Reconsidering dividend announcement returns: The role of investor expectations

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Abstract

We document market anticipation of dividend changes and show that more anticipated dividend changes are associated with lower announcement returns. This anticipation effect is stronger for firms that have a higher proportion of institutional ownership. By neglecting anticipation, short-term event studies systematically understate the true value effects of dividend changes. We also find that dividend increases are more anticipated than dividend decreases and that correcting for this explains the well-documented asymmetry in their market reactions. Moreover, we find that dividend changes are associated with information spillovers to industry rivals. These spillovers are more pronounced for rivals that are more likely to change their dividend in the same direction as the announcing firm.

Keywords- Anticipation, Dividend increases, Dividend decreases, Announcement returns, Institutional investors, Information spillovers

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1 Introduction

A well-established stylized fact in the literature on dividend policy is that announcements of changes in dividends affect firm value and therefore convey valuable information to the capital market. Dividend increases and initiations are associated with positive stock price reactions, and dividend decreases and omissions are associated with more pronounced negative price reactions[1]. Prior literature has provided multiple explanations for the market reaction to dividend change announcements, including cash flow signalling (Denis, Denis and Sarin, 1994; Yoon and Starks, 1995; Lee and Mauck, 2016 and Ham, Kaplan and Leary, 2020), the free cash flow agency problem (Lang and Litzenberger, 1989; Grullon, Michaely and Swaminathan, 2002 and Officer, 2011), firm maturity (Grullon, Michaely and Swaminathan, 2002) and dividend clienteles and catering (Bajaj and Vijh, 1990; Denis, Denis and Sarin, 1994; Baker and Wurgler, 2004 and Li and Lie, 2006).

A common characteristic in this literature is that it primarily relies on announcement-period CARs as a measure of the market's assessment of the information content of dividend changes. This dependence on CARs in cross-sectional tests implicitly assumes a naive dividend expectations model, whereby a dividend change in its totality is a surprise to investors. Such a model includes an assumption that the market reaction to the announcement of a dividend change is an unbiased estimate of the market's assessment of its information content.

However, assuming that corporate events such as dividend changes are a complete surprise to investors requires strong assumptions on market efficiency. Under a semi-strong-form efficient market, investors can have expectations, based on publicly available information, on the likelihood of a dividend change event. If dividend events are partially anticipated, announcement returns will not fully capture the market's perception of the information content of dividend changes, since anticipated event-related information is already impounded into prices prior to the actual announcement. Announcement returns may therefore be biased downwards in absolute terms, and any relationship between announcement-period price reactions and cross-sectional determinants of payout policy is likely to be obscured by such bias.

This paper attempts to fill a gap in the literature by answering the question of whether

[1] See for example Aharony and Swary, 1980; Asquith and Mullins, 1983; Ofer and Siegel, 1987; Healy and Palepu, 1988; Kothari, Shu and Wysocki, 2009 and Baker, Mendel and Wurgler, 2015.

investors anticipate announcements of dividend changes. Using a sample of 11,134 dividend increases and 2,074 dividend decreases and omissions for NYSE/NASDAQ-listed firms between 1967 and 2015, we present evidence that is consistent with investors anticipating dividend change announcements. We therefore argue that by ignoring the fact that market participants anticipate dividend changes, short-term event studies that are typically used in the literature systematically understate the true value effects of dividend changes.

Our main proxy for anticipation is the probability to increase and decrease/omit dividends, estimated using a multinomial logit model that captures firms' dividend payout choice as a function of publicly available information. In out of sample tests, the prediction model works well in identifying firms that are most likely to change their dividends in the same direction. Univariate sorts of the estimated probabilities to increase and decrease/omit dividends show a monotonically increasing incidence of dividend changes as we move from the bottom quintile to the top quintile of the probability to increase and decrease/omit dividends.

More importantly, we present evidence of announcement-period CARs representing investors' updating of prior beliefs on the likelihood of a dividend change event, rather than its full information content. For dividend increases, a one standard deviation increase in the probability of a dividend increase attenuates announcement period CARs by 0.16%. For dividend decreases, a one standard deviation increase in the probability of a dividend decrease attenuates announcement period CARs by 0.64%. Given that the average announcement period CARs of dividend increases and decreases is 0.98% and -3.35% respectively, the effect size of anticipation on announcement returns is economically large. Using an alternative measure of anticipation based on the Lintner's (1956) partial adjustment model also confirms the negative relationship between anticipation and the magnitude of announcement-period CARs.

We also examine whether sophisticated investors are more capable of anticipating dividend change announcements. Motivated by prior literature which shows that institutional investors are generally more sophisticated investors who are more capable of processing accounting information (Hand, 1990; Walther, 1997; Balsam, Bartov and Marquardt, 2002; Ke and Petroni, 2004 and Amihud and Li, 2006), we use the percentage of institutional ownership as a proxy for investor sophistication. Consistent with institutional investors being more capable of forming expectations of and anticipating dividend change announcements, we find that the anticipation effect is stronger for firms with high institutional ownership.

Having provided evidence that investors anticipate dividend change announcements, we then move to examining the implications of the existence of investor anticipation on the well-established asymmetry in market reactions between dividend increases and decreases. We find that dividend increases are, on average, considerably more anticipated than dividend decreases/omissions, with an estimated probability to increase dividends of 23.16% compared to an estimated probability of 4.38% to decrease/omit dividends. Since anticipation implies that announcement-period CARs are downward-biased estimates of the true value effects of dividend changes, it may be inaccurate to conclude that dividend decreases are necessarily associated with higher value effects without correcting for anticipation. We examine whether correcting for this asymmetry in anticipation between dividend increases and decreases/omissions can explain why market reactions to dividend decreases/omissions are generally more pronounced than dividend increases.

Sorting all dividend change events by quintiles of their predicted probabilities, we find that as dividend changes become more predictable, the differences between announcement period CARs of dividend increases and decreases significantly declines. While the magnitude of dividend decrease CARs are, on average, larger than dividend increase CARs by 5.03%, we find that these differences shrink and become a statistically insignificant difference of 0.88% for dividend changes in the top quintile of predictability. Multivariate regression tests confirm our univariate findings that the asymmetry in market reactions between dividend increases and decreases attenuates once we control for the asymmetry in predictability between dividend increases and decreases.

We corroborate our story by also examining spillover CARs to industry rivals of firms that change their dividends. Consistent with Firth (1996), Laux, Starks and Yoon (1998) and Howe and Shen (1998), we find that dividend change events are associated with intra-industry spillovers that translate into market reactions for rival firms belonging to the same four-digit SIC code as the announcing firms. For rivals of dividend increasing firms, we find a small negative market reaction of 4.8 basis points, consistent with a competitive effect of dividend increase announcements on rival firms. A dividend increase can reveal a competitive advantage for the announcing firm relative to its rivals. For rivals of dividend decreasing firms, we find a negative market reaction of 11.1 basis points, consistent with a contagion effect of dividend decrease announcements on rival firms, where a dividend decrease reveals adverse industry-wide news.

While the magnitudes of these effects are small on average (consistent with Laux, Starks and Yoon, 1998), we find sizable cross-sectional variation in market reactions across rivals depending on the rivals' ex-ante probability to increase or decrease their dividends. Sorting rivals of dividend increasing firms by quintiles of their ex-ante probability to increase their dividends, we find that that the negative market reaction is confined to rival firms that are most likely to increase their dividends but do not. This suggests that market participants adversely assess rival firms that are perceived to be most likely to increase their dividends relative to firms that actually increase their dividends. For rivals of dividend decreasing firms, we find that negative market reaction is concentrated with rival firms that are most likely to decrease their dividends, suggesting that the negative spillover effect of dividend decreases reflects investors anticipating an impending dividend decrease announcement for rival firms that are ex-ante most likely to do so. These results are further confirmed in a multivariate setting. Our findings therefore suggest that dividend change announcements provide information on the likelihood that rival firms will change their dividend in the same direction as the announcing firm.

Overall, our results can be summarized as follows: (1) We show that investors partially anticipate dividend change announcements, and incorporate these expectations into market reactions. This suggests that announcement period CARs are a biased estimate of the information content of dividend changes; (2) Institutional investors are more capable of anticipating dividend changes; (3) Correcting for asymmetry in predictability between dividend increases and decreases partially explains the asymmetry in market reactions between dividend increases and decreases. It is therefore inaccurate to make conclusions on the asymmetry in market reactions without correcting for the asymmetry in predictability between dividend increases and decreases; and (4) Previously documented intra-industry spillovers associated with dividend increases and decreases/omissions are partially driven by investors revising their expectations on the likelihood of a dividend change in the same direction for rival firms.

Our paper contributes to the literature in several ways. First, we add to the literature on the cross-sectional determinants of market reactions to dividend change announcements. To the extent that dividend changes are anticipated by the market, the market reaction to the actual announcement reflects market participants updating their prior beliefs about the event rather than reflecting the full information content of the dividend change. By showing that market participants can and do anticipate dividend changes, we argue that short-run event studies, which is the typical method of choice in the literature examining market reactions to dividend announcements, systematically understate the market's evaluation of the information content of dividend changes. Further and as a result, any relationship between price reactions and cross-sectional determinants of payout policy is likely to be obscured by noise induced by the downward bias in announcement-period CARs.

Second, we contribute to the literature on market anticipation of corporate events, by examining a relatively underexplored corporate event in this literature. Bessembinder and Zhang (2015) analyze the time-series pattern of stock dividends, stock splits and dividend increases, and find that managers have a tendency to announce them on the anniversary of a similar announcement by the firm. They show that the market does not seem to fully appreciate the time-series recurrence of these events at the firm-level. Andres and Hofbaur (2017) find that firms are increasingly following a four-quarter cycle in announcing dividend increases, leading to attenuated announcement reactions to dividend increases. This four-quarter cycle however does not apply to dividend decreases, due to the managerial reluctance to cut dividends. Our analysis complements the findings of Bessembinder and Zhang (2015) and Andres and Hofbaur (2017), by showing that market participants actively utilize public information to anticipate both dividend increases and decreases, leading to attenuated announcement period returns for both events. While Andres and Hofbaur (2017) find no evidence of calendar-time predictability of dividend decreases, we show that dividend decreases can be anticipated based on firm characteristics that inform the propensity to pay dividends. We also add to this literature by showing that the implications of anticipation extend beyond returns of announcing firms, to returns of their industry rivals.

