareholder (e.g. Gugler and Yurtoglu 2003). However, the simplicity of these measures comes at a cost. A simple example illustrates the problems that may arise. Assume a decision has to be taken by simple majority vote. Assume that the largest shareholder owns 60 percent of the votes and the second-largest shareholder owns 10 percent. As the largest shareholder already holds a majority stake, his position cannot be contested and the voting rights of the second largest shareholder will effectively be irrelevant in every majority decision. The situation is different if the largest shareholder owns less than 50 percent of the votes. Consider a firm with three shareholders, two holding 45 percent each and a third holding 10 percent of the votes. Here, any shareholder is able to potentially form a winning coalition. This means that each shareholder holds the same power, even though the disparity in voting rights is substantial. It becomes apparent that the mere share of voting rights does not necessarily reflect the power that those votes actually possess. How much power a shareholder has to affect the firm's decisions does not only depend on his own voting stake, but depends crucially on the distribution of voting rights among all shareholders. Hence, methods to determine voting power and control contestability need to consider the entire ownership structure. Therefore, we employ the Shapley-Shubik (1954) index to identify a shareholder's voting power.[10] The index measures a shareholder's relative importance as her ability to change a voting coalition from a losing to a winning one, given the distribution of voting rights. Put simply, it attributes each shareholder a power index reflecting the probability that she is pivotal in determining the outcome of a cooperative game. We calculate Shapley-Shubik values using quotas of both 25 and 50 percent. We also use 25% because according to the German Stock Corporation Act (*Aktiengesetz*), a stake of 25% provides a blocking minority and allows holders of voting shares to veto specific important decisions such as the issuance of new shares, dismissal of directors or amendments to the articles of incorporation. During our sample period, only shareholdings of more than 5% had to be registered with the German Financial Supervisory Authority. Therefore, the information about firm ownership is necessarily incomplete and assumptions must be made about the undisclosed holdings. One way would be to consider the entirety of unknown shareholding as powerless and to rescale the voting stakes of large shareholders to 100 percent. Instead of ignoring these stakes, we interpret unobserved voting rights in the sense of an oceanic game

[10] We thank an anonymous referee for suggesting this measure.

(Shapiro and Shapley, 1978), i.e. there is a small number of large shareholders and an “ocean” of shareholders with very small voting stakes.

Finally, the price reaction to dividend announcements may be related to the preferences of the shareholders of a firm. A firm that offers a high dividend yield is likely to have shareholders with a (potentially tax-induced) preference for dividend payouts. As these shareholders value dividends highly, the price reaction to dividend announcements should be stronger (dividend clientele effect; Bajaj and Vijh, 1990).

H5: Share prices react more strongly to dividend surprises in firms with higher dividend yields.

3 Data and Descriptive Statistics

The initial sample for our analysis consists of all 150 firms included in the DAX, MDAX, or SDAX[11] indices as of December 31, 2002. Our sample period covers the years 1996-2006. German firms pay and announce dividends on a yearly basis. Therefore, our sample potentially consists of 1,650 firm-year observations. Data on dividend announcements are obtained from Reuters newswires. We exclude 312 firm-year observations because we were unable to identify the exact dividend announcement date. Following Amihud and Li (2006) we exclude firms in the financial services sector (122 firm-year observations). In addition, firm-years in which a firm had a “control agreement”[12] in place (7 firm-years), or years in which firms acted as either acquirer or target in an M&A transaction (11 firm-years) are also

[11] The DAX (largest firms), MDAX (mid caps) and SDAX (smaller caps) are calculated by Deutsche Börse AG. They do not include "new economy" firms. We do not include these firms because a) most of them went public only in the hot issue market at the end of the 1990s, and b) many of these firms did not pay dividends. We note that the three indices alluded to above comprise about one third of the listed firms in Germany. Most firms that are not covered are very small and have insufficient analyst coverage to be included in our analysis.

[12] Control agreements are defined as agreements between a company and its parent company and take the form of either Profit and Loss Agreements (*Gewinnabführungsvertrag*) or Subordination of Management Agreements (*Beherrschungsvertrag*).

dropped from the sample. All accounting data items and share price data are obtained from the Thompson Financial Datastream database. 31 firm-year observations are excluded because of missing data items.

As already noted, we keep observations where dividend and earnings announcements are made on the same date. In order to control for the information conveyed by the earnings announcement, we include the earnings surprise as a control variable in our panel regressions. However, there are 65 cases in which other potentially value-relevant information (e.g., restructurings, changes in the composition of the board) is released on the same day as the earnings announcement. We exclude these observations from the sample. This reduces the size of our sample to 1,102 firm-year observations.

A major contribution of our paper is the use of dividend forecasts provided by Institutional Brokers' Estimate System (I/B/E/S) as a proxy for the market's dividend expectations.[13] We use the arithmetic mean (the median is used in a robustness check) of the final forecasts made by the analysts following a firm prior to the announcement of the dividend payment.[14] We only include firm-years that are covered by at least two analysts. This requirement leads to the exclusion of another 181 firm-year observations and reduces our final sample to 921 observations.[15]

Some of our sample firms (21 firms in 2002) have issued multiple share classes, usually common shares that carry a voting right along with non-voting preference shares.[16] In these

[13] To address the objection of Ljungqvist et al. (2009) that downloads from the I/B/E/S database may have been subject to errors before 2008, we check our data for consistency using a very recent download from the I/B/E/S database for a subsample and find no systematic bias in our data.
[14] In 93% of our observations, the consensus estimate refers to the last month before the dividend payment was announced. In 63 cases (6.8%), we use earlier forecast data (up to three months). Observations are excluded when no analyst forecasts were available for the three months preceding the dividend announcement.
[15] It should be noted that the requirement that a firm be covered by at least two analysts results in the exclusion of those firms where informational asymmetries are supposedly most pronounced. This might introduce selection bias.
[16] The only exception is Siemens AG, where preference shares are endowed with six times the voting rights of ordinary shares (from 1920 until 1998). Voting and cash flow rights of Siemens AG are adjusted accordingly.

cases, we only include one class of shares in our sample.[17] A closer look at these firms reveals that dividends on common shares usually change along with dividends on preference shares, a finding that confirms the observation of Goergen et al. (2005) regarding German firms during the period from 1984 to 1993.

