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SEPARATING THE STOCK MARKET'S REACTION TO SIMULTANEOUS DIVIDEND AND EARNINGS ANNOUNCEMENTS

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Separating the Stock Market's Reaction to Simultaneous Dividend and Earnings Announcements

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Abstract

We analyze simultaneous announcements of current dividends, current earnings and management forecasts of next year's earnings. By conducting the empirical analysis using Danish data, this study is the first not to suffer from problems related to low levels of agency costs and informational asymmetries between shareholders and management. We find that the stock market reacts to the surprise in management forecasts of next year's earnings and the current dividend. Additional breakdowns reveal that the signalling models and free cash flow hypothesis provide explanations for separate components of the market reaction. Thus, our results do not support the dividend irrelevancy proposition.

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In their seminal paper, Miller & Modigliani (1961) proposed the irrelevance of dividends, thereby initiating dividend theory. The rationale behind this proposition is, that in perfect capital markets with rational behavior, a firm's dividend policy will not affect its investment policy and can therefore have no impact on the valuation of the firm. The value of the firm will solely reflect future earnings and growth opportunities. Since the effect of increased dividends will merely be offset by the raising of new capital to fund the optimal investment policy, the firm's dividend policy will not affect investment and firm value. However, contradicting this idea of dividend irrelevance, dividends exist and are frequently used. Even more conflicting is the finding in empirical studies of a market reaction to dividend announcements.

This dividend puzzle has generated a number of theories attempting to explain the existence of dividends. One such explanation originated with Miller & Modigliani (1961) recognizing the potential for dividend announcements to contain information. This will be the case if dividend changes provide a signal of management's expectations regarding the future profits of the firm. The dividend change will then provide the occasion for a price change, but it will not be its cause. This idea was elaborated on in the literature attempting to explain the existence of dividends with signalling models based on information asymmetries between management and shareholders (see for example Bhattacharya (1979), Miller & Rock (1985), and John & Williams (1985)). A second explanation for the existence of dividends has been put forth by Easterbrook (1984) and Jensen (1986) and is based on agency conflicts between management and shareholders. Management is interested in increasing their power by allowing the firm to grow as large as possible. This gives them an incentive to waste free cash flow, that is cash flow in excess of what is needed to finance positive net present value projects, on unprofitable projects. Dividends can mitigate this problem by reducing the free cash flow available to management and forcing management to submit itself to the discipline of the financial markets. These two explanations for the existence of dividends both propose a market reaction to dividend announcements. However, while the signalling models pose purely an informational role for dividends, the free cash flow hypothesis sees dividends as having a real effect since they reduce overinvestment.

The empirical literature regarding the market reaction to dividend announcements is abundant and began with the conflicting studies by Pettit (1972) and Watts (1973). Later studies by Ahorny & Swary (1980), Kane, Lee & Marcus (1984), Chang & Chen (1991), and Leftwich & Zmijewski (1994) attempt to more explicitly control for the confounding effect of contemporaneous earnings announcements. In a similar vein, Penman (1983) recognizes the possible impact of management's forecasts of earnings as a confounding event, and attempts to asses whether management's earnings forecasts or dividend announcements have greater information content. The results from these studies are conclusive in that they all find a market reaction to dividend announcements, and therefore conclude that there is information content in dividends. The above studies on US data, however, suffer from the possible bias that management has deliberately selected contemporaneous announcement dates in an attempt

to influence the impact on returns. Supporting this possibility, Penman (1984) and Kalay & Loewenstein (1986) find evidence which suggests that management attempts to affect the stock market's reaction to the announcement of earnings and dividends through their choice of announcement dates. To overcome this bias, Easton (1991) and Lonie, Abeyratna, Power & Sinclair (1996) utilized the consistent simultaneous announcement of dividends and earnings in Australia and the UK, respectively. Their results are consistent with the above in that both studies find evidence of an information content.

While these studies all find evidence of a market reaction to dividends, they are unable to uncover whether this reaction is due to dividends functioning as signals of variables relevant to the valuation of the firm or to dividends in fact on their own having an impact on the value of the firm. If the latter is the case, then dividends do affect real considerations, in contradiction to the irrelevancy of dividends hypothesis proposed by Miller & Modigliani (1961). Disentangling the informational and real effects of dividends requires that management and shareholders have symmetric information regarding current and future earnings at the time of the dividend announcement. Utilizing unique Japanese data, Conroy, Eades & Harris (2000) is the first study to separate the two effects. In Japan dividends, earnings and management forecasts of next year's dividends and earnings are announced simultaneously, thereby enabling a disentanglement of the market's reaction to the different information. Using this Japanese information environment, Conroy et al. (2000) find that current dividend announcements do not explain any of the market's reaction to the announcements. These findings were interpreted as evidence supporting the irrelevancy of dividends. Thus, based on this study it seems that the Miller & Modigliani (1961) proposition holds. Once the possible information impact of dividend announcements has adequately been controlled for, there is no market reaction to dividends, thus supporting the proposition that they have no impact on real considerations with regard to future earnings and growth opportunities. The results could also be interpreted as indicating that current dividends contain no signal of future prosperity above and beyond that contained in current earnings and management forecasts of next year's earnings and dividends.

There are, however, some unique aspects of Japanese corporate governance that considerably reduce the potential for Japanese dividends to have a real impact on the value of the firm. Specifically, several studies indicate that the potential for agency conflicts is less in Japan. Hodder & Tschoegl (1990) argue that Japanese firms have a very close and long-term relationship with their main bank. Often the main bank has access to extensive and confidential information on the firm's operations as well as future plans, allowing it to perform a great deal of monitoring. Indeed, Sheard (1989) describes how the main bank system in Japan through its monitoring of firms, and intervention when necessary, alleviates agency conflicts and therefore substitutes for other methods of corporate control. Prowse (1990) posits that the agency problem in Japan is mitigated by the tendency for Japanese financial institutions to take large equity positions in the firms to which they lend. He finds evidence consistent with this notion. Additionally, Japanese firms use a great deal of short-term debt in

their leverage, ensuring that they are constantly in the financial markets, which again allows for a great deal of monitoring of management. Gerlach (1992) uses the Japanese stockholder ownership patterns to argue that agency conflicts are largely absent in Japan. He describes the complex overlapping ownership and business relationships that cause the distinction between shareholders as principals and managers as agents to blur, and which in their most extreme form are exemplified in the keiretsu organization form. Indeed, the Japanese firm's leading shareholders are often other firms with which it conducts business and in which it holds shares. These reciprocal share cross-holdings in effect constrain managers, diminishing the need for other forms of corporate control. These factors indicate that Japan is not a proper setting to test for a real effect of dividends, since the Japanese environment lacks the very elements that give rise to a real effect of dividends in the free cash flow hypothesis.

There are also several other unique features of the Japanese market that could be the underlying cause behind the finding that Japanese dividends contain no information over and above that contained in announcements of current earnings and management forecasts of next year's earnings and dividends. First, there is valid reason to believe that the information asymmetry between management and shareholders is less in Japan. As described in Gerlach (1992) the level of interaction between managers and shareholders is much more intense in Japan compared to the US. Additionally, Hodder & Tschoegl (1990) and Gerlach (1992) note that a majority of Japanese shareholders have a longer investment horizon than US shareholders, since they basically hold shares to maintain or enhance business relationships. This indicates that they will be less interested in any short-term signals, since any remaining information asymmetries will eventually be resolved in the long run.

A second unique aspect of the Japanese market is that the Tokyo Stock Exchange (TSE) virtually mandates a minimum annual cash dividend of 5 yen per share (10% of par value). In addition to this, dividends are fairly stable and close to this minimum level. Hodder & Tschoegl (1990) document that average dividends per share for First Section stocks that paid dividends fluctuated between 5.92 and 6.88 yen per share from 1960 through 1983. While it would appear that changing the dividend to a level below that mandated by TSE potentially carries much signal value to the market, it seems that a dividend above but close to the minimum mandated has little potential as a signal. Thus, a great majority of the Japanese dividends by nature of the Japanese stock market have little potential to function as a signal.

Finally, the simultaneous announcement of management forecasts of next year's dividend complicates the interpretation of the results. These dividend forecasts are fairly unique to the Japanese market, and Conroy et al. (2000) find a significant market reaction to them. One possible explanation for this could be, that if dividends function as signals of future earnings, then forecasts of next year's dividends function as even better signals. While Conroy et al. (2000) argue that these forecasts of next year's dividends enable a clear separation of the real and informational effect of dividends, it is unclear whether this is indeed the case. It has often been argued that the signalling effect leaves management

reluctant to cut dividends. A dividend increase therefore sends a strong signal to the market, since it can be interpreted as a commitment from management to pay this higher level of dividends in the future, and therefore must be due to high management expectations. Likewise, a dividend decrease is only undertaken when absolutely necessary. If the informational role of dividends indeed functions in this way, it is unclear whether management's announcement of next year's expected dividends can be interpreted as containing the full informational effect, since such a statement does not carry as high a level of commitment as an actual increased dividend payout.

Hence, it is quite plausible that the findings in Conroy et al. (2000) are due to unique Japanese circumstances and therefore should be interpreted with caution. Perhaps their finding of no reaction to dividends is not due to a correct disentanglement of informational and real effects, where there are no real effects, but instead simply to unique Japanese corporate governance features that leave dividends without any informational or real effects to disentangle. Indeed, Dewenter & Warther (1998) find a smaller reaction to dividend initiations and omissions and less dividend smoothing in Japan compared to the US. They interpret their findings as due to the smaller degree of information asymmetry and agency conflicts in Japan, which leaves little role for dividends as either a signalling vehicle or disciplinary mechanism. In line with this, it is conceivable that the finding of no market reaction to the announcement of current dividends in Conroy et al. (2000) should not be interpreted so much as evidence for the Miller & Modigliani (1961) proposition of dividend irrelevancy, but more as a consequence of specific and unique Japanese circumstances.