Third, our paper adds to the literature on the determinants of the asymmetric market reactions between good news and bad news. Kothari, Shu and Wysocki (2009) show that managerial tendency to withhold bad news partially explains why market reactions to negative earnings and dividend news are more pronounced than positive earnings and dividend news. Baker, Mendel and Wurgler (2015) use prospect theory to show that the marginal investor is loss averse, and this loss aversion explains why market reactions to dividend decreases are more pronounced than dividend increases. We add to this literature by showing that the asymmetry in predictability between dividend increases and decreases can partially explain why market reactions to dividend decreases are more pronounced than dividend increases.

Finally, our paper adds to the literature on intra-industry information transfers (Firth, 1996; Laux, Starks and Yoon, 1998; and Howe and Shen, 1998; for dividend changes; Bradley and Yuan, 2013 for SEOs; Hsu, Reed and Rocholl, 2010 for IPOs; Cai, Song and Walking, 2011 for M&As; and Gande and Lewis, 2009 for class action lawsuits). We show that in the context of dividend changes, spillover CARs to rival firms reflect information about the likelihood that rival firms will change their dividends.

The remainder of this paper is as follows. Section 2 outlines the hypothesis development. Section 3 describes our data, sample selection criteria and our proxies for anticipation. Section 4 presents our empirical results. Section 5 concludes.

2 Hypothesis Development

Implicit in the assumption of short-run event studies is that the market reaction to corporate events unbiasedly captures their valuation effect. However, under a semi-strong form efficient market, investors can form expectations on the likelihood of a corporate event based on publicly available information. Prior literature has shown that certain firm characteristics are related to the propensity to pay (or not pay) dividends (Fama and French, 2001; DeAngelo, DeAngelo and Stulz, 2006; Denis and Osobov, 2008; Hoberg and Prabhala, 2009; Grullon, Paye Underwood and Weston, 2011). Since these firm characteristics are primarily publicly available information that investors observe, we contend that dividend changes can to a reasonable extent be predicted based on this information set. Indeed, DeAngelo, DeAngelo and Skinner (1994), Lie (2005), Li and Lie (2006), Kale, Kini and Payne (2012), von Eije, Goyal and Muckley (2014) and Bessmbinder and Zhang (2015) find that dividend changes can be predicted based on such publicly available information.

However, even if events are predictable, whether market participants recognize this predictability is a different question. Bessembinder and Zhang (2015) find that even though certain corporate distributions are recurrent in nature, the market fails to fully recognize this, leading to an exploitable trading strategy that yields abnormal returns. Andres and Hofbaur (2017) find that the market partially recognizes that dividend increases follow a recurrent four-quarter cycle, leading to attenuated market reactions for more recurrent dividend increases. Therefore, predictability of an event does not necessarily imply that investors recognize it. This brings us to the first hypothesis:

H_1 : Markets recognize that dividend changes are predictable and account for this predictability in announcement-period reactions.

To the extent that H_1 holds, the degree to which investors anticipate corporate events such as dividend changes is related to how sophisticated they are. In particular, prior literature establishes that institutional investors play an important informational role in financial markets (e.g., Boehmer and Kelley, 2009, Holden and Subrahmanyam, 1992, Sias and Starks, 1997). In the context of earnings, Campbell, Ramadorai and Schwartz (2009) show that institutional investors anticipate earnings surprises and post-earnings announcement drift. More closely related to this paper, Amihud and Li (2006) document a declining information content of dividend increases that is related to the increase in institutional holdings for dividend increasing firms. To that end, we hypothesize that the anticipation effect is more pronounced for announcing firms with a higher proportion of institutional holdings. This brings us to the following hypothesis:

H_2 : Investor anticipation is more pronounced for firms with a higher proportion of institutional holdings.

A consequence of anticipation is that short-run event studies that are typically used systematically understate the market's perception of the information content of dividend increases and decreases. The size of the bias would therefore increase for events that are more anticipated by the market. A stylized fact associated with dividend change CARs is that announcement-period reactions to dividend decreases are more pronounced than dividend increases. However, to the extent that H_1 holds, it might be inaccurate to make conclusions about the asymmetry in market reactions between dividend increases and decreases if the bias due to anticipation is not corrected for. This brings us to the following hypothesis:

***H_3* : The asymmetry in market reactions between dividend increases and decreases attenuates after controlling for the probability of the event occurring.**

The consequences of anticipation however may extend beyond that of announcing firms to that of industry rivals. Prior literature shows that dividend increases and decreases are associated with valuation effects to industry rivals of announcing firms (Firth, 1996; Laux, Starks and Yoon, 1998; and Howe and Shen, 1998). Industry spillovers are based on the idea that the decision to increase dividends is partially influenced by dividend increases by other industry peers (Grennan, 2019), whereas dividend decrease/omission decisions can be made in response to a negative industry-wide shock. Therefore, when a firm changes its dividends, it may signal information that extends beyond the announcing firm to its industry rivals, leading to spillover valuation effects to these rivals.

The direction of the spillover effect however, can go both ways. One is a contagion effect in which good (bad) news for an announcing firm translates into good (bad) news for its industry rivals, or a competitive effect where good (bad) news for an announcing firm translates into bad (good) news for its industry rivals. In the context of a dividend increase event, market reactions to industry rivals of announcing firms may be positive, in anticipation of impending dividend increases for rivals. In contrast, a dividend increase event may reflect a competitive advantage of the announcing firm vis-a-vis its rivals, and/or a disappointment that rivals have not increased their dividends, leading to negative market reactions to rival firms. In the context of a dividend decrease/omission event, market reactions to industry rivals may be negative, in anticipation of impending dividend decreases/omissions for rivals. On the other hand, a dividend decrease/omission event may reflect a competitive advantage of rival firms who have managed to maintain their dividends vis-a-vis the announcing firm, leading to positive market reactions for rivals.

Regardless of the direction of the spillover effect, we posit that the spillover valuation effects on rivals reflects, amongst other things, information related to rival firms' likelihood to change their dividends in the same direction[2]. Therefore, market reactions to rival firms

[2]The conjecture that spillover CARs are associated with event anticipation for rival firms has been

are more pronounced for rival firms that are, ex-ante, more likely to change their dividends in the same direction as the announcing firm. This brings us to the following set of hypothesis:

$\boldsymbol{H_{4a}}$ **: Dividend increase and decrease announcements are associated with valuation effects for industry rivals of announcing firms.**

$\boldsymbol{H_{4b}}$ **: The valuation effects on rival firms are more pronounced for rivals that are perceived by the market to be more likely to change their dividends in the same direction as the announcing firm.**

3 Data and Sample Construction

3.1 Sample

Our sample comprises quarterly dividend announcements of firms listed on NYSE, AMEX and NASDAQ between 1967 and 2015. We obtain data on daily returns and dividend announcements from the Center for Research in Security Prices (CRSP). To be included in the sample, the dividend announcement must meet the following criteria:

a) The firm's financial data are available on CRSP and Compustat;

b) The firm pays quarterly taxable cash dividends (Distribution code 1232);

c) Dividend increases and decreases are defined as quarterly changes that are no less than 12.5%. The lower bound of 12.5% parallels Grullon, Michaely and Swaminathan (2002) to ensure that only economically significant dividend changes are included;

d) Dividend increases that are more than 500% are excluded from the sample.

e) For dividend omissions, we manually collect the announcement dates from the Wall Street Journal (WSJ), Nexis and Factiva;

f) Only ordinary shares domiciled in the US are included (Share codes 10 and 11);

g) The firm does not pertain to regulated utilities (SIC codes 4900-4949) or financial firms (SIC codes 6000-6999)

Table 1 presents the annual breakdown of our sample of dividend events that satisfy our criteria. Our sample comprises of 11,134 dividend increases, 1,492 dividend decreases and 582 dividend omissions for a total of 13,208 dividend events.

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confirmed in Cai, Song and Walking (2011) and Tunyi (2021) for M&As, and in Gande and Lewis (2009) for class-action lawsuits.

[PLEASE INSERT TABLE 1 HERE]

3.2 Estimating measures of anticipation

On each dividend date, dividend-paying firms choose between three different decisions: increase the dividend, maintain the current dividend, or decrease/omit the dividend. This choice between the three alternatives is informed by the management's information set, which comprises of a combination of public and private information. Since it is only the former that can be observed by investors, we estimate the probability to increase or decrease/omit a dividend using publicly available information that is observable by investors. Investors then revise their expectations of the information content of the dividend event when the actual announcement is made.

Prior literature has shown that certain firm characteristics are related to the propensity to pay (or not pay) dividends. These characteristics include (1) Profitability (Fama and French, 2001; Denis and Osobov,2008; Grullon, Paye Underwood and Weston, 2011); (2) Growth Opportunities (Fama and French, 2001; Denis and Osobov,2008; Grullon, Paye Underwood and Weston, 2011); (3) Size (Fama and French, 2001; Denis and Osobov,2008; Grullon, Paye Underwood and Weston, 2011); (4) Firm risk (Hoberg and Prabhala, 2009); Cash flow uncertainty (Chay and Suh, 2009) and (5) Financial slack (DeAngelo, DeAngelo and Stulz, 2006 and Brockman and Unlu, 2009). It is these characteristics which we use to proxy for investors' information set that allows them to predict a probability to increase or decrease a dividend.

