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**The Differences Between Stock Splits and Stock Dividends -
Evidence from Denmark**

by

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The Differences Between Stock Splits and Stock Dividends – Evidence from Denmark

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Key words: Stock splits; Stock dividends; Cash dividends; Signaling; Liquidity

JEL Classification: G14 (Information and Market Efficiency; Event Studies); G32 (Financing Policy; Capital and Ownership Structure); G35 (Payout Policy)

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Abstract

It is often asserted that stock splits and stock dividends are purely cosmetic events. However, many studies have documented several stock market effects associated with stock splits and stock dividends. This paper examines the effects of these two types of events for the Danish stock market. Consistent with the existing literature, the two events are associated with a significantly positive announcement effect of approximately 2.5%. However, when examining the two events more carefully, several important results are obtained. First, a firm's motivation for announcing the two events is completely different. Second, the positive stock market reaction is closely related to associated changes in a firm's payout policy, but the relationship varies for the two types of events. Finally, there is only very weak evidence for a change in the liquidity of the stock. On the whole, after controlling for the firm's payout policy, the results suggest that a stock split is a cosmetic event and that a stock dividend on its own is considered negative news.

1 Introduction

Stock splits and stock dividends are similar in several aspects. In particular, they are both corporate events in which each shareholder receives a certain number of new shares free of charge whereby the stock price is reduced accordingly. However, there are also some differences between the two events. In the case of a stock split, each old share is *split* into a number of new shares with a reduced par value, leaving the total equity capital unchanged. In the case of a stock dividend, a number of new shares is received for each share owned. The new shares have the same par value as the old shares, whereby the total equity capital increases proportionally with the size of the stock dividend.¹ It is well documented that, on average, the announcement of a stock split or a stock dividend is associated with a positive stock market reaction. Still, very little is known about the exact explanation for the positive announcement effect and only a few papers have taken the difference between stock splits and stock dividends into account when examining the announcement effect.

This paper examines stock splits and stock dividends (henceforth the events) in Denmark. Denmark is interesting for four main reasons. First, we have access to quite detailed company information, including all details about the announcement itself. For example, as it turns out, all announcements are contaminated with other news, suggesting that a stock split or a stock dividend is not considered to be a major event by Danish firms. Second, detailed announcements provide us with very reliable information on whether the event is a stock split, a stock dividend or a mixture of both, which is important because, as Rankine and Stice (1997) document, classifications made by both CRSP and firms themselves include many wrong classifications. Third, the Danish stock market is organized in such a way that some of the explanations given for stock splits and stock dividends in the U.S. can be ruled out for Denmark. Finally, the Danish Corporation Law requires that firms provide an explanation for the events, hence making it possible to determine whether the firms consider the two events to be different.

Many studies have considered the effects of stock splits and stock dividends since Fama et al. (1969) found that the two types of events are associated with a positive stock market effect, which in turn, is related to the firm's payout policy.² Similarly, Nayak and Prabhala (2001) find that approximately half of the positive announcement effect is explained by associated changes in the firms' payout policy. In addition, Nayak and Prabhala (2001) document that more than 80%

¹In practice, this is done in the accounts by transferring retained earnings to the equity capital. This will have implications for, among other things, the ability of the firm to pay out cash dividends in the future.

²Nielsen and Svarrer (1979) provide similar results in the only existing study of stock splits and stock dividends for the Danish stock market.

of stock split announcements are contaminated by cash dividend announcements. In a study of the Swedish stock market, where the stock split and stock dividend is announced simultaneously with annual proxy statements, Liljeblom (1989) finds that the positive announcement effect cannot be explained by information on earnings per share or cash dividends. However, like most of the existing literature on stock splits and stock dividends, none of these studies distinguish between stock splits and stock dividends.

Rankine and Stice's (1997) study is one of the very few studies that makes this distinction and documents that stock dividends are generally associated with a higher announcement effect than stock splits. In a study which also considers the difference between the events, Wulff (2002) looked at the German stock market and found that the stock market effect is more positive for stock dividends than for stock splits. However, Rankine and Stice (1997) and Wulff (2002) do not examine the relationship between the announcement effect and the changes in the level of cash dividends.

Four main competing explanations have been suggested for the stock price effect of stock splits and stock dividends. First, the *optimal trading range* hypothesis suggests that a stock split or a stock dividend changes the stock price to a more optimal trading range, for example such that the stock is affordable for a larger group of investors. This, in turn, could increase the demand for the stock, leading to a positive stock price effect (see for example Lakonishok and Lev (1987)). Second, the *market maker* hypothesis argues that the size of the relative bid-ask spread is important for the incentives of the market maker to promote the stock. Hence, a stock split or stock dividend can increase the relative bid-ask spread, whereby the market maker will be more active in promoting the stock, leading to a positive stock market effect (see Angel (1997) and Schultz (2000)). Third, the *neglected firms* hypothesis suggests that stock splits and stock dividends are made primarily by firms that believe themselves to be undervalued. The stock split or the stock dividend is considered to be a way to attract analysts' attention (see Grinblatt, Masulis, and Titman (1984)). Finally, there is the *cosmetic* hypothesis, which argues that stock splits and stock dividends are just cosmetic events. According to this hypothesis, the positive stock market reactions to stock splits and stock dividends can be explained by a close relationship between these events and changes in the firm's payout policy.

The Danish stock market is organized in such a way that neither the optimal trading range hypothesis nor the market maker hypothesis are expected to be relevant in explaining the stock price effect of stock splits or stock dividends. First, the Danish stock market is an order-driven

stock market and has relative tick-sizes, and hence also relative bid-ask spreads, which are in general independent of the stock price. Second, the trading lot size is defined based on the market value of shares traded and has, in general, been much higher than the stock prices before stock splits or stock dividends.³ Thus, stock splits and stock dividends will not have any major impact on the market value of a round lot. Similarly, brokerage costs are also defined as a fraction of the market value of shares traded and not as a function of the number of shares traded, which is, in general, the case in the U.S. As a result, the arguments for the market marker hypothesis, and partly also for the optimal trading range hypothesis are simply inapplicable when it comes to the Danish stock market.

The main findings of this paper are as follows: Consistent with the existing literature, the results show that in Denmark when stock splits and stock dividends are seen as a whole, they are associated with an average significant positive announcement effect of roughly 2.5%. However, this average announcement effect hides some important differences between the two types of events. In particular, the link to the firm's payout policy is different between the two events. For stock splits, the announcement of an increase in cash dividends at the same time as the split leads to a highly significant announcement effect of 3.51%, whereas a split without an increase in cash dividends leads to an insignificant announcement effect of only 0.49%. For stock dividends, where basically all firms increase the total amount of cash dividends around the announcement, the pattern is quite different. If the total amount of cash dividends is expected to increase *less* than proportionally with the increase in equity capital, then the announcement effect is an insignificant -0.29% . However, if instead, the amount of cash dividends is expected to increase *at least* proportionally with the increase in equity capital, then the announcement effect is a highly significant 4.07% . In addition, the results also document other important differences between the two types of events. For example, firms consider them to be different and there are differences with respect to pre-event stock returns and liquidity.