Additionally, recent empirical work finds evidence in support of both dividend signalling (Koch & Sun (2004)) and the free cash flow hypothesis based on agency conflicts (La Porta, Lopez-De-Silanes, Shleifer & Vishny (2000) and Farinha (2003)), while Brav, Graham, Harvey & Michaely (77) survey financial executives and find little support for any of the current theories explaining the existence of dividends. These conflicting results, combined with the possibility that specific Japanese corporate governance issues, at least in part, caused the findings in Conroy et al. (2000), point to the need for additional research in the area.

Fortunately, the simultaneous announcement of current earnings, current dividends and management's forecasts of next year's earnings in Denmark makes this possible. The objective of the present study is therefore to utilize the Danish information environment around dividend announcements to get a clean disentanglement of the informational and real effects of dividend changes without the influence of the unique Japanese corporate governance issues that may have clouded the results of Conroy et al. (2000). For this purpose, we collect simultaneous announcements for Danish firms in the period from 1999 to 2004 and use the event study methodology to calculate abnormal returns around the announcements. Following Conroy et al. (2000), we then regress these abnormal returns on the surprise component in earnings, dividends, and management's forecast of next year's earnings, thereby disentangling the market's reaction to the various components of the simultaneous announcement.

As a further contribution, we extend the Conroy et al. (2000) analysis in two directions, each of which improves our ability to distinguish between the explanations for the existence of dividends given by the signalling models and the free cash flow hypothesis. First, we also regress the abnormal returns on interaction effects between the three components of the simultaneous announcement. Kane et al. (1984) argue that such an additional analysis is interesting given the possibility that the stock market is interested in the consistency of dividend and earnings announcements, thereby leading to a corroboration effect. Indeed, for our purpose an analysis of the interaction effects is especially interesting, since the signalling models and the free cash flow hypothesis propose different signs for some of the interaction coefficients. Furthermore, our analysis presents new evidence on a corroboration effect compared to Kane et al. (1984) along two dimensions. First, our study uses simultaneous announcements, while the study by Kane et al. (1984) uses dividend and earnings announcements separated by up to ten days. Second, in addition to examining the interaction effects between dividend and current earnings announcements, we also analyze the corroboration effect between announcements of dividends and management forecasts of next year's earnings.

Our second extension of Conroy et al. (2000) uses an entirely different approach to distinguish between signalling and free cash flow explanations of market reactions to dividend announcements, following Lang & Litzenberger (1989). Thus, using empirical estimates of Tobin's Q we separate overinvesting firms from those that invest at the optimal level, and then test whether the market reaction to dividend announcements differs between the two groups, as the free cash flow hypothesis predicts. Additionally, the simultaneous announcement of management forecasts of next year's earnings enables us to control for cash flow signalling, providing an improvement over the approach from Lang & Litzenberger (1989). Finally, we combine the interaction effects with the subdivision conducted using Tobin's Q. This gives a clear test of the signalling models versus the free cash flow hypothesis explanation of dividends and extends the work of Kane et al. (1984), Lang & Litzenberger (1989) and Conroy et al. (2000) by combining their analyses.

We find that the stock market reacts to the component of surprise in dividend announcements and management's forecast of next year's earnings. However, the surprise component of current earnings seems to carry no information, since we find no indication of a reaction to the announcement of current earnings when controlling for the other announcements. These results are robust to various sensitivity analyses. Analyzing these results further, we find that the market mainly reacts to the surprise component in management's forecast of next year's earnings. In addition to this, there are three instances where dividend announcements induce a market reaction. First, in general, a dividend increase results in a positive market reaction. This result is supported by both the signalling models and the free cash flow hypothesis. Second, when the firm is investing optimally, there is a significantly negative reaction to a negative dividend surprise accompanied by no surprise in management's forecast of next year's earnings. Thus, when the latter contains no information, the dividend

seems to function as a signal of future cash flows. This result supports the signalling model explanation of dividends. Finally, for firms that are overinvesting, there is a significantly negative reaction to no dividend surprise measured as an unchanged dividend regardless of whether it is accompanied by a positive or negative surprise in management's forecast of next year's earnings. Thus, the market reacts unfavorably to an unchanged dividend for overinvesting firms, since it implies that additional free cash flow will not be paid out, but instead left in the hands of managers, who waste it on unprofitable projects. This result supports the free cash flow hypothesis. Therefore, our results find that the signalling models and the free cash flow hypothesis explain separate aspects of the market's reaction to dividend announcements. This indicates that both models offer valid and important explanations for the existence of dividends, and implies that dividends have both informational and real effects. Thus, contrary to Conroy et al. (2000) we reject the dividend irrelevancy proposition.

In the next section, we give a brief description of the Danish stock market and dividend announcements in Denmark. In section II we present the methodology of this study, while section III presents the data. Section IV examines the properties of dividend and earnings surprises in Denmark, and section V presents the basic results of our empirical tests including robustness analysis of these results. Section VI analyses interaction effects between the different components of the simultaneous announcement. In section VII we discuss the results of dividing the firms into over investors and optimal investors. Finally, conclusions are offered in section VIII.

I Dividend Announcements in Denmark

This section examines the environment surrounding dividend announcements in Denmark. We start by giving a brief description of the Danish stock market. This is followed by a discussion of corporate governance issues pertaining to the ownership structure of Danish firms. Finally, we present the information environment surrounding Danish dividend announcements.

The Copenhagen Stock Exchange (CSE) constitutes the Danish stock market. During our period of interest, 1999-2004, the market capitalization of listed companies rose from 629.3 billion DKK[1] ultimo 1998 to 896.1 billion DKK ultimo 2000, to fall to a level of 564.1 ultimo 2002, and hereafter rise to a level of 856 billion DKK ultimo 2004. The Danish stock market is concentrated, in that the KFX-index, which is comprised of the 20 stocks traded most actively in the preceding six month period, accounts for 70-80% of this value. The total turnover of listed companies rose from 260 billion DKK in 1999 to 455 billion DKK in 2000, to fall to 391 billion DKK in 2002, and finally rise to 593 billion DKK in 2004. Again, the KFX-index accounts for a large share of this, approximately 80-90%, indicating the infrequent (thin) trading of many stocks listed on the CSE.

From the recent literature in corporate governance on the ownership structure of firms, it is evident that there are only a few countries in which the

description of firms as widely held, first given in Berle & Means (1932), is valid. Indeed, for Danish firms it is also the case that ownership is concentrated. The evidence presented in La Porta, Lopez-De-Silanes & Shleifer (1999) and Pedersen & Thomsen (1997) indicates that the equity of Danish firms is seldom widely held, and instead it is common that there is a significant owner of the firm. Additionally, this significant owner is often a family that holds management positions in the firm. Given this, it seems likely that the traditionally posed agency conflict between shareholders and management is lacking in many Danish firms. However, as noted in Shleifer & Vishny (1997) and La Porta et al. (2000) this does not mean that an agency problem does not exist. Instead, one now arises between the controlling shareholders and minority shareholders, since the former have the control to implement policies that benefit themselves at the expense of the latter. This agency problem, like the one between management and shareholders, can also be mitigated by the payment of dividends. Thus, while the ownership structure of Danish firms does not resemble that of the often widely held firms in the United States, it still gives rise to an agency problem of the kind which the free cash flow hypothesis posits has the potential to give dividends a real effect.

It is interesting to return briefly to the case of corporate governance in Japan. La Porta et al. (1999) and Claessens, Djankov & Lang (2000) find that, as in the United States and the United Kingdom, the majority of firms in Japan are widely held. While this gives rise to a potential agency conflict between management and shareholders, there are unique circumstances in Japan such as the main banking relationship and cross-shareholdings that minimize such an agency conflict. This of course poses the question why corporate governance in other countries is not similar, since from an agency cost perspective this form of ownership structure seems optimal. While there are many explanations for this, naturally one is that there are other costs of this system. As Weinstein & Yafeh (1998) document, most of the benefits of the main bank relationship accrue to the banks, for example in the form of higher interest payments, leading to a higher cost of capital for the firm. In relation to this study, the interesting aspect is that the problems of expropriation that arise in the Japanese system can not be mitigated using dividends, thus leaving the possibility of a real effect of dividends in Japan miniscule.

In Denmark, dividends are first announced in the preliminary announcements of annual accounts (PAA) and take the form of a proposed dividend for the current year. Since this dividend proposal is nearly always accepted at the general meeting, the date of the PAA is also the dividend announcement date. All companies listed on the CSE are required to publicize PAAs. These are short versions of the annual report that are made public before the annual report, and at the latest on the same day. They contain the results for the completed fiscal year, a short description of the preceding year, the proposed dividend for the current year, and management's expectations regarding the future.

II Methodology

The methodology used in this study is the standard event study methodology, see for example Campbell, Lo & MacKinlay (1997). First, we calculate the abnormal returns that the PAA generates in an event window around the announcement date. We then attempt to explain these abnormal returns by conducting cross-sectional regressions of the abnormal returns on the elements of new information contained in the announcement. The abnormal returns are thus regressed on measures of surprise pertaining to the announcement of current dividends, current earnings and management's forecasts of next year's earnings. This allows for the disentanglement of the different effects. Additionally, we also regress abnormal returns on interaction effects between the different surprise components in the PAA. Finally, we categorize firms as to whether or not they are overinvesting and analyze how the market reaction to the PAAs differs between these two groups.

