Do Announcements of Dividend Payment Frequency Change Matter?

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A Thesis

in

The John Molson School of Business

Presented in Partial Fulfillment of the Requirements

for the Degree of Master of Science (Option Finance) at

Concordia University

Montreal, Quebec, Canada

August 2020

CONCORDIA UNIVERSITY

School of Graduate Studies

This is to certify that the thesis prepared

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Entitled: Do Announcements of Dividend Payment Frequency Change Matter?

and submitted in partial fulfillment of the requirements for the degree of

Master of Science (Option Finance)

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Date August 28th, 2020

Abstract

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Recently, we observe an increasing number of firms declaring monthly dividends. Although dividend policy itself has been in the focus of corporate finance literature, changes in dividend payment frequency are not given much attention. The objective of this paper is to investigate the significance of dividend payment frequency changes. This paper specifically analyzed cash dividends and sought to study the potential effect of dividend payment frequency change announcements on the returns of stocks. Meanwhile, this paper serves as an important way of understanding corporate policy decision. To examine the subject, we implement a standard event study of dividend payment frequency changes to detect the market reactions through measuring the abnormal returns occurred during the announcement period. The study found a rising trend in stock returns during frequency increase announcements and vice versa. It therefore reveals that a change in dividend payment frequency is relevant that are perceived as newsworthy in the market, supporting that signaling effect apply equally well to the dividend frequency changes. Further multivariate analysis reveals that the correlation between event period abnormal returns and frequency change remain significant after controlling for other unconditional firm characteristics.

Key Words: Cash dividends, payment frequency, abnormal returns

ACKNOWLEDGEMENT

I am extremely grateful to my thesis supervisor, Dr. Juliane Proelss, for giving infinite patience and constant encouragement to me during my work on the thesis. Her feedback and recommendations were immensely inspiring, and significantly facilitated my accomplishments throughout the research and writing processes. I would also like to acknowledge my thesis committee Dr. Rahul Ravi and Dr. Denis Schweizer for their valuable comments and insightful advice, which will be incorporated into my thesis and will certainly contribute to the thesis improvement.

In addition, I would like to give my thanks to my friends and classmates for their kind concern, timely responses and supportive assistance, which greatly ease my worries.

Last but not least, I must express my profound gratitude to my parents and family for continuously supporting and guiding me and always believing I could do it. I would not have accomplished this endeavor without them.

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1. Introduction

When it comes to the significance of dividend policy, the topics involving the decision to pay or not to pay dividends, how much to pay have been highly explored. While the issue of how investors would react to a change in dividend payment frequency is not given much attention in financial literature. Dividend policy has been defined for a long time as the process where a firm decides amount to be paid to the shareholders as a part in their profit (Khan et al., 2011). Until Ali (2013) update the definition by assuming dividend payment frequency as part of dividend policy, the dividend policy relating to payout frequency is becoming an emerging issue but remain less explored by finance researchers. If dividend payment frequency is a management decision, it is natural to view it as a value enhancing approach. The objective of this paper is to investigate the significance of dividend payment frequency changes by identifying the market reactions to frequency changes.[1] Abnormal share price movement is expected to appear if the market value the announcement of frequency change as significant. Based on the prior relevant findings about the significance of dividend changes, we are seeking an answer to the question that whether the investors will react to a change in payout frequency in a similar manner as to a change in dividend policy such it affects the share price of the firm. In turn, giving us insight into the potential incentives of managers changing their dividend frequency. To achieve that objective, we collect a sample of firms with changes in dividend payment frequency and attempt to capture the market reactions by measuring the unexpected share price variations surround the announcements of dividend payment frequency changes. In a multivariate analysis, we further examine the market reactions specifically related to the frequency change by controlling for other firm specific factors.

According to the *signaling hypothesis*, managers are more knowledgeable about the strategy of a firm than outside investors, thus they tend to use dividends as a signaling mechanism to convey implicit information about firm's future prospects to the market in order to close the information gap. From the standpoint of stockholders, they view the dividend announcements as a reflection of management's assessment of firm's future profitability. This is also referred to as "the information content of dividends" (Miller and Modigliani, 1961). Specifically, an increase in

[1] We consider only cash dividends in the empirical tests in this paper

dividend gives strong signals about the bright future prospects of the company thus trigger positive stock returns due to higher market expectations. While dividend decreases are perceived as negative signals about the company's future cash flow which lead to adversely market reactions. Inspired by Ali (2013), we regard dividend frequency changes as a form of dividend policy and expect the firms send new information about firm' strategy to investors by a change in dividend payment frequency. If the disclosures of dividend frequency changes do have information content, in other words, the market perceive the frequency changes as valuable information containing firm's future profitability, we conjecture that the frequency increases signal as "good news" and a dividend frequency decline signals as "bad news" conversely. Since cash dividends are generally paid from future earnings, firm may not sure they have regular cash inflows to be paid out as regular cash dividend if they change from high to low frequency and vice versa.[2] In this vein, we expect rising (falling) market valuations of firms associated with the corresponding signals perceived by investors during the frequency increase (decrease) announcement period. Additionally, with respect to the information content of dividends, there exists another explanation that the firm valuation is also affected by the investor cognition of a stock. Investors tend to become more willing to invest in a stock that they are aware of (Ferris et al., 2010). According to the *information content models* of Miller and Rock (1985), dividends contain information about managerial expectations regarding firm's future performance. Daniels et al. (1997) tested the "information content of dividend hypothesis" and provide empirical evidence showing robust relation between dividends and firm's future permanent earnings. That is to say, more frequent payments signal more information for investors to the value firms. This suggests that frequency with which dividends are paid affect the degree of investors awareness of the firm, which is in turn influencing investors' portfolio selection.