We run 49 multinomial logit models (one for each year from 1967 to 2015) to simultaneously estimate the probability to increase or decrease/omit a dividend on a recursive basis: For each year t, we run the model for the full sample of firms up until the year $t-1$ and use the coefficients obtained to compute the probability of a dividend increase or decrease for year t, which helps alleviate look-ahead bias[3]. We thus run the following model:

[3]We use annual rather than quarterly data to estimate the probabilities to change dividends due to the stylized fact that dividends are sticky (Lintner, 1956): Managers are particularly reluctant to reduce dividends, and are reluctant to make changes in dividends that are likely to be reversed (Brav, Graham, Harvey and Michaely, 2005). We therefore argue that, given the stickiness in payout policy, dividend change decisions would only be made based on long-lived changes in fundamentals, which would be more appropriately represented using annual data as compared to quarterly data.

$$
\begin{aligned}
D_{i,t} = {} & \alpha_0 + \alpha_1 * TA_{i,t-1} + \alpha_2 * RETE_{i,t-1} + \alpha_3 * BHAR_{i,t-1} + \alpha_4 * IRISK_{i,t-1} + \alpha_5 \\
& * SRISK_{i,t-1} + \alpha_7 * ROA_{i,t-1} + \alpha_8 * MB_{i,t-1} + \alpha_9 * LTDTA_{i,t-1} + \alpha_{10} * CATA_{i,t-1} \\
& + \alpha_{11} * SDROA_{i,t-1} + \alpha_{11} * DTA_{i,t-1} + \alpha_{12} * AGE_{i,t-1} + \alpha_{13} * T1 + \alpha_{14} * T2
\end{aligned} \tag{1}
$$

Where $D_{i,t}$ is an indicator variable that is set equal to 1 for dividend increasing firms, 0 for firms that do not change their dividends and 2 for firms that decrease or omit their dividends in fiscal year t. A firm is defined as a dividend increasing firm if it had at least one announcement of a dividend increase during fiscal year t, a firm is defined as a dividend decreasing firm if it had at least one announcement of a dividend decrease during fiscal year t and a firm is defined as a non dividend-changing firm if it does not announce any dividend increase or decrease during fiscal year t. Firm-years that included both dividend increases and decreases in the same fiscal year are excluded from the sample. The variables are fully defined in table A1.

To examine the overall relationship between firm characteristics and the propensity to increase/decrease dividends, we initially implement the multinomial logit model on the full sample period. The sign of the coefficient estimates in table 2 are largely consistent with priors. Dividend increasing firms tend to be larger (higher TA), have higher past returns ($BHAR$), lower idiosyncratic risk ($IRISK$), higher return on assets (ROA), lower market-to-book ratios (MB), higher cash holdings ($CATA$), less volatile earnings ($SDROA$) and higher growth in assets (ΔTA). Dividend decreasing firms tend to be smaller (lower TA), have poorer past returns ($BHAR$), higher idiosyncratic risk ($IRISK$), lower return on assets (ROA), lower market-to-book ratios (MB), higher leverage ($LTDTA$), lower cash holdings ($CATA$), more volatile earnings ($SDROA$) and lower changes in the size of total assets (ΔTA).

[PLEASE INSERT TABLE 2 HERE]

Next, we examine the predictive power of our multinomial logit model in estimating the probability of a dividend increase/decrease using the recursive method. For each fiscal year t, we use the estimated coefficients for the full sample period ending in fiscal year $t-1$ to estimate the probability of a dividend increase/decrease. Then for each year, we sort firms by quintiles of the estimated probability to increase/decrease dividends. We then examine the payout policies of firms in each quintile group to verify that our method is capturing firms that are more likely to increase/decrease dividends. The results in table 3 confirms that our method successfully distinguishes firms that are most likely to increase dividends and decrease/omit dividends.

Panel A presents the results for the sorts on the estimated probability to increase dividends. We find that the number and proportion of dividend increase announcements increases considerably as we move from the first quintile to the fifth quintile. For quintile 1, a total of 956 dividend increase announcements have been made, which accounts for only 3.93% of the total number of dividend announcements made by firms within the first quintile. On the other hand, a total of 3,812 dividend increase announcements have been made by firms belonging to the fifth quintile, which accounts for 16.12% of the total number of dividend announcements made by firms belonging to the fifth quintile. The difference in the proportion of dividend increasing firms between the first fifth quintile and the first quintile of 12.19% is statistically significant at the 1% level. We also inspect the average percentage change in dividends within each quintile, by averaging all zero and non-zero percentage dividend changes within each quintile group. Consistent with our methodology capturing dividend increases, we find a monotonically increasing percentage change in dividends, from an average of -1.37% for announcements in the first quintile to 5.64% for announcements in the fifth quintile. The difference between the percentage change in dividends between the quintiles 5 and 1 of 7.02% is statistically significant at the 1% level.

Panel B presents the results for the sorts on the estimated probability to decrease/omit dividends. We find that the number and proportion of dividend decrease/omission announcements increases considerably as we move from the first quintile to the fifth quintile. For quintile 1, a total of 111 dividend decrease/omission announcements have been made, which accounts for only 1.72% of the total number of dividend announcements made by firms within the first quintile. On the other hand, a total of 1,203 dividend decrease/omission announcements have been made by firms belonging to the fifth quintile, which accounts for 5.02% of the total number of dividend announcements made by firms belonging to the fifth quintile. The difference in the proportion of dividend decreasing/omitting firms between the first fifth quintile and the first quintile of 4.57% is statistically significant at the 1% level. We also inspect the average percentage change in dividends within each quintile, by averaging all zero and non-zero percentage dividend changes within each quintile group. Consistent with our methodology capturing firms that are struggling to maintain their dividends, we find a monotonically decreasing percentage change in dividends, from an average of 4.98% for announcements in the first quintile to -1.37% for announcements in the fifth quintile. The difference between the percentage change in dividends between the quintiles 5 and 1 of -6.35% is statistically significant at the 1% level.

[PLEASE INSERT TABLE 3 HERE]

Overall, we find that a simple model that predicts dividend changes based on publicly available information does a reasonable job at predicting dividend increases and decreases/omissions.

As an alternative (inverse) measure of anticipation, we also estimate a 'dividend surprise' measure from Lintner's (1956) partial adjustment model. The surprise measure is the percentage change between the actual dividend announced and the predicted dividend obtained from the Lintner model. For all firms with at least 20 quarters worth of data, we run the following panel regression:

$$D_{i,q} = \alpha_0 + \alpha_1 * D_{i,q-1} + \alpha_2 * EPS_{i,q-1} + \alpha_3 * EPS_{i,q-2} + \alpha_4 * EPS_{i,q-3} \tag{2}$$

Where $D_{i,q}$ is the dividend per share that has been announced by firm i in quarter q and $EPS_{i,q}$ is the earnings per share for firm i in quarter q. We then use the fitted values from (2) to calculate the following as the surprise measure:

$$\Delta\widehat{DIV} = \frac{D_{i,q} - \widehat{D_{i,q}}}{\widehat{D_{i,q}}} \tag{3}$$

Where $D_{i,q}$ is the actual dividend per share that was announced by firm i in quarter q, and $\widehat{D_{i,q}}$ is the predicted dividend for firm i in quarter q obtained from (2). The values of $\Delta\widehat{DIV}$ range between -1 (ie: dividend omissions) and 5 (dividend increases of 500%)[4].

[4] In line with conventional data screens regarding dividend changes, we drop announcements with $\Delta\widehat{DIV}$ lower than -1 (where -1 represents a dividend omission) and higher than 5 (where 5 represents a dividend increase of 500%).

4 Empirical Analysis

4.1 Do investors partially anticipate dividend changes?

The central hypothesis in this paper is that the announcement of dividend changes is partially anticipated by market participants. As a consequence, announcement period returns are biased downwards and do not fully reflect the market's evaluation of the information content of dividend changes. If our hypothesis is supported, we should find that announcement period market reactions to dividend changes are less pronounced for more anticipated events. We formally test this hypothesis using the following regression:

$$\begin{aligned} CAR = \beta_0 + \beta_1 * \hat{P}_{event} + \beta_2 * \Delta DIV + \beta_3 * YIELD + \beta_4 * MKTCAP + \beta_5 \\ * RETE + \beta_6 * RUNUP + \beta_7 * IRISK + \beta_8 * SRISK + \beta_9 * ROA + \epsilon \end{aligned} \tag{4}$$

$$\begin{aligned} CAR = \beta_0 + \beta_1 * \widehat{\Delta DIV} + \beta_2 * YIELD + \beta_3 * MKTCAP + \beta_4 * RETE \\ + \beta_5 * RUNUP + \beta_6 * IRISK + \beta_7 * SRISK + \beta_8 * ROA + \epsilon \end{aligned} \tag{5}$$

Where CAR is the three-day abnormal returns centered around the announcement of a dividend change event, estimated using a market model. Our main variables of interest are $\hat{P}_{event}$ from equation (4) and $\widehat{\Delta DIV}$ from equation (5). Our control variables, which are defined in table A1, include dividend yield ($YIELD$), percentage change in dividends (ΔDIV), market capitalization ($MKTCAP$), retained earnings to total equity ($RETE$), returns in the pre-announcement period starting 21 days and ending 2 days prior to the announcement ($RUNUP$), idiosyncratic risk ($IRISK$), systematic risk ($SRISK$) and return on assets (ROA)[5].

Table 4 presents the descriptive statistics of the dependent and independent variables used in equations (4) and (5). Consistent with prior literature, announcement CARs associated with dividend increases (CAR = 0.98%) are less pronounced than dividend decreases (CAR = -3.35%) and dividend omissions (CAR = -6.26%). However, it is also worthwhile to note from $\hat{P}_{event}$ that dividend increases are on average more predictable than dividend decreases/omissions, with an average probability to increase dividends of 31.62%, compared to 10.91% and 13.35% for dividend decreases and omissions respectively. This is consistent with positive dividend announcements being on average easier to anticipate than negative dividend

[5] Due to the high correlation between $\widehat{\Delta DIV}$ and ΔDIV ($\rho = 0.89$ to 0.94), we exclude ΔDIV in equation (5).

announcements. This is further corroborated by the values of $\Delta\widehat{DIV}$ of -7.97% for dividend increases compared to -51.13% for dividend decreases and -29.88% for dividend omissions, consistent with dividend increases being less surprising than dividend decreases and omissions. Dividend increasing firms also tend to have lower dividend yields, consistent with them having potentially more sustainable dividends, higher market capitalizations, higher retained earnings, more favourable pre-announcement market performance, lower idiosyncratic risk and higher profitability.