A Calculating Abnormal Returns

The part of a stock's return that concerns the firm's PAA is isolated by using a model to estimate the normal return, i.e. the stock's return if there had been no announcement. It is then assumed that the abnormal return generated by the PAA can be found as the difference between the actual return and the estimated normal return. There are several models that can be used to estimate the normal returns. This study uses the market model, which Brown & Warner (1985) find is well-specified under a variety of conditions when using daily returns. The market model for each firm is given as

$$R_{j,t} = \alpha_j + \beta_j R_{m,t} + \varepsilon_{j,t}, \tag{1}$$

where $R_{j,t}$ and $R_{m,t}$ denote the returns to stock j and the market portfolio on day t, respectively.

Using ordinary least squares, a market model is estimated for each firm in an estimation period running from 185 to 6 days before the announcement. One problem in this estimation is that the Danish stock market is characterized by having many stocks that trade infrequently, i.e. thin trading. There are two aspects to this problem. The first is that the registered closing stock prices can be from transactions made earlier in the day. It is a well known problem that this non-synchronous trading results in biased estimates of the market model parameters (see for example Brown and Warner (1985: 16)). However, several studies have shown that the results of event studies are not changed noticeably when alternative unbiased estimates are used (see Brown & Warner (1985) and Dyckman, Philbrick & Stephan (1984)). This aspect will therefore not be pursued further in this study.

The second aspect is that there are days where no trading has occurred, resulting in no registered stock price. Generally, two methods are used to handle this problem. One is to use fairly arbitrary restrictions on the trading frequency to remove stocks that are traded infrequently from the sample. This, however,

results in small samples that are not representative of the entire stock market. The second method is to use a procedure to allocate the multiperiod return on a given trading day over the previous interval where the stock was not traded. Maynes & Rumsey (1993) investigate three such procedures. The first is the "lumped" procedure, which allocates the entire return to the day the stock is traded, while the return on days with no trade is set to zero. The "uniform" procedure distributes the multiperiod return from a day of trade equally over the multiperiod interval. The last procedure is the "trade-to-trade", which directly uses the multiperiod returns instead of allocating them over the interval. In their simulation study, Maynes & Rumsey (1993) find that, while the lumped and uniform procedures give misspecified results, trade-to-trade returns give correct conclusions for all levels of trading frequency. In this study, we will apply as lenient trading frequency restrictions as possible in order to maintain as large a sample size as possible and use the trade-to-trade return allocation procedure to account for the thin trading.

The trade-to-trade procedure requires a number of extensions. Since the procedure uses multiperiod returns, matching multiperiod returns must be generated for the market index. Additionally, a trade-to-trade version of the market model must be used. Maynes & Rumsey (1993) assume an underlying stationary one-day return generating process and derive the trade-to-trade market model as

$$R_{j,n_t} = \alpha_j n_t + \beta_j R_{m,n_t} + \sum_{s=0}^{n_t-1} \varepsilon_{j,t-s},$$

where n_t is the period length of day t's multiperiod return, while R_{j,n_t} and R_{m,n_t} are multiperiod returns for stock j and the market index, respectively. The residuals in the model are heteroskedastic with variance equal to $n_t\sigma_j^2$, which makes it necessary to divide the data with the square root of the multiperiod return length when estimating the model's parameters. The abnormal return in the event window $AR_{j,t}$ for the jth PAA at day t is then

$$AR_{j,t} = R_{j,n_t} - \hat{\alpha}_j n_t - \hat{\beta}_j R_{m,n_t}.$$

Finally, we note that when trade-to-trade returns are generated for the estimation period, uniform returns will be used in the event window to enable using cross-sectional regressions to disentangle the effects. Therefore the above formula for ARs in effect has $n_t = 1$. We calculate abnormal returns for the day of the announcement and the day after. As is standard in the literature, this is done to take into account that some announcements are made late in the day after the stock market has closed, delaying the stock market reaction until the following day. The abnormal returns for these two days are then cumulated into a measure of cumulated abnormal returns (CAR) that is used as the dependent variable in the cross sectional regressions.

B Calculating Dividend and Earnings Surprises

To isolate the element of new information contained in the announcement, we define the surprise component of the announcement as the announcement minus an assessment of the market's expectation of this announcement. As a starting point, we define these dividend and earnings surprises in a manner as consistent with Conroy et al. (2000) as possible. This is done in order to ensure the highest degree of comparability between the studies. Later, as a robustness test, we will examine the effects on the results of using different definitions of the surprise components.

However, we do deviate from Conroy et al. (2000) in that dividend surprises are defined as dividend changes. In section IV we present justification for why this deviation seems necessary in Danish data. Dividend surprises (DS0) are therefore defined as

$$DS0 = current\ dividend\ \text{-}\ last\ year's\ dividend.$$

This continuous variable is then transformed into a grouped variable in the following manner:

$$\begin{aligned} DGROUP0 &= 1 \quad \text{if } DS0 > 0 \\ DGROUP0 &= 0 \quad \text{if } DS0 = 0 \\ DGROUP0 &= -1 \quad \text{if } DS0 < 0. \end{aligned}$$

In defining the surprise component of current earnings, we use consensus analyst forecasts from the International Brokerage Estimate System (IBES)[2] as a proxy for the market's expectation of current earnings. The IBES estimates are forecasts of eps excluding discontinued operations, extra-ordinary charges, and other non-operating items. The measure of current eps must therefore correspond to this definition. The I/B/E/S database provides such an adjusted measure of current eps, which we will use in calculating current earnings surprises. The current earnings surprise (ES0) is defined as a percentage deviation as follows

$$ES0 = \frac{current\ EPS_0 - IBES\ forecast\ EPS_0}{|IBES\ forecast\ EPS_0|}.$$

Again, this continuous variable is transformed into a grouped variable as in Conroy et al. (2000),

$$\begin{aligned} EGROUP0 &= 1 \quad \text{if } ES0 > 10\% \\ EGROUP0 &= 0 \quad \text{if } -10\% < ES0 < 10\% \\ EGROUP0 &= -1 \quad \text{if } ES0 < -10\%. \end{aligned}$$

Similarly the surprise component in management's forecast of next year's earnings (EPS1) is defined using IBES forecasts of next year's earnings given prior to the PAA. The percentage deviation is calculated as

$$ES1 = \frac{management's\ forecast\ of\ earnings_1 - IBES\ forecast\ earnings_1}{|IBES\ forecast\ earnings_1|}.$$

A complication in calculating this deviation is that the management forecasts are given in different measures. To avoid any errors that could occur from transforming these into eps, IBES forecasts are collected in the same measure as the management forecast is given in. ES1 is then calculated directly from these measures. It is also common that the management forecast is given as a range. When this is the case, the midpoint of the range is used, as is standard in the literature. The grouped variable EGROUP1 is defined analogously to EGROUP0 using ES1.

C Interaction effects

We create dummy variables for the interaction effects using the three grouped variables DGROUP0, EGROUP0, and EGROUP1. We first examine the interaction between dividends and earnings by creating nine dummy variables from DGROUP0 and EGROUP0. For example DE(+ -) is a dummy variable that takes the value 1 when the dividend surprise is positive and the earnings surprise is negative and 0 otherwise. The other dummy variables are defined analogously. The second interaction effect we examine is that between dividends and management's forecast of next year's earnings. Again DM(+ -) is a dummy variable that takes the value 1 if the dividend surprise is positive and the surprise in management's forecast of next year's earnings is negative and zero otherwise. When we regress abnormal returns on these dummy variables, we exclude DE(0 0) and DM(0 0) to avoid collinearity between the nine possible dummies and the intercept. Thus, the base case is that of no surprise in either of the two components of the announcement, and we therefore expect that the intercept in these regressions is insignificant.

D Overinvesting firms

The free cash flow hypothesis predicts a market reaction to dividend announcements due to dividend's ability to reduce the free cash flow available for managers to waste on unprofitable projects. Its predictions regarding market reactions to dividend announcements therefore apply to firms that are overinvesting. Contrary to this, in signalling models, dividends signal future cash flows and this causes the market reaction to dividend announcements. Signalling models, therefore, do not predict that the market reaction to dividend announcements will depend on whether or not the firm is overinvesting. A second methodological approach, adopted in Lang & Litzenberger (1989), to distinguish between the predictions of the free cash flow hypothesis and signalling models, is therefore to identify overinvesting firms and analyze whether the market reaction to dividend announcements is different for firms that are overinvesting compared to firms that are not.

Separating overinvesting firms from those that are investing at the optimal level requires a proxy for overinvestment. As is standard in the literature, we use Tobin's Q, which is defined as the ratio of the market value to replacement value of a firm's assets. As Lang & Litzenberger (1989) note, if it is assumed that a firm's investments are scale-expanding and exhibit decreasing marginal efficiency of capital, then an average Q less than unity implies that the firm is overinvesting.

A variety of estimators for Tobin's Q have been developed that generally can be grouped into computationally costly approaches and simple approaches. Chung & Pruitt (1994) find a large degree of consistency in estimates from the two approaches. Additionally, DaDalt, Donaldson & Garner (2003) find that the two approaches classify firms similarly as having a Tobin's Q either above or below unity. Given this and the high potential for sample bias when using the computationally costly approach due to data requirements, they recommend using a simple approach to estimate Tobin's Q. We follow this recommendation and estimate Tobin's Q using the simple approach derived in Chung & Pruitt (1994). Tobin's Q is thus defined as

$$Q = \frac{MVE + PS + BVINV + LTDEBT + CL - CA}{TA},$$

where MVE is the year-end value of common stock , PS is the liquidation value of the firm's preferred stock, BVINV is the book value of inventory, LTDEBT is the book value of the firm's long-term debt, CL and CA are the book values of, respectively, current assets and liabilities, and TA is the book value of the firm's total assets. For a given PAA we compute Tobin's Q using book values taken from the same PAA, such that Tobin's Q is calculated at the end of the financial year reported in the PAA.