We include special dividends in our dividends per share measure. It has been pointed out in the literature (see, e.g., Goergen et al., 2005; Andres et al., 2009) that special dividends frequently reflect permanent changes in dividends rather than transitory increases. However, large one-off payments (*Sonderausschüttungen*) - which are associated with special anniversaries or the sale of subsidiaries - are excluded. This procedure is also in line with previous studies on the dividend policy of German firms, such as Behm and Zimmermann (1993), Goergen et al. (2005) and Andres et al. (2009).

Hypothesis 4 predicts that the ownership structure of a firm is a potential determinant of the share price reaction to a dividend surprise. We therefore collect data on ownership structures from the *Hoppenstedt Aktienführer*.[18] All holdings of ordinary shares and preference shares in excess of 5% are recorded on an annual basis.[19] From the ownership data collected, we calculate the voting power of the largest and second largest shareholder as their respective Shapley-Shubik values.

Table 1 presents summary statistics for the final sample. In Panel A we report separate figures for firms that increased, decreased, and maintained their dividends. We consider a dividend change of less than 5% as an unchanged dividend since many of these small changes reflect rounding errors (due, for example, to the conversion from Deutsche Mark to Euro). The 5%

[17] The most common case is that the voting shares are privately held while the non-voting shares are listed. In these cases, the I/B/E/S database only contains forecasts for the dividend of the non-voting shares.
[18] This is a yearly publication that provides in-depth information about all listed German corporations.
[19] During our sample period, shareholdings of more than 5% must be registered with the German Financial Supervisory Authority (BaFin, see §21 of the German Securities Trading Act (*Wertpapierhandelsgesetz*)). Shareholdings of less than 5% - even when reported in Hoppenstedt - are excluded for reasons of data consistency.

threshold should be viewed in the context of the average magnitude of dividend changes in Germany. Andres et al. (2009) document an average dividend increase (cut) of 36% (30%) for a sample of 220 German firms for the period 1984-2005. Therefore, we consider the 5% threshold - though much larger than the 0.5% threshold employed by Amihud and Li (2006) for their U.S. sample - to be reasonable.

In 521 out of the 921 firm-year observations (56.5%), firms increase their dividends (18 of these cases (3.5%) are dividend initiations). Another 312 observations (33.9%) are associated with maintained dividends. We observe only 88 (9.6%) dividend cuts.[20] Among these, 33 cases (or 37.5% of the dividend cuts) are dividend omissions.

Panel A of Table 1 shows that firms that increase their dividends differ substantially from firms that maintain or decrease dividend payments. With an average leverage ratio[21] of 1.79, they are less heavily leveraged than firms that decrease (2.06) or maintain (2.14) their dividends. In addition, they exhibit higher Tobin's Q values[22] (1.82 compared to 1.32 for firms that cut dividends, and 1.41 for firms that maintain dividends) and a much lower average dividend yield[23] (1.88% as compared to 4.80% for decreased and 2.57% for maintained dividends), suggesting that firms that increase dividends tend to be growth stocks. On the other hand, firms that increase dividends are slightly larger than firms in the other two subgroups, both in terms of total assets and in terms of sales. With respect to ownership structure, our sample confirms one of the stylized facts of the German corporate governance

[20] Compared to Gugler and Yurtoglu (2003), we observe a slightly higher number of dividend increases and less dividend decreased. In their sample (from 1992 through 1998), 43.8% of the announcements are classified as dividend increases, 36.8% as unchanged dividends, and 19.4% as dividend cuts.

[21] Leverage is defined as the sum of total current liabilities and long-term debt divided by the book value of equity.

[22] Tobin's Q is defined as the market value of equity (including preference shares wherever appropriate) plus total assets minus book value of equity, divided by the book value of total assets.

[23] The dividend yield (*DIV_Y*) is defined as DIV(*i*,*t*-1) / P(*i*,*t*), where DIV (*i*,*t*-1) is the dividend per share of firm (*i*) in year *t*-1, and P(*i*,*t*) is the split adjusted share price 14 days before the dividend is announced in year *t*. This definition follows the procedure suggested in Amihud and Murgia (1997).

system, namely, the high degree of ownership concentration. On average, about 45% of the voting shares are held by the two largest shareholders.

(Insert Table 1 about here)

The percentage of firm-year observations with increased, decreased, and maintained dividends over the sample period is documented in Panel C of Table 1. The distribution of dividend increases, dividend cuts and unchanged dividends in our sample mirrors the trend observed in other recent empirical studies (see, e.g., Julio and Ikenberry, 2004). With the exception of 1996 an 1997, the percentage of firms that increase dividends declines gradually, reaching a low of 42% in 2003, before taking a sharp turn upward in 2004. In line with a poor economic environment following the burst of the technology bubble, the proportion of dividend-cutting firms is significantly higher during the years 2001-2003. In sum, our 11-year sample period covers an economic boom period, followed by a recession, which is then followed by a second upswing.

The classification into dividend increases, decreases and maintained dividends conforms to the naive expectations model. However, we argue that using analyst forecasts to classify events into good news (positive surprise), bad news (negative surprise) and no news events is preferable because only the unexpected component of an announcement should trigger a share price reaction. Following Campbell et al. (1997) we define dividend announcements as *good news* (*bad news*) if the announcement is more than 5% above (below) the dividend expected by analysts. Announcements that lie within a 10% range around the expected dividend are classified as *no news*.[24] Our proxy for the market's dividend expectations is the average of (at least two) analyst forecasts in the month preceding the dividend announcement.[25]

Our sample consists of 281 good news events (as compared to 521 dividend increases), 266 bad news events (as compared to 88 dividend reductions) and 374 no news events (as compared to 312 cases with an unchanged dividend). These numbers already illustrate that the naive model results in a classification that is very different from that obtained when taking market expectations into account.

Descriptive statistics for the good news, bad news and no news events are provided in Panel B of Table 1. Even though the numbers are slightly different from those in Panel A, the qualitative results are similar. Good news events are associated with lower leverage ratios, higher values of Tobin's Q and lower dividend yields. Good news firms are also larger in terms of total assets and sales as compared to bad news and no news firms.