[PLEASE INSERT TABLE 4 HERE]

Table 5 reports cross-sectional regression results of cumulative abnormal returns (CARs) on proxies for anticipation, while controlling for several firm characteristics that are hypothesized by the literature to explain announcement returns. Results are based on robust standard errors clustered at the firm-level. Columns (1) to (3) present results using our main variable of interest, $\hat{P}_{event}$. Columns 4 to 6 present results using the predicted change in dividends ($\Delta\widehat{DIV}$) obtained from Lintner's (1956) partial adjustment model.

The results in Column (1) presents the regression results of CAR of dividend increasing firms on the probability of a dividend increase. Consistent with investors anticipating dividend increases, we find a negative and statistically significant relationship (at the 1% level) between $\hat{P}_{event}$ and CARs. In terms of magnitude, the coefficient indicates that a one standard deviation increase in $\hat{P}_{event}$ reduces CARs of dividend increasing firms by 0.16% (-0.010 $\times$ 15.78% = -0.16%). Compared to an average CAR of 0.98% for dividend increases, this translates in percentage terms into a 16.32% reduction in CARs for each standard deviation increase in the probability to increase dividends. Column (2) presents the regression results of CAR of dividend decreasing firms on the probability of a dividend decrease. We find a positive and statistically significant relationship (at the 1% level) between $\hat{P}_{event}$ and CARs. Therefore, the more anticipated a dividend decrease event, the higher (less negative) is the market reaction to dividend decreases. In terms of magnitude, the coefficient indicates that a one standard deviation increase in $\hat{P}_{event}$ increases CARs of dividend decreasing firms by 0.64% (0.062 $\times$ 10.40% = 0.64%). Compared to an average CAR of -3.35% for dividend decreases, this translates in percentage terms into a 19.10% reduction in CARs in absolute value for each standard deviation increase in the probability to increase dividends.

Column (3) presents the regression results of CAR of dividend omitting firms on the probability of a dividend decrease. We find a positive and statistically significant relationship (at the 5% level) between $\hat{P}_{event}$ and CARs. Therefore, the more the market anticipates a dividend decrease, the higher (less negative) is the market reaction to dividend omissions. In terms of magnitude, the coefficient indicates that a one standard deviation increase in $\hat{P}_{event}$ increases CARs of dividend omitting firms by 0.15% ($0.014 \times 10.98\% = 0.15\%$). Compared to an average market reaction of -6.26% to dividend omissions, this translates in percentage terms into a 2.40% reduction in CARs in absolute value for each standard deviation increase in the probability to omit dividends. While not trivial, the magnitude of the effect considerably smaller than that for dividend increases and decreases. This suggests that dividend omissions are more difficult to anticipate by market participants as compared to other dividend changes.

Columns (4) to (6) uses an alternative measure, which is the predicted percentage change in dividends obtained from Lintner's (1956) partial adjustment model. In contrast to $\hat{P}_{event}$ which measures anticipation, $\Delta\widehat{DIV}$ measures the extent to which the dividend change event is a surprise. A larger predicted change in dividends suggests that the dividend change is more of a surprise to the market, which should reflect in more pronounced market reactions to dividend change events. Consistent with this notion, we find a positive and statistically relationship between $\Delta\widehat{DIV}$ and CARs for all dividend increases (at the 1% level), decreases (at the 1% level) and omissions (at the 10% level). A one standard deviation change in $\Delta\widehat{DIV}$ translates into a 0.19%, a 0.93% and 0.26% change in the same direction to market reactions to dividend increases, decreases and omissions respectively.

[PLEASE INSERT TABLE 5 HERE]

Overall, the results in table 5 are consistent with the prediction of H_1. Markets partially anticipate dividend change events and this degree of anticipation attenuates announcement-period market reactions to dividend change events. Market reactions therefore only reflect part of the market's assessment of the information content of dividend changes.

4.2 The role of investor sophistication in anticipation

Having established the presence of an anticipation effect attenuating market reactions to dividend changes, we examine whether sophisticated investors are more capable of forming expectations about future dividend changes and anticipating them. In line with prior literature which shows that institutional investors tend to be more sophisticated (Hand, 1990; Walther,1997; Balsam, Bartov and Marquardt, 2002; Ke and Petroni, 2004; Amihud and Li, 2006), we proxy for investor sophistication using the percentage of institutional ownership at the firm-level. To the extent that sophisticated investors are more capable of utilizing public information to form expectations about the probability of a dividend change event, we hypothesize that dividend changes made by firms with a higher proportion of institutional ownership are more anticipated.

Table 6 presents regression results examining this hypothesis. We obtain data on institutional ownership from the Factset Ownership database. For each year, we sort firms into tertiles of the ratio of institutional ownership to market capitalization. We assign an indicator variable that takes the value of 1 if a firm has institutional ownership in the top one-third of the sample, and zero otherwise ($INST$). We then run the following regressions:

$$\begin{aligned} CAR = \beta_0 + \beta_1 * \hat{P}_{event} + \beta_2 * \Delta DIV + \beta_3 * INST + \beta_4 * INST \\ \times \hat{P}_{event} + \beta_5 * YIELD + \beta_6 * MKTCAP + \beta_7 * RETE + \beta_8 \\ * RUNUP + \beta_9 * IRISK + \beta_{10} * SRISK + \beta_{11} * ROA + \epsilon \end{aligned} \tag{6}$$

$$\begin{aligned} CAR = \beta_0 + \beta_1 * \widehat{\Delta DIV} + \beta_2 * INST + \beta_3 * INST \times \widehat{\Delta DIV} \\ + \beta_4 * YIELD + \beta_5 * MKTCAP + \beta_6 * RETE + \beta_7 \\ * RUNUP + \beta_8 * IRISK + \beta_9 * SRISK + \beta_{10} * ROA + \epsilon \end{aligned} \tag{7}$$

Where $INST$ is an indicator variable that takes the value of one if the announcing firm is in the top one-third of institutional holdings, and zero otherwise. Our main variables of interest are $INST \times \hat{P}_{event}$ and $INST \times \widehat{\Delta DIV}$ from equations (6) and (7) respectively[6].

Columns (1) and (2) in table 6 show the results from equation (6) for dividend increases and decreases/omissions respectively. Consistent with the hypothesis that institutional investors are more capable of anticipating dividend increases, we find a negative coefficient on $INST \times \hat{P}_{event}$ in column (1) that is statistically significant at the 1% level. Therefore, market

[6] Due to database coverage limitations associated with Factset Ownership, our subsample in this analysis spans the period 2000 to 2015 for a total of 655 dividend increases and 104 dividend decreases and omissions.

reactions to dividend-increasing firms with a higher proportion of institutional holdings are more sensitive to anticipation, reflecting into lower price reactions for these announcements. For dividend decreases and omissions, we find a positive coefficient on $INST \times \hat{P}_{event}$ that is statistically significant at the 10% level, suggesting that the market reactions to dividend decreases/omissions are more sensitive to anticipation for firms with a higher proportion of institutional holdings, reflecting into higher (less negative) price reactions for these announcements.

In columns (3) and (4), we interact $INST$ with our alternative (inverse) measure of anticipation, $\Delta\widehat{DIV}$. Consistent with a stronger anticipation effect on announcement-period returns for firms with a larger proportion of institutional holdings, we find a positive coefficient that is positive and statistically significant at the 5% level for both increases and decreases. Therefore, dividend surprises are more impounded into prices for announcing firms with higher levels of institutional ownership.

[PLEASE INSERT TABLE 6 HERE]

Overall, the results in table 6 are consistent with H_2. Institutional investors are more capable of forming expectations about and anticipating dividend increases and decreases, reflecting into attenuated market reactions to dividend changes.

4.3 Investor anticipation of dividend changes and the asymmetry in market reactions

We now move to examining the implications of anticipation of dividend changes on the well-established stylized fact that announcement returns around dividend decreases are more pronounced than dividend increases. Our previous findings confirmed that CARs around dividend decreases and omissions are on average more pronounced than dividend increases. We also found that dividend increases are on average more anticipated than dividend decreases and omissions. Given that dividend increases are on average more anticipated, it is not surprising that prior literature has found that dividend decrease CARs are more pronounced than dividend increase CARs. Therefore, without correcting for the differences in predictability between different increases and decreases, it may be inaccurate to conclude that dividend decreases are necessarily associated with more pronounced value effects, since part of the value effects of dividend changes has already been capitalized prior to the announcement due to anticipation.

In table 7, we examine in a univariate setting whether differences in predictability between dividend increases and decreases explains the asymmetry in market reactions between them. We start by pooling all dividend increase (decrease/omit) announcements and sorting them into quintiles of their respective probabilities to increase (decrease/omit) dividends. We then examine the differences between CARs of dividend increases and decreases/omissions within each quintile group. This allows us to compare between CARs of dividend increases and decreases that have comparable levels of predictability.

Panel A presents the results with dividend omissions included in the sample. For the total sample, we find that the average market reaction to dividend increases is 0.98%, compared to -4.05% for dividend decreases and omissions, which translates into a difference of -5.03% in market reactions between dividend decreases/omissions and increases. This confirms the asymmetry in market reactions for the full sample. However, when we examine differences in CARs within each quintile group separately, we find that they considerably shrink, from -5.65% in the first quintile to 0.88% in the fifth quintile. The differences in the asymmetry between the fifth quintile and the first quintile of 6.53% is statistically significant at the 1% level. Therefore, when dividend changes are more predictable, the asymmetry in market reactions between dividend increases and decreases attenuates. We draw similar conclusions when we exclude dividend omissions in Panel B. This is not surprising, since market reactions to dividend omissions are the most pronounced, and their inclusion would make the asymmetry even more pronounced.