III Data

The sample is constructed from firms listed on the CSE from 1999 to 2004. To ensure that the PAAs are fairly congruent in their information content, we are only interested in companies that report earnings in accordance with the Danish Companies Account Act. This excludes banks and insurance companies from the study. The PAA dates for the above companies in the period 1999 to 2004 are extracted from Stockwise, which is CSE's database of stock exchange announcements. This resulted in a sample consisting of 215 companies and 1052 PAAs. In order to include a PAA in the study, we require that the company's stock is listed on the CSE the first day of the estimation period for a given PAA. This reduces the sample to 214 companies and 1034 PAAs.

The Danish stock market is characterized by having many stocks that are traded infrequently. In event studies of stock markets with thin trading, it is common practice to place certain demands on the trading frequency of a stock in order for it to be included in the study. As mentioned before we will use as lenient restrictions as possible. Our restrictions require that the stock is traded

in at least 1/3 of the estimation period and at least once in the 14 day trading period following the PAA. This reduces the sample to 661 PAAs. Additionally, some of these PAAs pertain to dual class shares. So as not to enhance any potential problem of event clustering, we delete the less frequently traded share from any pair of dual class shares, thereby ensuring that each PAA is only included in the sample once. This reduces the sample to 626 PAAs. In order to control for the confounding effect of other announcements made around the PAA, we delete any PAA where an announcement not pertaining to the PAA is made in the window starting 3 days before the PAA and running until the day after the PAA. This reduces the sample to 430 PAAs.

In addition to the dates of the PAAs, the data material consists of the individual stock's total return index, market value of equity, turnover by volume, number of shares, the liquidation value of preferred stock, and the book value of inventory, long-term debt, current assets, current liabilities, and total assets collected from Datastream. In instances where these latter book values are unavailable in Datastream, they are collected from the PAA itself. The total return indices are corrected for dividends and any changes in the capital structure, and are therefore used directly to calculate daily returns of the stocks. The market index is collected from the CSE and is the Exchange's all-share index, KAX. The analysts' forecasts used in the study are consensus forecasts from the International Brokerage Estimate System (IBES). These forecasts are obtained from the I/B/E/S database along with the actual current earnings.

We require that data is available for IBES forecasts of current and next year's earnings, which reduces the sample to 303 observations. Finally, there are instances where the management forecasts of next year's earnings from the PAA is given in purely qualitative rather than quantitative terms, thereby not enabling construction of an estimate of next year's earnings. Deleting these cases reduces the sample to 247 observations.

IV Patterns in Dividend and Earnings Surprises

In this section we examine the patterns in Danish dividend and earnings surprises. In Table I we present evidence on actual dividend changes in our sample, along with analyst's forecasts of these. From the first row in the table it is observed that in more than half of the announcements there is no dividend change, i.e. this year's dividend is equal to last year's. Danish dividends therefore show a high degree of stability, a phenomenon that has also been observed in the literature pertaining to dividend announcements in other countries. Additionally, while 32% of the dividend surprises are positive, only 12% of them are negative. So although dividend increases are fairly common, dividend cuts are more infrequent. In this sense it seems that Denmark is similar to the United States and other countries in that dividends tend to be rather stable, with companies refraining from dividend cuts when possible. Comparing these results to those

of Conroy et al. (2000), however, it is clear that the stability of dividends is less pronounced in Denmark than in Japan. While 55% of our sample involves no change in the dividend from one year to the next, more than 70% of their sample observes no dividend change. This highlights the above mentioned extreme stability that possibly limits Japanese dividends' ability to function as signals.

Insert Table I here

Comparing the first and second rows of the table, we see that when measured using the mean forecast, analysts forecast more increases and decreases in dividends than actually occur. From the third row of the table we see that mean analyst forecasts are rarely accurate, since it is only in 30% of the cases that the current dividend equals the mean IBES forecast. This result is striking, since a comparison of the first and third row of the table indicates that the mean analyst forecast performs worse than a simple random walk forecast that sets this year's dividend equal to last year's. Such a forecast will be correct for more than half of the announced dividends, while the mean analyst forecast is only correct in less than a third of the announcements. One possible explanation for this could be that the mean of the forecasts provides a poor measure of analyst forecasts, since only one analyst must forecast a changed dividend before this is reflected in the mean. We therefore also examine the performance of the median analyst forecast in the fourth and fifth row. The performance is indeed improved, since the current dividend equals the median IBES forecast 40% of the time. However, a simple random walk forecast still performs better. Given this observation, it does not seem rational to assume that analyst's forecasts of dividends provide an accurate proxy for the market's expectations of dividends in Denmark. As mentioned earlier, we will therefore in the following measure the dividend surprise as the difference between this year's and last year's dividend. Although this represents a deviation from Conroy et al. (2000), we feel that this is justified given the evidence of poor performance of analyst forecasts of dividends in Denmark.

Insert Table II here

Table II illustrates the relation between dividend and current earnings surprises. First, it is observed that there is a slight tendency for the earnings surprise to be negative. Thus, 38% of current earnings fall in more than a 10% shot of the corresponding IBES forecast. The previously mentioned stability of dividends is underscored by the fact that only 15% of the companies with negative earnings surprises cut their dividends.

Insert Table III here

Table III presents the relation between the dividend surprise and the surprise contained in management's forecast of next year's earnings, relative to the IBES forecast of the same based on information available prior to the PAA. There is a tendency for the management forecast of next year's earnings to contain a

negative element of surprise, with 47% of the management forecasts more than 10% lower than the corresponding IBES forecast . Again a striking result is that while almost half of the sample involves a negative surprise in the management forecast of next year's earnings, only 18% of these firms cut dividends, with a greater share (21%) actually choosing to increase the dividend. In addition, it is interesting that less than 20% of the companies increasing their dividends are doing this on the basis of a positive element of surprise in management's forecast of next year's earnings.

Insert Table IV here

In Table IV the connection between the current earnings surprise and next year's earnings surprise is examined. Here it is noteworthy that half of the announcements are concentrated along the diagonal, i.e. the surprise component in current earnings and management's forecast of next year's earnings is the same. In spite of this, the Pearson correlation coefficient between the two grouped variables for current and next year's earnings surprise, EGROUP0 and EGROUP1, is fairly modest, at 0.21. In particular, it does not seem high enough to induce a potential problem of multicollinearity in the regressions in the following section that include both variables.

V Stock Market Reaction to Dividend and Earnings Surprises

Table V presents the results of the regressions of cumulated abnormal returns on dividend and earnings surprises. The first regression only includes the dividend surprise and therefore gives an indication of what a Danish dividend announcement study that does not control for the simultaneous announcement of earnings might find. This regression shows a positive coefficient on dividend surprises that is significantly different from zero. While this result is in line with many empirical studies of dividend announcements, it deviates from the results in Conroy et al. (2000), since they find an insignificant coefficient. This first result therefore tends to support the hypothesis that the findings of Conroy et al. (2000) should be interpreted more as a result of unique Japanese circumstances than as support for the dividend irrelevance proposition.

In regressions (2) and (3) we attempt to explain the stock market reaction using the two earnings surprises separately. Both coefficients in these two regressions are positive, but while the coefficient on the current earnings surprise is only significant at the 10% level, the coefficient on next year's earnings surprise is significant at the 1% level. This fact and the much larger explanatory power of the latter regression seem to indicate that the information content of the surprise in management's forecasts of next year's earnings is much larger than that of the surprise component of current earnings. This interpretation is supported by regression (4), where both earnings surprise variables are included. Here, only the coefficient on next year's earnings forecast surprise remains significant.

Thus, it seems that the surprise in next year's earnings forecast carries much more information to the market than the surprise in current earnings, which can be interpreted as indicating that the stock market is reacting to expectations about the future rather than announcements of past performance. Additionally, given that time elapses between the analyst forecasts and the PAA, this result is consistent with previous evidence indicating information leakage prior to the announcement of current earnings, which was originally documented in Beaver (1968).

Insert Table V here

Regressions (5) - (7) present results using different combinations of dividend and earnings surprises. What is striking here is that the coefficient on the dividend surprise variable is positive and remains significant at the 5% level in all of the regressions. Additionally, it can be seen that, once either the dividend surprise or next year's earnings surprise is controlled for, there is no announcement effect in current earnings surprises. This result of a significant effect of dividend surprises is in contrast with the results of Conroy et al. (2000), since they only find an announcement effect for the surprise component of management's forecast of next year's dividend. Thus, it seems that even after controlling for the informational effect of management forecasts of next year's earnings, there is a stock price reaction to dividend surprises in Denmark. At a minimum, this can be interpreted as evidence that dividend surprises contain a signal to the market above and beyond that contained in management's forecasts of next year's earnings. At a higher level this result, in contrast to those in Conroy et al. (2000), does not support the dividend irrelevancy proposition, since even after controlling for information about future expectations, the stock market still reacts to dividend surprises. Since there is still the possibility that the reaction is caused by dividends containing a signal above and beyond that in management's forecasts, our results so far do not allow us to completely reject the dividend irrelevancy proposition. However, it is important to note that this dual interpretation issue is not unique to our study. Had Conroy et al. (2000) found a significant reaction to current dividend surprises, they too would have been unable to completely reject the dividend irrelevancy hypothesis, since such results would also have been open to the interpretation that current dividends contain a signal above and beyond that in management's forecasts of next year's earnings and dividends. Thus, their ability to disentangle the real and informational effects of dividends is not as strong as they suggest, and most importantly hinges critically on their finding of no reaction to current dividend surprises.