4 Event Study Results and Univariate Analysis

We measure the stock price reaction to the announcement of dividend payments using standard event-study methodology. Based on the market model (Brown and Warner, 1985), the abnormal return ε_{it} for firm *i* on day *t* is calculated as

$$\varepsilon_{it} = R_{it} - \left(\hat{\alpha}_i + \hat{\beta}_i R_{mt}\right), \tag{1}$$

where R_{it} is the return of firm *i* on day *t*, and R_{mt} is the return on the CDAX, our proxy for the market portfolio,[26] on day *t*. The coefficients $\hat{\alpha}_i$ and $\hat{\beta}_i$ are OLS estimates obtained from regressions of firm *i*'s daily returns on the CDAX return over the estimation window running

[24] As mentioned above, we change the bandwidth of the *no news* category to 5% (i.e. dividend announcements are classified as *good news* (*bad news*) if the announcement is more than 2.5% above (below) the dividend expected by analysts) to test the robustness of the results. All coefficient estimates and significance levels are similar to the results reported in the paper.

[25] As a robustness test, we also use the median of analyst forecasts and re-estimate all regressions using the median-based classification into *good news, bad news,* and *no news*. The results are not reported (but available on request) as they are qualitatively similar.

[26] The CDAX is a broad, value-weighted German index and comprises about 350 firms.

from t = -121 to t = - 2 (relative to the announcement day t = 0). We use two measures of abnormal returns: the average abnormal return on the announcement day, AAR_0, and the cumulative average abnormal return, $CAAR_{-1;1}$, measured over a three-day period centered on the event day. The statistical tests are based on the standardized cross-sectional t-statistic proposed by Boehmer et al. (1991) and the rank test of Corrado (1989).

Table 2 reports the event study results. In Panel A, all announcements are first classified according to the naive model into three groups: dividend increases, decreases and unchanged dividends. These groups are then subdivided into *good news*, *bad news*, and *no news* events, based on the dividend surprise (as defined above). We do not report results for two subgroups with ten observations or less.

The results in Panel A show that share prices increase after the announcement of a dividend increase. The average abnormal return on the announcement day, AAR_0, is significantly positive at 0.70%. The cumulative abnormal return over a three-day window, $CAAR_{-1;1}$, is also positive and highly significant at 1.13%. When we subdivide the dividend increases into good news, bad news and no news events, it becomes obvious that an increase in dividends does not necessarily imply good news for market participants. Out of 521 dividend increases, only about 48% (248) are in fact positive surprises, i.e. positive deviations from the analysts' expectations. In cases in which market participants expected an even higher increase (cases in which the announcement represents *bad news* in spite of an increased dividend) we observe an announcement day return of -0.10% and a $CAAR_{-1;1}$ of 0.10% (both statistically insignificant).

Dividend decreases trigger a significantly negative share price reaction on the event day. The AR_0 amounts to -0.86%. The three-day $CAAR_{-1;1}$ is also negative at -0.30%, but is insignificant. In both cases the share price reactions are more pronounced when the dividend decrease represents bad news. In the other two cases (dividend reductions that are good news or no news) the number of observations is too small to report reliable results.

The average abnormal return for announcements of an unchanged dividend is positive and weakly significant at 0.22%. The three-day $CAAR_{-1;1}$ is positive and significant at 0.65%. A closer look at the three subcategories reveals that the positive announcement return for unchanged dividends is driven by a highly significant return of 2.24% for announcements in which a maintained dividend is a positive surprise for market participants. This result confirms hypothesis 1, which states that market expectations play an important role in share price reactions to dividend announcements.

(Insert Table 2 about here)

Panel B of Table 2 shows the results that we obtain when we first sort by the dividend surprise and then subdivide into dividend increases, reductions and maintained dividends. Abnormal returns are highest for dividend announcements that constitute good news for market participants, with an average announcement day return of 0.95% and a three-day $CAAR_{-1;1}$ of 1.59% (both highly significant). Bad news announcements are associated with a significantly negative announcement day abnormal return. The three-day cumulative abnormal return, however, is slightly positive but insignificant. Surprisingly, we find that no news events are associated with significantly positive abnormal returns. These are slightly larger when the no news event is a dividend increase.

The results presented in Table 2 imply that sorting by dividend *changes* and dividend *surprises* yields different results. Admittedly, however, the results are somewhat less clear-cut than one might have hoped. In particular, the finding that no-news events are associated with positive abnormal returns is surprising. A possible explanation for this result is that the descriptive statistics presented thus far do not control for earnings announcements that are often made on the same day as dividend announcements. We return to this issue when we present the results of our panel estimation in the next section.

5 Panel Analysis

The descriptive analysis in the previous section shows that market expectations are an important determinant of the share price reaction to dividend announcements. It is natural to ask whether the dividend *change* has explanatory power for the abnormal return once we control for the dividend *surprise*. In order to answer this question we estimate three panel models. We use the random effects estimator, which is favored over the less efficient fixed effects estimator based on a Hausman test.[27]

The first model is the baseline specification. The dependent variable is the three-day $CAAR_{-1;1}$. The explanatory variables are year and industry dummies (results not reported) and a measure of the dividend change, namely, the change in the dividend yield. It is defined as the current minus last year's dividend per share, standardized by the split-adjusted stock price 14 days before the dividend is announced. The coefficient on the change in the dividend yield is positive and significant. Thus, when we do not control for the dividend surprise we find that the cumulative abnormal returns are significantly related to the magnitude of the dividend change.

In model 2 we replace the change in the dividend yield with the dividend surprise, defined as dividend per share minus the estimated dividend per share (based on the last I/B/E/S consensus forecast prior to the announcement), both divided by the split-adjusted stock price 14 days before the dividend is announced. The dividend surprise yields a highly significant coefficient that has twice the magnitude of the coefficient on the change in dividend yield in model 1.

[27] The main conclusions of our study do not change if the fixed effects estimator or the OLS estimator is used instead.