These results contribute to the existing literature in three main aspects. First, the results document the importance of distinguishing between stock splits and stock dividends when explaining the stock market reaction to these two types of corporate events. Second, when distinguishing between the two events, the relationship to changes in the firm's payout policy seems more pronounced than suggested by the existing literature. In particular, the positive stock market effect

³The trading lot size has gradually been reduced from a minimum of DKK 500,000 to a minimum of DKK 10,000 (DKK 20,000 for blue chip stocks). This should be compared with the average stock prices before the stock split or the stock dividend, as reported in Table 1.

associated with stock splits and stock dividends in Denmark seems to be explained completely by associated changes in the payout policy. Third, these findings, along with very weak evidence for an effect on liquidity, suggest that a stock split on its own is a purely cosmetic event. Similarly, there is no evidence that a stock dividend on its own is associated with a positive stock market reaction. Interestingly, some of the results even suggest that a stock dividend in itself is considered to be bad news by the stock market, whereas a stock dividend in combination with an expected proportional increase in cash dividends is considered as very good news.

The rest of this paper is organized as follows: Section 2 provides details on the regulation of stock splits and stock dividends in Denmark and discusses the difference between the two events. Section 3 describes the data set and the methodology used in this paper. Section 4 presents the main results of the paper in four parts. First, we consider the stock price pattern around the announcement and the effective date (also denoted the X-date). Second and third, we examine whether the events lead to changes in liquidity or stock price volatility. Fourth, we examine the ability of the different hypotheses to explain the announcement effect. Section 5 gives a short summary and concluding remarks.

2 Stock splits and stock dividends

In Denmark stock splits and stock dividends are primarily regulated by the Corporation Law and by the Rules Governing Securities Listing on the Copenhagen Stock Exchange (the Rules).

The Corporation Law is quite strict on how changes in equity capital have to be decided. In general, they have to be decided at an ordinary or extraordinary shareholders' meeting, which also applies to stock splits and stock dividends. As a result, it should be possible to find proposals on stock splits and stock dividends in the call to the shareholders' meeting. Moreover, decisions on these matters should also be stated in the minutes from the shareholders' meeting.

In addition to the Corporation Law, Section 18 in the Rules states that proposals for changes in equity capital have to be reported to the exchange immediately. Furthermore, the Rules do not allow proposals to be announced just before or after the release of the accounting report. This is an important rule in practice. More than 90% of the events in our data set are proposed in the release of the accounting report.

Finally, Section 9 in the Rules requires firms to provide a reason for the change in equity capital, which is interesting when examining why firms actually make a stock split or a stock dividend. In Section 3.2 we discuss the explanations provided by the firms.

Stock splits and stock dividends are treated differently in the Corporation Law. As briefly mentioned above, equity capital is unchanged in the case of a stock split, but increases in the case of a stock dividend. Among other things, this has implications for a firm’s ability to pay out cash dividends to shareholders. According to the Corporation Law, a firm cannot pay out cash to shareholders unless the book value of equity is above the equity capital. This means that a stock dividend will actually limit the possibilities for the firm to pay out cash to shareholders and hence be advantageous for other claimholders, causing an indirect cost for stock dividends compared to stock splits.⁴

There are also direct costs associated with a stock split or a stock dividend. However, stocks trade electronically on the Copenhagen Stock Exchange (CSE) and therefore, the costs are actually relatively low. First, CSE requires a fixed fee of DKK 10,000 for handling a stock split or a stock dividend.⁵ VP Securities Services also take a fixed fee of DKK 10,000 plus DKK 7.50 per shareholder for informing them about the change. Second, according to the Corporation Law, the stock split or the stock dividend should be approved at a shareholders’ meeting. Associated costs, however, turn out to be negligible. As will be discussed later, there are no firms in our sample that hold shareholders’ meeting with the single or most important issue being a stock split or a stock dividend. As a result, overall direct costs are relatively small, basically amounting to DKK 20,000 plus a stamp for each shareholder.

3 Data set and methodology

3.1 Data set

We have identified all stock splits and stock dividends for shares listed in DKK on the CSE from 1995 to 2002. The information on stock splits and stock dividends was obtained using several sources. First, Datastream, the DSD database, and the yearly reports from the CSE were used to identify stock splits and stock dividends.⁶ Based on this search, we obtained a data set consisting of 131 observations. Information on stock prices, trading volume, and number of shares outstanding were also obtained from these databases.

Second, StockWise, which contains all company announcements for firms listed on the CSE starting in 1995, was searched for stock split and stock dividends announcements. In addition

⁴It is worth to note that there are no tax advantages to stock dividends in Denmark. Anderson, Cahan, and Rose (2001) examine tax issues in connection with stock dividend announcements in New Zealand.

⁵The present exchange rate is 100 DKK = 13.42 EUR = 17.06 USD.

⁶DSD database (Danish Stock Data), also known as Børsdatabasen, contains a range of financial data from the Danish stock market starting January 2, 1985.

to announcement dates, StockWise allowed us to obtain quite detailed background information on the individual firms. In particular, this information includes details on the cash dividends paid out by the firms. However, StockWise can also be troublesome to work with. For example, the database is, in general, not searchable and therefore all announcements had to be read manually in order to check if the stock split or the stock dividend was mentioned. Furthermore, it turns out that, in a few cases, announcements are missing or unreadable. In order to check our announcement dates, we have also searched other databases with financial news.

Several of the firms in the sample have issued different classes of shares. In order to avoid including the same effect twice, we have chosen to include only the B-shares in the final sample because they are, in general, the most liquid class of shares. However, the results are not sensitive to whether these other classes of shares are included or not. Furthermore, it is worth noting that there is no evidence that the effect of stock splits and stock dividends is different between the different classes of shares.

In selecting the final data set among the 131 observations, the following additional selection criteria was used:

- i. Identifiable announcement date, leading to the removal of 7 observations.
- ii. In cases where the firm has issued more than one class of share, only the B-share is included, leading to the removal of 15 more observations.
- iii. For pure stock dividends, we require that the size is at least 10%; i.e. that at least one new share is received per ten shares owned, leading to the removal of 1 observation.

As a result, the final data set consists of 108 observations, which are described in detail in the following subsection.

3.2 Descriptive statistics

In the initial description of the final data set, three interesting observations can be made based on the collection of the data set.

First, no failed attempts to make a stock split or a stock dividend were found, i.e. all announced stock splits or stock dividends were accepted. In approximately 90% of the cases, this occurred at the first shareholders' meeting. However, it can be the case that not enough voting capital was present at the first shareholders' meetings, resulting in the proposal being accepted quite efficiently at a second shareholder' meeting using voting by proxy.

Second, all proposals for stock splits or stock dividends are announced with other proposals or other news in connection with a shareholders' meeting, implying that all events are contaminated.⁷ Furthermore, it is never the case that there is a shareholders' meeting where the only (or most important) purpose is to accept a stock split or a stock dividend.

Last, there are no examples of reverse stock splits, which is surprising given the seemingly small costs associated with a split.⁸ In particular, if an optimal trading range existed, one would expect some firms to make reverse splits.⁹ Similarly, according to the neglected firms hypothesis, firms could just as well have used reverse splits to attract attention.

After this initial description of some important observations drawn from the data collection, we turn our attention to the actual data set. The distribution of observations over time and across pure stock splits, stock dividends, and mixed events is given in Table 1. Mixed events are cases where a firm makes a stock split and a stock dividend at the same time. The table also includes descriptive statistics on the split factor and stock prices before and after the event. The split factor is defined as the total number of shares owned after the event per share owned before.

Table 1 shows that the data set consists of 68 stock splits, 29 stock dividends, and 11 mixed events. In addition, the observations are distributed fairly evenly over time. There is no clear trend in the relative use of stock splits compared to stock dividends even though stock splits seem to have been more popular for a few years up to 2002. In contrast, mixed events are primarily observed in 1995 and 1996. Stock splits have an average split factor of 5.82 compared to 2.45 for stock dividends, which means that the number of new shares issued is higher for stock splits than for stock dividends. The stock price on the day before the X-date reveals a price that is generally higher for stock splits than for stock dividends.¹⁰ The median stock price before was DKK 1,038 for stock splits compared to DKK 700 for stock dividends. The stock price on the X-date again reveals that the split factor is higher for stock splits than for stock dividends.