Besides of the aspect of *signaling hypothesis*, there are other reasons that affect an investor's valuation of a dividend distribution. Such as *investor preference*, which is first introduced by Shefrin and Statman (1984), that there is a tendency of investors to favor cash dividends over capital gains. According to the *prospect theory* (Kahneman and Tversky, 1979), investor's utility curve is steeper near the origin, thus a $2 dividend plus 8 % of profitability produce higher utility

[2] We expect seasonal industries to not pay frequent dividends e.g. monthly dividends because of seasonal cash inflows and provide statistics later on.

equal to u(2) + u(8)) than the utility associated with the stock gains 10% without dividends paid (u(10)). Similarly, Ferris et al. (2010) imply that investors prefer more frequent dividend payments based on *prospect theory*. Because of the concavity of individual's utility function, investors treat each dividend as a separate gain and achieve higher level of utility from more frequent payments. It still makes sense to explain by the *bird in the hand theory* that investors prefer higher frequency to lower frequency to reduce uncertainty about future cash payments. Obviously, investors afford less risk when they are accepting relatively near dividends payments. Thus, in spite of an identical payout level, this preference on higher frequency can effectively influence the firm valuations. Furthermore, the clientele effect demonstrates that different types of investors are attracted to particular kind of dividend policy. Hence, changes in dividend policy will form new sets of clienteles which lead to stock price changes.

Relying on the theoretical foundations of *dividend signaling theory* and *investor preference theory*, this paper argues that the market will respond positively to the dividend frequency increase announcements and negatively to dividend frequency decrease announcements, which can be reflected in the abnormal stock price. In this article we explore the role of dividend frequency changes in explaining the firm valuation effects during the announcement period. The first part of our analysis is to examine the relation between a firm's abnormal returns and its announcement of frequency change. To facilitate the examination of the announcement impact, a univariate event study is employed for a sample of 96 US firms experiencing the changes of dividend payment frequency for the years between 1970 and 2019. Consistent with the hypothesized effect of changes in dividend payment frequency, there is a significant positive abnormal return appears when a firm change to pay higher frequent dividends. Conversely, firms are penalized in the market when they convert to pay dividends with lower frequency. This finding certainly suggests there is an informational link between the dividend payers and shareholders of the firm when a change in dividend payment frequency is happening.

However, there are other firm-level characteristics that might also account for the significance of abnormal returns during announcement period. As suggested by Barros et al. (2020) that firm's specific characteristics have an impact on dividends. To determine the specific effects of target event on firm's stock return performance, our second tests focus on a multivariate analysis by regressing the cumulative abnormal returns (CARs) on frequency changes while controlling for a

number of other influence factors. The results indicate that the positive correlation between frequency change and CARs remain statistically significant. Therefore, supporting our hypothesis that the change in dividend payment frequency is relevant on firm's market valuations.

This paper contributes to the existing knowledge and findings in corporate finance field in various ways. Firstly, while a wide range of researchers examine the relationship between corporate payout policy and firm financial performance, there is a lack of literature on the effects of dividend payment frequency. Thus, this research provides supplementary evidence on the short-term effect of changes in payment frequency on firm's share price. Secondly, there is a gap in the literature on the influence of monthly dividend payment, which has becoming an emerging dividend distribution form applied by an increasing group of firms. This paper fills this hole by particularly adding monthly dividend involved frequency change into account. Although we find limited support on the extra influence of monthly dividends, this paper still has several implications for current and future researchers. Thirdly, learning from prior relevant papers (Ferris et al., 2010; Kambeu, 2017), this paper concentrates on research firms listed in U.S. liquid market to avoid the illiquidity problem and legal regime variations. Also, we apply for a sufficient period length during sample selection process to diversify the event observations.

We organize the remainder of this paper as follows. In the subsequent paragraph (Section 2) we integrate the theoretical frameworks and empirical studies concerning the relevance of dividend policy. Combined with the improved definition of dividend policy, it establishes the connection between dividend payment frequency change and firm's market valuations by *signaling hypothesis* and *investor preference theory*. In addition, it also discusses the findings of prior relevant papers studying on the significance of dividend payment frequency used to develop this study's hypotheses. Sections 3 describes the data source used in the paper, discusses the sample selection process, and outlines the distribution of sample firms briefly. The empirical methodology of event study and multivariate analysis concerning the relationship between the frequency change and firm valuations are introduced in Section 4. The empirical results are analyzed in section 5. Finally, we close the paper with a brief summary, followed by the limitations of this research and specific recommendations for further work in Section 6.

2. Literature Review and Hypothesis Development

2.1 Relevance of Dividend Policy

According to the seminal *dividend irrelevance proposition* of Miller and Modigliani (1961), given that in a perfect capital market dividend policy should have no effect on the wealth of shareholders. Regardless of how a firm distributes its income, its value is solely determined by its investment decisions. Therefore, financial managers cannot enhance the firm value by changing their dividend policy (Stulz, 2000). However, in the real world, the existence of market imperfection issues makes the dividend policy relevant (Al-Hasan et al., 2013; Luvembe et al., 2014).

Much literatures by the dividend relevance supporter document that dividend policy is associated with firm valuation effect such that dividend cuts (increases) cause share price to drop (rise) unexpectedly. The most frequently cited explanation for the share price changes following the dividends announcements is "the information content of dividend" as well as *signaling hypothesis*. This hypothesis state that dividends are used by firms as signaling device to convey information to the market. This debate can be traced back to the famous investigation of dividend policy stressed by Lintner (1956) that dividend policy always signal information to the market, as the prudent foresighted managements only increase dividends when they are certain about the firm's future income. Interestingly, "the informational content of dividends" was alluded by Miller and Modigliani (1961), which claim that the informational content of dividends is an attribute of dividend payments and state that dividend changes provide occasion for the stock returns as they signal new information about the firm's profitability. Essentially, the *signaling hypothesis* is based on the information asymmetry where managers have access to private information regarding the firm's current and future financial position that is not available to outside parties. Due to the existence of asymmetric information, the intrinsic value of firms cannot be accurately measured by the market share price. To clear the information gap, managers use dividends policy as communication device to share the asymmetric information. Unlike managers, stock owners are less aware of the internal operations of a firm. They usually interpret dividend changes as a form of information sent by managers, which enables them to estimate future earnings more accurately. For instance, when the firm announces to increase its dividend, investors will perceive the dividend increases as positive management assessment of firm's

future prospects, which motivates them to bid up the share price accordingly. Subsequently, this argument receives supportive explanations from a group of analysts (e.g., Pettit, 1972; Charest, 1978; Bhattacharya, 1979; Miller and Rock, 1985) who contend that dividend payment is regarded as the only reliable signaling tool for managers to supply information to investors, thus decisions made by managers to change dividend payments greatly affect what investors expect about the firm, i.e., a dividend increase (decrease) is taken as good (bad) news about the firm's future earnings, on which the firm's market value largely hinges. As further studies based on the notion of information asymmetries, a group of researchers including John and Williams (1985), John and Williams (1985) et al. declared that the dividend changes are not actions that just happen to have information content, instead, the information which reflect the future earnings is sent intentionally to make a proper valuation at some cost. *Tax-based signaling models* of Bhattacharya (1979) argue that higher taxes on dividends relative to capital gains are necessary conditions for dividends to be informative, which can be regarded as signaling cost (Bernheim, 1991; Amihud and Murgia, 1997). This is not to say, of course, that manager always tell the truth, there is particular instance that managers possibly attempt to mislead investors through manipulations of announcement effects.