[PLEASE INSERT TABLE 7 HERE]

The results in table 7 therefore indicate that the asymmetry in predictability between dividend increases and decreases/omissions may partially explain the asymmetry in market reactions. As dividend changes become more predictable, the market does not seem to consider dividend decreases to be any more significant or informative than dividend increases, which reduces the asymmetric market reactions. Therefore, anticipation plays a moderating role in the asymmetric market reactions to dividend changes.

We formally test whether the asymmetry in market reactions between dividend increases and decreases can be explained by the asymmetry in predictability between dividend increases and decreases. To do this, we run the following regression:

$$
\begin{aligned}
CAR = {} & \beta_0 + \beta_1 * DECREASE + \beta_2 * \hat{P}_{event} + \beta_3 * DECREASE \times \hat{P}_{event} \\
& + \beta_4 * \Delta DIV + \beta_5 * YIELD + \beta_6 * MKTCAP + \beta_7 * RETE \\
& + \beta_8 * RUNUP + \beta_9 * IRISK + \beta_{10} * SRISK + \beta_{11} * ROA + \epsilon
\end{aligned} \tag{8}
$$

Where $DECREASE$ is a dummy variable that takes the value of 1 for dividend decreases and zero otherwise. Our main variables of interest are $DECREASE$, which captures the difference in CARs between dividend decreases and dividend increases, the interaction term $DECREASE \times \hat{P}_{event}$, the intercept term, which captures the market reaction to dividend increases, and the sum of the coefficients on $DECREASE$ and the intercept term ($Constant$ + $DECREASE$), which captures the market reaction to dividend decreases.

Table 8 reports the regression results. Columns (1) and (2) present regression results examining the asymmetry in market reactions between dividend increases and decreases/omissions, whereas columns (3) and (4) present the results of the same regressions but excluding omissions. For the sake of benchmarking, column (1) presents the regression results without $\hat{P}_{event}$ and $DECREASE \times \hat{P}_{event}$. The coefficient on $DECREASE$ of -0.048, which is statistically significant at the 1% suggests that the difference in CARs between dividend decreases and increases is -4.80% after including control variables, which is close to the univariate difference of -5.03% presented in Panel A in table 7. The constant term shows that CARs to dividend increases after controlling for the control variables is 1.50%. The sum of coefficient on $DECREASE$ and the intercept term shows that CARs to dividend decreases after controlling for the control variables is -3.30% (=-0.048 + 0.015).

In column (2), we run the full regression in equation (8). The coefficient on $DECREASE$ of -0.027, which is statistically significant at the 1% level shows that the difference in CARs between dividend decreases and increases is -2.70% after controlling for anticipation. This difference is considerably smaller than the corresponding estimate in column (1) and the univariate results in table 7. The coefficient on $DECREASE \times \hat{P}_{event}$ is positive and statistically significant at the 5% level, which means that for a given level of anticipation, the differences in CARs between dividend decreases/omissions and increases are less negative. The constant term shows that CARs to dividend increases after controlling for anticipation is 2.10%, which is considerably larger than the average CAR of 0.98% in panel A of table 7. This suggests that anticipation masks the true value effects of dividend increases. The sum of the coefficient on $DECREASE$ and the intercept term shows that CARs to dividend decreases after controlling for the control variables is -0.60% (=-0.027 + 0.021), which is considerably smaller in magnitude than the 2.10% CARs for dividend increases. Untabulated F-tests fail to reject the null of equality between the magnitudes of the market reactions to dividend decreases/omissions and dividend increases ($H_0 : Constant + DECREASE = -1 \times 0.021$), with a p-value of 0.69. Therefore, after correcting for differences in anticipation between dividend increases and decreases/omissions, the announcement returns become indistinguishable from one another.

Columns (3) and (4) mimic the regressions run in columns (1) and (2) respectively, with dividend omissions excluded. The results in (3) and (4) are similar to those of (1) and (2). The coefficient on $DECREASE$ drops from -0.041 in column (3) to -0.024 once we account for anticipation in column (4). The coefficient on $DECREASE \times \hat{P}_{event}$ is positive and statistically significant at the 1% level in (4). The sum of the coefficient on $DECREASE$ and the intercept term in (4) shows that CARs to dividend decreases after controlling for the control variables is -0.50% (=-0.024 + 0.019), which is considerably smaller in magnitude than the 1.90% CARs for dividend increases in (4). The F-tests fail to reject the null of equality between the magnitudes of market reactions to dividend decreases and increases ($H_0 : Constant + DECREASE = -1 \times 0.019$), with a p-value of 0.48. Therefore, similar to the results in column (2), correcting for differences in anticipation makes differences between announcement returns of dividend increases and decreases indistinguishable from one another.

[PLEASE INSERT TABLE 8 HERE]

Our results therefore lends support to H_3. Correcting for differences in anticipation between dividend increases and decreases/omissions explains away the asymmetry in market reactions between dividend increases and decreases/omissions.

4.4 Evidence from abnormal returns to industry rivals

The implications of anticipation may extend beyond that of announcing firms, to that of its industry rivals. Prior literature has found that dividend changes are associated with market reactions to industry rivals of announcing firms (Firth, 1996 and Laux, Starks and Yoon, 1998), and attribute the same to intra-industry information transfers associated with dividend changes. We re-examine the cross-sectional variation in market announcements to rival firms to test whether market reactions to rival firms reflect investors anticipating a dividend change announcement in the same direction as the announcing firm for rival firms.

In the context of other event studies, Gande and Lewis (2009) find negative spillover effects of class-action lawsuits to industry rivals of firms that have received lawsuits. They find that these spillover effects are more pronounced for rivals that are more likely to receive a class action lawsuit. Cai, Song and Walking (2011) and Tunyi (2021) also find positive spillover effects to industry rivals of acquiring firms. They find that the spillover effect is more pronounced for firms that are more likely to announce an acquisition. We hypothesize that if CARs of rivals to dividend increasing (decreasing) firms are more pronounced for those rivals that are more likely to increase (decrease) dividends, then this is consistent with rival CARs reflecting an anticipation effect that is being capitalized prior to the actual announcement (if any) by the rival.

Table 9 presents univariate sorts of rival CARs by their ex-ante probabilities to change their dividends. Panel A presents the results for rivals to dividend increasing firms and Panel B presents the results for rivals to dividend decreasing firms. In line with literature, we define rival firms as non-event firms that belong to the same four-digit SIC code as the announcing firm. For rivals of dividend increasing firms, we find a negative market reaction of 4.8 basis points. Dividend increases are therefore associated with a competitive effect on rival firms (ie: a good news announcement for a firm is bad news for its rivals, and vice versa). While the sign of the rival CARs run in contrast to those reported by Firth (1996) and Laux, Starks and Yoon (1998), they are on average close to zero, consistent with Laux, Starks and Yoon (1998)[7]. More importantly for this paper, we find considerable variation across quintiles of

[7] It is worth noting that our sample spans a much longer time period than Firth (1996) and Laux, Starks and Yoon (1998). While their samples cover the periods 1980 to 1991 and 1969 to 1988 respectively, our sample covers the period 1967 to 2015. Unlike Firth (1996) who reports rival CARs of 37 basis points to dividend increasing firms, Laux, Starks and Yoon (1998) find a much weaker

the probability to increase dividends. In particular, we find that the competitive effect (ie: negative CARs) are confined to rivals that are most likely to increase their dividends. For firms in the first quintile, we find positive CARs of 12.9 basis points that are statistically significant at the 1% level, but they monotonically decrease to -22.1 basis points for firms in the fifth quintile.

For rivals of dividend decreasing firms, we find a negative market reaction of 11.1 basis points on average, consistent with a contagion effect of dividend decreases on rival firms (ie: a bad news announcement for a firm is bad news for its rivals). Univariate sorts show CARs that are decreasing in the probability to decrease dividends, from an insignificantly positive 13.3 basis points for firms in the first quintile, to a statistically significant (at the 1% level) CAR of -29.6 basis points for firms in the fifth quintile. Therefore, the contagion effect of dividend decreases is stronger for rival firms that are more likely to decrease their dividends.

[PLEASE INSERT TABLE 9 HERE]

Overall, our findings in table 10 are consistent with rival CARs reflecting an anticipation of an expected dividend change event, where part of the value effect of the expected dividend change is capitalized prior to the announcement.

We now formally test the hypothesis that announcement returns to rival firms are more pronounced for those that are more likely to change their dividend in the same direction by running the following regression:

$$\begin{aligned} CAR = \beta_0 + \beta_1 * \hat{P}_{event} + \beta_2 * ANNCAR + \beta_3 * MKTCAP + \beta_4 * RETE + \beta_5 \\ * RUNUP + \beta_6 * IRISK + \beta_7 * SRISK + \beta_8 * ROA + \beta_9 * HHI + \epsilon \end{aligned} \tag{9}$$

Where the dependent variable CAR is the rival's three-day abnormal return centered around the announcement of a dividend change made by a firm belonging to the same four-digit SIC code. Our main variable of interest, $\hat{P}_{event}$ is the rival firm's probability to increase/decrease dividends. In line with the literature that examines intra-industry information transfers, we also control for the announcement-period return for the dividend-change announcer ($ANNCAR$), and the Herfindahl-Hirschman Index of market concentration (HHI) in addition to the control variables used in the previous regressions.

reaction of 5 basis points, suggesting that the findings with respect to dividend increases are sensitive to the sample choice. Nonetheless, when we restrict our sample to the period ending 1991, we find a positive market reaction of 7 basis points.

Table 10 presents presents the multivariate regression results. For dividend increases in columns (1) and (2), we find a negative and statistically significant coefficient on $\hat{P}_{event}$ at the 5% level. Therefore, the negative abnormal returns to rivals to dividend increasing firms are more pronounced for those rivals that are most likely to increase their dividends. In terms of magnitude, a one standard deviation increase in $\hat{P}_{event}$ decreases CARs to rival firms by 5.1 basis points ($= -0.003 \times 16.96\%$) in column (1) and 6.8 basis points ($= -0.004 \times 16.98\%$) in column (2). Given that the average CARs for rivals to dividend increasing firms is -4.8 basis points, the economic effect is large. We interpret this as the market being disappointed when rivals that are most likely to increase their dividends do not increase their dividends.