⁷This, of course, implies that results from an event study should be interpreted with care. However, besides the fact that there are no uncontaminated stock splits or stock dividends in Denmark, there are several reasons why we study contaminated events. First, firms decide if the stock splits or stock dividend is contaminated or not. Therefore, a potential selection bias can be caused by only focusing on uncontaminated events (see discussions in Liljeblom (1989) and Nayak and Prabhala (2001)). Second, some studies of stock split and stock dividend announcements in the U.S. have found no significant differences between pure and contaminated events (see, for example McNichols and Dravid (1990)). Finally, our main focus is to document the differences between the announcement effect for the two types of events.

⁸There are no regulations or tax laws which prevent reverse splits or make them unattractive.

⁹Han (1995) examines reverse stock splits in the U.S. and finds that reverse splits enhance the liquidity of stocks.

¹⁰The average stock price for stock dividends was heavily influenced by two extraordinary stock dividends in 1998, both related to the large international shipping firm, the A. P. Møller Group (Maersk). The stock price for the two shares was DKK 458,000 and DKK 325,000 before the issuance of four new shares for each old share.

| | | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | All years |
|------------------------|------------|------|------|------|--------|------|-------|------|------|-----------|
| Number of Obs. | Splits | 6 | 4 | 11 | 8 | 13 | 15 | 9 | 2 | 68 |
| | Dividends | 3 | 6 | 6 | 6 | 2 | 1 | 2 | 3 | 29 |
| | Mixed | 6 | 2 | 0 | 1 | 1 | 0 | 0 | 1 | 11 |
| | All Groups | 15 | 12 | 17 | 15 | 16 | 16 | 11 | 6 | 108 |
| Split Factor (Average) | Splits | 6.67 | 7.50 | 5.09 | 6.25 | 4.69 | 6.13 | 5.89 | 7.00 | 5.82 |
| | Dividends | 1.64 | 1.36 | 1.78 | 2.93 | 5.56 | 10.00 | 1.67 | 1.73 | 2.45 |
| | Mixed | 7.69 | 5.00 | – | 7.00 | 4.00 | – | – | 4.00 | 6.47 |
| | All Groups | 6.07 | 4.02 | 3.92 | 4.97 | 4.76 | 6.38 | 5.12 | 3.53 | 4.98 |
| Split Factor (Median) | Splits | 5.00 | 7.50 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 7.00 | 5.00 |
| | Dividends | 1.60 | 1.29 | 1.75 | 2.25 | 5.56 | 10.00 | 1.67 | 1.70 | 1.70 |
| | Mixed | 5.83 | 5.00 | – | 7.00 | 4.00 | – | – | 4.00 | 5.00 |
| | All Groups | 5.00 | 2.90 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 | 2.00 | 5.00 |
| Price Before (Average) | Splits | 1376 | 1416 | 1144 | 1691 | 1493 | 1086 | 1152 | 1053 | 1247 |
| | Dividends | 753 | 718 | 758 | 131055 | 1288 | 1600 | 690 | 758 | 27768 |
| | Mixed | 4345 | 631 | – | 1450 | 903 | – | – | 1700 | 2853 |
| | All Groups | 2439 | 936 | 1008 | 53421 | 1430 | 1118 | 1068 | 1013 | 8564 |
| Price After (Average) | Splits | 209 | 210 | 249 | 264 | 342 | 183 | 237 | 183 | 245 |
| | Dividends | 482 | 545 | 432 | 26441 | 375 | 160 | 469 | 461 | 5834 |
| | Mixed | 523 | 122 | – | 207 | 226 | – | – | 425 | 386 |
| | All Groups | 389 | 363 | 314 | 10731 | 339 | 182 | 279 | 433 | 1760 |
| Price Before (Median) | Splits | 1475 | 1360 | 1090 | 1125 | 725 | 810 | 821 | 1053 | 1038 |
| | Dividends | 523 | 613 | 697 | 1053 | 1288 | 1600 | 690 | 815 | 700 |
| | Mixed | 3095 | 631 | – | 1450 | 903 | – | – | 1700 | 1360 |
| | All Groups | 1360 | 700 | 1020 | 1055 | 814 | 844 | 821 | 1003 | 955 |
| Price After (Median) | Splits | 202 | 245 | 206 | 225 | 249 | 162 | 177 | 183 | 205 |
| | Dividends | 392 | 458 | 372 | 741 | 375 | 160 | 469 | 562 | 465 |
| | Mixed | 422 | 122 | – | 207 | 226 | – | – | 425 | 240 |
| | All Groups | 270 | 261 | 260 | 360 | 237 | 162 | 192 | 342 | 241 |

Table 1: Summary statistics for the data set. *Number of Obs.* is the number of observations in the different groups over time. *Split Factor* denotes the total number of shares to be owned after the event per share owned before. *Price Before* refers to the stock price in DDK the day before the X-date, while *Price After* refers to it at the X-date.

Another aspect of the data set is the firm's payout policy. In the introduction, it was described how the announcement effect of stock splits or stock dividends could be related to the firm's payout policy. Table 2 describes changes in the payout policy for firms declaring a stock split or a stock dividend.¹¹

¹¹The cash dividends have been appropriately adjusted in the few cases where a firm has raised money on the equity market during the period from the last dividend payment before the event to the first dividend payment after the event.

| Group | #obs. | Hereof positive cash dividends (in %) | Change at time 0 compared to time -1 | | | Increased at time 1 compared to time -1 |
|-----------|-------|---|---|--------------|-------------|---|
| | | | <i>dec.</i> | <i>unch.</i> | <i>inc.</i> | |
| Splits | 68 | 62 (91%) | 1 (2%) | 24 (39%) | 37 (59%) | 43 (69%) |
| Dividends | 29 | 26 (89%) | 1 (4%) | 12 (46%) | 13 (50%) | 25 (96%) |
| Mixed | 11 | 10 (91%) | 1 (10%) | 3 (30%) | 6 (60%) | 7 (70%) |
| All | 108 | 98 (91%) | 3 (3%) | 39 (40%) | 56 (58%) | 75 (77%) |

Table 2: The relationship between the event and the associated change in the level of cash dividends paid per share. For each group, the table shows the total number of observations and the number of observations with positive cash dividends at the time of the event (time 0). The group having positive cash dividends is then divided into three subgroups: *dec.* is the group of observations that has a decrease in cash dividends at time 0 compared to the previous dividend payment (time -1), *unch.* is the group where cash dividends remain unchanged, and *inc.* is the group where cash dividends increased. The last column in the table shows the number of observations that have positive cash dividends at the time of the event and where the cash dividends at the following dividend payment (time $+1$) have increased compared to the previous dividend payment (time -1).

Thus, we argue that firms announcing stock splits or stock dividends have a payout policy that differs from the general payout policy of Danish firms listed on the Copenhagen Stock Exchange.¹²

The first thing to note in Table 2 is that quite a high fraction of firms making stock splits or stock dividends actually pay out cash dividends – in our sample, more than 90%. This fraction should be compared to the average fraction of firms paying out cash dividends. For firms listed on the Copenhagen stock Exchange this fraction has, on average, from 1995 to 2002 been approximately 70%.

Approximately 90% of stock split and stock dividend announcements coincide with the announcement of a cash dividend.¹³ Therefore, it is interesting to compare the cash dividend announcements in our sample to the normal cash dividend announcements made by Danish companies. This comparison is done for the firms paying a cash dividend.

