Fundamentals or Market Movements: What Drives the Dividend Decision?*

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Abstract

This paper investigates the determinants of the dividend decision. We examine the impact of fundamental variables like earnings, size, or leverage, as well as the effect of stock price movements. Using a sample of German companies, we find a negative relation between the probability for dividend increases and the performance of the firm's shares. Dividend increasing companies performed worse than the overall stock market or corporations that keep dividends constant. In addition, we demonstrate that the documented pattern cannot be explained by models of asymmetric information or catering considerations. Thus, our results suggest that in Germany, where share repurchases were highly restricted, dividends are increased as a compensation for the poor returns of the current shareholders.

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Keywords: Dividend Policy, Dividend Increases, Market Movements

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1 Introduction

Although the dividend policy of publicly listed companies has been a subject of considerable economic research, the dividend decision is still one of the main challenges for modern finance. We have still to understand why companies all over the world pay a substantial part of their earnings as dividends, despite the Miller and Modigliani (1961) argument that market valuation should not depend on the (form of) payout. The economic forces underlying the phenomenon of dividend smoothing, documented for the first time by Lintner (1956), are also not clear yet. The Lintner model is considered the "best description of the dividend-setting process available" (Benartzi, Michaely, and Thaler (1997)), but it still lacks a comprehensive theoretical justification. Moreover, surprisingly little is known about the reasons and the timing of dividend changes and especially, dividend increases.

With this paper, we intend to enhance our understanding of two different types of factors that drive the dividend-increase-decision. First, we study the impact of firm-specific, fundamental variables like size, profitability and leverage ratio. Second, we aim to shed light on the relation between dividend increases and market movements. We suppose that if share repurchases are not feasible, the management takes not only the financial strength of the company into account when deciding about the dividends to be paid out but also the return the shareholders earn. The dividend decision is made after juxtaposing the return due to the regular dividend payment and the capital gains or losses the shareholders experience. In "hard times," when the total return is not satisfactory, dividend increases are an instrument to smooth ruffled feathers among shareholders.

While the effects of financial characteristics are probably slightly better understood, an in-depth analysis of the potential links between the dividend policy and the stock market performance is still missing. One way to establish a link between the capital market dynamics and the dividends paid out is by introducing asymmetric information in the analysis. The signaling models, pioneered by Bhattacharya (1979) and Miller and Rock (1985), consider the payout communication device which is used by the management to reveal its private information to the market. Agency models (Easterbrook (1984)) derive the payout policy from the interaction between the various parties with relationships to the firm. Under certain circumstances, dividends may mitigate existing agency conflicts, which should be associated with an increase of the firm's value. These two classes of theoretical explanations make similar predictions about the relation between stock market dynamics and the dividend decision: in both cases, dividends are paid out because of the prospective for a higher market valuation. Hence, no matter if dividends are meant to communicate "good news" (signaling) or if they are the "good news" (because of the reduction of agency conflicts), one should observe a significant price jump after dividend increases.

The catering theory, put forward by Baker and Wurgler (2004) also allows for a relation between the dividend policy and the stock price performance. According to this theory, arbitrage may be limited and (irrational) investor demand may create a gap between the stock prices of payers and non-payers. Under certain conditions, managers will rationally cater to the demand by paying (or increasing) dividends when dividend payers are traded at a premium. Hence, a dividend increase should be followed by a rise of the market valuation in the year when the dividend decision is made.

In this paper, we adopt a different view. We state that one should not only study the effect of dividend payments on the price, but also look for the possibility of an inverse relationship. The empirical support for this hypothesis is encouraging. Dividend increases seem to be, at least partly, driven by poor stock price returns. We detect a significantly negative relationship between the dividend decision and the stock price return in the year before the dividend announcement. This result holds for a variety of specifications and especially, for different return measures. In addition, as expected, we find that dividend-increasing firms are more profitable in terms of current and past earnings to assets. Size and market-to-book seem to have a significantly positive impact on the dividend decision also.

The analysis was conducted using data for German companies. The main advantage of working with German data is that in Germany, share repurchases were highly restricted until 1999 and could not be used to disburse cash to the shareholders.[1] Thus, the specifics of the institutional settings allow us to largely ignore potential biases due to the impact of

[1] A brief overview of the evolution of the regulation of share repurchase in Germany can be found in Seifert and Stehle (2003). A detailed discussion is offered by Benckendorff (1998). As a robustness check, we repeated our analysis excluding all observations after 1999. However, we obtained qualitatively similar results.

share buybacks, which in turn increases the power of our results. In addition, as most of the related studies are based on US-data, some of our results may also be thought of as an out-of sample test of the theories put forward.

The remainder of the paper is organized as follows. Section 2 reviews the related literature and discusses the hypotheses that we aim to investigate. Section 3 describes our dataset. The main results of the study are presented in Sections 4 and 5. In Section 4, we analyze the determinants of the decision to increase dividends, as well as the relation between the magnitude of dividend increases and stock price performance. The subsequent Section 5 confronts our findings with some alternative explanations for the uncovered results. Section 6 presents the results of a robustness check, where we specify a different measure of dividend increases. Section 7 concludes.

2 Related Literature

Our paper is related to two strands of literature. Since we study the determinants of dividend increases, our work adds to the empirical literature on dividend changes. In addition, in analyzing the impact of market movements, we also draw upon some recent findings in behavioral finance.

Most of the empirical literature on dividend changes has concentrated on examining the market reaction to the announcements of the changes. Numerous papers have shown that dividend changes are associated with price changes in the same direction, which suggests that they are considered newsworthy by the market (see Allen and Michaely (2003) for an overview of the literature). Somewhat more informative about the underlying reasons are studies of the relation between dividend increases and the evolution of earnings. Their results indicate that dividend increases are preceded by significant earnings increases. On the other hand, the relation between dividend changes and future earnings seems less clear, with some more support for the notion that dividend changes do not convey valuable information (Healy and Palepu (1988), Benartzi, Michaely, and Thaler (1997), Nissim and Ziv (2001) and Benartzi, Grullon, Michaely, and Thaler (forthcoming). Hence, it seems that dividend changes do not signal the perspectives of the company. Instead, dividends should be better thought of as "lagging earnings" (Miller (1987)). Beside earned equity, risk and growth characteristics of the firm have also been identified as potentially important factors. Grullon, Michaely, and Swaminathan (2002) found that firms that increased dividends experienced a significant decline in their systematic risk, measured by the Fama-French three factor model or the CAPM.

Studies of the pre-announcement stock price performance of dividend-changing firms are relatively scarce. The existing literature suggests that dividend-increasing firms have done well and dividend-decreasers have not done as well prior to the announcement. For instance, Benartzi, Michaely, and Thaler (1997), document an average of 8.6% abnormal return in the year prior to dividend increase and -28% for firms that decrease dividends. In Grullon, Michaely, and Swaminathan (2002), dividend-increasing firms earned a significant positive excess return in the three years before the announcement (mean of 0.8% a month), and dividend decreasing firms earned a significantly negative excess return, with a mean of -0.6% a month. In general, our results are not easily comparable with the evidence presented in the two papers. As in the two papers cited above, we document a lower excess return of dividend-decreasing companies. However, the main part of our analysis centers on the comparison between dividend increasers and firms with unchanged dividends, and not on the differences between dividend increasing and dividend decreasing companies.[2] Furthermore, our studies differ in the methodology applied. We derive our main conclusions by investigating the dividend decision in the context of a multivariate logit model, with the (row) stock price return as an independent variable. On the other hand, Grullon, Michaely, and Swaminathan (2002) measure the abnormal return as the mean (or median) estimated intercept in the Fama-French three-factor model. Benartzi, Michaely, and Thaler (1997) do not look at the individual stock price performance but compute the adjusted, geometrically compounded return of equally weighted portfolios formed twelve months before the event. Neither of the two papers allows for a potential impact of the stock price performance on the dividend decision.

Most of the studies with German data investigate mainly the market reaction to divi-

[2] Grullon, Michaely, and Swaminathan (2002) use the characteristics of nondividend-changing firms to compute the adjusted changes in the factor loadings. However, they do not report the adjusted excess return.

dend changes. The results closely resemble those for the US-market. In particular, dividend changes are found to be associated with price changes in the same direction, with the reaction following dividend decreases being significantly stronger (Sahling (1981), Amihud and Murgia (1997), and Gerke, Oerke, and Sentner (1997). In a recent paper, Correia da Silva, Goergenand, and Renneboog (2005) analyze the determinants of the decision to change the dividend for a panel of German firms from 1984 to 1994. Although our studies share similar objectives, there are important differences. While Correia da Silva, Goergenand, and Renneboog (2005) investigate mainly the relation between profitability and dividend reductions/dividend increases, we also study the impact of other factors. In particular, we relate the decision to several individual-firm variables like size, profitability, growth or leverage, but also to external factors like share price evolution and market-wide movements. Our papers also differ in the modelling approach. For most of their study, Correia da Silva, Goergenand, and Renneboog (2005) analyze the dividend decision using an ordered probit model. A potential problem with this approach is that it implicitly assumes that dividend increases and dividend decreases are symmetric decisions, driven by similar factors. However, this may not necessarily be the case. The significantly different market reaction to increases and decreases indicates that the two types of decisions are perceived as inherently different by the market.

The nature of our results links this paper to behavioral finance literature.[3] The foundation of the modern behavioral-finance-based dividend theory is laid out by Baker and Wurgler (2004) who outline and test some of the predictions of the catering theory. Using data between 1963 and 2000, they find a strong relation between measures of the relative price of payers and nonpayers and measures of the aggregate dynamics of dividend initiations in the US. The catering theory was found to be able to explain not only the dynamics of dividend payers but was also identified as an important factor for the decision to initiate (Bulan, Subramanian, and Tanlu (2004)) or increase the dividends (Lie and Li (2005)). Bulan, Subramanian, and Tanlu (2004) showed that dividend initiating companies are bigger, more

[3]In fact, the most convincing explanation for our findings can hardly be reconciled with the traditional Miller-Modigliani framework. Under the rational-expectation paradigm, dividend increases cannot be meant to compensate shareholders for the poor return on their investment because they will be associated with an additional price drop of the same magnitude.

profitable, have less growth opportunities, and dispose of more free-cash flow. In addition, their results suggest a positive relation between the dividend premium and the initiation decision, which is in line with the catering theory. Consequently, the announcement effect is partly explained by the market sentiment for dividends. Lie and Li (2005) find that the decision to change the dividend, and by what magnitude, depends on the premium the capital market places on dividends. The stock market reaction to dividend changes seems to depend on the dividend premium, too. However, in their study of aggregate dividend payouts Dittmar and Dittmar (2004) do not detect a significant impact of the dividend premium.