For dividend decreases in columns (3) and (4), we find a negative and statistically significant coefficient on $\hat{P}_{event}$ at the 1% level. Therefore the contagion effect of dividend decreases is more pronounced for rival firms that are more likely to decrease their dividends. In terms of magnitude, a one standard deviation increase in $\hat{P}_{event}$ decreases CARs to rival firms by 28.6 basis points ($= -0.034 \times 8.41\%$) in column (3) and 31.4 basis points ($= -0.036 \times 8.71\%$) in column (4). Given that the average CARs for rivals to dividend decreasing firms is -11.1 basis points, the effect size is large. Therefore, the negative information conveyed by dividend decreases to rival firms is more pronounced for rivals that are more likely to decrease their dividends. We suggest that this reflects investors anticipating an impending dividend decrease for rivals that are most likely to decrease their dividends. For dividend omissions, while the results in columns (5) and (6) are directionally consistent with those of dividend decreases, they are only marginally significant at the 10% level in column (6).

[PLEASE INSERT TABLE 10 HERE]

Our results with respect to rival firms of dividend increasing and decreasing firm are therefore consistent with H_{4a} and H_{4b}. For rivals of dividend increasing firms, investors are more disappointed with rivals not increasing their dividends. This reflects into adverse market reactions that are more pronounced for rivals that are most likely to increase their dividends. For rivals of dividend decreasing firms, dividend decreases convey industry-wide negative information, which is more pronounced for rivals that are most likely to decrease their dividends.

5 Conclusion

Prior research has provided different, and at times, conflicting results on the determinants of market reactions to dividend changes. These papers typically use short-term CARs as a metric of the market's perception of the information content of dividend changes. In this paper, we argue that if dividend changes are anticipated by investors, then announcement period CARs may be an inaccurate measure to use in cross-sectional tests examining the determinants of market reactions to dividend events. Using a comprehensive sample of dividend increases, decreases and omissions from 1967 to 2015, we find that dividend changes can be reasonably predicted ex-ante.

More importantly, we find that the market at least partially recognizes the predictability of dividend changes. Multivariate regressions of announcement CARs on the ex-ante probability to increase/decrease dividends show that CARs attenuate as dividend change events are more predictable. We also find that the anticipation effect is more pronounced for firms with a higher proportion of institutional holdings, consistent with sophisticated investors being more capable of utilizing public information to form expectations about expected dividend changes. Correcting for differences in anticipation between dividend increases and decreases/omissions, we find that the well-documented asymmetry in market reactions between dividend decreases and increases is explained away.

Finally, we examine CARs to industry rivals of firms that announce a change in their dividends. We find that dividend increases are associated with negative CARs for non-announcing industry rivals, reflecting a competitive effect whereby the market is disappointed with rivals that do not increase their dividends. Consistent with our anticipation story, we find that the negative returns are more pronounced for rivals that are more likely to increase their dividends but do not. For dividend decreases, we find negative CARs to non-announcing industry rivals, consistent with a contagion effect whereby the bad news conveyed by dividend decreases reflects adversely on the valuation of industry rivals. The negative CARs are more pronounced for firms that are more likely to decrease their dividends, which we interpret as dividend decreases conveying information about the likelihood of rival firms to decrease their dividends.

Our findings therefore suggest that the results of short-term event studies examining market reactions to dividend changes are likely to be biased downwards. As a result, cross-sectional tests examining the determinants of CARs may yield biased results, which may explain why the literature that has examined the cross-sectional determinants of dividend change CARs have arrived at conflicting results. Our study therefore highlights the importance of accounting for anticipation in short-term event studies.

Our research opens the door to multiple avenues for future research. First, since we find that neglecting anticipation understates the true value effects of dividend changes, future research may look into devising methodologies that correct for anticipation in estimating the value effects of dividend events, or other corporate events for that matter. Second, our paper brings into question the need to reexamine the cross-sectional determinants of the value effects of dividend changes after obtaining estimates that correct for anticipation. Third, since our research finds that institutional investors anticipate dividend changes, this suggests that institutional investors care about dividends. Future research may look at which class of investors are more interested in dividends and the motivations behind this interest.

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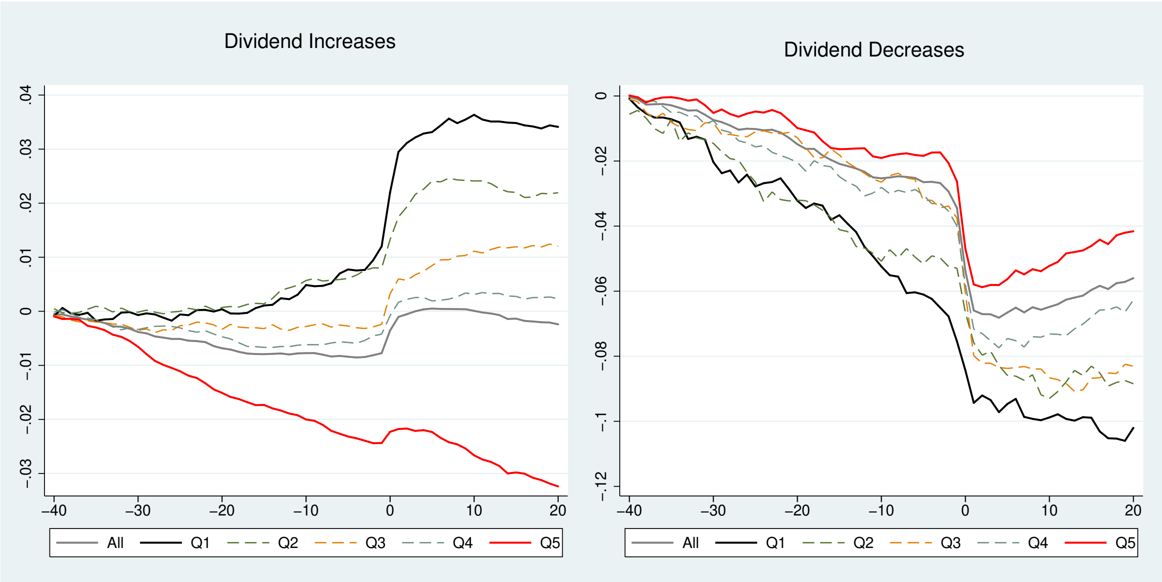

Figure 1: Cumulative abnormal returns and anticipation
This figure presents the cumulative abnormal returns (CARs) earned by dividend increasing and dividend decreasing firms between day -40 (40 days prior to the dividend event) and day 20 (20 days after the dividend event) across different quintiles of anticipation, where Q1 (Q5) represents the bottom (top) quintile of the probability of a dividend increase or decrease.

Table 1: Breakdown of dividend changes by year

This table presents the sample of dividend changes of non-financial (SIC codes 6000-6999) and non-utility (SIC codes 4900-4949) firms on CRSP/Compustat from the years 1967 to 2015, broken down by the announcement year. Dividend increases are defined as an increase in the quarterly dividend of no less than 12.5%. Dividend decreases are defined as an decrease in the quarterly dividend of no less than 12.5%. Dividend omissions are defined as first announcement of a cash dividend omission in the firm's history, or after a minimum of six quarterly cash dividends.

Year	**Increases**	**Decreases**	**Omissions**	**All**
1967	123	3	3	129
1968	86	7	1	94
1969	127	20	10	157
1970	63	57	26	146
1971	58	58	12	128
1972	45	33	5	83
1973	199	21	9	229
1974	322	33	8	363
1975	335	73	13	421
1976	621	38	4	663
1977	700	44	10	754
1978	629	45	8	682
1979	614	38	13	665
1980	429	52	13	494
1981	353	30	22	405
1982	222	95	34	351
1983	212	56	13	281
1984	277	30	14	321
1985	208	24	30	262
1986	172	37	18	227
1987	228	19	10	257
1988	282	18	9	309
1989	266	18	14	298
1990	196	17	21	234
1991	118	47	19	184
1992	140	33	17	190
1993	160	31	20	211
1994	191	17	3	211
1995	219	27	18	264
1996	219	16	10	245
1997	188	21	7	216
1998	174	21	16	211
1999	121	29	15	165
2000	75	19	17	111
2001	82	46	25	153
2002	73	26	5	104
2003	140	20	8	168
2004	235	11	2	248
2005	270	9	11	290
2006	226	12	5	243
2007	221	0	7	228
2008	159	38	20	217
2009	69	67	11	147
2010	150	10	1	161
2011	224	15	5	244
2012	237	17	8	262
2013	246	35	5	286
2014	232	27	2	261
2015	198	32	5	235
Total	**11,134**	**1,492**	**582**	**13,208**

Table 2: Multinomial Logit Regressions for dividend changes

This table presents the results of multinomial logit regressions for the full sample period starting 1967 and ending 2015. The dependent variable is an indicator variable that takes the value of 1 if the firm has increased a dividend, 2 if it has decreased/omitted a dividend and zero if no dividend change has been made. Definitions of all variables are included in Appendix A1. All variables are lagged at one year and winsorized at the top and bottom 1%. Industry dummies based on two-digit SIC code are included but have been suppressed to conserve space. T-statistics are reported in paranthesis. ***, ** and * represent statistical significance at the 1%, 5% and 10% respectively.