Table 2 shows that in only 3% of the events do the firms decrease cash dividends. This observation should be compared with the fact that 20% of the Danish firms paying dividends cut their cash dividends at any given dividend announcement.

In Table 2 it can also be noted that firms increase the level of cash dividends in 58% of the events. This observation should be compared with the fact that approximately 40% of the

¹²Raaballe and Aagaard (2004) provide details on the use of cash dividends and share repurchases on the Danish stock market.

¹³Only yearly cash dividends payments are allowed in Denmark.

Danish firms paying cash dividends increase the level of cash dividends at any given dividend announcement. However, this observation understates the generosity of the cash dividends given by firms announcing stock splits or stock dividends. For 9 out of 62 firms, the stock split announcement does not coincide with the accounting report, hence, automatically grouping them as having unchanged cash dividends. The last column in Table 2 shows that in 69% of the stock splits an increase in cash dividends is eventually observed.

All stock dividend announcements coincide with an announcement of the accounting report. Despite this, only 50% of the events are associated with a simultaneous increase in cash dividends. However, almost all firms (96%) in this group eventually end up paying higher cash dividends. The explanation, which we document later, is as follows: Firms in this group communicate their dividend policy by means of the dividend percent, which is defined as total cash dividends divided by equity capital. In almost all cases, an unchanged dividend percent at the time of announcement means that the firm will maintain this dividend percent, implying that cash dividends will increase proportionally with the increase in the equity capital caused by the stock dividend. In fact, for the group of stock dividends, it turns out that unchanged cash dividends/dividend percent at the time of announcement prove to send a more generous message regarding cash dividends in the future than an increase in cash dividends/the dividend percent. This is because it also turns out that an increased dividend percent at the time of announcement tells that the dividend percent, in general, will be reduced at the next dividend announcement. As a result, the cash dividends for this subgroup eventually increase less than proportionally with the increase in equity capital.

Hence, firms paying out cash dividends are over represented among stock splits and stock dividends. The majority of these firms (77%) increase their cash dividends either at the announcement of the event or the cash dividend announcement immediately following. Finally, for firms announcing stock dividends, a simultaneously unchanged dividend percent sends a more positive message regarding future cash dividends than an increased dividend percent.

The announcement effect of stock splits or stock dividends is often explained by changes in the liquidity of the firm's stock. Table 3 provides information on the liquidity of stocks before the event. The table shows that firms making stock splits are generally more liquid than firms making stock dividends, which is true for the number of trading days as well as for daily turnover. The table reveals that there are quite big differences in liquidity between observations. Liquidity is looked at in further detail in Subsection 4.2.

| Group | Trading Days | Daily Turnover in% |
|-----------|----------------|--------------------|
| Splits | 140.4 (162) | 0.1760 (0.1345) |
| Dividends | 130.2 (138) | 0.1283 (0.0843) |
| Mixed | 107.0 (115) | 0.2001 (0.0855) |

Table 3: Liquidity of the stocks before the event. The left side of the table is based on counting the number of days with trading in the period $-250 : -50$ trading days relative to the announcement date. The results on the right side of the table are based on the daily number of shares traded relative to number of shares outstanding. Numbers in parentheses denote medians.

As mentioned in Section 2, the Rules of the Copenhagen Stock Exchange require firms to provide an explanation as to why they declare a stock split or a stock dividend. In Table 4, which examines the explanations provided by the firms for stock splits and stock dividends, we only consider firms paying out cash dividends and which declare a pure stock split or stock dividend.¹⁴ First of all, Table 4 shows that only a small fraction of firms provide an explanation for stock splits or stock dividends even though regulations require them to do so. Especially firms making stock splits fail to provide an explanation, which can be found in only 27% of the stock split announcements. For stock dividends, this fraction is 54%. The two groups also differ with respect to the explanations provided. In 71% of cases for stock splitting firms, the explanation is related to improving liquidity. For firms declaring a stock dividend, this fraction is only 7%. Instead, these firms explain the stock dividend through aspects primarily related to improving equity capital.

Based on the descriptive statistics, some conclusions on stock splits and stock dividends can be made. The two types of events are always contaminated by other news implying that the two events are not considered to be major events by firms. However, there are also several differences between the two events. First, in general, stock splits have a higher split factor, higher stock prices before the event, and are more liquid than stock dividends. Second, there are also differences regarding changes in the payout policy around the event. For stock splits, an increase in the level of cash dividends at the time of the split signals an unchanged or an additional increase in the cash dividends the following year. For stock dividends, an unchanged dividend percent signals that the cash dividends will increase proportionally with the increase in equity

¹⁴All firms with zero dividends fail to provide an explanation. Only two of the mixed firms provide an explanation, which in both cases is liquidity.

| | Stock Splits | Stock Dividends |
|---|--------------|-----------------|
| Fraction of firms providing an explanation: | 27% | 54% |
| Fraction of these where the explanation is: | | |
| – liquidity | 71% | 7% |
| – improving equity capital | 0% | 64% |
| – other | 29% | 29% |

Table 4: Explanations as to why the firm proposes a stock split or a stock dividend. The table is only based on the 88 firms with positive cash dividends which declare a pure stock split or pure stock dividend. The 'other' category includes a jubilee, changing the level of the stock price, good results, positive expectations for the future, and the general well-being of shareholders.

capital, whereas an increased dividend percent signals that the cash dividends will increase by less than the increase in equity capital. The final difference is with respect to the explanations for the events provided by the firms. For stock splits, the main explanation is improving liquidity whereas the main reason for stock dividends is related to improving equity capital. After a short description of the methodology used in this paper, we will use these differences in an attempt to understand the effects of stock splits and stock dividends.

3.3 Methodology

A standard event study is used to derive the pattern of abnormal stock returns in a period around the announcement date (or the X-date, where the stock split or stock dividend becomes effective).¹⁵ An estimation period from 50 to 250 days after the announcement is used in order to avoid a possible selection bias caused by the use of a pre-event estimation period.¹⁶ This period is used to estimate the normal return parameters according to the market model with the All-Share Index for the Copenhagen Stock Exchange being used as the market index. The event study has also been performed with other methods to calculate the excess returns, other estimation periods, a constant return model, and other stock market indices as the market index. In all cases, the results are similar to those in the next section as long as the estimation period is after the event. If the estimation period is before the event, conclusions regarding the announcement effect remain unaltered, but the post-event returns do decrease.

¹⁵The event study used is as described in Campbell, Lo, and MacKinlay (1997).

¹⁶In general, stock splits and stock dividends could be expected to occur after a period where stock prices increase. Hence, the use of a pre-event estimation period will lead to a potential bias of the so-called normal returns used in the event study and therefore, a post-event estimation window is used.

The next section also examines changes in the liquidity of stocks, which is measured by the number of days a stock trades as well as daily turnover. The number of days with trading is considered because several of the stocks are quite illiquid. Therefore, a simple way to examine if liquidity has improved is by considering the number of days when a stock is traded. Daily turnover is defined as the number of shares traded during a day divided by the total number of shares outstanding in the firm. These daily turnovers are used as one approach for testing whether the stock split or a stock dividend leads to an increase in the liquidity of shares.

4 Results

This section describes the empirical results. First, the event study results from around the announcement date are considered in detail and then the results from around the X-date are briefly discussed. Subsequently, we turn our attention to changes in liquidity and stock price volatility. Finally, we examine the relationship between the announcement effect and several of the competing explanations for the announcement effect using a cross sectional regression.