3 Data, Methodology, and Summary Statistics

Using the Datastream database, we create a sample of all the German companies that appear in the database for the period 1982-2003. To construct our sample, we make use of the constituent lists "fger1", "fger2" and "deadbd". The first two lists contain equities currently traded ("active stocks") and the last one includes stocks that have ceased trading ("dead stocks" in the terminology of Datastream). We exclude stocks of Non-German companies (identified by the geographical code GEOG), preferred shares as well as various convertibles and participating certificates. Financial firms are also deleted because of the different structure of their accounts. As the Frankfurt Stock Exchange is by far the largest of the eight German stock exchanges, we include only shares traded in Frankfurt in our final sample. Thus, we also avoid potential problems of dealing with companies listed on more than one domestic exchange.

From the remaining stocks, we form an unbalanced panel dataset using the date when the company went public (DS-item BDATE). If the IPO took place in the second half of the year, the corresponding yearly observation is deleted. The month in which a "dead stock" ceased trading is assessed from monthly price data. Our price measure is the actual historical price of the share (DS-item UP), taken from the Frankfurt continuous market.[4] Because Datastream fills the time period after delisting with constant values equal to the last available data, we delete all monthly observations with zero returns going back to the

[4] For shares not traded continuously, Datastream uses the midday "Kassa" price.

first non-zero return. Companies delisted in the first half of a year are eliminated from the list of companies in that year.

For all the companies in our dataset, we gather various firm-specific financial data from the Datastream database. To be included in our final sample, a firm-year observation must have nonmissing values for total assets (DS item 392), equity capital (301), operating profit (993), ebit (1300), number of shares outstanding (nosh), and dividends. Dividends are defined as total amount of dividends paid (434). If the total amount is missing, we use equity dividends paid (1129) or ordinary dividend requirements (187) instead. Further, we use but do not require: total borrowing repayable within a year (309), total loan capital (321), capital expenditures (1024), annual profit (175), intangible assets (344), reserves (304), total deferred taxes (wc03263), depreciation (136), and date of fiscal year end (wc05350). Based on the fiscal year end, we redefine some annual observations, assigning companies with a fiscal year end before July 1st to the previous year. Non-credible data, like i.e., negative total assets or debt exceeding total assets, are eliminated. All of the variables are winsorized at the 1st and 99th percentile to avoid the influence of extreme observations.

The final sample contains 844 companies with a total of 6671 firm-year observations over the period 1982 to 2003.[5] For each observation, we create the following variables:

- Market value: average unadjusted price in a year times shares outstanding. The average is taken over the monthly end prices.
- Size: Percent of companies with the same or lower amount of market value.
- Current growth ($d(TA)/TA$): growth rate of total assets. Total assets are defined as total assets (392), net of intangible assets (344) if available.
- Total debt ($Debt$): short-term debt (309) plus long term debt (321).
- Market-to-Book Ratio (MtB): the sum of market value and total debt divided by the sum of book equity and total debt.

[5]The relatively low number of observations per company (on average, there are 7.9 observations available for each company) is because the most firms appear in the sample after 1990 or 2001. However, as noted above, this does not affect the nature of our findings. We obtain similar results if we conduct our analysis excluding all observations after 1999.

- Leverage Ratio ($Debt/TA$): total debt to total assets.

- Capital Expenditures ($Cap.Exp.$): capital expenditures divided by total assets

We measure profitability either by ebit (1300) or by operating profit (993), both scaled by total assets.

Furthermore, we use the time series of annual returns of DAX, CDAX, and REX, constructed using data from Deutsche Börse. For the period before Deutsche Börse launched DAX in 1988 and CDAX in 1993, we use the annual returns of the two indices as calculated by Stehle and Hartmond (1991).

A dividend increase is defined as a higher ordinary cash dividend, compared to the dividend paid out in the previous year. A dividend decrease is the difference between the year t dividend and the year $t-1$ dividend, provided the difference is negative. Companies with positive dividend payments in their first year are excluded. We also exclude all observations identified as dividend initiations or dividend omissions. When analyzing the amount of dividend increases, we scale each dividend payment by the amount of total assets.

We assign dividends for the fiscal year t to year t of our sample and will refer to as current dividends.[6] The same rule is applied to the variables derived from balance sheet or income statement figures. Our measures of the return in year t (referred to as current return) are based on price data from the calendar year t. Because the dividend for the fiscal year t is usually announced (and paid out) in the first half of the next year $(t+1)$, the current return measures should not contain information about the subsequent dividend changes.[7]

We investigate Hypothesis 1 by relating the dividend decision to various measures of stock market movements. Our key measure of stock price performance is defined as the

[6] In Germany, dividends are paid on annual basis.

[7] This may not hold if the fiscal year does not concur with the calendar year or if the announcement is made before the fiscal year end. However, for the most of the companies in our sample, fiscal year is the calendar year. In addition, we also checked the precise announcement date of some randomly selected companies using articles and news published on the German business newspaper Handelsblatt. All of the firms announced the dividend to be pay out after the fiscal year end. Finally, note that it is not quite clear whether potential misclassification due to the approach applied may bias our findings, and if yes, in what direction.

stock price at the end of December divided by the stock price one year ago minus one:

$$R_{12} = \frac{p_{12,t} - p_{12,t-1}}{p_{12,t-1}} \tag{1}$$

We opt for this particular return measure because the stock price and the annual return as of the end of the year are widely used in the corporate finance literature (see e.g., Benartzi, Michaely, and Thaler (1997), Fama and French (2001), or Baker, Stein, and Wurgler (2003)). However, since we cannot completely ensure that the stock price in December does not contain any information about the upcoming dividend change, we will also regress the dividend decision to the June-to-June return of the share R_{06}:

$$R_{06} = \frac{p_{06,t} - p_{06,t-1}}{p_{06,t-1}} \tag{2}$$

In addition, we use various measures of the relative share price performance of the company to control for the impact of the overall stock market movements. In general, the relative stock price performance is defined as the annual return of the share minus the annual return of the corresponding proxy for stock market movements. The proxies for market movements are derived from the annual return of the overall share market index (CDAX), the mean annual return of the companies in the sample, and the annual return of the CDAX index in excess of the fixed-income index REX. We use price indexes only in order to avoid potential reverse causality problems.

The numbers of dividend increases by year are displayed in Table 1. The Table also details the number of companies in the sample in every year as well as the dynamics of dividend decreases and the number of observations with unchanged dividends. The relative frequency of increases, decreases, and unchanged dividends is similar to the rates documented by Dewenter and Warther (1998) for the US and Japan and by Rahman (2002) in his sample covering 28 countries. Dividend increases are the most often observed events. For more than 50 percent of all firm-year observations with positive past and current payout, the dividend in t exceeds the last year's value. The dividend reduction rate is relatively high, compared to the results reported in studies with US-data. Depending on how we measure dividends, the rate varies between 19 and 30 percent. These figures contrast sharply to the dividend decrease frequency of 5.5 percent documented by Dewenter and Warther (1998) for the US. This discrepancy indicates that German companies are less reluctant to reduce dividends. The results of the descriptive analysis of Rahman (2002) also point in that direction. The dividend reduction rate in Germany (equal to 21%) was found to be about twice that of the US (10.9%). A similar view is expressed by Correia da Silva, Goergenand, and Renneboog (2005), who suggest that the dividend policy of German companies tends to be more flexible than that of their US- of UK-counterparts.

In general, there is no big difference if one identifies increases, decreases, and unchanged dividends according to the amount spent on dividends or the dividends per share. Although we detect some minor differences between the outcomes of the two classification methods, the composition of the sample remains nearly the same. The relative proportion of dividend decreasers is slightly higher if one classifies the firm-year observations according to their dividends per share. This indicates that sometimes increases of the amount paid out as dividends are overcompensated by a higher number of shares outstanding, which translates into lower dividends per share.

4 Empirical Results

This section presents our main empirical results on the driving forces behind the dividend decision. We start with simple descriptive analysis. In the next step, the dividend decision is investigated in the context of a multivariate logit model. Alternative modeling approaches are discussed in the Robustness section.

Drawing on the existing literature, we link the dividend decision to various firm-specific accounting variables. Numerous papers suggest that dividend changes are mainly driven by (changes in the) past and current earnings. We attempt to examine the issue by relating the increase decision to measures of past and current profitability. The size of the company is expected to have a similar impact as the profitability measures. Bigger companies are hypothesized to be more prone to rising the payout because they dispose of higher cash reserves and generate less volatile earnings (Fama and French (2002)). We also include the leverage ratio in the regression, expecting to find evidence that higher debt levels translate into lower probability for a dividend increase. Finally, we study the effects of capital expenditures, current growth rate, and the market-to-book ratio as a proxy for the expected growth.

4.1 Descriptive analysis

Table 2 reports the means of key financial variables for the companies classified as dividend increasers, dividend decreasers, or firms with unchanged dividends. Dividend increasers are slightly larger than most of the companies in the sample. The generated earnings (in terms of ebit and operating profit) are also higher. Somewhat surprisingly, they do not seem to invest significantly less or grow slower. The mean of the capital expenditures of dividend increasing companies exceeds the amount spent by firms with unchanged dividends. In line with this finding, dividend increasers exhibit higher current growth, measured by the yearly change of the total assets. The higher mean leverage ratio suggests that this expansion is financed (partly) by debt. However, in spite of the higher debt ratio, the free cash flow is (slightly) higher, mainly because of the high level of generated (and retained) earnings.

Dividend decreasing companies exhibit the worst operating performance among the three groups. Their earnings declined over the last year; investments and asset growth are below the levels of dividend increasers or firms with unchanged dividends. Corresponding to the weak fundamentals, the stock market valuation, as measured by the market to book ratio, is significantly lower than the valuation of the remaining companies in the sample. The stock price follows a similar pattern. According to Table 3, dividend decreasers earn a negative stock price return on average. The two key measures of stock price performance- the December-to-December return R_{12} and the adjusted return $R_{12} - Mean(R_{12})$ - are highly negative.

The results in Table 3 indicate that dividend increases are preceded by poor stock price performance, too. The mean annual stock price return of -2.26% is lower than the return of dividend decreasing companies and significantly below the return of stocks with unchanged dividends. The poor return also causes the total return to the shareholders of dividend increasing firms to fall below that of the control groups. However, the mean adjusted return, which takes account of the aggregate market movements is positive. This suggests that dividend increases follow not only individual stock price underperformance but also overall market downturns.

To summarize, our results so far demonstrate that companies tend to change the dividends after years of poor stock price performance. However, while dividend decreases come along with weak operating performance, which in turn may explain the negative market reaction, dividend increasers exhibit a sound financial development, which is not reflected by the stock price.