The most interesting aspect of the results in Table V is that, contrary to Conroy et al. (2000), our results do not support the dividend irrelevancy proposition. Thus, our results support the hypothesis that the higher level of agency costs and information asymmetry in Denmark compared to Japan leaves a role for dividend surprises after management's expectations for the future have been taken into account.

A Robustness Analysis

The robustness of the above results is tested by conducting the regression analysis with various other specifications of the independent variables. In particular, we examine the effects of (i) using continuous surprise variables rather than grouped variables, (ii) allowing for an asymmetry in the market reaction to dividend and earnings surprises, (iii) including extraordinary dividends in the dividend surprise measure, and (iv) controlling for any potential problems related to clustering.

A.1 Continuous Earnings Surprise Variables

The regression results of Table V indicated that current earnings surprises had no impact on share price once the effect of next year's earnings surprise was taken into account. To asses the robustness of this result, we now define the surprise variables as continuous variables. Christie (1987) concludes that the correct deflator to use when regressing returns on independent variables is the market value of equity at the beginning of the period. We therefore define our continuous measure of dividend surprise as

$$DS0 = \frac{actual\ dividend\ -\ last\ year's\ dividend}{market\ value\ of\ equity},$$

and the current earnings surprise as

$$ES0 = \frac{actual\ EPS - IBES\ forecast\ EPS}{market\ value\ of\ equity}.$$

Finally, the measure of next year's earnings surprise is defined as

$$ES1 = \frac{management\ forecast\ E_1 - IBES\ forecast\ E_1}{market\ value\ of\ equity}.$$

As mentioned previously, a complication arises since management forecasts are given in different measures of earnings. To ensure consistency, IBES forecasts are collected in the same measure as the management forecast. If these earnings measures are not already on a per share basis, we deflate them by the number of shares before calculating ES1. Thus, our ES1 measure is based on different earnings measures. However, given that we are not interested in the level of management's forecast, but rather the surprise component in management's forecast, we do not consider this a problem, as long as the management forecast and IBES forecast are consistent with respect to the earnings measure.

Insert Table VI here

Table VI presents the results of the regressions on the continuous surprise measures. Our continuous surprise measures require the market value of equity at the beginning of the period. This new requirement reduces the sample to 242 observations. From the table, we see that the continuous dividend surprise

measure defined above performs poorly. Its coefficient is negative, which is the opposite of what we would expect a priori, and, more importantly, the coefficient is always insignificant. It is quite likely, however, that although using last year's dividend to proxy for the market's dividend expectations performs well when grouping the surprises, the same proxy performs poorly when measuring the surprise continuously. This phenomenon may be caused by the high likelihood that the market will expect part of any dividend increase or decrease. To examine this issue, we first calculate the mean squared error (MSE) between the current dividend and the market's expectation of the current dividend, when the market's expectation is proxied using last year's dividend, the IBES mean forecast, and the IBES median forecast, respectively. The MSE when using the IBES median forecast as a proxy is in fact the lowest, at 16.87, while the MSEs calculated based on last year's dividend and the IBES mean forecast are 19.71 and 43.26, respectively. This supports our notion that the IBES median forecast provides a better proxy for the market's expectation when measuring the surprise component of the dividend announcement continuously.

We therefore also define a continuous dividend surprise measure, using the IBES median forecast to proxy for market's expectations of dividends. The results from this analysis are given in regressions (8) - (11). Indeed, we see that this continuous dividend surprise measure performs better. The coefficient is significant at the 10% level in two instances and is always positive. Secondly, we see that the continuous measure of the current earnings surprise is only significant when it is included in the regression by itself or with the poor measure of the continuous dividend surprise. This result is similar to that in regressions conducted on grouped variables, and thus supports our finding that there is no announcement effect in current earnings when announced simultaneously with dividends and management forecasts of next year's earnings. Finally, the continuous measure of management's forecast of next year's earnings is always significant, and often at the 1% level. However, it is worth noting that the t-statistics and explanatory power are lower than in the regression with grouped variables. As in Conroy et al. (2000) we therefore find that there is little gain to using continuous variables. In line with our previous results, we conclude that the market reaction to PAAs is driven by the surprise component in dividends and management forecasts of next year's earnings.

A.2 Asymmetry in the Reaction to Dividend and Earnings Surprises

Previous empirical studies of dividend announcements have documented an asymmetry in the reaction to dividend announcements in that the market reacts more strongly to dividend decreases than increases. To allow for this effect, we define two dummy variables for each of the three surprise variables. The first dummy for a given surprise variable assumes the value 1 when the surprise is positive and zero otherwise, while the second dummy variable for this surprise measure assumes a value of 1 when the surprise is negative and zero otherwise. We then regress the cumulated abnormal returns on combinations of these 6 dummy variables.

Surprisingly, our untabulated results (available from the author upon request) indicate a significant market reaction to dividend increases, while dividend decreases seem to have no effect. In all regressions including the dummies for the dividend surprise, it is only the positive coefficient for the positive dummy variable that is significant. This finding indicates a clear asymmetry in the market's reaction to dividend changes, yet contradicts the findings of previous studies since only dividend increases seem to have an effect.

Additionally, the results clearly indicate that the announcement effect of management forecasts of next year's earnings is driven by the negative surprises. In all regressions including the dummies for next year's earnings surprise, it is only the negative coefficient for the negative dummy variable that is significant, and indeed always highly significant at a 1% level. This indicates that while the stock market reacts negatively to management forecasts of next year's earnings that are below the market's expectations, it is indifferent to positive surprises. Thus it seems that there is a clear asymmetry in the stock market's reaction to next year's earnings surprises.

Finally, it is interesting to note that the explanatory power of a regression that only includes the dummy variables for a dividend increase and a management forecast below market expectations increases to 8.4% (adjusted R^2). Although the explanatory power of the regression is still low, it is quite an improvement over the explanatory power of the regressions in Table V.

A.3 Extraordinary Dividends

The preceding results only pertained to announcements of ordinary dividends in that any extraordinary dividends were excluded. We now relax this restriction and also include any extraordinary dividends in the definition of current and last year's dividends. Extraordinary dividends are only announced in seven instances, and including these instances in the definition of dividends does not qualitatively change the results of the first regression analysis.

A.4 Clustering

A potential problem in estimating the above regression is that some of the announcements are clustered on the same calendar days. In fact, the 247 observations are concentrated on 186 days (137 days have single announcements and 49 days have two or more announcements). As recognized in Conroy et al. (2000), if there is day-dependent information, this clustering can result in biased estimates. Following Conroy et al. (2000), we examine the robustness of our results to the potential effects of clustering by including a dummy intercept variable for each calendar day that has more than one PAA. Our untabulated results (available from the author upon request) reveal that the results of the first regression analysis are not qualitatively changed by accounting for clustering in this manner. This result is similar to that found in Conroy et al. (2000). Given this finding, we will not pursue potential clustering problems in the following analyses.

B Summary

Our above results have indicated that the stock market reaction to the PAA can be explained by the component of surprise contained in the current dividend and management forecast of next year's earnings. Additionally, this result was shown to be robust to various alternative specifications. As previously indicated, there are two possible explanations for our result. First, there is the possibility that the current dividend contains a signal above and beyond that contained in the management forecast of next year's earnings, indicating an informational role for dividend announcements. Second, if we assume that management's forecast of next year's earnings fully controls for information regarding future expectations, the results indicate a real effect of dividends, in line with the free cash flow hypothesis and contradicting the dividend irrelevance proposition. In the following two sections we attempt to uncover which of these two explanations is in fact valid, by conducting a deeper analysis of the stock market reaction to the PAA.

VI Interaction Effects

We now regress the cumulative abnormal returns on the dummies for interaction effects between the components of the PAA. In order to distinguish between the individual surprise component's effect on the market reaction and the effect of any possible interaction, we also include the continuous surprise measures DS0, ES0 and ES1 defined previously.

Insert Table VII here

Table VII presents the results of regressing cumulative abnormal returns on the continuous surprise variables and interaction effects between the dividend and current earnings announcement. There are only three variables that are significant in the first regression. These are the management forecast of next year's earnings and the interaction effects DE(- 0) and DE(+ 0). In the second regression we have removed any variables with a coefficient that is insignificant at the 10% level. This is done stepwise where the most insignificant is removed first. Again the continuous measure of the surprise component in management's forecast of earnings is significant. Additionally, the intercept and interaction effects DE(+ 0) and DE(+ +) are significant. Given the significantly negative intercept, these results must be interpreted carefully. We therefore also test whether the combined effect of the intercept and the significant interaction effects is significantly different from zero. This is only the case for the interaction effect between a dividend increase and no surprise in current earnings, DE(+ 0). Given the results from the first regression, it seems highly likely that the negative reaction to a dividend decrease combined with no current earnings surprise is the driving factor behind the significantly negative intercept. The results from the third and fourth regression, where the dividend surprise is measured continuously using IBES median forecasts of dividends, are similar.

Thus, the results again support our previous finding that the stock market is reacting to the announcement of dividends and management forecasts of next year's earnings. There is no reaction to the current earnings announcement, nor are there any interaction effects between this and the dividend announcement.