Although, taking advantage of asymmetric information, managers are likely to use dividend policy to transmit signals to the local market and create firm value. In the meanwhile, with the concern about affecting the stock price, management always take signaling effect of dividends into account while making dividend decisions. That is to say, there is an impact of market reactions on the dividend policy. Managers believe firms should have some long-term target payout ratio. With the purpose of maximizing share price continuously, they prefer to sustain a smooth dividend stream, increase dividends slowly and incrementally as earnings increase. They are reluctant to cut dividends due to the fear of negative signaling effect. A change in dividends is usually triggered by a major unexpected and persistent change in earnings. As described early by Lintner (1956), firms only increase dividends when management believes that earnings have permanently increase. In a similar vein, Jagannathan et al. (2000) predicted that dividends represent firm's commitment for future permanent cash flow. It is true that managers are unlikely to promise future payout when they are uncertain about sufficient future cashflow. Once the unexpected change in dividend happens in one company, such as lowering the dividend, it will be interpreted by investors as a sign that the company is experiencing financial distress or less

profitable investment, thus losing shareholders confidence and reputation around the markets, consequently leading to adverse impact on firm value (Ghosh and Woolridge 1988; Luvembe, 2014). In an attempt to reduce disappointment and to avoid unwanted market reactions, firms always consider prudently before making decision to change dividend payment and try their best to smooth the dividends. In essence, the above analysis implies that managers should set their payout policy not depend on current and past earnings, but on expected long term growth (Khan et al., 2011). In light of this, it is reasonable to evaluate firm's actions to adjust dividend policy as management expectations and confidence as to the future performance and prospects of the firm.

An alternative explanation, the *bird-in-the-hand hypothesis* is going back to Gordon (1963) and Lintner (1962) and supports the positive relation between dividend policy and firm value. The characteristics of investor such that rationality and risk-averse let them prefer the "bird in the hand" dividends from stock investing to the "two in the bush" of potential capital gains in the future due to the inherent uncertainty. In comparison with uncertain capital gain in the future, dividends provide investors reliable income and a source of return even during down markets, giving reasons for the higher valuations of the dividend paying firms. Subsequently, Shefrin and Statman (1984) illustrate the investor preference for cash dividends over capital gains. Based on the *prospect theory* (Kahneman and Tversky, 1979), investors utility curve tends to be steeper near the origin. Investors obtain higher utility from a $2 dividend plus 8 % of profitability than the utility associated with the stock gains 10% without dividend payments, since they value the capital gains and dividends separately. According to the *self-control theory* (Thaler and Shefrin, 1981), investors might be willing to pay a premium for cash dividends in pursuit of self-control.

Another view claims that the movement in a company's stock price according to the demands and goals of its investors, which is the *clientele effect*. Miller and Modigliani (1961) initially demonstrated that different types of investors are preliminarily attracted to certain type of dividend-paying stocks. In the same vein, Pettit (1977) stated the investor tendency to hold portfolios of securities that have particular dividend paying characteristics. These investor demands come in reaction to market imperfections, such as tax and transaction cost. For instance, institutional investors tend to be attracted to invest in dividend-paying stocks because they have relative tax advantages over individual investors (Allen et al., 2000). From the

proposition of transaction costs, small investors relying on regular income from dividends may prefer high and stable-dividend stocks since they cannot afford the significant transaction costs associated with shifting portfolio allocation. Some would instead prefer a company that doesn't pay dividends at all but invest towards profitable project for future capital gains so that avoid transaction costs associated with reinvesting the proceeds of dividends (Bishop et al., 2000). Similar to *bird-in-the-hand hypothesis*, another possible dividend clientele effect is related to risk clienteles that high-payout stocks tend to be less risky than low-payout stocks; thus, and based on the risk factor, dividends may attract certain clientele investors (Scholz, 1992). Hence, when a company's policy alters, investors will adjust their stock holdings accordingly. As a result of this adjustment, stock prices may fluctuate.

Numerous financial researchers have tried to find the empirical support for the "information content of dividends" by investigating the impact of dividend distributions on firm value.[3] There is, surely, general agreement that changes in dividend policy have an obvious bearing on the stock price changes. Watts (1973) was among the first to test the information content of dividends while his tests suggest that the information conveyed by the unexpected dividend changes is trivial. In contrast, Pettit (1972) observed that market favorably react to announcements of dividend announcements with a corresponding significant higher share price. In the following, Pettit's (1972) findings receive supportive results that there is a positive relationship between dividend payment and market price of shares from Aharony and Swary (1980), Asquith and Mullins (1983), Woolridge (1983) and Kalay and Lowenstein (1985). Thus, it is not surprising that many theories (e.g., Bhattacharya, 1979; John and Williams, 1985; Miller and Rock, 1985) assume that dividends do contain information about the firm's future cash flow. Bajaj and Vijh (1990) explained the significant abnormal returns around dividend announcements by the existence of dividend clienteles. They proposed that the price reactions to the dividend changes are partially determined by the marginal investors' dividend yield preferences. Michaely et al. (1995) offer evidence that the market tends to become more pessimistic toward dividend decreases reflected in more severe negative abnormal returns in comparison with dividend increases. Chen et al. (2002) studies among the firms that change dividends frequently and find no significant association between dividends and stock returns,

[3] Two popular dividend Models from Walter (1956) and Gordon (1956) on dividends and firm value confirm that dividend policy affects the value of the enterprise.

suggesting that the signaling function of dividends is established on the basis of sustainable dividend distribution.[4]

2.2 The Significance of Dividend Payment Frequency Change

As shown above, the correlation between dividend policy and firm value is most intensely studied on the decision of whether a firm pay a dividend or not and the increase or decline of dividend payment amount. While the information contained in a change of dividend payment frequency with given level of dividend has received less attention. It is probably owing to the fact that frequency of payment is assumed as of secondary importance once the level of payment is decided (Ferris et al, 2010). Can a change in dividend payment frequency be perceived as valuable information by investors such it affects the share price of the firm? Based on Ali (2013)'s argument that dividend policy involves not only the form and the size of dividend payments, but also the frequency of dividend payments, we assume conversions of dividend payment frequency as part of dividend policy and research on the potential valuation effect arising from a change in dividend payment frequency.