	(1) Increases	(2) Decreases/Omits
TA	0.051***	-0.046**
	(4.80)	(-2.13)
$RETE$	-0.197***	-0.095
	(-3.76)	(-0.93)
$BHAR$	1.002***	-0.948***
	(31.51)	(-12.32)
$IRISK$	-14.097***	32.393***
	(-6.87)	(9.69)
$SRISK$	26.643***	-3.849
	(9.48)	(-0.72)
ROA	7.590***	-4.094***
	(22.34)	(-6.69)
MB	-0.063***	-0.417***
	(-3.63)	(-7.24)
$LTDTA$	0.058	0.709***
	(0.53)	(3.47)
$CATA$	0.584***	-0.693**
	(4.60)	(-2.38)
$SDROA$	-3.245***	8.145***
	(-5.87)	(9.54)
ΔTA	0.454***	-0.690***
	(6.46)	(-4.38)
AGE	-0.006***	-0.001
	(-8.16)	(-0.56)
T	0.012***	-0.034***
	(2.99)	(-4.10)
$T2$	-0.000***	0.001***
	(-3.23)	(4.20)
$Constant$	-1.532***	-2.150***
	(-13.42)	(-9.55)
N	41,674	41,674
$pseudo - R^2$	0.072	0.072

Table 3: Validity of anticipation measures

This table examines the validity of our anticipation measure ($\hat{P}_{event}$). Panel A shows descriptive statistics of dividend increases of firms sorted by the quintiles of the predicted probability to increase dividends. Panel B shows descriptive statistics of dividend decreases of firms sorted by the quintiles of the predicted probability to decrease dividends. The descriptive statistics are the sample size within each quintile, the average estimated probability to increase (Panel A) or decrease (Panel B) dividends, the number of dividend increases (Panel A) and dividend decreases (Panel B), the percentage of dividend announcements that are dividend increases (Panel A) or dividend decreases (Panel B), and the average percentage change in dividends within each quintile. T-statistics are reported in paranthesis. ***, ** and * represent statistical significance at the 1%, 5% and 10% respectively.

Quintile	**N**	$\hat{\mathbf{P}}_{\mathbf{event}}$	**# Event**	$\mathbf{P}_{\mathbf{event}}$	**ΔDIV**
Panel A: Dividend Increases					
Total Sample	120,397	23.16%	11,134	9.25%	2.49%
1 (Low)	24,327	11.79%	956	3.93%	-1.37%
2	24,277	17.42%	1,522	6.27%	1.52%
3	23,964	21.52%	2,026	8.45%	2.95%
4	24,178	26.62%	2,818	11.66%	3.80%
5 (High)	23,651	38.89%	3,812	16.12%	5.64%
High - Low				**12.19%***** **(45.57)**	**7.02%***** **(39.04)**
Panel B: Dividend Decreases and Omissions					
Total Sample	120,397	4.38%	2,074	1.72%	2.49%
1 (Low)	24,213	0.55%	111	0.46%	4.98%
2	23,961	1.64%	121	0.50%	3.94%
3	24,024	2.90%	204	0.85%	3.13%
4	24,252	4.85%	435	1.79%	1.72%
5 (High)	23,947	12.01%	1,203	5.02%	-1.37%
High - Low				**4.57%***** **(31.05)**	**-6.35%***** **(-36.84)**

Table 4: Descriptive Statistics

The table reports descriptive statistics of dividend change firms. The sample comprises announcements of dividend decreases, increases and omissions from the period 1967-2015. Definitions of all variables are included in Appendix A1. All variables are winsorized at the top and bottom 1%.

Variable	**Dividend increases**	**Dividend decreases**	**Dividend omissions**
CAR	0.98%	-3.35%	-6.26%
$\hat{P}_{event}$	31.62%	10.91%	13.35%
ΔDIV	39.27%	-62.25%	-100.00%
$\widehat{\Delta DIV}$	-7.97%	-51.13%	-29.88%
$YIELD$	0.005	0.006	0.011
$MKTCAP$	13.220	11.936	11.199
$RETE$	0.734	0.690	0.646
$RUNUP$	-0.001	-0.010	-0.031
$IRISK$	0.020	0.024	0.027
$SRISK$	0.008	0.008	0.007
ROA	0.084	0.036	0.020
N	**10,889**	**1,123**	**534**

Table 5: Cross-sectional regressions of dividend change CARs

The table reports results of regressions examining whether investor anticipation of dividend changes affect announcement period CARs. The sample comprises announcements of dividend decreases, increases and omissions from the period 1967-2015. Robust standard errors are clustered at the firm level. Definitions of all variables are included in Appendix A1. All variables are winsorized at the top and bottom 1%. T-statistics are reported in paranthesis. ***, ** and * represent statistical significance at the 1%, 5% and 10% respectively.

	(1) Increase	(2) Decrease	(3) Omit	(4) Increase	(5) Decrease	(6) Omit
$\hat{P}_{event}$	-0.010***	0.062***	0.014**			
	(-3.35)	(3.05)	(2.23)			
$\Delta\widehat{DIV}$				0.005***	0.018***	0.004*
				(2.70)	(2.67)	(1.75)
ΔDIV	0.004***	0.027**				
	(2.73)	(1.98)				
$YIELD$	0.964***	0.053	-1.752**	0.804***	-0.058	-0.735
	(6.86)	(0.11)	(-1.99)	(6.06)	(-0.15)	(-1.39)
$MKTCAP$	-0.002***	0.006***	-0.001	-0.002***	0.004***	0.002
	(-4.79)	(4.04)	(-0.34)	(-5.06)	(3.72)	(0.68)
$RETE$	-0.003	-0.005	-0.020	-0.001	-0.005	-0.006
	(-1.44)	(-0.62)	(-1.04)	(-0.66)	(-0.77)	(-0.56)
$RUNUP$	-0.014**	-0.008	-0.063*	-0.011*	-0.010	-0.053**
	(-2.20)	(-0.40)	(-1.74)	(-1.87)	(-0.66)	(-2.49)
$IRISK$	-0.047	0.637**	0.186	0.014	0.647***	0.229
	(-0.48)	(2.07)	(0.29)	(0.15)	(2.75)	(0.65)
$SRISK$	-0.129	-0.527	-1.210	-0.227**	-0.265	-0.714
	(-1.00)	(-1.22)	(-1.22)	(-2.02)	(-0.78)	(-1.24)
ROA	-0.013	0.005	-0.002	-0.028***	-0.046	-0.002
	(-0.98)	(0.09)	(-0.02)	(-2.65)	(-1.46)	(-0.04)
$Constant$	0.036***	-0.104***	-0.017	0.037***	-0.078***	-0.055
	(5.50)	(-4.55)	(-0.32)	(5.81)	(-4.40)	(-1.57)
N	10,889	1,122	521	10,889	1,122	521
$Adj-R^2$	0.026	0.024	0.020	0.025	0.021	0.023

Table 6: Institutional investors and market anticipation

The table reports results of regressions examining whether the anticipation effect on announcement-returns is stronger with the level of institutional ownership. The sample comprises announcements of dividend decreases, increases and omissions from the period 1967-2015. Robust standard errors are clustered at the firm level. Definitions of all variables are included in Appendix A1. All variables are winsorized at the top and bottom 1%. T-statistics are reported in paranthesis. ***, ** and * represent statistical significance at the 1%, 5% and 10% respectively.

	(1) Increases	(2) Decreases	(3) Increases	(4) Decreases
$\hat{P}_{event}$	-0.044	-0.020		
	(-1.16)	(-0.13)		
$\Delta\widehat{DIV}$			-0.002	0.072**
			(-0.29)	(2.36)
$INST$	-0.009	-0.011	-0.007	0.012
	(-0.80)	(-0.39)	(-1.21)	(0.33)
$INST \times \hat{P}_{event}$	-0.025***	0.294*		
	(-2.66)	(1.91)		
$INST \times \Delta\widehat{DIV}$			0.007**	0.005**
			(1.99)	(2.11)
ΔDIV	0.002	0.110***		
	(0.55)	(3.06)		
YIELD	0.974	2.176	0.961*	0.812
	(1.49)	(1.27)	(1.71)	(0.72)
$MKTCAP$	0.000	0.000	0.000	-0.001
	(0.08)	(0.02)	(0.24)	(-0.25)
$RETE$	-0.007	-0.013	-0.001	-0.015
	(-0.96)	(-0.43)	(-0.25)	(-0.77)
$RUNUP$	0.009	-0.014	-0.002	0.031
	(0.37)	(-0.19)	(-0.11)	(0.66)
$IRISK$	0.105	-1.540	0.040	-0.953
	(0.32)	(-1.14)	(0.15)	(-1.14)
$SRISK$	0.017	0.849	-0.144	0.758
	(0.04)	(0.65)	(-0.48)	(0.89)
ROA	-0.012	0.055	-0.034	-0.024
	(-0.21)	(0.30)	(-1.02)	(-0.26)
$Constant$	0.019	0.060	0.008	0.059
	(0.76)	(0.56)	(0.37)	(0.83)
N	655	104	655	104
$Adj - R^2$	0.018	0.018	0.015	0.012

Table 7: Cumulative Abnormal Returns (CARs) of equally anticipated dividend changes

This table examines whether the asymmetry in market reactions to dividend increases and decreases can be partially explained by differences in anticipation between dividend increases and decreases. Dividend increases and decreases are pooled together and sorted into quintiles of their respective estimated probabilities. The first column is the Quintile group. The second column is the average estimated probability of a dividend increase or decrease. The third and fourth columns are the cumulative abnormal returns (CARs) of dividend increase and decrease announcements respectively. The final row is the CARs of dividend decreases minus CARs of dividend increases. Panel A presents the results where dividend decreases include omissions. Panel B presents the results excluding dividend omissions. T-statistics are reported in paranthesis. ***, ** and * represent statistical significance at the 1%, 5% and 10% respectively.