Insert Table VIII here

The results examining interaction effects between the announcement of the dividend and management's forecast of next year's earnings are given in Table VIII. The results of the different regressions are similar and we will comment on them using regression (2). First, note that the explained portion of the variation in abnormal returns is the highest we have seen yet, at 10.8%. Second, even when taking the interaction effects into account, the surprise component in management's forecast of next year's earnings is still significant. Third, the intercept is significantly positive. Again, this must be taken into account when interpreting the significance of the interaction effects. The intercept represents the market reaction to the base case interaction effects. In this regression, these are DM(0 0), DM(- +), DM(+ 0), and DM(+ +). It seems most likely that the significantly positive intercept term is driven by the latter two. Thus, a dividend increase results in a positive market reaction as long as management's forecast of next year's earnings does not contain a negative element of surprise. This explains our previous finding regarding an asymmetry in the market reaction to the announcements. There we found a market reaction to a negative surprise in the management forecast and a positive surprise in the dividend announcement. The results in Table VIII deepen our understanding of this relation. Thus, it seems that the market is first and foremost reacting to the surprise in management's forecast. In addition, there is a reaction to a dividend increase, as long as this does not coincide with a negative surprise in management's forecast. Unfortunately, this result does not help distinguish between the signalling models and the free cash flow hypothesis, since both predict such a reaction.

Finally, after taking the significance of the intercept term into account, of the four significant interaction effects only two remain significant. These are DM(0 -) and DM(0 +), which are both significantly negative. This is a very interesting result. Given that ES1 controls for the effect from the surprise component in management's forecast, a significantly negative reaction to an unchanged dividend when combined with a negative or positive surprise in management's forecast seems odd at first glance. Indeed, the signalling models can not explain such a result. As there is no surprise component in the dividend announcement, there is no possibility that the dividend can signal future cash flows. On the other hand, the free cash flow hypothesis can explain our result. For overinvesting firms an unchanged dividend results in a negative market reaction, since it implies no reduction in the free cash flow available to managers to waste on unprofitable projects. This effect should be even stronger in the instance where an unchanged dividend is accompanied by a positive surprise in management's forecast. This result therefore supports the free cash flow hypothesis and indicates that dividends have a real effect contradicting the dividend irrelevancy

proposition.

For firms investing at the optimal level we would expect no reaction to an unchanged dividend. In our results, overinvesting firms are grouped with firms investing at the optimal level, and we postulate that the first group is driving the result of a significantly negative market reaction to unchanged dividends. In the next section we will examine this result in more detail by dividing our sample into overinvesting firms and firms investing at the optimal level.

VII Overinvesting Firms

We now use Tobin's Q to subdivide our sample into over and optimally investing firms. We first present results of analyses similar to those conducted in Lang & Litzenberger (1989). Hereafter, we extend the analysis by combining the regression on interaction effects presented in the previous section with the grouping into firms investing above or at the optimal level.

Insert Table IX here

In Table IX we average the CARs on dividend increases with the negative of CARs for dividend decreases separately for each group of firms. Interestingly, only the average CARs for the group of overinvesting firms, that is firms with a Tobin's Q less than unity, are significant. Thus, this is a first indication that the market reaction to PAAs and therefore to dividend announcements differs depending on whether the firm is overinvesting or investing at the optimal level. This result is similar to that reported in Lang & Litzenberger (1989), since they also find a significantly higher market reaction to dividend announcements for overinvesting firms. Contrary to them, however, we do not find a significant market reaction to announcements from firms investing at the optimal level.

Insert Table X here

In Table X we present average CARs grouped by dividend change and Tobin's Q. We deviate from Lang & Litzenberger (1989) by also including dividend announcements with no surprise component in the table. This is done in recognition of the aspect that since we here measure a dividend surprise as the dividend change, the signalling models and the free cash flow hypothesis differ with regard to their predictions for an unchanged dividend. While the free cash flow hypothesis predicts a negative reaction to an unchanged dividend for overinvesting firms, signalling models predict no reaction, since an unchanged dividend, given that market expectations are proxied using last year's dividend, carries no signal of future earnings. Again, we only find a significant market reaction for overinvesting firms. Thus, there is a significantly positive reaction to the announcement of a dividend increase for overinvesting firms, and a significantly negative reaction to the announcement of an unchanged dividend for overinvesting firms. These results, and in particular the latter, support the free cash flow hypothesis. Surprisingly, however, we do not find a significant negative reaction to dividend decreases for overinvesting firms, as we would expect

from the free cash flow hypothesis. Following Lang & Litzenberger (1989), our result that dividend increases are only significant for overinvesting firms can be explained by a conditional cash flow signalling model, where it is assumed that high future cash flows for firms investing at the optimal level are anticipated. If this is the case, there will be no reaction to a dividend increase for this group.

In order to control for expectations regarding future cash flows, we now again draw on the unique simultaneous announcement of dividends, current earnings, and management's forecast of next year's earnings. This is done by combining the analysis of interaction effects between dividends and management forecasts presented in the previous section with the grouping of firms into over investors and optimal investors. We thus regress the cumulative abnormal returns on the continuous surprise components from the PAA and interaction effects for each group created using Tobin's Q. The results of these regressions are presented in Table XI.

Insert Table XI here

We present the results of two regressions, which are similar, and again we will only comment on the results of regression (2), where variables insignificant at the 10% level have been removed. First, we note that the continuous surprise contained in management's forecast of next year's earnings is significant at the 10% level. This indicates that this signal of future prosperity from management is highly valuable for the market, which reacts to this component individually. Additionally, the inclusion of this variable controls for future cash flow signals.

Second, the intercept is significantly positive. This represents the base case and includes DM (0 0) for both groups of firms as well as the interaction effects excluded due to lack of significance. We see that these are mostly interaction effects where the dividend surprise is positive, which explains why the intercept is significantly positive at a 1% level. This result can be explained by both the signalling models and the free cash flow hypothesis.

Third, when the significance of the intercept term is taken into account in interpreting the coefficients of the interaction effects, only the interaction effect DM (- 0) remains significantly negative for the group of firms investing at the optimal level. This is the interaction effect of a negative dividend surprise combined with no surprise in managements forecast. Thus, the management forecast carried no signal of the future, since it did not deviate from the market's expectations. In this instance, it seems that the market interprets a negative dividend surprise as a signal of lower future profits and therefore reacts negatively to the signal. This finding is in line with the signalling models, but indicates that when dividends are announced simultaneously with management's forecasts of next year's earnings they only function as a signal when management's forecasts carry no signal. Supporting this, we do not find significant interaction effects for the instances where the two surprise components of the PAA are in opposite directions.

Finally, after taking into account the significantly positive intercept term, only the interaction effects DM(0 -) and DM(0 +) remain significantly negative for the overinvesting firms. This result can only be explained by the free cash

flow hypothesis. Thus, for overinvesting firms no dividend surprise measured as an unchanged dividend is interpreted as a negative announcement by the market, since it implies that additional free cash flow will not be paid out by management, but instead wasted on unprofitable projects. This result supports our explanation of the findings in section VI. The lack of significance for negative dividend surprises for the overinvesting group is surprising, as it is a prediction of the free cash flow hypothesis. A possible explanation for this result is that there are relatively few announcements of dividend decreases for overinvesting firms.

Thus, the evidence presented in this section seems to indicate that in fact dividends have both an informational and a real effect. There are instances where the market reacts to negative dividend surprises for optimal investing firms which can be explained by signalling models. Similarly, the reaction to an unchanged dividend for overinvesting firms after controlling for the future cash flow signal in management's forecast can be explained by the free cash flow hypothesis. Additionally, these results indicate a fairly sophisticated market, in that the dividend is interpreted in conjunction with management's forecasts and information on whether or not the firm is an over investor or an optimal investor. Thus, in conclusion, we find support for both the signalling models and the free cash flow hypothesis, as they explain different aspects of the market's reaction to dividend announcements.

VIII Conclusion

This study draws on the simultaneous announcement of current dividends, current earnings and management forecasts of next year's earnings to provide an analysis of the informational and real effect of dividend announcements. While not being the first study to analyze simultaneous announcements of these three variables, ours is the first to do this in an environment characterized by informational asymmetry and agency costs; characteristics that are proposed to be crucial to the existence of informational and real effects of dividends. Additionally, the present study is the first to analyze interaction effects between the three components of the simultaneous announcement and combine such an analysis with an examination of how the market reaction differs across overinvesting and optimally investing firms. These analyses deepen our understanding of the market reaction to the simultaneous announcements and facilitate a complete disentanglement of the informational and real effects of dividends.

Our results indicate that the stock market reacts to the component of surprise in dividend announcements and management's forecast of next year's earnings. There is no indication of a reaction to the surprise component in announcements of current earnings. Analyzing these results further, we find that the market mainly reacts to the surprise component in management's forecast of next year's earnings. In addition to this, there are three instances where dividend announcements induce a market reaction. First, in general, a positive dividend surprise results in a positive market reaction. This result is supported

by both the signalling models and the free cash flow hypothesis. Second, when the firm is investing optimally, there is a significantly negative reaction to a negative dividend surprise accompanied by no surprise in management's forecast of next year's earnings. Thus, when the latter contains no information, the dividend seems to function as a signal of future cash flows. This result supports the signalling model explanation of dividends. Finally, for firms that are overinvesting, there is a significant negative reaction to no dividend surprise measured as an unchanged dividend, regardless of whether it is accompanied by a positive or negative surprise in management's forecast of next year's earnings. Thus, the market reacts unfavorably to an unchanged dividend for overinvesting firms, since it implies that additional free cash flow will not be paid out, but instead left in the hands of managers, who waste it on unprofitable projects. Thus, this result supports the free cash flow hypothesis.