Acting as pioneers to examine how dividend payment frequency influence the firm value across global capital markets, Ferris et al. (2010) conjecture a positive relationship between dividend payment frequency and firm value from the perspective of investor preference. Relying on the *prospect theory* (Kahneman and Tversky 1979) and *mental accounting* developed by Thaler (1980), investors treat each dividend as a separate component of total equity return and derive higher utility from receiving more frequent dividends. This could also be explained by the *bird-in-the-hand hypothesis*, investors prefer more reliable dividend income to uncertain capital gain in the future and reflect this preference in a higher valuation of a dividend distribution firm. Similarly, the risk-averse investors should prefer near dividends to future dividends since the higher frequency dividends further reduce uncertainty about future cash payments. The higher uncertainty, the higher risk investors need to afford which affects the rate of profit required by shareholders and the consequent valuations of the stock. As claimed by Barberis and Huang

[4] The *tax-effect hypothesis* suggests that low dividends increase stock value due to the higher tax rate on cash dividends. But do not expect this to be relevant for this paper since we are using U.S. listings firms only.

(2001) that the sooner the investors receive payments, the lower risk they would undertake. Hence, it is natural to expect higher market preference for the frequently paying firms.

The empirical findings of Ferris et al. (2010) reveal that the positive correlation applies equally well between dividend frequency change and firm value. The event study of dividend payment frequency confirm that firms gain positive abnormal return surrounding the date when they announce the dividend will be paid more frequently. But the firms choose to reduce their dividend frequency receive adverse market reactions. They conclude that the market response to the changes in dividend payment frequency in a consistent way as the *prospect theory* (Kahneman and Tversky, 1979) and *mental accounting theory* (Thaler, 1980) expect. Moreover, they observe firms paying dividend more frequently appear more valuable with higher market-to-book ratio than those paying low frequency firm. Thus, it is reasonable to expect that firms want to send the signal that they expect high future growth by increasing payment frequency, since growing stocks generally exhibit high price-to-book ratios.

Most recently, Kambeu (2017) analyze the significance of the announcement of dividend payment frequency change from quarterly to bi-annual in one specific firm listed on the Botswana Exchange. Contrary to their initial argument, the results did not show significant abnormal returns during the frequency changing period. Even so, they are still adamant that the firm's decision to change its dividend payment frequency matters and speculate the illiquidity nature of the target stock market probably lead to the contradiction, because the stock prices during the highly illiquid market become less responsive to new information.

This paper serves as complement to make up the lack of literature on the effects of dividend policy about payment frequency. In particular, as the monthly dividend is becoming an emerging form of dividend distribution, we attempt to examine extra market reactions to monthly involved frequency change, which possibly explain the increasing number of monthly dividends payers. By applying for a longer time horizon and limiting all sample firms in the liquid U.S. listings during the data-gathering process, we tend to research on a more homogenous setup without illiquidity problems. As compared with past relevant studies, same tax regime with only U.S. listing rules out tax theory to a certain degree. Importantly, same market usually has similar types of investors which enables us to research monthly dividend changes easily as compared to earlier studies.

2.3 Hypotheses

Summarizing above theories and empirical finding, now present all arguments which are in favor for *Hypothesis 1*. Depending on the *investor preference theory*, individual investors prefer to invest in a more frequent dividend paying stock. Because of the concavity of individual's utility function, investors treat each dividend as a separate gain and value frequent payments higher. It is easier to understand if we further extend the *bird-in-the-hand hypothesis*. Investors prefer dividends to capital gains due to the inherent uncertainty. Similarly, the higher frequency should further reduce uncertainty about future cash payments, offering investors higher level of certainty. Considering the "information content of dividends", dividend frequency changes might signal as managerial expectations about firm future earnings as informed by dividend increases and decreases. As dividends are mainly drawn from future permanent cash flow, which are determined by future earnings. Hence, future earnings of firm determine not only the firm's ability to pay dividend, but also the dividend frequency the firm elect to pay (Ferris et al. (2010)). Investors might perceive the occurrence of dividends frequency increases as good news indicating firm's positive future cash flow. While decisions made to reduce payment frequency might signal investors that this firm is experiencing poor operating conditions.

In addition to the arguments presented in above literature, there might be additional reasons to interpret the association between dividend payment frequency and firm value. As noted earlier in *signaling hypothesis*, dividends are viewed as continuing information about firm's future earnings, more frequent dividend means more dividend announcements and more news about future earnings provided to the investors. Contrarily, less frequent dividend payments decrease the breadth of investor awareness of the firm. This kind of unknown issues increase the level of risk taken on by investors thus require a higher rate of return when they are valuing the firm. As developed by Merton (1987) that, individuals are more willing to put securities of which they are aware into their investment basket. In summary, changes in dividend frequency can make a difference to the perception on firm value by influencing the breadth of investor cognizance of the firm.

It seems plausible to connect the effect of the breadth of investor cognizance to the *investor preference theory* by the link of the *bird-in-the-hand hypothesis*. Accordingly, the market satisfaction with the stock holding not only comes from profit maximization, but also from the

higher level of certainty about stock investing. Then it is understandable that investors prefer to make investment to those stocks which they are more aware of because they derive higher level of certainty. This view holds in the opposite direction that fewer news cognizance of the firm arising from lower frequent dividends cause adverse firm valuations due to high uncertainty.