4.1 Event study results

4.1.1 Announcement effect

Initially, the stock market reaction to the announcement of a stock split or a stock dividend is considered. Table 5 presents results regarding the cumulative abnormal return (CAR) obtained using the event study methodology.

The first observation to be made concerns the abnormal returns in the period before the announcement of the event. Table 5 shows that, on average, the abnormal returns are positive in the period from 50 to 2 days before the announcement date. From unreported results it follows that similar positive abnormal returns are found for longer periods before the announcement. This is as expected according to, for example, the optimal trading range hypothesis. However, it is only for stock splits that the average CAR and the number of positive CAR s are significant at the 5% level. Hence, it is especially in the case of a stock split that the stock price has increased in the period before the event. This is also consistent with some of the differences between stock splits and stock dividends identified in Table 1.

Table 5 also shows that the announcement effect is positive and significant at the 10% level for all groups. The announcement effect is defined as the cumulative abnormal return from one

| Period | −50 : −2 | | −1 : 3 | | 4 : 50 | |
|-----------|--------------------|-------------|---------------------|-------------|-------------------|-------------|
| | \overline{CAR} | $\# > 0/\#$ | \overline{CAR} | $\# > 0/\#$ | \overline{CAR} | $\# > 0/\#$ |
| Splits | 5.34%** (4.87%) | 42/68** | 2.62%*** (2.02%) | 45/68*** | 1.64% (1.31%) | 36/68 |
| Dividends | 3.15% (4.66%) | 16/29 | 2.38%* (0.37%) | 17/29* | 0.43% (−0.11%) | 14/29 |
| Mixed | 6.54% (5.97%) | 8/11* | 1.88%* (1.41%) | 9/11** | 1.66% (3.44%) | 6/11 |

Table 5: Results from the event study. Date 0 is the announcement date. \overline{CAR} is the cumulative average abnormal return for the different time periods. The corresponding levels of significance are based on a Z -test statistic for the significance of \overline{CAR} . Numbers in parentheses denote medians. $\# > 0/\#$ denotes the number of observations with a positive CAR relative to the total number of observations. The corresponding test for significance is a sign-test. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

day before the announcement to three days after the announcement in order to take into account that some of the stocks are quite illiquid. Again, stock splits stand out from the two other groups. For stock splits, the announcement effect is significantly positive at the 1% level based on both the average and the number of positive announcement effects.

The final observation to be made from Table 5 concerns the post-event abnormal returns. The \overline{CAR} from 4 to 50 days after the announcement date is insignificant (at the 10% level) for all groups. This shows that the announcement effect is of a permanent nature. Furthermore, this gives some credibility to the method used to calculate abnormal returns.

Consistent with the existing literature, these results suggest that, on average, the announcement of stock splits or stock dividends is associated with a positive stock market reaction. However, the results do not help to explain this announcement effect. In the following, we shall examine how the announcement effect is related to changes in the level of cash dividends. In order to do so, only firms paying out positive cash dividends are considered, reducing the number of observations by 6 splits and 3 stock dividends. Furthermore, since we are trying to understand the announcement effect associated with a stock split or a stock dividend, we focus primarily upon these two groups. Table 6 presents results for the announcement effect for stock splits and stock dividends divided into two subgroups, depending on whether the firm's level of cash dividends is unchanged or increased at the time of the event, as also considered in Table 2.¹⁷

¹⁷Two firms decrease the level of cash dividends. For simplicity, these two firms are included in the group with increased cash dividends. The conclusions are the same if these two firms are left out of the analysis.

| Group | Cash Dividends | No. Obs | \overline{CAR} | Median CAR | # > 0 |
|-----------|----------------|---------|------------------|--------------|-------|
| Splits | Unchanged | 24 | 0.49% | 0.41% | 14 |
| | Increased | 38 | 3.51%*** | 3.48% | 27*** |
| | – Difference: | | 3.02%** | | |
| Dividends | Unchanged | 12 | 4.07%** | 1.52% | 11*** |
| | Increased | 14 | −0.29% | −1.21% | 5 |
| | – Difference: | | −4.36%** | | |

Table 6: The relationship between the announcement effect, \overline{CAR} , and changes in the firm’s level of cash dividends. Only firms with positive dividends at the time of the event are considered. ‘Unchanged’ means that the total amount of cash dividends paid out by the firm is unchanged at the time of the event compared to the total amount of cash dividends paid out the year before. ‘Increased’ means that the total amount of cash dividends is increased at the time of the event compared to the total amount of cash dividends paid out the year before. ‘Difference’ denotes the difference between the two subgroups. The test for difference between these two groups is a standard t-test for the difference of means between two samples. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Several interesting observations follow from Table 6. First, only stock splits which are associated with an increase in the level of cash dividends have a significant positive announcement effect. For this group, the average announcement effect is 3.51% and it is positive for 27 out of the 38 observations, both significant at the 1% level. If the level of cash dividends is unchanged, the average announcement effect is only 0.49% and only 14 out of 24 have a positive announcement effect, both insignificant at the 10% level. In addition, the announcement effect is different between the two groups at the 5% level.

For stock dividends, the pattern is the completely opposite. In this case, observations with an unchanged level of cash dividends are associated with an average announcement effect of 4.07% significant at the 5% level and the announcement effect is positive in 11 out of 12 observations, significant at the 1% level. If the stock dividend is instead associated with an increase in the level of cash dividends, the announcement effect is negative but insignificant. Again, the difference between the two subgroups is significant at the 5% level.

Thus, Table 6 supports the conclusion that there is a close relationship between the announcement effect of a stock split or a stock dividend and the associated changes in the payout policy. Moreover, the relationship is different for stock splits and stock dividends. In particular, only an unchanged level of cash dividends is considered to be positive news for stock dividends,

a difference from stock splits that is clearly important for studies examining the importance of associated changes in the payout policy. For example, the difference may explain why some earlier studies, which did not distinguish between stock splits and stock dividends, found a less pronounced relationship with changes in payout policy (see, for example Liljeblom (1989) or Nayak and Prabhala (2001)). In order to look at the relationship with changes in the payout policy in further detail, we examine whether information about future changes in cash dividends can be inferred from changes in the level of cash dividends at the time of the announcement of an event.

Panel A: Changes in the cash dividends for stock splits

| Stock Splits | Change from time -1 to $+1$ | #obs | in % |
|---------------------|----------------------------------|------|------|
| Unchanged at time 0 | <i>Increased</i> | 10 | 42% |
| | <i>Unchanged</i> | 9 | 38% |
| | <i>Decreased</i> | 5 | 20% |
| Increased at time 0 | <i>Increased</i> | 33 | 87% |
| | <i>Unchanged</i> | 2 | 5% |
| | <i>Decreased</i> | 3 | 8% |

Panel B: Changes in the dividend percent for stock dividends

| Stock Dividends | Change from time -1 to $+1$ | #obs | in % |
|---------------------|----------------------------------|------|------|
| Unchanged at time 0 | <i>Increased</i> | 2 | 17% |
| | <i>Unchanged</i> | 9 | 75% |
| | <i>Decreased</i> | 1 | 8% |
| Increased at time 0 | <i>Increased</i> | 5 | 36% |
| | <i>Unchanged</i> | 1 | 7% |
| | <i>Decreased</i> | 8 | 57% |

Table 7: Information contained in the change in cash dividends at the time of the announcement of a stock split or a stock dividend. Panel A covers the stock splits with positive cash dividends at the time of the event (time 0). As in Table 2, these observations are divided into two groups, dependent on the change in the level of cash dividends at time 0 compared to the previous dividend payment (time -1). For these two groups, the table presents the number of observations and the fraction that *Increase*, are *Unchanged*, and *Decrease* the level of cash dividends from time -1 to time 1. Panel B presents the same information as Panel A except for the stock dividends with positive cash dividends. For stock dividends, the dividend percent is used to determine the change in the level of cash dividend from time -1 to time 1.