Therefore, our results indicate that the signalling models and the free cash flow hypothesis explain separate aspects of the market's reaction to dividend announcements. This indicates that both models offer valid and important explanations for the existence of dividends and implies that dividends have both an informational and a real effect. Thus, contrary to Conroy et al. (2000), we reject the dividend irrelevancy hypothesis. At the same time, our results underscore the importance of taking the institutional environment into account when interpreting results, since in an environment with informational asymmetries and agency costs, we find results that differ from those found in an environment characterized by low levels of these elements.

Notes

[1]During our period of interest, 1 EUR was approximately equal to 7.5 DKK.

[2]The author gratefully acknowledges the contribution of Thomson Financial for providing earnings per share forecast data, available through the Institutional Brokers Estimate System. This data has been provided as part of a broad academic program to encourage earnings expectations research.

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Table I: Dividend Changes and Analyst Forecasts

Entries represent the percentage of total announcements falling in a given category. The sample consists of preliminary annual account announcements (PAAs) without other concurrent announcements for firms listed on the Copenhagen Stock Exchange from 1999 - 2004, N=247.

Measure of Change	Negative	Zero	Positive
Current dividend minus last year's dividend	12.5%	55.1%	32.4%
IBES mean forecast of current dividend minus last year's dividend	18.5%	34.4%	47.1%
Current dividend minus IBES mean forecast	39.3%	29.5%	31.2%
IBES median forecast of current dividend minus last year's dividend	16.4%	45.9%	37.7%
Current dividend minus IBES median forecast	32.0%	38.1%	29.9%

Table II: Dividend and Current Earnings Surprises

Entries represent the number of announcements falling in a given category and this number as a percentage of total announcements. The sample consists of preliminary annual account announcements (PAAs) without other concurrent announcements for firms listed on the Copenhagen Stock Exchange from 1999 - 2004, N=247. The dividend surprise, DS0, is calculated as the announced current dividend per share minus last year's dividend per share. Current earnings surprises, ES0, are measured as the announced current earnings minus the IBES consensus forecast of the earnings divided by the absolute value of the IBES forecast. DGROUP0 is equal to -1 when the dividend surprise is negative, zero when there is no dividend surprise, and 1 when the dividend surprise is positive. EGROUP0 is set to -1 if the announced current earnings are more than 10% below the IBES consensus analyst forecast of current earnings, zero if current earnings are within 10% of the forecast, and 1 if current earnings are more than 10% above the IBES forecast.

Dividend Surprise	**Current Earnings Surprise**			
	ES0 < -10%	-10% < ES0 < 10%	ES0 > 10%	Total
DS0 < 0	14	9	8	31
	5.7%	3.6%	3.2%	12.5%
DS0 = 0	67	37	32	136
	27.1%	15.0%	13.0%	55.1%
DS0 > 0	13	40	27	80
	5.3%	16.2%	10.9%	32.4%
Total	94	86	67	247
	38.1%	34.8%	27.1%	100.0%

Pearson Correlation (DGROUP0, EGROUP0) = 0.20

Table III: Dividend and Next Year's Earnings Surprises

Entries represent the number of announcements falling in a given category and this number as a percentage of total announcements. The sample consists of preliminary annual account announcements (PAAs) without other concurrent announcements for firms listed on the Copenhagen Stock Exchange from 1999 - 2004, N=247. The dividend surprise, DS0, is calculated as the announced current dividend per share minus last year's dividend per share. Next year's earnings surprises, ES1, are measured as the announced management forecast of next year's earnings minus the IBES consensus forecast of next year's earnings divided by the absolute value of the IBES forecast. DGROUP0 is equal to -1 when the dividend surprise is negative, zero when there is no dividend surprise, and 1 when the dividend surprise is positive. EGROUP1 is set to -1 if management's forecast of next year's earnings is more than 10% below the IBES consensus analyst forecast of next year's earnings, zero if management's forecast is within 10% of the IBES forecast, and 1 if management's forecast is more than 10% above the IBES forecast.

Dividend Surprise	**Next Year's Earnings Surprise**			
	ES1 < -10%	-10% < ES1 < 10%	ES1 > 10%	Total
DS0 < 0	21	7	3	31
	8.5%	2.8%	1.2%	12.5%
DS0 = 0	71	34	31	136
	28.7%	13.8%	12.6%	55.1%
DS0 > 0	25	42	13	80
	10.1%	17.0%	5.3%	32.4%
Total	117	83	47	247
	47.3%	33.6%	19.1%	100.0%

Pearson Correlation (DGROUP0, EGROUP1) = 0.16

Table IV: Current and Next Year's Earnings Surprises

Entries represent the number of announcements falling in a given category and this number as a percentage of total announcements. The sample consists of preliminary annual account announcements (PAAs) without other concurrent announcements for firms listed on the Copenhagen Stock Exchange from 1999 - 2004, N=247. Current earnings surprises, ES0, are measured as the announced current earnings minus the IBES consensus forecast of earnings divided by the absolute value of the IBES forecast. Next year's earnings surprises, ES1, are calculated as the announced management forecast of next year's earnings minus the IBES consensus forecast of next year's earnings divided by the absolute value of the IBES forecast. EGROUP0 is set to -1 if the announced current earnings are more than 10% below the IBES consensus analyst forecast of current earnings, zero if current earnings are within 10% of the forecast, and 1 if current earnings are more than 10% above the IBES forecast. EGROUP1 is defined in a similar manner based on ES1.

Current Earnings Surprise	**Next Year's Earnings Surprise**			
	ES1 < -10%	-10% < ES1 < 10%	ES1 > 10%	Total
ES0 < -10%	62	16	16	94
	25.1%	6.5%	6.5%	38.1%
-10% < ES0 < 10%	30	43	13	86
	12.2%	17.4%	5.2%	34.8%
ES0 > 10%	25	24	18	67
	10.1%	9.7%	7.3%	27.1%
Total	117	83	47	247
	47.4%	33.6%	19.0%	100.0%

Pearson Correlation (EGROUP0, EGROUP1) = 0.21

Table V: Regressions of Abnormal Returns on Dividend and Earnings Surprises

Abnormal returns are calculated for the day of the preliminary annual account announcement (PAA) and the day after using the market model as a benchmark. The cumulated abnormal return for these two days is the dependent variable in the regression. This variable is regressed on a constant and the independent variables that are measures of the dividend and earnings surprises. Entries are estimated coefficients with t-statistics based on heteroskedasticity consistent errors given in parenthesis. DGROUP0 is defined as -1 if the announced dividend is less than last year's dividend, zero if it is equal to last year's dividend, and 1 if it is larger than last year's dividend. EGROUP0 is set to -1 if the announced current earnings are more than 10% below the IBES consensus analyst forecast of current earnings, zero if current earnings are within 10% of the forecast, and 1 if current earnings are more than 10% above the IBES forecast. EGROUP1 is defined analogously based on management forecasts of next year's earnings and IBES consensus analyst forecasts of next year's earnings. The sample consists of preliminary annual account announcements (PAAs) without other concurrent announcements for firms listed on the Copenhagen Stock Exchange from 1999 - 2004, N=247.

Regression	**DGROUP0**	**EGROUP0**	**EGROUP1**	**Adj. R^2**
(1)	0.020***			0.028
	(2.88)			
(2)		0.010*		0.008
		(1.74)		
(3)			0.018***	0.032
			(3.04)	
(4)		0.006	0.016***	0.034
		(1.15)	(2.74)	
(5)	0.018**	0.007		0.030
	(2.58)	(1.21)		
(6)	0.017**		0.015***	0.051
	(2.44)		(2.63)	
(7)	0.016**	0.004	0.014**	0.050
	(2.28)	(0.76)	(2.45)	

*, **, and *** denote that the coefficient is significantly different from zero at the 0.10, 0.05, or 0.01 significance levels (two-tailed test), respectively.

Table VI: Regressions of Abnormal Returns on Continuous Dividend and Earnings Surprises

Abnormal returns are calculated for the day of the preliminary annual account announcement (PAA) and the day after using the market model as a benchmark. The cumulated abnormal return for these two days is the dependent variable in the regression. This variable is regressed on a constant and continuous measures of the surprise in the dividend, current earnings, and management forecasts of next year's earnings, denoted as DS0, ES0, and ES1, respectively. Entries are estimated coefficients with t-statistics based on heteroskedasticity consistent errors given in parenthesis. Each continuous variable is calculated as the difference between the announced value and a proxy for the market's expectation, deflated by the market value of equity. For DS0 market expectations are proxied using both last year's dividend and the median of analyst forecasts from IBES. For ES0 and ES1, market expectations are proxied using consensus analyst forecasts from IBES. The sample consists of preliminary annual account announcements (PAAs) without other concurrent announcements for firms listed on the Copenhagen Stock Exchange from 1999 - 2004, resulting in N=242 and N=239 when market expectations of dividends are proxied using last year's dividend and median IBES forecasts, respectively.