Overall, both dividends *signaling hypothesis* and *investor preference theory* draw the same conclusion in terms of the market reactions to dividend frequency changes, expecting that market valuation of firm is an increasing function of the dividend payment frequency, although in two aspects of interpretations. In light of the aforementioned theories and literature, the present study aims to test the first hypotheses:

Hypothesis 1 The occurrences among firms transforming their current dividend payment frequency to higher (lower) level are correlated to the positive (negative) abnormal returns surrounding the announcement period.

Beyond the payment frequency, firms tend to adjust the overall dividend amount at the same time. Considering the effect of annual payout change coinciding with frequency change announcements, this paper investigates an additional hypothesis of *Hypothesis 1*:

Hypothesis 1(a) The firms who announce to pay more frequent dividends receive higher positive abnormal returns if they increase annual dividend payment amount at the same time.

Based on the literature provided above, it is clear that there is a gap in the literature pertaining to the value of monthly dividends for stock investors. As a further examination of frequency change, we specifically aim at frequency increase sample which convert to pay monthly dividends, which is the form of dividend distribution applied by an increasing group of firms. According to the *clientele effect*, specific investors are attracted to firms with different dividend policy. Thus, changes in dividend payment frequency may induce investors to adjust their stock holdings. We expect the firms that convert to pay monthly dividends will attract a new group of monthly dividend induced clienteles who take dividends as regular source of income and prefer a regular cash dividend paid in higher frequency over a low-frequency payment, which lead to different clientele structure and higher market valuations of the stock.

Hypothesis 2 Conversion of dividend payment frequency to monthly generates higher abnormal returns during announcement period.

3. Data and Sample Construction

3.1 Data Sources

Our dataset is constructed from the University of Chicago's Center for Research in Security Prices (CRSP) and Standard and Poor's Compustat database. Data on the firm's dividend distribution is required in the first step in order to identify the target firms that change their dividend payment frequency. The "CRSP Daily Stock Event – Distribution" file from CRSP database provides us the specific daily stock distribution information such as distribution code and dividend declaration date with corresponding identifying information, such as permno and cusip. To estimate the expected stock return performance and calculate the event period abnormal returns during the univariate event study. Both daily stock return data and daily market returns are collected from CRSP daily return files. Fama French daily research factors are collected from Ken French Website. For further multivariate analysis, cumulative abnormal returns obtained from event study are calculated from the daily stock price data. Compustat Fundamental Annual datafile in is used to retrieve the company level fundamentals including firm name, gvkey and business description, which are used to filter the non-real firms. Firm level financial information is obtained from Compustat.

3.2 Event Sample Collection

Our sample period comprises dividend distribution information from January 1, 1970 to December 31, 2019, to ensure a sufficient number of observations. In line with the literature and to avoid illiquidity issues, we require our securities to be listed at U.S. stock markets. We use the four-digit distribution code to identify dividend payment frequency changes. The first digit describes the type of distribution; the second digit describes the form or method of payment. The meaning of the third digit gives a more detailed description of the event. The fourth digit provides information about the tax status of the distribution. This work studies regular cash dividend frequency changes, thus, we only select firms with the first digit equals to 1, which represent the ordinary dividend; and the second digit equals to 2, 3 or 4 (referring to cash dividends in USD dollar). This step ensures only regular cash dividend payments in USD are selected. In terms of the value of the third digit that contains information about dividend frequency, we pay attention to 2, 3, 4 and 5, which representing monthly, quarterly, semi-annual

and annual dividend payment respectively. Thus, we further exclude observations that are equal to 0, 1, 6, 7, 8 and 9, which respectively refer to unknown, unspecified, year-end or final, extra or special, interim and non-recurring dividend frequency. This sample selection criteria result in a sample of 179,513 observations including 6,735 different firms in total.

This study focusses on firm events, as non-firms distribute dividends that they received from investing in other dividend paying companies, thus might represent different information about company's prospects and attract different clienteles. As mentioned in the literature and hypothesis that mangers are using dividends to signal firm performance, this argument doesn't apply to funds and thus they should be removed to fit our sample to prior arguments. We initially identify the non-real firms from those observations with missing gvkey variable in Compustat datafile because theoretically we are unable to find information on specific "non-companies" from Compustat database. Precisely, the kinds of firms that are listed in Compustat are: companies with an equity security included in the S&P 500, S&P 400, S&P 600, S&P/TSX Composite, or Russell 3000 indices; companies with an equity security actively trading on the NYSE, AMEX, NASDAQ, TSX, or NYSE/Arca exchanges. After removing the identified non-firms, the total number of firms in my sample went down from 6,735 to 5,199 with 151,576 observations.

We start to pick the changing firms by comparing the third digit of distribution code. Initially, we assume that the announcement date of frequency change is the dividend declaration date corresponding to the change of distribution code. Through this process, we obtain our original target sample with 703 observations in 543 firms with assumed event date.

However, using the gvkey to remove non-firms is not a precise process thus we need to manually double check the remaining cases. We screen the non-firm one more time by manually identifying the company name ending with 'FUND', 'TRUST', 'REIT(s), ETF', etc., then double check with company description variable.[5] After the application of this manual filtering, our real changing sample consist of 280 firms with 373 announcement observations.

[5] The remaining non-firms mainly exist in the division of "Finance, Insurance and Real Estate" with the SIC code ranging from 6000 to 6799. More specifically, in "Holding and Other Investment Office" industry with two-digit SIC code equal to "67", such as 6722, 6726, 6730, 6733, 6792, 6798, 6799, etc.

To further clean the sample to only keep firms which are continuously paying cash dividends before a frequency change announcement, in a final step each dividend-frequency event was checked manually as follows: 1) We verify the validity of the event by comparing the third digit distribution code before and after the change with the firm's actual distribution history to check whether the firm is paying dividends with the same frequency represented by the distribution code, which helps to detect the coding mistakes and decide the correct event date accordingly. Notice, we consider 0 (unknown) and 1 (unspecified) as third digit as candidates for data correction. Because we recognized that there might be some incomplete information included in the distribution code (e.g. "1" could actually be regular dividend payment such as monthly or quarterly and so on). 2) We make sure all firms in our sample have been paying dividends regularly one year before the event and continued to do so after the event. 225 events are removed during above two steps which do not comply with the requirement and the total number of frequency change announcements is scaled down to 148 occurrences in 133 firms. 3) We confirm with Factiva manually whether the real announcement date of frequency change is indeed the date where the company declares to pay a new type of dividend. We find that some firms declare to change their payout frequency prior to the next dividend announcement date especially among the frequency decreasing firms. Through strictly inspecting and capturing actual event date, we are confident that we get a clean dataset. There are 48 observations are dropped since the exact announcement dates could not be confirmed in Factiva. The final confirmed sample has 92 firms with 100 frequency changes. We keep the extended sample including both 100 confirmed sample and 48 unconfirmed sample as robustness database.