(Insert Table 3 about here)

Model 3 includes both variables. The coefficient estimate for the dividend surprise is statistically significant at the 1% level, whereas the coefficient estimate for the dividend change is insignificant. We can thus conclude that dividend surprises, not dividend changes, drive the cumulative abnormal returns.[28]

As noted previously, dividends and earnings are often announced simultaneously. In order to disentangle the effects that dividend and earnings announcements have on share prices, we estimate model 4, which includes the earnings surprise as an additional independent variable. It is defined as the difference between the actual earnings per share and the I/B/E/S consensus forecast, standardized by the stock price 14 days before the dividend announcement. The variable is set to zero when no earnings announcement was made on the event date.[29] Neither the change in the dividend yield nor the earnings surprise has explanatory power for the abnormal returns. The dividend surprise, on the other hand, is positively and significantly related to the CAARs. These results stand in contrast to those reported in Leftwich and Zmijewski (1994). Based on a sample of contemporaneous quarterly earnings and dividend announcements these authors conclude that earnings announcements provide information beyond that provided by dividend announcements. A possible reason for the different findings is the fact that U.S. firms announce both dividends and earnings each quarter. German firms, on the other hand, make dividend announcements only once a year, but often announce earnings on a quarterly basis (although there is no legal requirement to do so). Consequently, the relative information content of dividend announcements as compared to earnings announcements may be higher in Germany than in the U.S. We further note that the

[28] As a robustness check, we include long-term volatility in our models to control for information asymmetry between managers and shareholders. In line with Amihud and Li (2006), long-term volatility is measured by the standard deviation of monthly returns in the 24 months priot to the month of the dividend announcement. Re-estimating our panel models including this measure, we obtain very similar results.

[29] We re-estimate model 4 and include only those cases in which a dividend and an earnings announcement are made on the same day. The results are virtually identical, and are therefore omitted.

regressions shown in Table 3 do not control for other variables which may affect the CARs. They may thus suffer from omitted variables bias. Table 4 later in the paper shows the results of regressions that include additional explanatory variables.

These results corroborate hypothesis 1. They allow two conclusions. First, they suggest that studies of dividend announcements should take market expectations into account and thus should consider dividend surprises rather than dividend changes. Second, the results imply that, in cases in which earnings announcements and dividend announcements are made on the same day, share prices react to the dividend announcement, not to the earnings announcement.[30]

In the next step we extend the set of independent variables in order to test hypotheses 2, 3, 4, and 5. We include the dividend surprise and the earnings surprise as control variables. The number of analysts following is used as a proxy for the degree of informational asymmetry. The cash flow signaling hypothesis (hypothesis 2) predicts a lower share price reaction if informational asymmetries are less pronounced. In order to test the free cash flow hypothesis (hypotheses 3a and 3b) we include three variables. The first is the ratio of free cash flow[31] to sales for the previous financial year. The second variable is the natural logarithm of Tobin's Q. This variable is intended to identify firms without profitable investment opportunities. We expect a positive (negative) coefficient on the free cash flow variable (hypothesis 3a) and a negative (positive) coefficient on Tobin's Q (hypothesis 3b) for good news (bad news) announcements. We further include the leverage ratio as the free cash flow hypothesis suggests that dividends and debt serve as substitutes.

[30] We note that, at least in the first years of our sample period, many firms are still using German accounting standards rather than IAS/IFRS or US-GAAP. It would be interesting to explore whether the lack of a share price reaction to earnings announcement is due to the specific characteristics of German accounting standards. An investigation of this issue is, however, beyond the scope of this paper.

[31] The free cash flow is defined as EBIT + depreciation - taxes + delta def. taxes - minority interest - interest - dividends + extra items.

Hypothesis 4 predicts that ownership structure matters. As explained in section 2 we expect a j-shaped or u-shaped relationship between the voting power of the largest shareholder and the announcement returns. At low levels, increasing voting power reflects the shareholders increasing ability and willingness to monitor. At higher levels, voting power allows to extract rents at the cost of the remaining (minority) shareholders. In order to capture this potential non-linearity, we include the Shapley-Shubik value of the largest shareholder as well as its squared value.

We also include the Shapley-Shubik value of the second largest shareholder. We hypothesize that larger values thereof reflect the ability of the second largest shareholder to exert a controlling influence on the first shareholder. Consequently, a positive (negative) dividend surprise provides a weaker signal on reduced (increased) agency conflicts and hence weakens the market reaction.

Finally, to capture a possible clientele effect, we include the dividend yield as independent variable (hypothesis 5). We expect a positive (negative) coefficient on this variable for good news (bad news) announcements. Our regression models further include year and industry dummies (results not reported). For some of the variables, we expect opposing signs for good news and bad news announcements. To provide an example, when share prices of larger firms react less strongly to dividend surprises, we expect a negative relation between firm size and the magnitude of the CAARs for good news announcements, but a positive relation for bad news announcements. We therefore estimate separate models for good news announcements and bad news announcements. The no news announcements are excluded from the analysis. To ensure that our results can be compared to those of previous studies, we repeat the analysis using the subsamples of dividend increases and decreases instead of the good news and bad news subsamples.

Tables 4a and 4b present the results for all four specifications. The tables differ in the way we calculate the Shapley-Shubik index. In table 4a, we use a quota of 25%, whereas in table 4b, the quota is set to 50%. Considering the good news subsample first, we confirm our earlier result that the CAARs are positively related to dividend surprises. This confirms hypothesis 1. However, with the additional explanatory variables included, the earnings surprise now also has explanatory power.

The negative coefficient on the number of analysts is consistent with cash flow signaling (hypothesis 2). Informational asymmetries are more pronounced in firms followed by fewer analysts.[32] Therefore, dividend announcements made by these firms convey more information.

The free-cash-flow-to-sales ratio, Tobin's Q and the leverage ratio are all not significantly different from zero.[33] Thus, we do not find support for the free cash flow hypothesis (hypotheses 3a and 3b). This is in line with the findings of Yoon and Starks (1995).

Our predictions with respect to the relationship between abnormal returns and the voting power of the largest shareholder find empirical support. Consistent with the monitoring effect the coefficient on the Shapley-Shubik value for the largest shareholder is negative. This implies that increases in the voting power of the largest shareholder are associated with a weaker price reaction to dividend news. The coefficient on the squared Shapley-Shubik value is positive. This is consistent with the rent extraction hypothesis. At high levels of voting power the largest shareholder has the power to expropriate minority shareholders. She can use dividend announcements to signal that she abstains from such rent-extracting activities. This signaling role for dividend announcements results in a stronger share price reaction which

[32] Using the market value of equity rather than the number of analysts yields qualitatively similar results (not reported).

[33] We also estimate a model that includes an interaction term between free cash flow and Tobin's Q. The coefficient estimate of the interaction term is insignificant.

counterbalances the negative impact due to the monitoring effect. The Shapley-Shubik value for the second largest shareholder is never significant.

The positive coefficient on the dividend yield is consistent with the existence of dividend clientele effects. Firms with higher dividend yields have shareholders who value dividends more highly. Consequently, the share price reacts more strongly to dividend news.