Based on Panel A in Table 7, the information contained in the cash dividend does depend on whether the cash dividends are unchanged or increased at the time of the stock split. If the level of cash dividends is unchanged, the change in cash dividends from time -1 to 1 is quite similar to the general payout pattern for firms listed on the Copenhagen Stock Exchange,

as described in Section 3.2. If the level of cash dividends is instead increased at the time of the stock split, it is very likely (87%) that the increase is of a permanent nature. Thus, these results are consistent with the difference in the announcement effect between the two subgroups. Furthermore, the results suggest that the reason for the positive announcement effect is the change in cash dividends and the information contained herein. Thus, a stock split on its own seems to be a cosmetic event.

As illustrated in Table 2, the level of cash dividends is increased in 96% of the stock dividends either at the time of the announcement or the following year. Therefore, in order to examine the information provided by changes in cash dividends in the case of stock dividends more carefully, we use the dividend percent, which is often used by firms to define and communicate their level of cash dividends. The dividend percent is defined as the total amount of cash dividends divided by equity capital. Thus, a constant dividend percent means that the level of cash dividends is increased proportionally with the increase in equity capital.

Panel B in Table 7 shows that for stock dividends an unchanged dividend percent at the time of announcement implies in nearly all cases (92%=17%+75%) that the firm will maintain or increase the dividend percent the following year. Thus, cash dividends at least increase proportionally with the increase in the equity capital caused by the stock dividend, which is consistent with the positive and highly significant announcement effect of 4.07% for this group of stock dividends. In contrast, for the group of stock dividends with an increased dividend percent at the time of the announcement, it is quite likely (57%) that the dividend percent later will be reduced.¹⁸ All in all, cash dividends are increased, but by less than proportionally with the increase in equity capital. Despite the increase in the level of cash dividends for this group, the average (median) announcement effect is an insignificant -0.29% (-1.21%). Hence, these results suggest that a stock dividend on its own is considered to be bad news by the stock market.

Based on these results, two groups of firms actually declare a stock split or stock dividend without any positive stock market reaction. In particular, it can be argued that a stock dividend on its own can be considered negative news. The last observation is consistent with the fact that a stock dividend increases the level of equity capital and hence, can be considered advantageous to claimholders other than shareholders.

¹⁸It is worth noting that it is primarily the large stock dividends that subsequently reduce the dividend percent and hence, increase the level of cash dividends less than proportionally with the increase in equity capital. This is based on the fact that the 8 stock dividends which decrease the dividend percent from time -1 to time 1 have an average (median) split factor of 3.71 (2). This should be compared to 1.78 (1.8) for the 5 stock dividends which increase the dividend percent from time -1 to time 1.

These results raise the question as to why these firms actually make the stock split or stock dividend. In the following section, we examine whether there are other effects associated with a stock split or stock dividend. First, the stock price pattern around the X-date is examined briefly. Second, we turn our attention to liquidity, which was actually the explanation for the stock split provided by many of the splitting firms.

4.1.2 X-date effects

Some studies of stock splits and stock dividends have found stock price effects around the X-date.¹⁹ Therefore, the stock price pattern around this date is examined using the event study methodology. Table 8 presents results for the stock price effect around the X-date using different time periods, which are different from the periods considered in Table 5 for two reasons. First, the periods are extended to before the X-date because the event is known in advance; hence, a possible effect can be expected to be found before the X-date. Second, we wish to focus on short periods around the X-date, but the results turn out to depend on the length of these periods.

| Period | −3 : 1 | | −2 : 2 | | −5 : 5 | |
|-----------|---------------------|-------------|--------------------|-------------|--------------------|-------------|
| | \overline{CAR} | $\# > 0/\#$ | \overline{CAR} | $\# > 0/\#$ | \overline{CAR} | $\# > 0/\#$ |
| Splits | 0.88% (0.87%) | 40/68* | 0.51% (0.90%) | 42/68** | 0.56% (0.46%) | 37/68 |
| Dividends | 2.22%*** (1.66%) | 21/29*** | 1.27%** (0.85%) | 18/29* | 1.66%* (0.99%) | 18/29* |
| Mixed | 2.35%** (0.97%) | 9/11** | 2.45%** (1.90%) | 9/11** | 3.87%** (1.90%) | 9/11** |

Table 8: Results from the event study. Date 0 is the X-date. \overline{CAR} is the cumulative average abnormal return for the different time periods. Numbers in parentheses denote medians. The corresponding levels of significance are based on a Z -test statistic for the significance of \overline{CAR} . The $\# > 0/\#$ denotes the number of observations with a positive CAR relative to the total number of observations, while the corresponding test for significance is a sign-test. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

These results provide some evidence for a stock market effect around the X-date. For stock splits, an effect can be found when considering the period $-2 : 2$, where the number of firms with a positive abnormal stock return is significant at the 5% level. However, when considering the period $-5 : 5$, there is no evidence of a significant effect. For stock dividends and mixed

¹⁹See for example, Nayar and Rozeff (2001) and Wulff (2002).

events, there is strong evidence of a stock price effect. The average abnormal stock return, as well as the number of firms with a positive abnormal stock return, are significantly positive at levels varying from 1% to 10%. For stock dividends, the effect seems most pronounced for the period $-3 : 1$, which when compared to the period $-5 : 5$ shows some evidence that part of the effect is only temporary and primarily observed in the period before the X-date. Therefore, one explanation for the effect could be price pressure around the X-date.²⁰ This is consistent with the observation that the split factor for many stock dividends is such that it is necessary to own a certain number of shares in order to receive a whole number of new shares. As a result, some investors may buy shares around the X-date, perhaps causing price pressure around the X-date for stock dividends. However, this is not the case for stock splits, where one share is split into a whole number of new shares with all events. Thus, this difference may explain the difference between the effect for stock splits and stock dividends.

4.2 Liquidity

In the following, we examine changes in liquidity as a possible explanation for the announcement effect of stock splits and stock dividends.²¹ As described in Section 3, two simple measures are used for liquidity. The first is the number of days where the individual stock is traded and the second is the average daily turnover, defined as the number of shares traded relative to the number of shares outstanding. The results from comparing these two measures before and after the event are given in Table 9.

Table 9 provides mixed evidence regarding the effect on liquidity. First, based on the number of days with a trade, there is a significant increase for stock splits but not for stock dividends. In addition, the effect is significant for the two subgroups of stock splits, but most pronounced for the subgroup with unchanged cash dividends, which is interesting because this group did not experience a positive announcement effect, as seen in Table 6.

If we instead consider turnover, the picture is quite different. The results for both groups are an insignificant decrease in turnover. Similarly, the results for the subgroups do not provide any evidence for a significant change in turnover.

²⁰We attempted to examine this in further detail by analyzing intraday data. Unfortunately, for most of the time period, the quality of the data prevented such an analysis.