3.3 Sample Description

Based on the third digit of distribution code, we can classify the 100 confirmed sample into two general categories: firms changing from high to low frequency and firms changing from low to high frequency. We provide an overview on headquarters of sample firms in Table I. A significant proportion of frequency changes concentrate in America, especially for frequency increases.

We are using SIC code to identify industry and provide an industry division description of the sample firms in Table II. We observe that almost half frequency changes happened in "Finance,

Insurance and Real Estate" industry. Specifically, to assess possible seasonality issues, the 2-digit sic codes are summarized in Appendix A for further information. Only one observation of frequency change from quarterly to semi-annual is within seasonal industry. Appendix B provides the same industry classification for the extended sample. The main difference could be found in extended sample is that a quarter of frequency increase companies locate in manufacturing division.

Figure I provides an overview of the year's frequency changes are observed. We can clearly see the frequency change trend among our entire sample during the time period from 1970 to 2019. The peak period for frequency change in our study appear from 2008 till present also together with an increasing number of frequency change related to monthly dividends. During this peak time, majority of target firms announce their dividend will be paid more frequently while few firms announce to pay dividends with lower frequency. In the manual check for high to low frequency change, it is observed to be often connected to earning declines. Because of the specific emphasis on monthly dividends, frequency increase and decrease categories can be further broken into monthly involved frequency change subsample: frequency increase to monthly and frequency decrease from monthly to low. The first firm change to pay monthly dividend was observed in 2003. Until in 2008, monthly dividends became an emerging type of dividend distribution applied by a group of companies. In the meanwhile, some firms transit from monthly payment to lower frequency. Through the whole time period, the number of firms who announce to increase their dividend payment frequency are obviously greater than the number of firms that lower their dividend payment frequency.

− Please insert Table I and II and Figure I about here –

4. Methodology

4.1 Univariate Event Study

According to *signaling hypothesis*, we hypothesize that the market perceives the frequency increase as positive information and the frequency decline as negative signals conversely concerning firm's future perspective. On the other hand, the *investor preference* predicts that investor derive higher utility when they are given more frequent payments and reflect this preference in a higher share price. Closely parallel the bird-in-the-hand theory that investors

prefer higher frequency because of the reduced uncertainty about future gains. Hence, our study starts with hypothesis that the market will positively react to the frequency increasing announcements, while adversely response to the announcements of frequency decline.

To capture the market reactions to changes in frequency of dividend payment, we have employed a standard event study methodology with a sample of firms experiencing the changes of dividend payment frequency. In semi-efficient markets we expect new information to be immediately reflected in the stock price. Hence, the unanticipated market reactions arsing from the declaration of changing dividend payment frequency can be translated in the stock illustrating an abnormal return, which can be directly measured by the difference between realized return and the estimated drift. Experiencing the prior data filtering process, we are able to identify 100 announcements of dividend frequency changes in total, including 82 frequency increase and 18 frequency decrease. In order to examine market reactions to different types of frequency changes, we implement the event study on frequency increasing and decreasing sample separately.

For each announcement we compute the announcement effects as the excess of the actual stock return over the benchmark "expected return". Considering that information from event can be leaked before the actual announcement and investors may not immediately react to the event, hence, for each announcement we use event period consist of a total of 41 days, 31 days, 26 days, 21 days, 16 days, 11 days and 5 days respectively. Let the announcement of dividend payment frequency change as day 0, then we measure the daily abnormal returns over 10 kinds of event windows: day -20 through +20, day -20 through +10, day -20 through +5, day -10 through +20, day -10 through +10, day -10 through +5, day -5 through +20, day -5 through +10, day -5 through +5 and day -1 through +3 relative to the announcements. We then use a 150-days estimation period with minimum 120 days of non-missing returns included and a 15-day gap between the end of the estimation period and the beginning of the event window to calibrate our market model. The time period with [-20;+20] as event window can be presented graphically in Figure II.

− Please insert Figure II about here –

We are using Fama French model to compute the expected returns. Model parameters were estimated from daily realized returns over the estimation period which are subsequently used to calculate the expected return during event period.[6]

$$R_{i,t} = R_f + \alpha + \beta_1 * \left(R_m - R_f\right) + \beta_2 * SMB + \beta_3 * HML + \varepsilon_{i,t} \quad (1)$$

Let $R_{i,t}$ designate the observed return at day t for each sample security i, R_m as the value-weight market index in NYSE, AMEX, and NASDAQ markets (from CRSP), R_f is the one-month Treasury bill rate (from Ibbotson Associates) as proxy for the risk-free return, with SMB as size premium, HML as value premium, and $\varepsilon_{i,t}$ as an error term at time t. The parameters α, β_1, β_2 and β_3 represent the linear structure of the model obtained in the estimation window. According to the assumption inherent in the Fama French model, the error term is unrelated to the overall market return with the expected value equal to zero. Equation (2) outlines the calculation of expected return unconditional on the event but conditional on the Fama French factors occurred during event period.

$$\mathrm{R}_i^e = R_f + \alpha + \beta_1 * \left(R_m - R_f\right) + \beta_2 * SMB + \beta_3 * HML \quad (2)$$

The security i's event date abnormal return can be estimated using MacKinlay (1997)'s method by simply subtracting the estimated event date return ($\mathrm{R}_{i,0}^e$) from the observed event date return ($R_{i,0}$):

$$AR_{i,0} = R_{i,0} - \mathrm{R}_{i,0}^e \quad (3)$$

As we are considering an event period longer than one day, once we obtain the individual daily abnormal return, the next step is to calculate the cumulative abnormal returns during the period of event. We continue to follow the procedures described by MacKinlay (1997), we cumulate the daily abnormal returns over $T_2 - T_1$ event window length starting at time $T_1 + 1$ through time T_2 in Equation (4) to identify the overall stock price effects.

$$CAR_i = \sum_{t=T_1+1}^{T_2} AR_{i,t} \quad (4)$$

[6] We also use Market model $R_{i,t} = R_f + \alpha + \beta_1 * \left(R_m - R_f\right) + \varepsilon_{i,t}$ and Carhart model $R_{i,t} = R_f + \alpha + \beta_1 * \left(R_m - R_f\right) + \beta_2 * SMB + \beta_3 * HML + \beta_4 * UMD + \varepsilon_{i,t}$ to calculate the normal return, where UMD represents the momentum factor (premium on winners minus losers).