(Insert Tables 4a and 4b about here)

In column 2 we consider dividend increases instead of good news events. Despite the much larger number of observations, this specification yields lower explanatory power. Both the coefficients on the number of analysts and on the Shapley-Shubik values of the largest shareholder lose significance. Thus, a categorization based on the naive dividend expectations model may lead to different conclusions. While the results of model 1 – the "good news" model – support the cash flow signaling, monitoring and rent extraction hypothesis, the results of model 2 – the naive model – do not. Given our previous results, which clearly favored dividend surprises over dividend changes, we conclude that, whenever data on analyst dividend forecast are available, the naive model should be abandoned in favor of a model that takes market expectations into account.

In the bad news sample, the dividend surprise is again positively related to the CAARs, as expected. However, in contrast to the good news sample, the earnings surprise has no additional explanatory power. All other variables are insignificant. Thus, we find no support for any of the theories when we consider bad news events. This conclusion does not change when we consider dividend reductions instead. The insignificant results may in part be due to the small number of observations in the bad news and dividend decrease samples. To put these results further into perspective, we wish to note that many related papers do not even present results for dividend decreases (see, e.g., Bernheim and Wantz, 1995; Amihud and Li, 2006). Bernheim and Wantz (1995) argue that market reactions to dividend cuts are likely to be driven by fundamentally different processes compared to reactions to dividend increases.

To summarize, our analysis shows that share prices react to dividend surprises, not to dividend changes. With regard to the good news subsample, we document a number of further results. We find a negative relation between the number of analysts and the CAARs after positive dividend surprises, consistent with the cash flow signaling hypothesis. In addition, we also find supporting evidence for a dividend clientele effect and we document a significant and non-linear relation between the price reaction to dividend surprises and the ownership structure of the firm. These results are consistent with both the monitoring and the rent extraction hypotheses. We do not find evidence in favor of the free cash flow hypothesis.

6 Conclusion

It is a stylized fact that share prices react to dividend announcements. In an efficient market, however, we should expect that only unanticipated dividend changes trigger a share price reaction. A natural estimate of the surprise in the announcement is the difference between the actual dividend and the analyst consensus forecast. Such a procedure is standard in the earnings announcement literature, but has rarely been applied in the dividend announcement literature, most likely because of a lack of appropriate data.

In this paper we try to fill this gap in the literature. We analyze dividend announcements made by German firms in the period from 1996 to 2006. We perform a standard event study and then use random effects panel models to analyze the determinants of the cumulative abnormal returns. The results show that share prices react to the surprise in the dividend announcement, not to a dividend change *per se*. Our results also suggest that, when dividend and earnings announcements are made on the same day, the dividend surprise has, if anything, higher explanatory power for the share price reaction than the earnings surprise.

We estimate panel regressions to discriminate between several popular hypotheses that aim to explain the price reaction to dividend announcements: the cash flow signaling hypothesis, the free cash flow hypothesis, the monitoring and rent extraction hypothesis and dividend clientele effects. When analyzing positive dividend surprises we find evidence in favor of the cash flow signaling hypothesis and dividend clientele effects. We further document a non-linear relation between the cumulative abnormal returns and the ownership structure of the firm which is consistent with the monitoring and rent extraction hypotheses. The free cash flow hypothesis receives no support. The results of the panel analysis are different when we consider dividend changes rather than dividend surprises. Most importantly, results of the naive model based on dividend changes do support neither the dividend signaling hypothesis nor the monitoring or rent extraction hypothesis. We therefore conclude that the naive model may yield misleading results. Our results thus suggest that future research on dividend announcements should make use of the analyst forecast data that are now readily available.

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Table 1

Summary Statistics

Table 1 provides descriptive data for all sample firms. The sample consists of a total of 921 announcements for the 150 largest companies listed on the Frankfurt Stock Exchange (member firms of the DAX, MDAX and SDAX indices as of December 2002) for the 11-year period from 1996 to 2006. Dividend yield is calculated as DIV(*i*,*y*-1)/P(*i*,*y*) and market capitalization measures the market value of equity 14 days before the announcement. The change in dividend yield is defined as the change in dividends as a percent of price (P(*i*,*y*)) 14 days before the dividend announcement, (DIV(*i*,*y*)-DIV(*i*,*y*-1))/P(*i*,*y*), where DIV(*i*,*y*) is the total (adjusted) dividend per share for stock (*i*) announced for year (*y*) and DIV(*i*,*y*-1) is the total (adjusted) dividend per share for stock (*i*) announced for the preceding year (y-1). Tobin's Q is defined as the market value of the firm's equity plus total assets minus book value of equity, all divided by total assets. The firm's leverage is defined as the sum of total current liabilities and long-term debt divided by book value of equity. Analyst coverage denotes the number of analysts in the I/B/E/S database. The earnings estimation error is measured as (EPS(*i*,*y*)-ESTEPS(*i*,*y*))/P(*i*,*y*), where EPS(*i*,*y*) denotes (adjusted) earnings per share for stock (*i*) announced for year (*y*) and ESTEPS(*i*,*y*) is the last I/B/E/S consensus earnings estimates before the announcement. In addition to the voting rights of the largest shareholder, the voting rights of the second-largest shareholder are reported if they exceed 5% (they are set to zero if the second-largest shareholder holds less than 5%).

Panel A. Descriptive Statistics for Firms with Increased, Decreased and Maintained Dividends over the Entire Sample Period (1996-2006) - Naïve Expectation Model (Dividend Changes)

	Increases (521 observations)			Decreases (88 observations)			No Change (312 observations)		
	Mean	Median	Standard Dev.	Mean	Median	Standard Dev.	Mean	Median	Standard Dev.
Dividend Yield (%)	1.88	1.67	1.36	4.80	4.09	3.73	2.57	2.44	1.86
Change in Dividend Yield (%)	0.57	0.33	0.67	-2.62	-1.95	2.50	0.01	0.00	0.04
Dividend Estimation Error (%)	0.16	0.08	0.41	-1.29	-0.86	1.42	-0.15	-0.07	0.38
Earnings Estimation Error (%)	0.13	0.00	2.54	-5.74	0.00	20.52	-0.56	0.00	4.28
Market Capitalization (Mio. €)	7197.91	1806.14	13100.63	3840.08	602.29	10578.83	5496.78	553.63	16414.32
Total Assets (Mio. €)	13634.58	1873.57	30499.10	11342.05	1354.76	33072.42	10739.01	1216.38	30134.27
Sales (Mio. €)	10384.13	1998.10	19477.11	8526.12	1860.30	20819.03	9717.28	1473.38	23478.73
Tobin's Q	1.82	1.37	1.40	1.32	1.07	1.13	1.41	1.20	0.91
Leverage	1.79	1.33	2.58	2.06	1.48	1.68	2.14	1.88	2.52
Analyst Coverage	17.33	17.00	10.41	15.61	12.00	10.84	15.25	13.00	10.89
Voting Rights of the Largest Shareholder (%)	39.07	36.07	26.93	38.32	30.33	25.32	43.30	37.08	29.08
Voting Rights of the 2nd-Largest Shareholder	4.83	0.00	7.03	5.69	2.50	6.98	5.12	0.00	6.52