4.2 Multivariate analysis of the Dividend Decision

We study the relative importance of fundamentals and market movements for the dividend decision using discrete choice models. We specify two multivariate logit models in which the dependent variable is 1 if a firm changes the amount distributed to the shareholders and 0 if the dividend is kept constant. The explanatory variables are size, current and lagged profitability, growth rate of assets, market-to-book ratio, leverage, capital expenditures, and past dividends. Following Correia da Silva, Goergenand, and Renneboog (2005), we also include a dummy variable that takes the value of one if there is a loss (negative $EBIT$) in period t. Our modeling approach treats decreases and increases as two inherently different decisions, driven by different factors. However, the main results are not affected by the particular methodology applied. As a robustness check, we specified the dividend decision as an ordered logit or multivariate logit model.[8]

4.2.1 Dividend Increases

Table 4 contains the test results for the basic regression model of the increase decision. The dependent variable is 1 if a firm increases the amount distributed to the shareholders via dividends and 0 if the dividend is kept constant. Model (1) studies the relation between the probability of dividend increases and the financial characteristics of the companies in the sample. The results indicate that there are two fundamental variables which play a crucial role. The coefficient of past earnings is highly significant and has the expected sign.

[8] The results are presented in Secion 6.2.

High current and especially high past earnings translate into higher probability for dividend increases. The coefficient of the size measure is found to be significantly positive, which indicates that large firms are more likely to raise their dividends. In contrast to studies with US-data (Grullon, Michaely, and Swaminathan (2002), Deshmukh (2003)), we could not find any evidence of an adverse impact of investments and current growth on the dividend decision of German companies. Partly confirming this pattern, we estimate a significantly positive effect of the market-to-book ratio. Thus, it is safe to conclude that in Germany the dividend decision does not reflect the investment and growth opportunities of the company. As first shown by Lintner (1956), there is a strong relation between dividend increases and previously paid dividends. Firms that pay out a higher portion of their total assets are less prone to raise the amount disbursed to the shareholders.

Models (2) to (5) examine the relation between the dividend decision and the (individual) stock return of the company in the year before the dividend announcement. Controlling for the stock price performance does not alter the estimated relation between the probability for a dividend increase and the fundamental variables. Again, we detect a significant impact of profitability, size, and lagged dividends.

The probability for dividend increases seems to be negatively related to the stock price return. The two measures applied are both significant and have the expected negative sign. The higher the price drop in t the more likely the management is to raise the payout. In order to control for potential intertemporal effects, we also included lagged value of the return measures in the regression. However, past stock price development does not seem to be an important factor. The estimated coefficients are insignificant and do not exhibit a stable behavior. This suggests that dividends are paid out to compensate shareholders for "foregone" capital gains in the year before the dividend announcement, the decision is not related to the return in $t-1$.

Following this line of argumentation, it is not surprising that we get slightly higher p-values for the December-to-December return measure. The June-to-June-return reflects partly "past" stock price movements and does not capture to the full extent of the stock price performance in the "current" year.

The regression results so far indicate that the individual stock price performance is a major factor. However, it is also possible that there are more dividends paid out in "bear markets", when the whole market goes down. In the first case, one can think of the dividend decision as being made after comparing the total return the shareholders earn with the return of the stocks of competing companies. In the second case, the relevant benchmark is the return of alternative investment opportunities like placing money with a bank or purchasing fixed-income products.

As outlined above, some of the findings of the descriptive analysis suggest that the two effects play some role. The return of dividend increasing companies is below that of firms with constant positive dividends; adjusting the annual returns for overall market movements narrows the gap between the two groups. However, even if we control for the mean return of the remaining companies, we still document a significantly lower return of increasers. In what follows, we will investigate this issue further by relating the dividend decision to aggregate stock market movements.

Table 5 contains the results. We found a significant impact of nearly all variables of interest. As demonstrated by Columns (1) to (4), the impact of the measures of overall market movements closely resembles the impact of the individual return variables. Although the 22 available yearly observations are probably not enough to draw reliable statistical inferences, the economic implications of the regressions provide further support for the notion that dividend increases are partly driven by poor stock price performance. In down markets, the annual returns of most of the companies are not satisfactory. Hence, dividends become more valuable for the shareholders. They are the only source of positive return and the managers, who seem to recognize that, try to actively contribute to the total returns of the company's owners. As a result, the management increases the dividend. This holds regardless of how we proxy for down markets, as shown by the first four specifications.

The remaining two models study the question of whether the individual stock price performance or aggregate market movements are the main determinants of the dividend decision. In model (5), the dependent variable is related to the difference between the annual December-to-December stock return R_{12} and the mean return of all the companies in the sample, model (6) links the decision to increase the dividends to the stock return and the return of the CDAX price index. The estimated coefficients in (5) and (6) are significantly negative and have the same sign. These results suggest that dividends are not automatically increased in down markets. Instead, it seems that when deciding about the dividend, the management takes the evolution of the individual stock price into account. The slopes of the excess return measures are all negative and mostly significant. Thus, it is safe to conclude that dividend increases are partly triggered by downward price movements, with companies underperforming the overall market being more likely to raise the amount distributed to the shareholders.

4.2.2 Dividend Decreases

Table 6 extends our analysis to the case of dividend decreases. The dependent variable is 1 if a firm decrease the amount distributed to the shareholders via dividends and 0 if the dividend is kept constant. In each of the specifications, the size variable has a positive and statistically significant effect on the likelihood that the dividend is cut. Together with the evidence on dividend increases, this suggests that small companies are less likely to change the dividends. When a company is smaller (and younger), it tends to follow a more stable policy. The probability of a dividend decrease is higher when a company reports a negative EBIT. In line with the findings of DeAngelo and DeAngelo (1992), we estimate a significantly positive coefficient of the earnings loss dummy. Finally, the slope of the capital expenditures is also found to be significant. The negative sign suggests that the declining profitability causes the company to reduce not only the payout but also the investments.

The inclusion of the return measure does not materially alter the relation between the fundamental variables and the decrease decision. Although we estimated several specifications, we cannot detect any evidence of a significant impact of the stock price performance. In contrast to dividend increasers, the finding of the descriptive analysis that dividend decreasing companies earn a negative return in the pre-announcement period should be attributed to their poor operating performance; the poor stock price performance itself does not seem to influence the decrease decision.

5 Discussion of the Results

Our results so far suggest that market movements have a significant impact on the decision of whether to increase the dividend or keep it constant. This pattern may be explained by models of asymmetric information. The asymmetric-information-view hypothesizes that dividends are increased either to communicate private information to the market (signaling) or to mitigate existing agency conflicts between management and shareholders (agency). Both types of models may generate a price process consistent with our findings from the previous sections. Implicitly, they assume that the company is traded at a discount prior to the announcement of dividend increases. Under certain circumstance, this may manifest into poor stock price performance.

One way to distinguish between the competing explanations is by looking at the company's performance after the dividends are increased. No matter if dividends are paid out to communicate "good news" (signaling) or they are the "good news," one should observe a significant price jump or an improvement of the operating performance after dividend increases.

The findings of Fuller and Goldstein (2005) offer another economic rationale for some of our result. They presented evidence that dividend-paying stock outperform non-dividend paying stocks in declining market stronger than in advancing markets. If the same pattern holds in Germany, managers may tend to increase the amount disbursed to the shareholders since this will result in a more favorable market valuation. Closely related to that line of argumentation is the catering theory of Baker and Wurgler (2004). One can reconcile the catering view with our findings by assuming that the market values dividend increasers at a premium in times when the overall stock market return is low. However, note that these two explanations can only rationalize the negative relation between the increase decision and the aggregate market movements; they cannot account for the negative impact of the individual return measures.

5.1 Post-Announcement Price Performance

In this section, we are going to examine a very basic condition for the asymmetric-information view. Numerous papers have shown that the market reacts positively to dividend increases in the short run (Aharony and Swary (1980), Michaely, Thaler, and Womack (1995), Gerke, Oerke, and Sentner (1997)). However, if dividends are really meant to communicate some sort of fundamental information or to mitigate existing agency conflicts, one should detect not only significant short-term reaction to dividend increases, but also a significant rise of the market value in the middle term.

We investigate the development of the market valuation of dividend increasing companies using a simple categorical analysis, measuring market valuation as market-to-book ratio or stock price in every quarter of the year. Table 7 contains our results. The table reports median market-to-book ratios changes of the ratios. The second part of the table presents median price changes (unadjusted returns) as well as adjusted returns over the two years before and after the dividend announcement. We derive our conclusions by comparing the variables of interest of three different groups. Specifically, we contrast quarterly returns and changes of the market-to-book for all the firms that increase the dividend (group "*increaser*") with the corresponding measures for firms that keep the dividend constant ("*continues*") and firms that reduce dividends ("*decreases*"). To ensure that the dividend decision is announced in $Q1_{t+1}$ or $Q2_{t+1}$, we excluded firms with financial year end different from the calendar year end.

The calculated market-to-book ratios are relatively stable. For dividend decreasing companies, we find a positive reaction to the announcement of dividend decreases. The ratio rises continuously from $Q4_t$ to $Q2_{t+11}$. On the other hand, the median market-to-book of "increasers" falls steadily until $Q2_{t+1}$. This translates into negative change rates, as depicted at the bottom part of the table. Initially, dividend increasers have higher market-to-books, but starting in $Q4_t$, they get surpasses by companies with constant dividends. However, the difference between the two groups is not significant. Especially the fact that in the periods following the dividend decision, increasers do not significantly outperform the remaining companies in the sample is troubling for the signaling and agency theory. Their market-to-book seems to have the highest growth rate in $Q2_{t+1}$ but also in this case the difference is not significant.

Examining the dynamics of the median quarterly returns provides further evidence against the view that dividend increases contain some sort of fundamental information. We could not detect any significant upward shift at the time when dividend increases are announced. Adjusting the return measure for overall market movements does not change the pattern.

In summary, our results show that the market does not react to the announcement of dividend increases. The "missing" stock market reaction indicates that dividend increases are not considered relevant information for the company's valuation.

Contrary to the evidence we presented, studies with US data tend to report a positive long-term stock market reaction to dividend increases. In an early work, Charest (1978) found a 4% abnormal return in the two years after a dividend increase announcement. Although there are some limitations to his study because of the time period analyzed, a positive market reaction to dividend increases was also documented by Michaely, Thaler, and Womack (1995) or Grullon, Michaely, and Swaminathan (2002).

However, one should not be quick to interpret these results as supportive for the information-based view of the dividend policy. First of all, a positive market reaction is only a necessary condition for signaling or agency, not a sufficient one. This leads us to the more basic question of what kind of information the dividends are supposed to convey. In two prominent papers, Benartzi, Michaely, and Thaler (1997) and Benartzi, Grullon, Michaely, and Thaler (forthcoming) demonstrated convincingly that dividend increases are not associated with significant earnings improvements in the next years. This implies that the dividend decision does not convey information about future earnings and profitability. Rather, it seems that it is associated with changes in the risk profile of dividend increasing companies. Venkatesh (1998) reports a decline in the overall volatility of returns when firms commence dividend payments. Grullon, Michaely, and Swaminathan (2002) found that firms that increased dividends experienced a significant decline in systematic risk, while dividend decreasing companies exhibited a significant increase in systematic risk. However, the idea that dividends are meant to reveal a lower risk cannot explain why the dividend decision is preceded by negative stock price returns.