The average abnormal return as well as the cumulative abnormal return over a several days period window without additional information entering the market is expected to be zero. As we are studying a combination of multiple security-event, we aggregate the individual cumulative abnormal return corresponding to event windows in order to test the cross-sectional event effect by the cumulative average abnormal returns (Schimmer, 2012).

$$CAAR = \frac{1}{N}\sum_{i=1}^{N} CAR_i \quad (5)$$

4.2 Multivariate Analysis

By looking through our event study distribution data, majority of changes in payout frequency are announced jointly with a contemporaneous increase or decrease in total dividend amount, which might result in significant effect on the stock return behavior. We predict in *Hypothesis 1(a)* that the favorable market reactions to frequency increase will be greater if the firm increases dividend payment amount at the same time. Thus, it is essential to control for the influence of the changes in overall dividend payment when we are testing the correlation between frequency change and announcement period abnormal returns. Moreover, there may be other firm-level characteristics that might affect the firm stock performance during the announcement period. In the following step we further analyse what fraction of the abnormal stock return effects can be explained by the firm event of frequency change, and what fraction can be explained by other firm related factors. Following the previous empirical research by Ferris et al. (2010), we conduct a multivariate analysis with a number of firm specific characteristics selected as control variables. By regressing the cumulative abnormal returns (CARs) in various event windows on the occurrence of frequency change with the control of other influencing factors, we are able to correctly measure the event period cumulative abnormal returns related to the frequency change and get an approximation on what may drive investor sentiment.

We use the CARs for all firms, and then estimate the following regression:

$$CAR_i = \alpha + \beta_1 * FreqChange_i + \beta_2 * Monthly_i + \beta_3 * DivChange_i + b * X_i + \varepsilon_{it} \quad (6)$$

where CAR_i is calculated in Equation (4) for all firms for the event windows defined in Section 4.1; $FreqChange_i$ represents the dividend payment frequency change; $Monthly_i$ is a dummy

variable created to estimate the specific value of monthly dividends; $DivChange_i$ is the dividend change generated at the same time as the frequency change; and X_i is a vector of company firm-level control variables (*Firm size, Book-to-Market, Return on asset, Stock return volatility, and Free cash return on assets*).

4.2.1 Dependent Variable

The dependent variable in the regressions is the CAR for the Fama French model, as calculated in Equation (4). We are using [-5;+5] and [-10;+10] as a symmetrical interval, which are frequently cited in previous studies (Al-Yahyaee et al., 2011; Dasilas and Leventis, 2011; Anjali and Raju, 2017). Additionally, we also apply for two asymmetric event windows with 20 days subsequent to the announcement date: [-5;+20] and [-10;+20] where the information is fully processed by the market.

4.2.2 Dividend Change Related Variables

To distinguish the effects of frequency change from other dividend change related factors and to explicitly research the value of monthly dividends for stock investors, we control for possible effects from changes in the total amount distributed in cash dividends to the investor as follows:

Dividend payment frequency change (*FreqChange*). We define the frequency change as the change in the total number of times a firm pays dividend in one year. For example, if the firm change from quarterly to monthly dividend payment, we assume the frequency change equal to 8 (12-4).

Monthly dividend (*Monthly*). A dummy variable aiming at frequency increasing group with values of 1 if the firms increase their dividend payment frequency from low to monthly and 0 if otherwise. Relying on the *clientele effect*, the market reactions could be greater to frequency increase firms who have changed to pay monthly dividend than those who have not. Thus, we expect a positive sign on the coefficient.

Total annual dividend payment change (*DivChange*). The implied change in total dividend payment amount is measured as change rate of total annual dividend amount (new total annual dividend minus the old total annual dividend divided by the old total annual dividend) relative to the market capitalization (the product of the market trading price and number of shares

outstanding as obtained from CRSP). The total annual dividend amount is calculated as the product of annual dividend per share and the outstanding shares on corresponding ex-dividend date.[7] Investors are always pursuing a high-level dividend payment. Therefore, we expect a positive coefficient.

4.2.3 Control Variables

Firm size. In empirical corporate finance, size of the firm is commonly used as an important, fundamental firm characteristic because it is shown to affect firm performance (Fama and French (1992)). It is argued that size increases the possibility that a firm would achieve economies of scale and market power which could enhance its profits and distribute more dividends. On the other hand, larger firms are monitored by institutional investors and financial analyst more frequently which might push firms to adopt a higher dividend payout so that reduce the level of information asymmetry. Contrarily, Farinha (2003) find a negative correlation between firm size and dividends, which could be explained by the higher cash demand for investment in large firms. These arguments, in turn, suggest the existence of size difference amongst the large and small firms affects their dividend policy and consequently valuations for firms. As for the determinants of firm size, scholars employ varying proxies of firm size such as total assets, total sales, and market capitalization. This study approximates the firm size by the natural logarithm of a firm's market capitalization five trading days prior to the event date (in lien with e.g. Nayak and Prabhala (2001)). The market capitalization is the product of the market trading price and number of shares outstanding as obtained from CRSP.