Panel B. Descriptive Statistics for Firms with Good News, Bad News and No News over the Entire Sample Period (1996-2006) - Market Expectation Model (Dividend Surprises)

	Good News (281 observations)			Bad News (266 observations)			No News (374 observations)		
Dividend Yield (%)	2.04	1.83	1.48	2.56	2.15	2.75	2.54	2.21	1.82
Change in Dividend Yield (%)	0.62	0.40	0.84	-0.55	0.00	1.81	0.11	0.11	0.88
Dividend Estimation Error (%)	0.41	0.28	0.39	-0.73	-0.36	0.96	0.00	0.00	0.08
Earnings Estimation Error (%)	0.27	0.00	3.05	-1.75	0.00	7.86	-0.59	0.00	8.78
Market Capitalization (Mio. €)	5813.50	1270.42	11391.25	4781.78	766.05	12984.94	7747.29	1221.49	16492.05
Total Assets (Mio. €)	10540.25	1286.30	25453.66	8836.06	1285.27	26692.68	16417.34	1754.56	35963.10
Sales (Mio. €)	9256.63	1530.68	19081.50	7529.96	1435.15	19120.12	12267.75	2103.84	23396.43
Tobin's Q	1.83	1.32	1.49	1.61	1.17	1.37	1.51	1.27	0.88
Leverage	1.79	1.24	2.82	1.93	1.54	1.57	2.05	1.65	2.08
Analyst Coverage	16.30	15.00	10.73	15.03	13.00	9.91	17.59	17.00	10.99
Voting Rights of the Largest Shareholder (%)	39.37	35.90	25.92	40.58	36.57	27.06	41.12	36.04	29.16
Voting Rights of the 2nd-Largest Shareholder	5.22	0.00	7.34	5.07	0.00	6.83	4.80	0.00	6.50

Panel C. Percentage of Firm-Year Observations with Maintained, Increased and Decreased Dividends

Year	Number of Firms	Firms that Maintained Dividends (%)	Firms that Increased Dividends (%)	Firms that Decreased Dividends (%)
1996	67	39	52	9
1997	80	29	68	4
1998	78	26	67	8
1999	88	34	60	6
2000	87	32	64	3
2001	91	34	46	20
2002	89	38	43	19
2003	89	39	42	19
2004	85	33	60	7
2005	81	25	69	6
2006	86	19	78	3

Table 2
Wealth Effects of Dividend Announcements

Table 2 presents the (market model-adjusted) average abnormal returns (AAR_0) on the announcement date and the cumulative average abnormal returns ($CAAR_{-1,1}$) over the event window -1 to +1 relative to the announcement date. Panel A classifies the announcements into the three groups: dividend increases, dividend decreases and unchanged dividends, and then subdivides them into good news, bad news and no news events. In Panel B the announcements are first categorized into good news, bad news and no news events, and then subdivided into dividend increases, decreases and unchanged dividends. The test statistic proposed by Boehmer et al. (1991) and the non-parametric test statistic of Corrado (1989) are reported in columns 4 and 5 and in columns 7 and 8, respectively. Asterisks denote statistical significance at the 0.01 (***), 0.05 (**) and 0.10 (*) levels.

Panel A. Increases, Decreases and No Change

	#	AAR_0	T-Statistic	Corrado	$CAAR_{-1,1}$	T-Statistic	Corrado
Increases	521	0.70%	4.63***	4.19***	1.13%	5.24***	4.54***
Good News	248	0.99%	5.20***	4.53***	1.58%	5.74***	4.34***
Bad News	72	-0.10%	-0.53	-0.83	0.10%	0.32	0.12
No News	201	0.64%	2.45**	2.64***	0.93%	2.28**	3.12***
Decreases	88	-0.86%	-3.43***	-3.54***	-0.30%	-1.17	-0.43
Good News	7	-	-	-	-	-	-
Bad News	71	-0.95%	-3.52***	-3.65***	-0.53%	-1.69*	-0.93
No News	10	-	-	-	-	-	-
No Change	312	0.22%	1.68*	2.46**	0.65%	2.61**	3.13***
Good News	26	0.71%	2.62***	2.65***	2.24%	3.36***	3.53***
Bad News	123	-0.06%	-0.23	-0.09	0.37%	1.08	0.97
No News	163	0.36%	1.45	2.84***	0.61%	1.48	2.45**

Panel B. Good News, Bad News and No Change

	#	AAR_0	T-Statistic	Corrado	$CAAR_{-1,1}$	T-Statistic	Corrado
Good News	281	0.95%	5.67***	4.86***	1.59%	6.41***	4.87***
Increases	248	0.99%	5.20***	4.53***	1.58%	5.74***	4.34***
Decreases	7	-	-	-	-	-	-
No Change	26	0.71%	2.62***	2.65***	2.24%	3.36***	3.53***
Bad News	266	-0.31%	-1.50	-2.50**	0.06%	0.22	0.07
Increases	72	-0.10%	-0.53	-0.83	0.10%	0.32	0.12
Decreases	71	-0.95%	-3.52***	-3.65***	-0.53%	-1.69*	-0.93
No Change	123	-0.06%	-0.23	-0.09	0.37%	1.08	0.97
No News	374	0.47%	2.72***	3.34***	0.81%	2.84***	3.78***
Increases	201	0.64%	2.45**	2.64***	0.93%	2.28**	3.12***
Decreases	10	-	-	-	-	-	-
No Change	163	0.36%	1.45	2.84***	0.61%	1.48	2.45**