²¹A more careful analysis of liquidity in this subsection and stock price volatility in the next subsection would require intraday data. However, as mentioned in footnote 20, the poor quality of these data prevents such analyses. Therefore, the two aspects are examined using only daily data. In section 4.4, we use a cross-sectional regression to examine if these two aspects are relevant in explaining the announcement effect.

| Group | Before | After | Change | # > 0/Total |
|-----------------------|------------------|------------------|--------|-------------|
| Splits – All | 140 (162) | 158 (190) | 18*** | 45/68*** |
| – Cash div. unchanged | 144 (160) | 161 (193) | 16*** | 17/24** |
| – Cash div. increased | 145 (167) | 159 (185) | 14** | 23/38* |
| Dividends – All | 130 (138) | 134 (157) | 4 | 15/29 |
| – Cash div. unchanged | 121 (136) | 130 (136) | 9 | 8/12 |
| – Cash div. increased | 139 (167) | 140 (184) | 1 | 6/14 |
| Splits – All | 0.176 (0.135) | 0.164 (0.132) | −0.012 | 32/68 |
| – Cash div. unchanged | 0.178 (0.156) | 0.186 (0.137) | 0.008 | 13/24 |
| – Cash div. increased | 0.176 (0.130) | 0.145 (0.130) | −0.030 | 17/38 |
| Dividends – All | 0.128 (0.084) | 0.102 (0.074) | −0.027 | 11/29* |
| – Cash div. unchanged | 0.087 (0.064) | 0.084 (0.072) | −0.003 | 5/12 |
| – Cash div. increased | 0.128 (0.082) | 0.088 (0.062) | −0.040 | 5/14 |

Table 9: The change in liquidity around the event. The upper part of the table is based on the number of days with trading in the period $-250 : -50$ trading days before the announcement date and $10 : 210$ trading days after the X-date. The results in the lower part of the table are based on the daily values of shares traded relative to the number of shares outstanding, all in % for the same periods as considered for trading days. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. The numbers in parentheses denote the medians.

The results on liquidity thus show that only very illiquid stocks declaring a stock split seem to experience an improvement in liquidity. For all remaining stocks, the results suggest an unchanged (or small decrease in) liquidity.

4.3 Stock price volatility

It is also quite common to examine whether stock price volatility changes around stock splits and stock dividends. For example, Desai, Nimalendran, and Venkataraman (1998) find an increase in stock price volatility, which they show is explained by market microstructure effects as well as increased trading activity. The change in volatility around the events is examined in Table 10.²²

²²Volatility is measured as the standard deviation of daily stock returns. We have also considered the standard deviation of weekly and bi-weekly returns, which does not change the conclusion for stock splits. However, for stock dividends, the increase in volatility becomes insignificant based on these measures.

| Group | Before | After | Change | # > 0/ <i>Total</i> |
|------------------|----------------|----------------|---------|---------------------|
| Splits – All | 1.50 (1.32) | 2.34 (2.10) | 0.84*** | 54/68*** |
| – Div. unchanged | 1.47 (1.35) | 2.17 (1.99) | 0.70*** | 19/24*** |
| – Div. increased | 1.48 (1.25) | 2.16 (2.02) | 0.68*** | 29/38*** |
| Dividends – All | 1.24 (1.09) | 1.58 (1.43) | 0.33** | 19/29** |
| – Div. unchanged | 1.11 (1.09) | 1.32 (1.11) | 0.21 | 5/12 |
| – Div. increased | 1.35 (1.28) | 1.85 (1.66) | 0.50** | 12/14*** |

Table 10: The change in stock price volatility around the event. The volatility is calculated as the standard deviation of daily stock returns. The estimation periods are $-250 : -50$ trading days before the announcement date and $10 : 210$ trading days after the X-date. All standard deviations are in %. ‘Div. unchanged’ is the subgroup where the level of cash dividends is unchanged at the time of the event compared to the previous year. ‘Div. increased’ is the subgroup where the level of cash dividends is increased at the time of the event compared to the previous year. The numbers in parentheses are medians. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 10 shows that there is a significant increase in stock price volatility for stock splits. The increase is highly significant independent of the associated change in the level of cash dividends. For stock dividends, there is also evidence for an increase in stock price volatility, but the increase is only significant for the group with an associated increase in the level of cash dividends. One of several probable reasons for these observations is related to the difference in stock prices before and after the event and hence, to the difference in the split factor. Table 1 shows that, on average, stock splits have a larger split factor than stock dividends. By examining the two subgroups of stock dividends, it turns out that the average (median) split factor for the group with unchanged cash dividends is 2.1 (1.3), while it is 2.9 (2.0) for the subgroup with an increase in the level of cash dividends. Hence, the stock dividend has a greater effect on stock prices for the subgroup with an increase in the level of cash dividends than for the subgroups with unchanged cash dividends.

All in all, the results on stock price volatility suggest that stock splits and stock dividends have some market-microstructure related effects on the stocks. In the next subsection we examine whether these effects are relevant in explaining the positive stock market reaction to the announcement of the events.

4.4 Cross-sectional regression

In the following, we attempt to disentangle the competing explanations for the announcement effect associated with a stock split or a stock dividend. Furthermore, the robustness of some of the above conclusions is examined. This is done by running a cross sectional regression of the announcement effect on different variables expected to be relevant in explaining the announcement effect according to the competing explanations. First, in order to examine the difference between stock splits and stock dividends and their relationship with the level of cash dividends, we include a dummy for stock splits which have increased cash dividends at the announcement date and a dummy for stock dividends which have unchanged cash dividends at the announcement date.

To examine the relationship between the announcement effect and the magnitude of the split or the stock dividend, the split factor is included in the regression. The split factor is defined as the total number of shares owned after the event for each share owned before the event. If the magnitude of the event is relevant for the explanation of the announcement effect, a positive relationship is expected between the announcement effect and the split factor. However, one should note that there are several reasons for a positive relationship between the announcement effect and the split factor. For example, there might be market-microstructure related effects that are not captured by a change in liquidity or a change in stock price volatility.

In order to examine the neglected firm hypothesis, the market value of the firm is included in the regression. If the purpose of declaring a stock split or stock dividend is to attract attention, we would expect the event to be more important for smaller firms and thus expect a negative relationship between the announcement effect and the market value of the firm.

The optimal trading range hypothesis and the market maker hypothesis are more difficult to examine. As discussed in Section 1, the market maker hypothesis is irrelevant for the Danish stock market. To some extent, the same is also true for the optimal trading range hypothesis. However, if the optimal trading range hypothesis is relevant, it would be expected that the change in liquidity, and perhaps also the change in stock price volatility, would be relevant in explaining the announcement effect. Therefore, these two variables are included in the cross sectional regression.

All in all, in order to examine the relation between the announcement effect and the variables described, the following cross sectional regression is run:

$$CAR_i = \gamma_0 + \gamma_1 \cdot SI_i + \gamma_2 \cdot DU_i + \gamma_3 \cdot SF_i + \gamma_4 \cdot \ln(MktVal_i) + \gamma_5 \cdot \Delta Liq_i + \gamma_6 \cdot \Delta Vol_i + \epsilon_i, \quad (1)$$

where SI is a dummy variable for stock splits with increased cash dividends at the announcement date. DU is a dummy variable for stock dividends with an unchanged level of cash dividends at the announcement date, i.e. according to Table 7, corresponding to the stock dividends where the amount of cash dividends is expected to increase permanently proportional to the change in equity capital. SF is the split factor as defined above. $MktVal$ is the total market value of equity at the time of the event and ΔLiq is the change in liquidity measured as the change in turnover as examined in Table 9.²³ ΔVol is the change in stock price volatility as examined in Table 10. The results from running the regression are given in Table 11.

| Row (Adj. R^2) | Intercept $\hat{\gamma}_0$ | Stock Splits – increased SI $\hat{\gamma}_1$ | Stock Div. – unchanged DU $\hat{\gamma}_2$ | Split Factor SF $\hat{\gamma}_3$ | Market Value $\ln(MktVal)$ $\hat{\gamma}_4$ | Change in Liquidity ΔLiq $\hat{\gamma}_5$ | Change in Volatility ΔVol $\hat{\gamma}_6$ |
|----------------------|-------------------------------|---|---|---|--|--|---|
| 1 (8.4%) | 0.0220 (0.0244) | 0.0261* (0.0127) | 0.0495* (0.0238) | 0.0034** (0.0015) | −0.0041 (0.0032) | 0.0396 (0.0357) | −0.2339 (0.5664) |
| 2 (7.1%) | −0.0088 (0.0110) | 0.0241* (0.0125) | 0.0549** (0.0244) | 0.0034** (0.0015) | — | — | — |
| 3 (5.1%) | 0.0086 (0.0082) | 0.0265* (0.0125) | 0.0448* (0.0242) | — | — | — | — |

Table 11: Results from the regression given in equation (1). The numbers in parentheses are White's (1980) heteroscedastic consistent errors. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively in the standard test for significance of the estimated coefficients.