A further problem is that all studies found that prices continued to drift in the same direction in the year following an announcement. The existence of a drift implies that even if dividends convey valuable information, the market does not get the full extent of the signal immediately, as predicted by the rationality assumption of the models. This may cast doubts on the validity of the results if one believes that the stock market is efficient. In particular, the presence of post-dividend announcement drift may indicate that the return measures are biased, for instance because they are based on misspecified asset pricing models and, therefore, do not control for changes in the risk profile (Fama (1998), Boehme and Sorescu (2002)). For those who are not convinced of the efficiency of the market, the post-announcement drift could indicate the presence of market undervaluation at the time when dividends were increased rather than positive stock market reaction. Although ex-post measures of misvaluation are subject to several critiques (Baker, Ruback, and Wurgler (2005)), the pattern could be thought of as evidence for the notion that dividend increases reflect management's attempt to prevent the shareholders from selling their stocks in times when the firm is undervalued (Allen and Michaely (2003)).

Finally, although international studies of the long-term post-announcement performance are rare, their results are not always consistent with the US evidence. Gunasekarage and Power (2002) report that UK companies, which announce a reduction in dividends (and earnings) outperform their dividend increasing counterparts. This implies that dividend reduction is a stronger signal of positive future prospectives, which is exactly the opposite of what the information-based theories predict. A similar pattern is uncovered by Gwilym, Seaton, and Thomas (2004). They found that the stock price performance of non-increasers is superior to the price return of dividend increasers.

5.2 Dividend Changes and Future Profitability

In this section, we examine a second prediction of the asymmetric information models, that dividend increases are followed by higher profitability in the post-announcement period. We study the relation between future earnings changes and the dividend decision using a regression-analysis framework where we can control for the expectations of the market. In order to mitigate concerns about model misspecification, we test two different regressions.

The linear model of Nissim and Ziv (2001) allows for asymmetric reaction to dividend increases and decreases and controls for uniform mean reversion and momentum in earnings. Our second regression specifications controls for potential non-linearities in the time series of earnings. Following Benartzi, Grullon, Michaely, and Thaler (forthcoming), we examine the relation between dividend changes and earnings changes using the partial adjustment model of Fama and French (2000).

We start with the regression specification that Nissim and Ziv (2001) use in their study. Specifically, we estimate the following regression model:

$$CE_1 = \alpha_0 + \alpha_{1p}DPC + \alpha_{1n}DNC + \alpha_2 ROA_0 + \alpha_3 CE_0 + \varepsilon \tag{3}$$

CE_1 stands for the change in earnings from 0 to 1: $CE_1 = (Y_1 - Y_0)/TA_0$, where Y_t is operating profit in year t and TA_0 is the book value of assets at the end of year 0. DPC (DNC) is a dummy variable that takes the value of 1 for positive (negative) dividend changes and 0 otherwise, ROA_0 is equal to operating profit in year 0, scaled by total assets at the end of year 0.

Our second regression specification explicitly accounts for potential non-linearities in the evolution of earnings. It assumes that earnings changes can be written as follows:

$$\begin{aligned} CE_1 = {} & \beta_0 + \beta_{1p}DPC + \beta_{1n}DNC + \\ & + (\gamma_1 + \gamma_2 NDFED_0 + \gamma_3 NDFED_0 * DFE_0 + \gamma_4 PDFED_0 * DFE_0) * DFE_0 + \\ & + (\lambda_1 + \lambda_2 NCED_0 + \lambda_3 NCED_0 * CE_0 + \lambda_4 PCED_0 * CE_0) * CE_0 + \varepsilon \end{aligned} \tag{4}$$

DFE_0 is equal to $ROA_0 - E[ROA_0]$, where $E[ROA_0]$ is the fitted value from the cross-sectional regression of ROA_0 on the logarithm of total assets in year -1, the logarithm of the market-to-book ratio in year -1, and ROA_{-1}. $NDFED_0$ ($PDFED_0$) is a dummy variable that takes the value of 1 if DFE_0 is negative (positive) and 0 otherwise. $NCED_0$ ($PCED_0$) is a dummy variable that takes the value of 1 if CE_0 is negative (positive) and 0 otherwise.

Specification 4 builds on the existing empirical literature for the US, which suggests that the earnings process is highly non-linear (Brooks and Buckmaster (1976), Elgers and Lo

(1994), Fama and French (2000)). As discussed by Fama and French (2000), the model is designed to capture the fact that large changes in earnings revert faster than small changes and that negative changes revert faster than positive changes. Benartzi, Grullon, Michaely, and Thaler (forthcoming) demonstrate convincingly that assuming linearity when the true functional form is non-linear might leave out important information, which seems to be correlated with dividend changes. As a result, the estimates of a linear model are likely to be biased.

Table 8 reports our results. The first column contains the estimates of Equation (3). Unlike Nissim and Ziv (2001), we find no evidence that dividend changes contain information about future earnings. The coefficients for DPC and DNC are not significantly different from zero. Somewhat surprisingly, we document a strong reversal pattern in the evolution of earnings. The estimated coefficients of ROA_0 and CE_0 are both significantly negative, which suggests that positive earnings changes and higher profitability in year 0 are associated with negative earnings changes in the future. This contrasts to the results of US-studies (Nissim and Ziv (2001), Benartzi, Grullon, Michaely, and Thaler (forthcoming)), where earnings changes in the year after the dividend announcement are found to be positively related to contemporaneous earnings changes.

The second column reports the estimates of (4). The evidence in the table indicates that the behavior of profitability is highly non-linear. The corresponding coefficients of the most of the measures in (4) were found to be significantly different from zero. Thus, it seems that the linear model indeed ignores important information about the evolution of earnings. In line with conjecture, we find that the non-linear model explains a larger fraction of the cross-sectional variation in earnings changes than the linear model. The adjusted R-squared increases from 0.051 to 0.208. Again, we do not detect any evidence of a signaling power of the dividend decision. The coefficients on dividend increases and decreases are neither economically nor statistically significant.

Overall, it seems that dividend changes do not convey any information about future earnings changes. The results of the regression analysis suggest that the dividend decision is not associated with unexpected changes of the future operating performance. In turn, this implies that the documented negative relation between the probability for dividend increases and the stock price return can be hardly thought of as evidence in favor of the asymmetric-information models.

5.3 Do Dividends Matter More in Declining Markets?

Fuller and Goldstein (2005) demonstrate that dividend-paying stocks outperform non-dividend-paying stocks in declining markets and attribute this phenomenon to varying investors' preferences. If investors' preferences depend on the state of the market, with investors valuing dividends more in declining markets, then a company may boos its market value by announcing dividend increases. To investigate this hypothesis, we calculate the return of dividend increasing companies in up and down markets and compare it to the price performance of firms with stable dividends. Table 9 summarizes the results.

The first part of the table depicts the return of dividend-paying and of non-dividend-paying stocks. In addition to showing results for the whole market (in the first row), the table presents evidence for the years where the market was classified as declining or advancing. In order to ensure the robustness of our results, we adopted two measures of declining markets. We partition the sample according to the annual or to the annual adjusted return of the CDAX index. The later measure is defined as the difference between the return of the CDAX and the REX index. The next two parts of the table compare the return of dividend-increasing and dividend-maintaining stocks in the year before the dividend announcement (second part of the tables) and for the year when the dividend decision is announced.

The results indicate that in declining markets dividend-payers significantly outperform non-dividend paying stocks. Depending of how we define declining markets, the difference is either 0.216 or 0.204. However, in advancing markets we get the reverse picture. Now, non-dividend-paying stocks outperform; the return difference is again significant at the 1%-level. For the overall sample, we detect a slight outperformance of dividend-paying stocks. However, because of the asymmetric stock price development in advancing and declining markets, the difference between the two groups is not significant.

While the first part of the table backs the idea of Fuller and Goldstein (2005) that in declining market investors may trade dividend payers at a premium, the remaining two parts demonstrate that this can hardly offer an explanation for our findings. Regardless of how we proxy for down markets, we do not find any evidence of a superior stock price performance of dividend increasing companies. For all the cases examined, dividend increasers exhibit lower returns than firms with stable dividends. In the pre-announcement period, they perform significantly worse in down markets, which is not surprising given our results. However, even after the dividend decision is announced, the numbers in the table do not suggest any preferential treatment by the investors.

5.4 Catering Theory

The last alternative explanation that we investigate is the catering theory of dividend policy. The empirical analysis of the catering theory centers on the so-called dividend premium. The dividend premium is the difference between the logs of aggregate market-to-book ratio of dividend payers and the market-to-book ratio of non-dividend payers. We specify this measure in two different ways. The equally weighted dividend premium averages the market-to-books across payers and non-payers in each year. The value-weighted dividend premium is the difference between the logs of the weighted sums of market-to-book of dividend payers and non-payers; the associated weight equals the ratio of the company's market value to the sum of the market values of dividend payers or non-payers.[9] A potential drawback of this variable is that it may not only proxy for investors' sentiment toward dividends, but also reflect the relative investment opportunity of dividend payers and non-dividend payers. To mitigate this problem, we also regress the market-to-book to the current growth of the company and formulate the dividend premium using the residuals from that regression.

Table 10 incorporates the measures in a logit regression. The relation between the two dividend-premium measures and the increase decision does not behave in the way hypothesized by the catering theory. The estimated coefficients in (1) and (2) are not significant and do not have the same sign. Thus, our results are more in line with the findings of Dittmar and Dittmar (2004) who showed that the dividend premium does not explain changes of aggregate dividends in the US. Unlike Lie and Li (2005), we do not find any evidence that, on the individual level, firms are more likely to increase dividends when the dividend premium

[9] The time series of our dividend premium measures closely resembles those constructed by Denis and Osobov (2005) in their international study of dividend policy.

is large. The partly conflicting evidence may be due to the different institutional settings (especially the role of the stock market) but may also stem from the problem that the market-to-book ratio includes information about the profitability of investment. A major problem for all sentiment measures based on market-to-book ratios is that the market-to-book may serve as a proxy for existing irrational overvaluation but may also just represent a rational valuation of the current or expected growth of the company. In our case, this means that the logged difference between the market-to-books of dividend payers and non-payers may also represent the different growth prospects of the two kinds of firms, and not necessarily reflect the market sentiment for dividend payments.

We approach this problem in two ways. First, we try to isolate the two potential effects by controlling for the current growth rate of dividend payers and non-payers in the regression. To ensure the robustness of the results, we apply two growth measures. We include the current growth rate of the total assets of payers and non-payers in the regression. In addition, we also use the difference between the logs of the aggregated capital expenditures (deflated by total assets). In our second strategy, we regress the companies' market-to-book ratios on the current assets growth or capital expenditures measure and use the residuals from the regression to compute a proxy for the dividend premium. Since it turned out that the so calculated (and equally weighted) market-to-book ratio of non-payers might become negative, we construct a proxy, which is slightly different than the original one. In particular, our measure is equal to the mean market-to-book of non-payers, divided by the mean market-to-book of dividend payers. Since this measure increases if the market valuation of non-payers increases, we will refer to it as "dividend discount." If the sentiment manifests itself in the market-to-book ratios in the way predicted by the catering theory, we should obtain a negative coefficient for the dividend discount variable.