Quintile	$\hat{\mathbf{P}}_{\mathbf{event}}$	**Increases**	**Decreases**	**Differences**
Panel A: Decreases & Omissions				
Total Sample	28.62%	0.98%***	-4.05%***	-5.03%***
1 (Low)	7.72%	1.50%***	-4.14%***	-5.65%***
2	16.99%	0.84%***	-4.02%***	-4.86%***
3	25.42%	0.88%***	-5.28%***	-6.16%***
4	37.18%	0.91%***	-3.96%***	-4.88%***
5 (High)	55.77%	0.99%***	1.87%	0.88%
High - Low		**-0.51%*** **	**6.02%*** **	**6.53%*** **
		(-3.02)	**(4.71)**	**(6.90)**
Panel B: Decreases only				
Total Sample	29.25%	0.98%***	-3.24%***	-4.22%***
1 (Low)	7.72%	1.50%***	-3.69%***	-5.06%***
2	16.99%	0.84%***	-2.40%***	-3.49%***
3	25.42%	0.88%***	-4.20%***	-4.85%***
4	37.18%	0.91%***	-1.51%	-1.93%*
5 (High)	55.77%	0.99%***	1.11%	0.89%
High - Low		**-0.51%*** **	**5.44%*** **	**5.95%*** **
		(-3.02)	**(4.04)**	**(5.70)**

Table 8: Cross sectional variation in the asymmetry of dividend change CARs

This table examines whether the asymmetry in market reactions to dividend increases and decreases can be partially explained by differences in anticipation between dividend increases and decreases. The sample comprises announcements of dividend decreases, increases and omissions from the period 1967-2015. Robust standard errors are clustered at the firm level. Definitions of all variables are included in Appendix A1. All variables are winsorized at the top and bottom 1%. T-statistics are reported in paranthesis. ***, ** and * represent statistical significance at the 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(4)
	Including Omissions		Excluding Omissions	
$DECREASE$	-0.048***	-0.027***	-0.041***	-0.024***
	(-19.15)	(-6.28)	(-19.86)	(-9.84)
$\hat{P}_{event}$		-0.005		-0.007
		(-1.03)		(-1.55)
$DECREASE \times \hat{P}_{event}$		0.033**		0.054***
		(2.07)		(3.15)
ΔDIV	0.009***	0.004**	0.004**	0.004**
	(5.37)	(2.20)	(2.33)	(2.32)
$YIELD$	0.239	0.375**	0.807***	0.829***
	(1.63)	(2.56)	(5.72)	(5.83)
$MKTCAP$	-0.001	-0.001	-0.000	-0.001*
	(-1.60)	(-1.44)	(-1.28)	(-1.72)
$RETE$	-0.004*	-0.005**	-0.004	-0.004*
	(-1.74)	(-2.13)	(-1.54)	(-1.77)
$RUNUP$	-0.012*	-0.016**	-0.009	-0.010
	(-1.82)	(-2.36)	(-1.43)	(-1.61)
$IRISK$	0.146	0.180*	0.207**	0.153
	(1.45)	(1.75)	(2.18)	(1.57)
$SRISK$	-0.314**	-0.251*	-0.271**	-0.208
	(-2.35)	(-1.80)	(-2.18)	(-1.59)
ROA	-0.035***	-0.029**	-0.040***	-0.021
	(-2.78)	(-2.01)	(-3.41)	(-1.58)
$Constant$	0.015***	0.021***	0.015**	0.019***
	(2.92)	(2.90)	(2.36)	(2.82)
N	12,532	12,532	12,012	12,012
$Adj-R^2$	0.127	0.135	0.095	0.096

Table 9: Cumulative Abnormal Returns (CARs) of non-announcing rival firms

This table examines cumulative abnormal returns (CARs) of non-announcing rival firms of firms that make dividend change announcements, and whether the market's assessment of the likelihood of a rival firm to change a dividend explains the spillover returns. Rival firms are defined as firms that are in the same four-digit SIC code as the announcing firm. Panel A shows the announcement returns of non-announcing rival of dividend increasing firms, sorted by quintiles of their probability to increase dividends. Panel B shows the announcement returns of non-announcing rival of dividend decreasing firms, sorted by quintiles of their probability to decrease dividends. T-statistics are reported in paranthesis. ***, ** and * represent statistical significance at the 1%, 5% and 10% respectively.

Quintile	**N**	$\hat{\mathbf{P}}_{\mathbf{event}}$	**CAR (%)**
Panel A: Dividend Increases			
Total Sample	73,173	23.16%	-0.048***
			(-3.39)
1 (Low)	9,718	11.79%	0.129***
			(3.15)
2	10,598	17.42%	0.060*
			(1.71)
3	11,142	21.52%	-0.003
			(-0.08)
4	12,937	26.62%	-0.060*
			(-1.85)
5 (High)	13,721	38.89%	-0.221***
			(-6.38)
High - Low			**-0.350*** **
			(-6.52)
Panel B: Dividend Decreases and Omissions			
Total Sample	17,512	4.38%	-0.111**
			(-2.32)
1 (Low)	960	0.55%	0.113
			(0.89)
2	1,127	1.64%	-0.215**
			(-2.27)
3	1,350	2.90%	-0.089
			(-0.90)
4	1,569	4.85%	-0.129
			(-1.12)
5 (High)	1,808	12.01%	-0.296***
			(-2.60)
High - Low			**-0.409** **
			(-2.11)

Table 10: Cross-sectional regressions of non-announcing rival CARs

The table reports results of regressions examining whether the market's assessment of the likelihood that rivals will subsequently change their dividends explains the spillover CARs to rivals of announcing firms. The sample comprises firms in the same four-digit SIC code as firms that announced dividend decreases, increases and omissions from the period 1967-2015. Robust standard errors are clustered at the firm level. Definitions of all variables are included in Appendix A1. All variables are winsorized at the top and bottom 1%. T-statistics are reported in paranthesis. ***, ** and * represent statistical significance at the 1%, 5% and 10% respectively.

	(1) Increases	(2) Increases	(3) Decreases	(4) Decreases	(5) Omissions	(6) Omissions
$\hat{P}_{event}$	-0.003**	-0.004**	-0.034***	-0.036***	-0.008	-0.008*
	(-1.98)	(-2.41)	(-3.34)	(-3.20)	(-1.54)	(-1.87)
$ANNCAR$		0.043***		0.066***		0.059***
		(12.03)		(6.87)		(4.79)
$MKTCAP$	0.000***	0.000***	0.000	-0.000	0.000	0.000
	(2.96)	(3.30)	(0.88)	(-0.49)	(0.55)	(0.23)
$RETE$	-0.001	-0.001	0.002	0.002	0.001	0.002
	(-1.14)	(-1.14)	(0.76)	(0.60)	(0.17)	(0.39)
$RUNUP$	-0.004***	-0.004***	-0.004**	-0.004*	-0.001	-0.002
	(-8.21)	(-7.75)	(-2.08)	(-1.69)	(-0.30)	(-0.61)
$IRISK$	0.087***	0.099***	-0.150	-0.232*	-0.183	-0.176
	(3.08)	(3.40)	(-1.42)	(-1.90)	(-0.92)	(-0.90)
$SRISK$	-0.107**	-0.094**	-0.390***	0.004	-0.626**	-0.626**
	(-2.41)	(-2.05)	(-2.64)	(0.02)	(-2.06)	(-2.08)
ROA	0.010*	0.011**	0.010	0.028	-0.048	-0.045
	(1.90)	(1.98)	(0.54)	(1.30)	(-1.31)	(-1.23)
HHI	-0.002**	-0.002*	-0.005	-0.003	-0.000	-0.003
	(-2.13)	(-1.87)	(-1.39)	(-0.67)	(-0.03)	(-0.47)
$Constant$	-0.000	-0.001	0.001	0.006	0.014*	0.019**
	(-0.31)	(-0.89)	(0.15)	(1.14)	(1.77)	(2.41)
N	53,987	51,135	5,031	3,878	1,307	1,307
$Adj-R^2$	0.003	0.006	0.009	0.020	0.019	0.036

Table A1: Variable descriptions

Variable	Definition
AGE	Year of observation minus the year of first CRSP. observation
$ANNCAR$	Abnormal returns of the announcing firm measured over the window (-1,+1) using a market model.
$BHAR$	Twelve-month compounded returns in excess of the CRSP value-weighted index.
CAR	Abnormal returns measured over the window (-1,+1) using a market model.
$CATA$	Cash and cash equivalents (che) as a ratio of total assets (at).
$DECREASE$	An indicator variable that takes the value of 1 if a firm has decreased a dividend and zero otherwise.
ΔTA	Year-on-year change in total assets.
HHI	Herfindahl-Hirschman Index of market concentration, calculated as the sum squared ratios of firm sales to the total industry sales, where an industry is defined by the four-digit SIC code.
$INST$	An indicator variable the takes the value of 1 if a firm's institutional ownership lies in the top tertile of the distribution in a given year and zero otherwise.
$IRISK$	Idiosyncratic risk is estimated following Hoberg and Prabhala (2009) as the standard deviation of the residuals obtained from a regression of daily returns on Fama-French (1993) three-factor model.
TA	Natural log of one plus total assets (at).
$LTDTA$	Long-term debt (dltt) as a ratio of total assets (at).
MB	Firm market value as a ratio of total assets (at), where Firm market value equals total assets (at) minus book equity (seq - pstkl + txditc) plus market capitalization (prcc*csho).
$MKTCAP$	Natural log of one plus market capitalization in the month prior to the announcement.
ΔDIV	Percentage change in quarterly dividends.
$\Delta DIV_{Lintner}$	Predicted percentage change in dividends obtained from Lintner's (1956) partial adjustment model.
$\hat{P}_{event}$	The probability of a dividend change event obtained from a multinomial logit model.
$RETE$	Retained earnings (re) as a ratio of the market value of firm equity (ceq).
ROA	Net income (ni) as a ratio of total assets (at).

Table A1: Variable descriptions (Continued)

Variable	Definition
$RUNUP$	Pre-announcement abnormal returns which are measured over the window (-21,-2) using the market model.
$SDROA$	Standard deviation of ROA over the most recent three years.
$SRISK$	Systematic risk is estimated following Hoberg and Prabhala (2009) as the standard deviation of the fitted values obtained from a regression of daily returns on Fama-French (1993) three-factor model.
T	Linear time trend
$T2$	Quadratic time trend
$YIELD$	Dividend per share divided by stock price the month prior to the announcement.