Table 11 shows that the two dummy variables both for stock splits with an increased level of cash dividends and stock dividends with an unchanged level of cash dividends are positive and significant at the 5% to 10% levels in the regression. The regression thereby confirms earlier results about the relationship between the announcement effect and the change in the level of cash dividends. Furthermore, the split factor is significantly positive, suggesting that the size of the stock split or the stock dividend is important for the size of the announcement effect. The change in the level of significance in the parameters from row 2 to 3 also suggests a relationship between the split factor and the two dummy variables. Finally, the cross sectional regression does not provide any evidence for the other hypotheses. In particular, the market value of stock, the change in liquidity, and the change in volatility all show up as insignificant in the regression.

²³The change in the number of days traded has also been used to measure the change in liquidity. This measure also turned out to be insignificant in the regression.

5 Conclusions

This paper has examined stock splits and stock dividends in Denmark. The results document a few similarities and some important differences between the two types of corporate events. The two events are similar in the sense that they are not considered to be major events by firms. Despite this, the announcements of both events are on average associated with a positive announcement effect of approximately 2.5%. Furthermore, the announcement effect is closely related to changes in the firm's payout policy.

The relationship of the announcement effect to the level of cash dividends is at the top of the list of important differences. For stock splits, only firms that also increase the level of cash dividends at the time of a split experience a positive and significant announcement effect. If there is no change in the level of cash dividends, an insignificant announcement effect is observed, suggesting that a stock split on its own is simply a cosmetic event.

For stock dividends, basically all firms increase the amount of cash dividends paid out. However, only firms that seem to signal a permanent increase in the level of cash dividends, at least proportionally with the increase in equity capital, experience a positive and significant announcement effect. If the firm instead signals that the level of cash dividends will be increased, but by less than proportionally with the increase in equity capital, the announcement effect is negative and insignificant. This suggests that a stock dividend on its own is considered to be negative news by the stock market, which is consistent with the fact that a stock dividend increases equity capital. This increase in equity capital increases the security provided to other claimholders at the potential cost of shareholders. Therefore, the stock market reaction to a stock dividend seems to be negative unless shareholders are compensated sufficiently by an increase in cash dividends.

The results also suggest three other differences between stock splits and stock dividends. First, stocks that are split are more liquid and have a higher positive abnormal return in the period before the event than stocks receiving a stock dividend. Second, stock splits are larger in size than stock dividends in the sense that the relative reduction in stock prices is larger for stock splits. The third and final difference concerns the reason for the events provided by firms. The predominant reason for declaring a stock split is a wish to improve the liquidity of the stock, whereas the reason for a stock dividend is related to improving equity capital.

As the results suggest, the relationship of the announcement effect to cash dividends is important in explaining the announcement effect. The evidence for the other suggested hypotheses, on the other hand, is quite weak. In particular, the strong link to changes in payout policy and

strong pre-event stock price performance for stock splits seem inconsistent with the neglected firms hypothesis. Similarly, results on liquidity only provide evidence for an improvement in liquidity for the most illiquid stock splits based on the number of days with trading. Furthermore, the liquidity effect is most pronounced for the group with unchanged cash dividends, i.e. for the stock splits that are associated with an insignificant announcement effect. Finally, many of the market maker related arguments leading to the market maker hypothesis and the optimal trading range hypothesis are simply not applicable when it comes to the Danish stock market.

References

- ANDERSON, H., S. CAHAN, AND L. C. ROSE (2001): “Stock Dividends Announcement Effects in an Imputation Tax Environment,” *Journal of Business Finance & Accounting*, 28(5):653–669.
- ANGEL, J. (1997): “Tick Size, Share Prices, and Stock Splits,” *The Journal of Finance*, 52(2):655–681.
- CAMPBELL, J. Y., A. W. LO, AND A. C. MACKINLAY (1997): *The Econometrics of Financial Markets*, Princeton University Press, Princeton, New Jersey, USA.
- DESAI, A., M. NIMALENDRAN, AND S. VENKATARAMAN (1998): “Changes in Trading Activity Following Stock Splits and Their Effect on Volatility and the Adverse Information Component of the Bid-Ask Spread,” *Journal of Financial Research*, 21(2):159–184.
- FAMA, E. F., L. FISHER, M. C. JENSEN, AND R. ROLL (1969): “The Adjustment of Stock Prices to New Information,” *International Economic Review*, 10:1–21.
- GRINBLATT, M. S., R. W. MASULIS, AND S. TITMAN (1984): “The Valuation Effects of Stock Splits and Stock Dividends,” *Journal of Financial Economics*, 13(4):461–490.
- HAN, K. C. (1995): “The Effects of Reverse Splits on the Liquidity of the Stock,” *Journal of Financial and Quantitative Analysis*, 30(1):169–170.
- LAKONISHOK, J. AND B. LEV (1987): “Stock Splits and Stock Dividends: Why, Who and When,” *The Journal of Finance*, 42:913–932.
- LILJEBLOM, E. (1989): “The Informational Impact of Announcements of Stock Dividends and Stock Splits,” *Journal of Business Finance & Accounting*, 16(5):681–697.

- MCNICHOLS, M. AND A. DRAVID (1990): “Stock Dividends, Stock Splits, and Signaling,” *The Journal of Finance*, 45(3):857–879.
- NAYAK, S. AND N. R. PRABHALA (2001): “Disentangling the Dividend Information in Splits: A Decomposition Using Conditional Event-Study Methods,” *The Review of Financial Studies*, 14(4):1083–1116.
- NAYAR, N. AND M. S. ROZEFF (2001): “Record Date, When-Issued, and Ex-Date Effects in Stock Splits,” *Journal of Financial and Quantitative Analysis*, 36(1):119–139.
- NIELSEN, N. C. AND K. SVARRER (1979): “A Test of Efficiency for the Danish Stock Market (In Danish: En test af det danske aktiemarkeds effektivitet),” *Danish Journal of Economics*, 2:173–189.
- RAABALLE, J. AND M. AAGAARD (2004): “Danish Companies Are Paying Out Money Like Never Before (In Danish: Danske selskaber udbetaler udbytter som aldrig før),” *Finans/Invest*, 1:22–30.
- RANKINE, G. AND E. K. STICE (1997): “The Market Reaction to the Choice of Accounting Method for Stock Splits and Large Stock Dividends,” *Journal of Financial and Quantitative Analysis*, 32(2):161–182.
- SCHULTZ, P. (2000): “Stock Splits, Tick Size, and Sponsorship,” *The Journal of Finance*, 55(1):429–450.
- WULFF, C. (2002): “The Market Reaction to Stock Splits – Evidence from Germany,” *Schmalenbach Business Review*, 54(3):280–297.

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