However, our results do not support this hypothesis. As shown by specifications (3) to (6), the estimated slopes of the dividend discount variables are mostly not significant. This holds regardless of the adjustment method applied. Thus, the poor performance of the dividend premium measure does not seem to be caused by potential conflicts between the two overlapping effects it may stand for. It may rather be due to the different corporate governance structures in Germany, compared to those in the US. The results of Denis and

Osobov (2005) offer some support for this hypothesis. In a cross-country comparison of the time trends in the dividend policy, they documented a systematic difference in the time series of the dividend premium between the common law and civil law countries. Since civil law countries are largely believed to rely more on debt than on equity financing, it is possible that the market-to-book ratio does not play such a vital role in the management's decisions.

6 Robustness Check

6.1 Time Series Issues

A potential problem of our data is the changing composition of the sample. The number of firms goes from 67 in 1982 to over 600 in 2002. The last four years account for nearby 40% of all firm-year observations while, on the other hand, for the years between 2000 and 2002 the CDAX and the DAX index generate a negative return. To verify that our results are not driven by the end of sample period, we repeated our analysis including year dummies or using Fama-Macbeth (Fama and MacBeth (1973)) style regressions to capture potential year fixed effects. Tables 11 and 12 report the results.

The two type of regression estimations generate similar results. Overall, controlling for time fixed effects does not yield the nature of our findings. The first three columns in Tables 11 and 12 study the increase decision. Size, (past) profitability, and past dividends are again deemed the most important fundamental factors. The coefficients of the return measure exhibit similar behavior as in the specifications without fixed effects. We detect a significantly negative relation between the stock price performance in the year before the dividend announcement and the probability for dividend increases. Including year fixed effects seems to increase the explanatory power of our specification. Although Pseudo-R^2s are known to be imperfect measures of overall explanatory power, the R^2s in Table 11 are all in the 10% region for models that include year dummies, versus the $7.5\% - 8\%$ for regressions without year dummies.

The econometric model of dividend decreases (specifications (4) to (6)) is not robust to introducing time fixed effects in the regression. Including year dummies renders the most of the fundamental variables insignificant. In Table (11), the proxy for negative earnings is the only one variable with significant coefficient in all the specifications examined. On the other hand, estimating the model using Fama-Macbeth methodology suggests a negative impact of the capital expenditures and a positive impact of the past dividends on the decrease decision. However, regardless of the methodology applied, we estimate qualitatively similar coefficients of the return measure.

6.2 Ordinal Logit Models

Following Amihud and Li (2002) and Correia da Silva, Goergenand, and Renneboog (2005), we also modeled the dividend decision as an ordinal variable. We estimated an ordered logit model, where the dependent variable takes the values +1, 0, or -1 if the dividend decision is an increase, no change, or decrease, compared to the dividend in the previous year. As an advantage of this model, is has been often claimed that it explicitly takes into account the ordinal nature of dividend decision (Correia da Silva, Goergenand, and Renneboog (2005)). However, a major drawback of the approach is that it assumes that the effects of the explanatory variables on the cumulative response probabilities are constant across all categories of the ordinal response. That is, it states that the independent variables have the same effect on the increase and on the decrease decision. However, our results so far suggest that this can hardly be the case. Decreases and increases seem to be inherently different, with different driving forces behind the two decision. Applying some standard statistical tests provides further support for this view: for instance, the likelihood ratio test computes a chi-square of 256.68. We attempt to take care of that problem by estimating the ordered logit model using the more general procedure of Peterson and Harrell (1990) that allows for a impact of the explanatory variables across categories.

Table 13 summarizes our results. The first three columns contain the estimates of the standard ordinal logit model, the remaining models present the regression coefficients computed using the generalized procedure. In (4) and (6), we compare dividend decreases with constant dividends, (5) and (7) study the differences between dividend increasers and firms with constant dividends. The evidence in the Table supports our previous results: in (2) and (5), the coefficient of R_{12} is negative and significant. Thus, the effect of the stock price performance on the dividend increase decision seems to be robust to alternative modelings of the dividend decision.

6.3 Changes of the number of shares outstanding

As a final robustness check, we examine different measures of stock price performance and dividends. The modified measures deviate form those used so far in the way they take into account changes of the number of shares .

Our empirical approach centered on a dividend-increase-dummy derived from changes of the amount spent on dividends. As outlined above, one may use a measure based on the dividends per share instead. This may lead to a different classification of dividend-paying firms if the number of shares outstanding changes. Which measure is more appropriate is not clear. Therefore, it is necessary to examine whether our results are affected by the way we define dividend changes. In order to do so, we repeated the main regressions of our analysis, defining dividend changes as changes of the dividends per share. Table 14 summarizes the results.

In the first three columns, the independent variable is a dummy which takes the value 1 if the dividends per share in t are higher than the dividends per share in $t-1$. If the two numbers are equal and positive, the independent variable is equal to zero.

Although we use a modified measure of dividend increases, the results are qualitatively the same as in Section 4.2. Specification 1, which is the basic model, demonstrates that dividend increases are largely due to higher profitability and bigger size. Larger former dividends reduce the probability for increases. Again, we document a negative relation between the dividend decision and current individual stock price performance. Consistent with our previous results, we do not find a significant impact of the price development in the past. The dividend decision is not affected by the return in the pre-announcement year, either.

To verify that our results are not driven by return measures improperly corrected for stock splits, we regressed the dividend decision on the annual change of the company's market value. The market value is defined as stock price at the end of the year, multiplied by the number of shares outstanding. Table 15 presents the regression results. In general, the overall picture is not affected by the way we measure the stock price performance. The estimates closely resemble the estimates of the previous regressions. For dividend increases, the coefficient of R_{12} remains negative and significant.

7 Conclusion

A great deal of research has been devoted to understanding why firms pay dividends. The traditional view, embodied in the Miller-Modigliani theory, does not allow for a dividend policy since it rules out any impact of the dividends paid on the firm's value. Asymmetric-information models emphasize the role of dividends as methods to convey good news or to mitigate existing agency problems. However, empirical attempts to verify these theories uncovered ambiguous evidence.

In this paper, we took a different approach. Instead of looking for some sort of potential impact of the dividend policy on the market value of the company, we state that it is the market dynamic that drives the dividend increase decision. Thus, we claim that one should study not only the effect of dividend payments on the price but also examine the inverse relationship. Dividend increases seem to be, at least partly, driven by poor stock price returns. The subsequent discussion demonstrated that the documented pattern can hardly be explained by signaling or agency theories. In addition, we could not find any evidence supporting the catering theory.

In summary, the impact of the stock price performance on the dividend decision in Germany closely resembles the negative sensibility of repurchase activity to stock price changes in the US or in Canada. Numerous studies have found that current undervaluation (or at least,the perceived undervaluation) plays an important role in the management's decision to repurchase (see, e.g. Netter and Mitchell (1989) or Ikenberry, Lakonishok, and Vermaelen (2000)). This suggests that in Germany, where share repurchases were hardly restricted, dividends may share common functions with share buybacks. In turn, this implies that the negative sensitivity of share repurchase activity should be attributed not only to "smart" managers, trying to take advantage of a temporary mispricing (as in Stein (1996)), but may be also because the management intends to compensate shareholders for the poor stock price performance.

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Table 1: **Increasers by year**

Table 1 details the number of dividend increases and the number of control events by year. The first column displays the number of companies in the sample in every year. The next six columns contain the number of dividend increasing (dD>0) and decreasing (dD<0) firms as well as the number of companies that do not change the dividend (dD=0). A dividend increase is defined as a higher ordinary cash dividend, compared to the dividend paid out in the previous year. The corresponding figures are derived either from the amount spent on dividend payments (first three columns) or from the dividends per share (the next three columns in the Table).

		Amount Spent on Div.			**Div. Per Share**		
Year	# Comp.	dD>0	dD=0	dD<0	dD>0	dD=0	dD<0
1982	67	28	15	11	20	12	22
1983	67	27	16	12	24	14	17
1984	72	33	16	7	29	14	13
1985	85	40	18	6	36	15	13
1986	91	46	18	9	40	15	18
1987	97	45	27	5	38	25	14
1988	112	32	36	10	33	30	15
1989	175	38	45	9	32	36	24
1990	206	79	46	17	65	34	43
1991	221	102	42	20	91	33	40
1992	224	109	46	24	96	42	41
1993	237	87	63	30	75	54	51
1994	261	90	49	44	83	37	63
1995	283	116	33	38	101	30	56
1996	296	125	44	30	102	34	63
1997	326	109	38	47	92	36	66
1998	374	124	56	29	110	45	54
1999	473	154	46	44	130	38	76
2000	594	150	47	57	129	37	88
2001	658	178	27	61	166	22	78
2002	619	145	31	69	139	29	77
2003	557	122	20	73	113	17	85
Total	6095	1979	779	652	1744	649	1017

Table 2: **Summary statistics of accounting variables of dividend paying firms**

Table 2 details the means of size, assets growth, capital expenditures, market-to-book, ebit, operating profit, leverage ratio, volatility of operating profit, free cash flows, and age for all the companies that increase (*Increases*), decrease (*Decreases*), or maintain (*Continues*) the dividend. The significance of the difference between the means is estimated using a two-tailed t-test. The corresponding p-values are reported in the last two rows.

(Mean)	*size*	*d(TA)/TA*	*Cap.Exp*	*MtB*	*EBIT/TA*	*d(EBIT)/TA*	*OP/TA*	*Debt/TA*	*s(OP/TA)*	*Free CF*	*Age*
Decreases	0,608	0,080	0,080	1,970	0,060	-0.015	0,015	0,191	0,035	0,079	13,034
Continues	0,550	0,097	0,091	2,213	0,076	0.001	0,027	0,169	0,029	0,104	12,104
Increases	0,637	0,155	0,095	2,320	0,091	0.000	0,046	0,188	0,030	0,107	12,857
p-values											
Incr.=Decr.	0,016	0,021	0,043	0,006	0,000	0.000	0,000	0,729	0,069	0,000	0,632
Incr.=Cont.	0,000	0,046	0,587	0,388	0,000	0.813	0,000	0,011	0,797	0,468	0,023

Table 3: **Summary statistics of market variables of dividend paying firms**

Table 3 details the means of dividend yield (D/P), total return, and stock price return for companies that increase (*Increases*), decrease (*Decreases*), or maintain (*Continues*) the dividend. Stock price return is the December-to-December return. The Total Return variable TR(Div_t) is equal to stock price return plus the return due to dividends ($\mathrm{D}_t/\mathrm{P}_{t-1}$). TR($\mathrm{Div}_{t-1}$) is the (hypothetical) total return to the shareholders if the dividend payment is left unchanged. The significance of the difference between the means is estimated using a two-tailed t-test. The corresponding p-values are reported in the last two rows.