Table 3
Cumulative Abnormal Returns and Market Expectations

Table 3 presents the results on the determinants of cumulative abnormal returns (random effects regressions). Cumulative abnormal returns ($CAR_{-1,1}$) are measured over the event window -1 to +1 relative to the announcement date. The change in dividend yield is defined as the change in dividends as a percentage of price (P(*i*,*y*)) 14 days before the dividend announcement, i.e., (DIV(*i*,*y*)-DIV(*i*,*y*-1)/P(*i*,*y*), where DIV(*i*,*y*) is the total (adjusted) dividend per share for stock (*i*) announced for year (*y*) and DIV(*i*,*y*-1) is the total (adjusted) dividend per share for stock (*i*) announced for the preceding year (y-1). The dividend surprise is calculated as (DIV(*i*,*y*)-ESTDIV(*i*,*y*))/P(*i*,*y*), where ESTDIV(*i*,*y*) is the estimated dividend per share based on the last I/B/E/S consensus estimates before the dividend announcement. The earnings surprise is measured as (EPS(*i*,*y*)-ESTEPS(*i*,*y*))/P(*i*,*y*), where EPS(*i*,*y*) covers diluted (adjusted) earnings per share for stock (*i*) announced for year (*y*) and ESTEPS(*i*,*y*) is the estimated earnings per share based on the last I/B/E/S consensus estimates before the announcement. All regressions include dummy variables for each year of the sample period and industry dummies (based on the classifications of Deutsche Börse AG). The regressions comprise 921 firm-year observations. T-statistics from cluster-robust standard errors appear in parentheses. Asterisks denote statistical significance at the 0.01 (***), 0.05 (**) and 0.10 (*) levels.

	$CAR_{-1,1}$			
	(1)	(2)	(3)	(4)
Change in Dividend Yield	0.514		0.185	0.180
	(3.03)***		(0.92)	(0.84)
Dividend Surprise		1.152	0.935	0.939
		(5.41)***	(3.00)***	(2.97)***
Earnings Surprise				0.002
				(0.12)
Intercept	-0.003	-0.011	-0.002	-0.012
	(-0.31)	(0.15)	(-0.25)	(-0.71)
R-Squared	0.073	0.084	0.086	0.086
Number of Observations	921	921	921	921

Table 4a
Dividend Announcement Returns and Firm Characteristics
(Shapley-Shubik indices calculated using a quota of 25%)

Table 4a presents the results on the determinants of cumulative abnormal returns for good news events, dividend increases, bad news events and dividend decreases (all random effects regressions). Cumulative abnormal returns ($CAR_{-1,1}$) are measured over the event window -1 to +1 relative to the announcement date. The change in dividend yield is defined as the change in dividends as a percentage of price (P(*i*,*y*)) 14 days before the dividend announcement, i.e., (DIV(*i*,*y*)-DIV(*i*,*y*-1)/P(*i*,*y*), where DIV(*i*,*y*) is the total (adjusted) dividend per share for stock (*i*) announced for year (*y*) and DIV(*i*,*y*-1) is the total (adjusted) dividend per share for stock (*i*) announced for the preceding year (*y*-1). The dividend surprise is calculated as (DIV(*i*,*y*)-ESTDIV(*i*,*y*))/P(*i*,*y*), where ESTDIV(*i*,*y*) is the estimated dividend per share based on the last I/B/E/S consensus estimates before the dividend announcement. The earnings surprise is measured as (EPS(*i*,*y*)-ESTEPS(*i*,*y*))/P(*i*,*y*), where EPS(*i*,*y*) is diluted (adjusted) earnings per share for stock (*i*) announced for year (*y*) and ESTEPS(*i*,*y*) is the last I/B/E/S consensus earnings estimate before the announcement. Dividend yield is calculated as DIV(*i*,*y*-1)/P(*i*,*y*). Analyst coverage is the total number of analysts covering the respective firm in the last I/B/E/S file available before the announcement. Tobin's Q is defined as the market value of the firm's equity plus total assets minus book value of equity, all divided by total assets. The firm's leverage is defined as the sum of total current liabilities and long-term debt divided by book value of equity. Free cash flow is defined as EBIT + depreciation - taxes + delta def. taxes - minority interest - interest - dividends + extra items and divided by sales and lagged by one year.
The measures of voting power for the largest and second largest shareholder are based on the Shabley-Shubik index (using a quote of 25%). All regressions include dummy variables for each year of the sample period and industry dummies (based on the classifications of Deutsche Börse AG). T-statistics from cluster-robust standard errors appear in parentheses. Asterisks denote statistical significance at the 0.01 (***), 0.05 (**) and 0.10 (*) levels.

	$CAR_{-1,1}$							
	(1)		(2)		(3)		(4)	
	Good News		Increases		Bad News		Decreases	
Change in Dividend Yield			0.653 (1.82)*	0.646 (1.81)*			0.573 (1.42)	0.614 (1.50)
Dividend Surprise	1.845 (2.49)**	1.848 (2.46)**			0.896 (2.13)**	0.896 (2.12)**		
Earnings Surprise	0.144 (1.98)**	0.142 (1.88)*	0.201 (2.87)***	0.201 (2.82)***	0.003 (0.13)	0.003 (0.14)	-0.007 (-0.27)	-0.003 (-0.12)
Dividend Yield	0.310 (1.78)*	0.334 (1.95)*	0.395 (2.24)**	0.396 (2.24)**	0.171 (1.38)	0.173 (1.40)	0.005 (0.03)	0.067 (0.40)
Analyst Coverage	-0.001 (-2.18)**	-0.001 (-2.04)**	-0.000 (-1.34)	-0.000 (-1.28)	0.000 (0.69)	0.000 (0.69)	-0.001 (-1.28)	-0.001 (-1.05)
Ln(Tobin's Q)	0.010 (1.51)	0.010 (1.51)	0.002 (0.44)	0.002 (0.46)	0.002 (0.25)	0.002 (0.28)	0.007 (0.52)	0.005 (0.32)
Leverage	-0.001 (-1.51)	-0.001 (-1.54)	-0.001 (-1.24)	-0.001 (-0.39)	0.000 (0.01)	0.000 (0.03)	0.004 (0.98)	0.005 (1.12)
Free Cash Flow/Sales (Lag)	0.009 (0.34)	0.009 (0.36)	-0.010 (-0.41)	-0.010 (-0.39)	0.004 (0.07)	0.004 (0.07)	0.164 (1.37)	0.183 (1.47)
Shapley Value for Largest Shareholder	-0.074 (-2.37)**	-0.073 (-2.32)**	-0.016 (-0.64)	-0.017 (-0.67)	0.018 (0.47)	0.018 (0.48)	-0.144 (-1.35)	-0.134 (-1.27)
Shapley Value for Largest Shareholder^2	0.070 (2.44)**	0.068 (2.36)**	0.016 (0.73)	0.016 (0.70)	-0.011 (-0.31)	-0.012 (-0.32)	0.146 (1.51)	0.126 (1.38)
Shapley Value for Second-Largest Shareholder		0.015 (1.03)		0.009 (0.78)		0.002 (0.11)		0.060 (1.44)
Intercept	0.028 (1.18)	0.027 (1.13)	0.012 (0.78)	0.012 (0.78)	-0.014 (-0.67)	-0.014 (-0.67)	-0.002 (-0.06)	-0.012 (-0.31)
R-Squared	0.222	0.225	0.121	0.122	0.127	0.127	0.440	0.454
Number of observations	281	281	519	519	265	265	88	88