Regression	**DS0**	**DS0**	**ES0**	**ES1**	**Adj.** R^2
	Last dividend	IBES Median			
(1)	-0.13				-0.003
	(-0.50)				
(2)			0.15*		0.008
			(1.74)		
(3)				0.80***	0.025
				(2.68)	
(4)			0.12	0.75**	0.030
			(1.48)	(2.52)	
(5)	-0.16		0.15*		0.006
	(-0.59)		(1.77)		
(6)	-0.23			0.84***	0.024
	(-0.87)			(2.78)	
(7)	-0.25		0.13	0.79***	0.029
	(-0.94)		(1.51)	(2.62)	
(8)		0.84*			0.010
		(1.84)			
(9)		0.66	0.11		0.013
		(1.41)	(1.29)		
(10)		0.81*		0.71**	0.026
		(1.81)		(2.22)	
(11)		0.67	0.09	0.67**	0.027
		(1.44)	(1.05)	(2.09)	

*, **, and *** denote that the coefficient is significantly different from zero at the 0.10, 0.05, or 0.01 significance levels (two-tailed test), respectively.

Table VII: Regressions of Abnormal Returns on Interaction Effects between Dividend and Current Earnings Surprises

Abnormal returns are calculated for the day of the preliminary annual account announcement (PAA) and the day after using the market model as a benchmark. The cumulated abnormal return for these two days is the dependent variable in the regression. This variable is regressed on a constant, interaction effects between the dividend and current earnings surprise, and continuous measures of the surprise in the dividend (DS0), current earnings (ES0), and management forecasts of next year's earnings (ES1). Entries are estimated coefficients with t-statistics based on heteroskedasticity consistent errors given in parenthesis. Each continuous variable is calculated as the difference between the announced value and a proxy for the market's expectation, deflated by the market value of equity. For DS0, market expectations are proxied using both last year's dividend and the median of analyst forecasts from IBES. For ES0 and ES1, market expectations are proxied using IBES consensus analyst forecasts. The sample consists of PAAs without other concurrent announcements for firms listed on the Copenhagen Stock Exchange from 1999 - 2004.

Regression	**(1)**	**(2)**	**(3)**	**(4)**
	DS0 - Last dividend		DS0 - IBES Median	
Intercept	0.00	-0.01*	0.00	-0.01*
	(0.09)	(-1.93)	(0.22)	(-1.92)
DS0	-0.40		0.47	
	(-1.42)		(1.00)	
ES0	0.07		0.05	
	(0.81)		(0.58)	
ES1	0.77**	0.68**	0.60*	0.60*
	(2.56)	(2.31)	(1.89)	(1.91)
DE(- -)	-0.00		-0.00	
	(-0.22)		(-0.10)	
DE(- 0)	-0.04*		-0.04	
	(-1.76)		(-1.54)	
DE(- +)	-0.00		0.00	
	(-0.03)		(0.02)	
DE(0 -)	-0.01		-0.01	
	(-0.85)		(-0.92)	
DE(0 +)	-0.01		-0.01	
	(-0.76)		(-0.80)	
DE(+ -)	-0.00		-0.02	
	(-0.09)		(-0.75)	
DE(+ 0)	0.03*	0.04***	0.02	0.04***
	(1.69)	(3.07)	(1.53)	(3.07)
DE(+ +)	0.02	0.03**	0.01	0.03**
	(1.08)	(2.05)	(0.72)	(2.07)
N	242	242	239	239
Adj. R^2	0.054	0.063	0.043	0.056

*, **, and *** denote that the coefficient is significantly different from zero at the 0.10, 0.05, or 0.01 significance levels (two-tailed test), respectively.

Table VIII: Regressions of Abnormal Returns on Interaction Effects between Dividend and Management Forecast Surprises

Abnormal returns are calculated for the day of the preliminary annual account announcement (PAA) and the day after using the market model as a benchmark. The cumulated abnormal return for these two days is the dependent variable in the regression. This variable is regressed on a constant, interaction effects between the dividend and management forecast of next year's earnings, and continuous measures of the surprise in the dividend, current earnings, and management forecast of next year's earnings, denoted as DS0, ES0, and ES1, respectively. Entries are estimated coefficients with t-statistics based on heteroskedasticity consistent errors given in parenthesis. Each continuous variable is calculated as the difference between the announced value and a proxy for the market's expectation, deflated by the market value of equity. For DS0, market expectations are proxied using the median of analyst forecasts from IBES, while market expectations for ES0 and ES1 are proxied using IBES consensus analyst forecasts. The sample consists of PAAs without other concurrent announcements for firms listed on the Copenhagen Stock Exchange from 1999 - 2004.

Regression	**(1)**	**(2)**
Intercept	0.02*	0.03***
	(1.92)	(4.08)
DS0	0.35	
	(0.75)	
ES0	0.05	
	(0.56)	
ES1	0.47	0.58**
	(1.45)	(1.96)
DM(- -)	-0.04*	-0.04***
	(-1.89)	(-2.69)
DM(- 0)	-0.04	-0.05*
	(-1.50)	(-1.87)
DM(- +)	0.00	
	(0.11)	
DM(0 -)	-0.04***	-0.05***
	(-2.80)	(-4.49)
DM(0 +)	-0.04**	-0.05***
	(-2.42)	(-3.50)
DM(+ -)	-0.04**	-0.04***
	(-2.16)	(-2.83)
DM(+ 0)	0.01	
	(0.67)	
DM(+ +)	0.01	
	(0.39)	
N	239	242
Adj. R^2	0.089	0.108

*, **, and *** denote that the coefficient is significantly different from zero at the 0.10, 0.05, or 0.01 significance levels (two-tailed test), respectively.

Table IX: Average Abnormal Returns for Overinvestors and Optimal Investors

Abnormal returns are calculated for the day of the preliminary annual account announcement (PAA) and the day after using the market model as a benchmark. Entries represent the average cumulated abnormal returns (CARs) for a given category with t-statistics given in parenthesis. Average CARs are calculated by averaging the abnormal returns for dividend increases with the negative of returns for dividend decreases. Optimal investors are firms with a Tobin's Q greater than unity, while overinvestors are firms with a Tobin's Q less than unity. The sample consists of PAAs without other concurrent announcements for firms listed on the Copenhagen Stock Exchange from 1999 - 2004. Deleting all observations with an unchanged dividend results in N=178.

	Optimal Investor	**Over Investor**
Average Cumulated Abnormal Returns	0.019	0.014***
	(1.47)	(2.72)

*, **, and *** denote that the coefficient is significantly different from zero at the 0.10, 0.05, or 0.01 significance levels (two-tailed test), respectively.

Table X: Average Abnormal Returns for Overinvestors and Optimal Investors Grouped by Dividend Change

Abnormal returns are calculated for the day of the preliminary annual account announcement (PAA) and the day after using the market model as a benchmark. Entries represent the average cumulated abnormal returns for a given category with t-statistics given in parenthesis. Optimal investors are firms with a Tobin's Q greater than unity, while overinvestors are firms with a Tobin's Q less than unity. The sample consists of PAAs without other concurrent announcements for firms listed on the Copenhagen Stock Exchange from 1999 - 2004, N=430.

	Dividend Decrease	**Dividend Unchanged**	**Dividend Increase**
Optimal Investor	-0.087	-0.004	0.004
	(-1.77)	(-0.46)	(0.41)
Overinvestor	-0.003	-0.017***	0.020***
	(-0.38)	(-2.97)	(3.27)

*, **, and *** denote that the coefficient is significantly different from zero at the 0.10, 0.05, or 0.01 significance levels (two-tailed test), respectively.

Table XI: Regressions of Abnormal Returns on Interaction Effects Grouped by Overinvestors and Optimal Investors

Abnormal returns are calculated for the day of the preliminary annual account announcement (PAA) and the day after using the market model as a benchmark. The cumulated abnormal return for these two days is the dependent variable in the regression. It is regressed on a constant, interaction effects between the dividend and management forecast of next year's earnings for firms that are overinvestors and optimal investors, and continuous measures of the surprise in the dividend (DS0), current earnings (ES0), and management forecasts (ES1). Entries are estimated coefficients with t-statistics based on heteroskedasticity consistent errors in parenthesis. Each continuous variable is calculated as the difference between the announced value and a proxy for the market's expectation, deflated by equity's market value. For DS0, market expectations are proxied using the median IBES analyst forecasts. For ES0 and ES1, market expectations are proxied using IBES consensus analyst forecasts. Q refers to Tobin's Q, which is assumed to be less than unity for overinvestors and larger than unity for optimal investors. The sample consists of PAAs without other concurrent announcements for firms listed on the Copenhagen Stock Exchange from 1999 - 2004.

Regression	**(1)**		**(2)**	
Intercept	0.02*		0.02***	
	(1.94)		(3.53)	
DS0	0.31			
	(0.67)			
ES0	0.04			
	(0.53)			
ES1	0.46		0.55*	
	(1.43)		(1.87)	
	$Q > 1$	$Q < 1$	$Q > 1$	$Q < 1$
DM(- -)	-0.08*	-0.03	-0.08*	-0.03**
	(-1.65)	(-1.63)	(-1.68)	(-1.99)
DM(- 0)	-0.10**	-0.02	-0.10**	
	(-2.19)	(-0.52)	(-2.22)	
DM(- +)		0.00		
		(0.10)		
DM(0 -)	-0.04*	-0.04***	-0.04*	-0.04***
	(-1.73)	(-2.80)	(-1.94)	(-3.94)
DM(0 +)	-0.03	-0.05**		-0.05***
	(-1.18)	(-2.52)		(-3.06)
DM(+ -)	-0.04	-0.04**		-0.04**
	(-1.18)	(-2.04)		(-2.26)
DM(+ 0)	0.00	0.02		
	(0.06)	(0.98)		
DM(+ +)	-0.03	0.01		
	(-0.41)	(0.53)		
N	239		242	
Adj. R^2	0.080		0.099	

*, **, and *** denote that the coefficient is significantly different from zero at the 0.10, 0.05, or 0.01 significance levels (two-tailed test), respectively.

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