(Mean)	Div_t/TA	DPS_t	*Div. Yield*	$TR(Div_t)$	$TR(Div_{t-1})$	R_{12}	R_{12}-$Mean(R_{12})$
Decreases	1,88%	2,96	16,81%	1,64%	4,90%	-1,66%	-0,95%
Continues	2,79%	9,35	32,11%	8,02%	8,02%	3,66%	1,38%
Increases	2,53%	6,47	26,22%	2,64%	0,88%	-2,26%	0,45%
p-values							
Incr.=Decr	0,000	0,102	0,079	0,658	0,036	0,738	0,415
Incr.=Cont	0,624	0,365	0,261	0,013	0,000	0,000	0,558

Table 4: **Logit analysis of the dividend-increase decision**

Table 4 presents the estimates of a logit regression model that relates the dividend-increase-decision to a set of firm-specific financial characteristics and different measures of the stock price performance. The dependent variable is equal one if the company increases the dividend (and pays dividends in the year before) and is equal zero if the dividend is held constant. R_{12} is the annual return of the company, measured from December to December. R_{06} is the annual return of the company, measured from June to June. All regressions include industry dummies to control for potential industry impact. The reported p-values are derived using robust Huber/White/Sandwich variance estimator. * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

	(1)	*(2)*	*(3)*	*(4)*	*(5)*
size	1.204***	1.218***	1.224***	1.190***	1.228***
	(0,000)	(0,000)	(0,000)	(0,000)	(0,000)
d(TA)/TA	0,139	0,108	0,105	0,145	0,09
	(0,187)	(0,244)	(0,199)	(0,198)	(0,240)
MtB	0.035*	0.047*	0.035*	0.037*	0,03
	(0,066)	(0,069)	(0,091)	(0,069)	(0,107)
EBIT/TA	1,641	1,658	2.087*	1.883*	1.869*
	(0,126)	(0,136)	(0,061)	(0,076)	(0,092)
$EBIT_{t-1}/TA_{t-1}$	8.909***	8.987***	8.416***	8.799***	8.494***
	(0,000)	(0,000)	(0,000)	(0,000)	(0,000)
Neg. EBIT	-0,037	-0,115	-0,070	-0,074	-0,047
	(0,902)	(0,702)	(0,814)	(0,806)	(0,873)
Debt/TA	0,244	0,158	0,211	0,185	0,262
	(0,469)	(0,641)	(0,538)	(0,586)	(0,445)
Cap. Exp.	0,329	0.366*	0,348	0.363*	0,334
	(0,121)	(0,082)	(0,109)	(0,096)	(0,117)
Div_{t-1}/TA_{t-1}	-29.352***	-30.331***	-30.184***	-30.102***	-29.283***
	(0,000)	(0,000)	(0,000)	(0,000)	(0,000)
Constant	-0.426*	-0.441*	-0.411*	-0.417*	-0.416*
	(0,056)	(0,051)	(0,069)	(0,063)	(0,064)
R_{12}		-0.470***			
		(0,000)			
$R_{12,\ t-1}$			-0,156		
			(0,156)		
R_{06}				-0.299***	
				(0,009)	
$R_{06,\ t-1}$					0,145
					(0,217)
Observations	2702	2702	2596	2692	2584
Pseudo R^2	0,074	0,079	0,073	0,075	0,073

Table 5: **Logit analysis of the dividend-increase decision**

Table 5 presents the estimates of a logit regression model that relates the dividend-increase-decision to aggregate market movements. The dependent variable is equal one if the company increases the dividend (and pays dividends in the year before) and is equal zero if the dividend is held constant. In all specifications, aggregate measures of market movements are added to the basic model of Table 4. All regressions include industry dummies to control for potential industry impact. The reported p-values are derived using robust Huber/White/Sandwich variance estimator. * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

	(1)	(2)	(3)	(4)	(5)	(6)
size	1.150***	1.073***	1.158***	1.162***	1.232***	1.234***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
d(TA)/TA	0.114	0.151	0.13	0.131	0.128	0.127
	(0.206)	(0.197)	(0.191)	(0.191)	(0.209)	(0.209)
MtB	0.039**	0.041**	0.036*	0.036*	0.040*	0.040*
	(0.049)	(0.044)	(0.068)	(0.069)	(0.063)	(0.062)
EBIT/TA	1.47	1.554	(1.605)	(1.613)	1.669	1.668
	(0.184)	(0.147)	(0.137)	(0.134)	(0.117)	(0.118)
$\text{EBIT}_{t-1}/\text{TA}_{t-1}$	9.178***	8.951***	8.962***	8.944***	8.918***	8.923***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Neg. EBIT	-0.076	-0.162	-0.041	-0.039	-0.072	-0.073
	(0.800)	(0.587)	(0.891)	(0.896)	(0.811)	(0.809)
Debt/TA	0.116	-0.018	0.193	0.206	0.227	0.226
	(0.734)	(0.958)	(0.568)	(0.541)	(0.500)	(0.504)
Cap. Exp.	0.34	0.399*	0.342	0.344	0.34	0.337
	(0.101)	(0.100)	(0.105)	(0.105)	(0.108)	(0.110)
$\text{Div}_{t-1}/\text{TA}_{t-1}$	-30.916***	-31.934***	-29.965***	-29.840***	-29.511***	-29.520***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.357	-0.266	-0.335	-0.342	-0.476**	-0.480**
	(0.110)	(0.242)	(0.132)	(0.123)	(0.033)	(0.031)
$\text{Mean}(\text{R}_{12})$	-0.920***					
	(0.000)					
$\text{Mean}(\text{R}_{06})$		-1.522***				
		(0.000)				
CDAX			-0.476***			
			(0.005)			
DAX				-0.396**		
				(0.014)		
$\text{R}_{12}\text{-Mean}(\text{R}_{12})$					-0.224**	
					(0.043)	
$\text{R}_{12}\text{-CDAX}$						-0.224**
						(0.035)
Observations	2702	2692	2702	2702	2702	2702
Pseudo R^2	0.08	0.085	0.076	0.076	0.075	0.075

Table 6: **Logit analysis of the dividend-increase decision**

Table 6 presents the estimates of a logit regression model of the dividend-decrease-decision. The dependent variable is equal one if the company increases the dividend (and pays dividends in the year before) and is equal zero if the dividend is held constant.. All regressions include industry dummies to control for potential industry impact. The reported p-values are derived using robust Huber/White/Sandwich variance estimator. * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
size	0.979***	0.993***	1.111***	0.994***	0.978***	0.943***	0.962***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
d(TA)/TA	-0.189	-0.199	-0.552**	-0.165	-0.212	-0.199	-0.184
	(0.223)	(0.197)	(0.049)	(0.284)	(0.175)	(0.197)	(0.237)
MtB	-0.019	-0.015	-0.01	-0.009	-0.017	-0.018	-0.022
	(0.421)	(0.538)	(0.679)	(0.726)	(0.481)	(0.448)	(0.356)
EBIT/TA	-1.177	-1.116	-0.069	-0.713	-1.267	-(1.218)	-1.227
	(0.328)	(0.354)	(0.955)	(0.561)	(0.297)	(0.314)	(0.314)
$EBIT_{t-1}/TA_{t-1}$	1.773	1.708	0.62	1.364	1.748	1.658	1.794
	(0.222)	(0.228)	(0.643)	(0.316)	(0.213)	(0.236)	(0.220)
Neg. EBIT	0.745**	0.725**	0.660**	0.694**	0.707**	0.724**	0.755**
	(0.011)	(0.013)	(0.029)	(0.018)	(0.015)	(0.013)	(0.010)
Debt/TA	0.309	0.278	0.295	0.166	0.267	0.237	0.315
	(0.442)	(0.490)	(0.482)	(0.684)	(0.499)	(0.547)	(0.433)
Cap. Exp.	-2.005*	-1.951*	-2.603**	-1.891*	-1.969*	-1.986*	-2.038*
	(0.075)	(0.082)	(0.038)	(0.092)	(0.079)	(0.073)	(0.070)
Div_{t-1}/TA_{t-1}	0.657	0.612	0.340	0.514	0.606	0.601	0.676
	(0.850)	(0.840)	(0.750)	(0.808)	(0.808)	(0.817)	(0.850)
Constant	-0.587*	-0.596**	-0.634**	-0.622**	-0.556*	-0.487	-0.560*
	(0.055)	(0.048)	(0.038)	(0.036)	(0.062)	(0.104)	(0.071)
R_{12}		0.091					
		(0.687)					
$R_{12,\ t-1}$			-0.334				
			(0.139)				
R_{06}				-0.173			
				(0.439)			
Mean(R_{12})					-0.139		
					(0.712)		
CDAX						-0.203	
						(0.454)	
R12-Mean(R12)							0.188
							(0.367)
Observations	1390	1390	1333	1387	1390	1390	1390
Pseudo R^2	0.048	0.049	0.063	0.053	0.05	0.051	0.048

Table 7: **Market to Book and Annual Return around Dividend Increases: Categorical Analysis**

The table presents mean market-to-book values, mean yearly changes in market-to-book, and mean annual returns for three types of companies. Each firm-year observation with positive past and current dividends is assigned to one of the following groups. Decreasers reduce the dividend, the group "Continue pay" contains dividend payers that keep the level of the dividend payment unchanged, increasers are firms that increase the dividend. Firms with a financial year end deviating from the calendar year end are excluded.