Table 4b
Dividend Announcement Returns and Firm Characteristics
(Shapley-Shubik indices calculated using a quota of 50%)

Table 4b presents the results on the determinants of cumulative abnormal returns for good news events, dividend increases, bad news events and dividend decreases (all random effects regressions). Cumulative abnormal returns ($CAR_{-1,1}$) are measured over the event window -1 to +1 relative to the announcement date. The change in dividend yield is defined as the change in dividends as a percentage of price (P(*i*,*y*)) 14 days before the dividend announcement, i.e., (DIV(*i*,*y*)-DIV(*i*,*y*-1)/P(*i*,*y*), where DIV(*i*,*y*) is the total (adjusted) dividend per share for stock (*i*) announced for year (*y*) and DIV(*i*,*y*-1) is the total (adjusted) dividend per share for stock (*i*) announced for the preceding year (*y*-1). The dividend surprise is calculated as (DIV(*i*,*y*)-ESTDIV(*i*,*y*))/P(*i*,*y*), where ESTDIV(*i*,*y*) is the estimated dividend per share based on the last I/B/E/S consensus estimates before the dividend announcement. The earnings surprise is measured as (EPS(*i*,*y*)-ESTEPS(*i*,*y*))/P(*i*,*y*), where EPS(*i*,*y*) is diluted (adjusted) earnings per share for stock (*i*) announced for year (*y*) and ESTEPS(*i*,*y*) is the last I/B/E/S consensus earnings estimate before the announcement. Dividend yield is calculated as DIV(*i*,*y*-1)/P(*i*,*y*). Analyst coverage is the total number of analysts covering the respective firm in the last I/B/E/S file available before the announcement. Tobin's Q is defined as the market value of the firm's equity plus total assets minus book value of equity, all divided by total assets. The firm's leverage is defined as the sum of total current liabilities and long-term debt divided by book value of equity. Free cash flow is defined as EBIT + depreciation - taxes + delta def. taxes - minority interest - interest - dividends + extra items and divided by sales and lagged by one year.
The measures of voting power for the largest and second largest shareholder are based on the Shabley-Shubik index (using a quota of 50%). All regressions include dummy variables for each year of the sample period and industry dummies (based on the classifications of Deutsche Börse AG). T-statistics from cluster-robust standard errors appear in parentheses. Asterisks denote statistical significance at the 0.01 (***), 0.05 (**) and 0.10 (*) levels.

	$CAR_{-1,1}$							
	(1)		(2)		(3)		(4)	
	Good News		Increases		Bad News		Decreases	
Change in Dividend Yield			0.653 (1.79)*	0.655 (1.79)*			0.510 (1.21)	0.522 (1.30)
Dividend Surprise	1.875 (2.58)***	1.897 (2.74)***			0.895 (2.10)**	0.863 (2.02)**		
Earnings Surprise	0.150 (2.01)**	0.149 (1.96)**	0.203 (2.88)***	0.203 (2.87)***	0.006 (0.22)	0.010 (0.38)	-0.018 (-0.70)	-0.014 (-0.49)
Dividend Yield	0.320 (1.81)*	0.292 (1.63)	0.385 (2.19)**	0.386 (2.18)**	0.177 (1.43)	0.172 (1.40)	0.040 (0.27)	0.033 (0.23)
Analyst Coverage	-0.001 (-1.99)**	-0.001 (-2.24)**	-0.000 (-1.34)	-0.000 (-1.21)	0.000 (0.65)	0.000 (0.47)	-0.001 (-1.01)	-0.001 (-1.22)
Ln(Tobin's Q)	0.008 (1.20)	0.009 (1.43)	0.002 (0.34)	0.001 (0.33)	0.002 (0.21)	0.002 (0.21)	0.004 (0.30)	0.007 (0.49)
Leverage	-0.001 (-1.59)	-0.001 (-1.50)	-0.001 (-1.21)	-0.001 (-1.22)	0.000 (0.08)	0.000 (0.12)	0.003 (0.70)	0.003 (0.70)
Free Cash Flow/Sales (Lag)	0.011 (0.42)	0.018 (0.69)	-0.010 (-0.35)	-0.009 (-0.35)	0.006 (0.12)	0.008 (0.13)	0.136 (1.21)	0.149 (1.29)
Shapley Value for Largest Shareholder	-0.074 (-2.03)**	-0.062 (-1.72)*	-0.002 (-0.07)	-0.003 (-0.10)	0.048 (1.02)	0.062 (1.24)	-0.052 (0.55)	-0.046 (-0.48)
Shapley Value for Largest Shareholder^2	0.064 (1.96)**	0.048 (1.47)	0.001 (0.03)	0.002 (0.08)	-0.039 (-0.95)	-0.055 (-1.23)	0.046 (0.62)	0.032 (0.42)
Shapley Value for Second-Largest Shareholder		-0.077 (-1.52)		0.006 (0.13)		-0.065 (-1.11)		-0.104 (-0.93)
Intercept	0.028 (1.16)	0.026 (1.12)	0.010 (0.63)	0.010 (0.60)	-0.021 (-0.99)	-0.020 (-0.90)	-0.023 (-0.56)	-0.016 (-0.38)
R-Squared	0.216	0.222	0.121	0.121	0.130	0.134	0.443	0.453
Number of observations	281	281	519	519	265	265	88	88

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