	$Q3_t$	$Q4_t$	$Q1_{t+1}$	$Q2_{t+1}$	$Q3_{t+1}$	$Q4_{t+1}$		$Q3_t$	$Q4_t$	$Q1_{t+1}$	$Q2_{t+1}$	$Q3_{t+1}$	$Q4_{t+1}$
(Median)	(MV+Debt)/(BE+Debt)							R_{12}					
Decreases	1.47	1.43	1.49	1.52	1.46	1.45	Decreases	-2.92%	-3.45%	1.43%	1.82%	-2.93%	-2.60%
Continues	1.65	1.63	1.62	1.69	1.61	1.53	Continues	-1.03%	-2.29%	2.36%	2.88%	-1.28%	-2.81%
Increases	1.71	1.61	1.57	1.63	1.60	1.52	Increases	-3.89%	-3.77%	1.68%	3.36%	-2.36%	-3.03%
p-values							p-values						
Incr.=Decr.	0.000	0.000	0.076	0.032	0.014	0.032	Incr.=Decr.	0.127	0.729	0.665	0.097	0.607	0.763
Incr.=Const.	0.180	0.528	0.965	0.961	0.762	0.708	Incr.=Const.	0.000	0.016	0.158	0.821	0.032	0.990
	(MV+Debt)/(BE+Debt)							R_{12}-Mean(R_{12})					
Decreases	-2.15%	-2.45%	2.32%	1.13%	-1.93%	-1.74%	Decreases	2.73%	0.77%	-0.11%	1.14%	1.44%	-0.21%
Continues	-0.61%	-1.31%	0.32%	1.79%	-0.43%	-1.47%	Continues	1.44%	0.40%	-0.99%	0.67%	1.84%	0.23%
Increases	-2.84%	-2.65%	-1.03%	2.29%	-1.59%	-2.10%	Increases	0.75%	-0.43%	-0.33%	2.12%	0.63%	-0.62%
p-values							p-values						
Incr.=Decr.	0.076	0.698	0.000	0.177	0.729	0.688	Incr.=Decr.	0.027	0.468	0.571	0.129	0.971	0.713
Incr.=Const.	0.000	0.007	0.099	0.903	0.016	0.959	Incr.=Const.	0.402	0.038	0.878	0.151	0.309	0.355

Table 8: **The Relationship between Market Valuation and the Dividend Decision**

The table reports the estimates of Models (3) and (4). The dependent variable CE_1 is the change in earnings from year 0 to year 1, scaled by the book value of total assets at the end of year 0, $E_1/TA_0$is earnings before interests and taxes in year 1 divided by the book value of total assets at the end of year 0. DPC (DNC) is a dummy variable that takes the value of 1 for dividend increases (decreases) and 0 otherwise. CE_0 is the change in earnings from year -1 to year 0, scaled by the book value of total assets at the end of year -1. The earnings in t are measure by the operating profit in t. DFE_0 is equal to ROA_0-E[ROA_0], where ROA_0 is equal to the operating profit in 0, scaled by the book value of total assets at the end of year 0. E[ROA_0] is equal to the fitted value from the cross-sectional regression of ROA_0 on the logarithm of total assets in year -1, the logarithm of the market-to-book ratio in year -1, and ROA_{-1}. $NDFED_0$ ($PDFED_0$) is a dummy variable that takes the value of 1 if DFE_0 is negative (positive) and 0 otherwise. $NCED_0$ ($PCED_0$) is a dummy variable that takes the value of 1 if CE_0 is negative (positive) and 0 otherwise. All regressions include industry dummies to control for potential fixed effects. The reported p-values are derived using robust Huber/White/Sandwich variance estimator. * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

	CE_1 Overall	CE_1 Overall
ROA	-0.422***	
	(0.000)	
DFE		0.039
		(0.816)
NDFED*DFE		-0.629***
		(0.006)
NDFED*DFE*DFE		0.577***
		(0.000)
PDFED*DFE*DFE		-0.154
		(0.623)
CE	-0.670***	-0.111
	(0.000)	(0.424)
NCED*CE		0.370*
		(0.058)
NCED*CE*CE		0.351**
		(0.041)
PCED*CE*CE		0.041
		(0.676)
Constant	0.000	0.001
	(0.988)	(0.828)
DPC	0.028	-0.002
	(0.254)	(0.477)
DNC	0.072	-0.008
	(0.447)	(0.185)
Observations	2451	2451
R^2	0.051	0.208

Table 9: **Average Return for Advancing and Declining Markets**

The Table reports the average annual return to dividend- and non-dividend-paying stocks (firts part) as well as the average annual return for dividend increasing stocks and stocks with unchanged dividens. The returns are computed for the whole sample and for the subsamples identified as advancing or declining markets. Advancing markets are the years when the CDAX index earned a positive return or a higher return than the REX index.

Payers	Non-Payers	Difference	p-value	CDAX	CDAX (adj)
-0.011	-0.035	0.024	0.142		
-0.111	-0.326	0.216	0.000	-0.210	
0.054	0.259	-0.205	0.000	0.256	
-0.092	-0.296	0.204	0.000		-0.234
0.089	0.316	-0.228	0.000		0.255
dD>0	dD=0	Difference	p-value	CDAX	CDAX (adj)
-0.023	0.037	-0.059	0.000		
-0.115	-0.054	-0.061	0.013	-0.210	
0.040	0.086	-0.046	0.040	0.256	
-0.095	-0.035	-0.059	0.002		-0.234
0.071	0.111	-0.040	0.155		0.255
dD>0	dD=0	Difference	p-value	CDAX	CDAX (adj)
-0.014	0.035	-0.048	0.005		
-0.110	-0.067	-0.044	0.079	-0.210	
0.052	0.095	-0.043	0.053	0.256	
-0.090	-0.064	-0.027	0.196		-0.234
0.075	0.156	-0.081	0.003		0.255

Table 10: **The Increase Decision, Dividend Premium and Investment Opportunities**

In Table 10, we relate the increase decision to the dividend-premium measure. In addition, we try to disentangle the sentiment for dividend payment from the relative valuation of the current or future growth perspectives of dividend payers by controlling for the current growth rate of dividend payers and nonpayers. d(TA)/TA (P) (d(TA)/TA (NP)) is the mean assets growth rate of payers (nonpayers). Cap. Exp. Diff. is the log difference between the mean capital expenditures of payers and non-payers in t (deflated by the total assets). Div. Disc.(dTA/TA) is equal to the mean modified market-to-book of non-payers, divided by the mean modified market-to-book of payers. The modified market-to-book is computed from the residuals of a regression that relates the market-to-book ratio to the assets growth. Div. Disc. (Cap. Exp.) is calculated in the same way. * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

	(1)	(2)	(3)	(4)	(5)	(6)
size	1.087***	1.104***	0.995***	1.104***	0.989***	1.088***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
d(TA)/TA	0.134	0.136	0.118	0.133	0.128	0.133
	(0.195)	(0.199)	(0.191)	(0.202)	(0.186)	(0.197)
MtB	0.034**	0.035**	0.034**	0.034**	0.035**	0.034**
	(0.029)	(0.032)	(0.026)	(0.031)	(0.026)	(0.030)
EBIT/TA	1.593	1.62	(1.417)	(1.606)	1.501	(1.585)
	(0.136)	(0.129)	(0.185)	(0.133)	(0.158)	(0.138)
$\text{EBIT}_{t-1}/\text{TA}_{t-1}$	9.331***	9.273***	9.410***	9.304***	9.312***	9.319***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Neg. EBIT	-0.004	0.01	-0.043	0.004	-0.033	-0.004
	(0.988)	(0.972)	(0.883)	(0.990)	(0.909)	(0.989)
Debt/TA	0.367	0.414	0.252	0.398	0.274	0.375
	(0.272)	(0.214)	(0.456)	(0.236)	(0.418)	(0.260)
Cap. Exp.	0.263	0.261	0.285	0.261	0.311	0.264
	(0.182)	(0.185)	(0.156)	(0.184)	(0.130)	(0.179)
$\text{Div}_{t-1}/\text{TA}_{t-1}$	-29.919***	-29.542***	-30.910***	-29.601***	-30.659***	-29.798***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.348*	-0.281	-0.367	-0.329	-0.135	-0.326
	(0.099)	(0.193)	(0.130)	(0.118)	(0.541)	(0.122)
Div. Prem	-0.033		-0.014		-0.035	
	(0.568)		(0.809)		(0.563)	
Div. Prem. (vw.)		0.033				
		(0.340)				
d(TA)/TA (P)			0.574			
			(0.542)			
d(TA)/TA (NP)			0.318			
			(0.170)			
Div. Disc.(dTA/TA)				0.003		
				(0.757)		
Cap. Exp. Diff.					-0.530***	
					(0.004)	
Div. Dsic. (Cap. Exp)						-0.005
						(0.631)
Observations	2702	2702	2702	2702	2702	2702
Pseudo R^2	0.069	0.069	0.072	0.069	0.071	0.069

Table 11: **Dividend Decision and Year Dummies**

Table 11 presents the estimates of a logit regression model that relates the dividend decision to current and past individual stock price movements. In the first three specifications, the dependent variable is equal one if the company increases the amount spent on dividends (and pays dividends in the year before) and is equal zero if the dividends are held constant. Models (4) to (6) examine the decrease decision. R_{12} is the annual return of the company, measured from December to December. All regressions include industry dummies to control for potential industry impact and year dummies to capture potential year fixed effects. The reported p-values are derived using robust Huber/White/Sandwich variance estimator. * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

	(1)	(2)	(3)	(4)	(5)	(6)
size	0.924***	0.931***	0.972***	0.505	0.508	0.689**
	(0.000)	(0.000)	(0.000)	(0.103)	(0.102)	(0.032)
d(TA)/TA	0.195	0.181	0.146	-0.098	-0.100	-0.331
	(0.204)	(0.234)	(0.228)	(0.548)	(0.541)	(0.210)
MtB	0.050**	0.056**	0.048**	-0.001	0.000	0.003
	(0.012)	(0.020)	(0.021)	(0.975)	(0.999)	(0.916)
EBIT/TA	1.518	1.581	1.926*	-2.034*	-2.018	-(1.021)
	(0.188)	(0.149)	(0.094)	(0.096)	(0.102)	(0.421)
$EBIT_{t-1}/TA_{t-1}$	9.554***	9.528***	9.031***	1.133	1.120	0.144
	(0.000)	(0.000)	(0.000)	(0.426)	(0.430)	(0.919)
Neg. EBIT	-0.242	-0.28	-0.254	0.432**	0.429**	0.421**
	(0.425)	(0.356)	(0.401)	(0.017)	(0.017)	(0.019)
Debt/TA	-0.299	-0.323	-0.302	-0.689	-0.693	-0.663
	(0.425)	(0.388)	(0.422)	(0.114)	(0.112)	(0.151)
Cap. Exp.	0.711	0.723	0.803	-0.929	-0.917	-1.785
	(0.249)	(0.238)	(0.232)	(0.379)	(0.388)	(0.120)
Div_{t-1}/TA_{t-1}	-36.376***	-36.709***	-36.718***	0.003	0.000	-0.070
	(0.000)	(0.000)	(0.000)	(0.996)	(0.999)	(0.883)
Constant	-0.474	-0.469	-0.477	-0.054	-0.056	-0.099
	(0.218)	(0.222)	(0.217)	(0.916)	(0.913)	(0.849)
R_{12}		-0.277**			-0.031	
		(0.048)			(0.872)	
$R_{12,\ t-1}$			-0.006			-0.734*
			(0.962)			(0.091)
Observations	2702	2702	2596	1390	1390	1333
Pseudo R^2	0.11	0.111	0.109	0.114	0.114	0.12

Table 12: **Robustness check of the relation between the dividend decision and the stock price evolution: Fama-MacBeth estimates**

Table 12 the estimates of a logit regression model that relates the dividend decision to current and past individual stock price movements. In the first three specifications, the dependent variable is equal one if the company increases the amount spent on dividends (and pays dividends in the year before) and is equal zero if the dividends are held constant. Models (4) to (6) examine the decrease decision. R_{12} is the annual return of the company, measured from December to December. The logit regression is estimated for each year. The Table shows means (across years) of the regression coefficients, and t-statistics for the means, defined as the mean divided by its standard error. * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

	(1)	(2)	(3)	(4)	(5)	(6)
size	0.834***	0.788**	0.93***	1.205***	0.959	1.696*
	(2.762)	(2.452)	(3.184)	(2.900)	(1.275)	(1.797)
d(TA)/TA	0.654	0.654	0.636	0.378	-0.292	-0.817
	(1.508)	(1.637)	(1.472)	(0.309)	-(0.188)	-(0.556)
MtB	0.032	0.066	0.029	-0.296	-0.291	-0.389
	(0.491)	(0.913)	(0.455)	-(1.511)	-(1.459)	-(1.211)
EBIT/TA	4.034	5.042	(4.845)	-16.592	-21.518	-(26.960)
	(1.258)	(1.423)	(1.613)	-(1.579)	-(1.307)	-(1.084)
$EBIT_{t-1}/TA_{t-1}$	9.901***	9.746***	9.663***	-1.755	2.229	3.653
	(3.101)	(2.965)	(3.351)	-(0.180)	(0.131)	(0.169)
Neg. EBIT	-0.272	-0.271	-0.368	0.382	0.437*	0.429
	-(1.056)	-(0.983)	-(1.470)	(1.488)	(1.678)	(1.610)
Debt/TA	2.505	2.919	2.637	2.498	4.978	3.691
	(1.200)	(1.183)	(1.259)	(1.441)	(1.334)	(1.258)
Cap. Exp.	-0.632	-0.735	-0.635	-8.053*	-13.202*	-13.534*
	-(0.517)	-(0.568)	-(0.506)	-(1.811)	-(1.754)	-(1.677)
Div_{t-1}/TA_{t-1}	-40.139***	-43.838***	-41.451***	82.372**	74.796**	116.525**
	-(3.965)	-(3.977)	-(4.150)	(2.412)	(2.409)	(1.971)
Constant	-0.129	-0.118	-0.209	-0.637**	0.235	-0.904*
	-(0.322)	-(0.294)	-(0.530)	-(2.036)	(0.389)	-(1.881)
R_{12}		-0.703***			-1.062	
		-(2.598)			-(1.126)	
$R_{12,\ t-1}$			-0.260			-2.368
			-(0.957)			-(1.032)

Table 13: **Ordered logit analysis of the relation between the decision to increase dividends and the stock price evolution**

Table 13 presents the estimates of an ordinal logit regression model that relates the dividend decision to current and past individual stock price movements. The dependent variable is equal 1 if the company increases the dividends (and pays dividends in the year before), 0 if the dividends are constant, and -1 if the dividends are decreased. R_{12} is the annual return of the company, measured from December to December. All regressions include industry dummies to control for potential industry impact. The reported p-values are derived using robust Huber/White/Sandwich variance estimator. * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
size	0.655*	0.670*	0.668*	0.081	1.048***	0.023	0.784***
	(0.036)	(0.031)	(0.038)	(0.646)	(0.000)	(0.895)	(0.000)
d(TA)/TA	0.161	0.136	0.321*	0.17	0.122	0.638**	0.279
	(0.208)	(0.250)	(0.041)	(0.240)	(0.293)	(0.005)	(0.065)
MtB	0.035*	0.042*	0.028	0.047	0.04	0.035	0.040*
	(0.047)	(0.044)	(0.131)	(0.095)	(0.103)	(0.143)	(0.022)
EBIT/TA	1.324	1.426	(1.095)	1.39	0.584	1.124	(0.956)
	(0.264)	(0.272)	(0.389)	(0.057)	.	(0.222)	(0.225)
$EBIT_{t-1}/TA_{t-1}$	5.486	5.422	5.27	1.767*	4.868***	3.385***	7.051***
	(0.093)	(0.099)	(0.087)	(0.034)	(0.000)	(0.000)	(0.000)
Neg. EBIT	-0.725**	-0.769**	-0.701**	-0.986***	-0.726***	-0.738***	-0.644**
	(0.006)	(0.004)	(0.008)	(0.000)	(0.000)	(0.000)	(0.001)
Debt/TA	0.092	0.03	0.074	-0.012	0.315	-0.063	0.196
	(0.768)	(0.926)	(0.820)	(0.963)	(0.147)	(0.809)	(0.373)
Cap. Exp.	0.949	0.977	1.191	2.218**	0.837	2.400**	0.764
	(0.150)	(0.139)	(0.073)	(0.003)	(0.125)	(0.002)	(0.155)
Div_{t-1}/TA_{t-1}	-15.384	-15.735	-12.844	-3.973***	-4.091	-4.916***	-21.697***
	(0.433)	(0.427)	(0.528)	(0.000)	.	(0.000)	(0.000)
cut1	-(0.548)	-(0.538)	-(0.521)				
	(0.127)	(0.133)	(0.167)				
cut2	0.662*	0.677*	0.702*				
	(0.031)	(0.027)	(0.031)				
Constant				0.991***	-0.905***	0.962***	-0.626***
				(0.000)	(0.000)	(0.000)	(0.000)
R_{12}		-0.327**		-0.136	-0.340**		
		(0.002)		(0.278)	(0.001)		
$R_{12,\ t-1}$			0.230			0.593***	0.117
			(0.064)			(0.000)	(0.253)
Observations	3338	3338	3198	3338		3198	
Pseudo R^2	0.044	0.046	0.043	0.046		0.057	

Table 14: **Dividends per Share**

Table 14 presents the estimates of a logit regression model that relates the dividend decision to current and past individual stock price movements. In the first three specifications, the dependent variable is equal one if the company increases the dividends per share (and pays dividends in the year before) and is equal zero if the dividends are held constant. Models (4) to (6) examine the decrease decision. R_{12} is the annual return of the company, measured from December to December. All regressions include industry dummies to control for potential industry impact. The reported p-values are derived using robust Huber/White/Sandwich variance estimator. * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

	(1)	(2)	(3)	(4)	(5)	(6)
size	1.382***	1.422***	1.400***	1.432***	1.473***	1.507***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
d(TA)/TA	0.237	0.201	0.186	0.426*	0.363	0.327
	(0.213)	(0.305)	(0.349)	(0.069)	(0.116)	(0.162)
MtB	0.031	0.045	0.036	0.032	0.056	0.036
	(0.108)	(0.109)	(0.136)	(0.159)	(0.121)	(0.151)
EBIT/TA	1.606	1.626	(1.976)	-0.177	0.102	(0.406)
	(0.169)	(0.175)	(0.105)	(0.891)	(0.937)	(0.760)
$\text{EBIT}_{t-1}/\text{TA}_{t-1}$	8.985***	9.116***	8.499***	2.588**	1.991	1.917
	(0.000)	(0.000)	(0.000)	(0.042)	(0.115)	(0.129)
Neg. EBIT	-0.062	-0.15	-0.093	0.519*	0.394	0.486
	(0.850)	(0.647)	(0.775)	(0.089)	(0.197)	(0.116)
Debt/TA	0.347	0.252	0.365	0.586	0.434	0.689*
	(0.339)	(0.493)	(0.330)	(0.144)	(0.295)	(0.095)
Cap. Exp.	0.236	0.286	0.251	-1.004	-0.966	-1.159
	(0.225)	(0.143)	(0.196)	(0.183)	(0.206)	(0.157)
$\text{Div}_{t-1}/\text{TA}_{t-1}$	-29.478***	-30.352***	-30.003***	0.059	-0.014	-0.005
	(0.000)	(0.000)	(0.000)	(0.910)	(0.976)	(0.991)
Constant	-0.459*	-0.489**	-0.454*	-0.608**	-0.617**	-0.645**
	(0.054)	(0.044)	(0.060)	(0.013)	(0.015)	(0.010)
R_{12}		-0.528***			-0.095	
		(0.000)			(0.547)	
$R_{12,\ t-1}$			-0.085			-0.923***
			(0.467)			(0.000)
Observations	2342	2342	2250	1622	1622	1555
Pseudo R^2	0.083	0.088	0.082	0.048	0.069	0.047

Table 15: **Alternative Measure of Stock Price Performance**

Table 15 presents the estimates of a logit regression model that relates the dividend-increase-decision to current and past individual stock price movements.The dependent variable is equal one if the company increases the amount spent on dividends (and pays dividends in the year before) and is equal zero if the dividends are held constant. MV_t is the market value of the company, defined as the stock price at the end of year t multiplied by the number of shares outstanding in t. All regressions include industry dummies to control for potential industry impact and year dummies to capture potential year fixed effects. The reported p-values are derived using robust Huber/White/Sandwich variance estimator. * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

	(1)	(2)	(3)	(4)	(5)	(6)
size	1.204***	1.208***	1.225***	0.979***	0.992***	1.092***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
d(TA)/TA	0.139	0.135	0.069	-0.189	-0.199	-0.661**
	(0.187)	(0.197)	(0.303)	(0.223)	(0.199)	(0.018)
MtB	0.035*	0.040*	0.029	-0.019	-0.014	-0.019
	(0.066)	(0.072)	(0.104)	(0.421)	(0.555)	(0.415)
EBIT/TA	1.641	1.661	(1.787)	-1.177	-1.054	-(0.702)
	(0.126)	(0.121)	(0.106)	(0.328)	(0.380)	(0.564)
$EBIT_{t-1}/TA_{t-1}$	8.909***	8.960***	8.506***	1.773	1.674	1.07
	(0.000)	(0.000)	(0.000)	(0.222)	(0.237)	(0.428)
Neg. EBIT	-0.037	-0.072	-0.039	0.745**	0.704**	0.673**
	(0.902)	(0.810)	(0.896)	(0.011)	(0.016)	(0.024)
Debt/TA	0.244	0.235	0.269	0.309	0.316	0.512
	(0.469)	(0.484)	(0.429)	(0.442)	(0.430)	(0.205)
Cap. Exp.	0.329	0.347	0.329	-2.005*	-1.975*	-2.654**
	(0.121)	(0.109)	(0.120)	(0.075)	(0.079)	(0.033)
Div_{t-1}/TA_{t-1}	-29.352***	-29.634***	-29.264***	0.657	0.606	0.422
	(0.000)	(0.000)	(0.000)	(0.850)	(0.842)	(0.770)
Constant	-0.426*	-0.427*	-0.422*	-0.587*	-0.578*	-0.588*
	(0.056)	(0.057)	(0.059)	(0.055)	(0.055)	(0.051)
$(MV_t-MV_{t-1})/MV_{t-1}$		-0.149**			-0.192	
		(0.049)			(0.705)	
$(MV_{t-1}-MV_{t-2})/MV_{t-2}$			0.160*			0.005
			(0.071)			(0.949)
Observations	2702	2702	2596	1390	1390	1333
Pseudo R^2	0.074	0.076	0.074	0.048	0.05	0.052