Book-to-Market. The ratio of a firm's book value of equity to its market value of equity, which are obtained from a combination of Compustat and CRSP sources as proxy for value effect. It is popularly used as a return predictor that is expected to alter the variability of firm's prospective financial performance. Normally, a company's share value will be greater than its book value because the share price takes into account of how investors estimate about the future profitability

[7] For example, a firm announce to increase its dividend payment frequency from quarterly to monthly and declare its first monthly dividend with cash amount equal to $0.16 per share on December 3, 2013. There are 58618 shares on its corresponding ex-dividend date (January 9, 2014). The previous last quarterly dividend payment was announced on October 25, 2013 with dividend cash amount equal to 0.49 per share. There are 58566 shares on its corresponding ex-dividend date (Novmber 5, 2013). Then we calculate the new total annual dividend amount as 0.16*12*58618 and the old total annual dividend as 0.49*4*58566.

of the company – how well it uses its assets – into consideration. As a result, high book-to-market stocks are referred as value stock while low book-to-market ratio stocks are referred as growth stock. A low book-to-market ratio indicates that investors are willing to pay a premium for firm's future potential growth, which implies the firm has higher growth opportunities. It is observed that the high book-to-market stocks earn a higher excess return relative to stocks with low book-to-market ratios (Fama and French, 1992). High growth firms are found to have lower dividend yields (Gaver, J. and Gaver, K., 1993; La porta et al., 2000). Thus, the less abnormal returns in securities with low book-to-market ratios are likely attributed to less dividend yields.

Return on assets (ROA). This variable represents the firm's profitability calculated using net income divided by total assets. The level of profitability might reduce the firm's propensity to pay dividends if we pay attention to the cash constraint a firm might face. Since high profitability comes from higher investment. Especially for growth firms, they may drain out of cash for positive NPV projects instead of paying dividends.

Return volatility. As a proxy for uncertainty of stock return behavior, which might lead to the different magnitude of CARs during event period, it is computed as the standard deviation of stock holding period returns over the one year prior to the announcement date of dividend payment frequency change.

Free cash return on assets (Free Cash). Since cash dividends payments are generally paid from firm's permanent cash flow, the level of permanent cash flow determines not only the firm's ability to pay dividend, but also the dividend frequency the firm elect to pay (Ferris et al. (2010)). We are using the free cash return on assets to represent the level of permanent cash flow, which is estimated by earnings before interest (EBIDTA) minus the capital expenditure divided by the total assets from last available fiscal year, in order to control for the possible influence on dividend policy.

5. Empirical Results

5.1 The Market Reactions to Changes of Dividend Payment Frequency

The first part of this section illustrates the univariate event study results. As noted in methodology, the unexpected market reactions triggered by the frequency changes can be

interpreted as abnormal returns during disclosure period. By defining the announcement date as day 0, various CAARs for different event windows are calculated to identify the overall market reactions. The null hypothesis to be tested is that the CAARs will be equal to zero. 100 announcements in 1970-2019 period were investigated during data collection process. Notably, we are missing 4 events by using event study methodology due to less than 120 returns data available over estimation period. Hence, the univariate event study is completed based on 96 announcements of frequency change including 78 frequency increase and 18 frequency decline.

Figure III and Figure IV visualize the market reactions to the frequency increase and frequency decrease respectively by CARs calculated by Fama French model during the [-20;+20] event window. We expect over reactions from investors to the disclosure of frequency change, there by resulting in positive stock price movement in frequency increasing firms and negative stock price behavior in frequency declining firms. Consistently, the CARs in firms that elect to increase dividend payment frequency experienced a gradual upward trend following the announcement date. While a downward tendency occurred in CARs among frequency decrease firms since they declared to pay less frequent dividends. Similar CARs trend in extended sample can be found in Appendix C.

− Please insert Figure III and IV about here –

The estimates of CAARs using the Fama-French three factor model over various event windows are presented in Table III for the sample of 78 events of frequency from low to high (Panel 1) as well as for 18 events of frequency from high to low (Panel 2). Statistical inferences for the different event-windows CAARs are drawn using Patell's Z (see Patell (1976)) and the "standardized cross-sectional test (SCS)" of Boehmer et al. (1991). The SCS test is more reliable as it allows for the event-induced variance.

In Panel 1 of Table III we observe that changes in dividend payment frequency among frequency-increasing sample firms produce positive cumulative average abnormal returns for all chosen event windows. However, not all results are statistically significantly different from zero. We extend the event window before the event to control for possible information leakage which should be measured after the event date. Thus, a shorter event window may be more beneficial since it reduces volatility which is induced by the information leakage. Considering the event

windows only 5-day after the announcement date, the narrowest event window [-5;+5] which is widely implemented in previous event studies (Dasilas and Leventis, 2011; Ferris et al., 2010; Ozo and Arun, 2017) shows that the CAAR is less than one percent and statistically insignificant. Results are similar for the event windows that proceed the announcement date 10 or 20 days. It suggests that the information might be leaked less than five days before the official announcements but not much. In line with the information asymmetry arguments, majority of investors are less aware of the firm's internal information about the frequency change until the firm inform to the public. Specially, a significant CAAR appear in [-10;+20] event window, combined with the bump at day -10 in Figure III, there might be some information got into the market from coinciding other events. Looking at 5 days prior to announcement day, the CAARs become statistically significant different from zero as the number of days after the event date, to be considered in the event window, is increased. Relying on the less significant and lower CAAR for [-5;+5] event window, it looks like the information is not yet fully incorporated after 5 days. The largest CAAR equal to 2.33% at the five percent significance level exists in a 26-day event window from 5-days prior to the event to 20-days thereafter. Contrary to our expectations in semi-efficient markets that information should be incorporated into stock prices right after the announcement, however it seems like it takes 20 days. As recommended in papers of Anjali and Raju (2017) and Yaseen and Trifan (2019), we use two additional symmetric event windows which respectively contain 21 days and 41 days and obtain relatively higher CAAR (2.16%) in the wider interval but remain insignificant. We also add [-1;+3] window to see the short-term effect and get significant CAAR equal to1.44%. Combined with a CAAR jump within the first five days seen from Figure III, we conclude that the market reacts immediately to frequency increase information once it is disclosed.

Panel 2 display the CAARs pertaining to the announcements of frequency decrease. As we expected, we receive negative excessive returns among the entire sample regardless of which event window is applied. Similar as the results of frequency increase sample, the market reaction is more significant and distinctive in absolute term if we shorten the pre-announcement period and prolong the event window after the announcement date. For instance, the three event windows starting from day -5 relative to event date generate uniformly significant CAARs. Again, we obtain the most significant CAARs with strongest absolute value (-6.98%) during [-5;+20] event window. This confirms our comments that the market does not absorb the

information of frequency change efficiently. The CAAR in short-term effect period is only -0.99% which is statistically insignificant, indicating that the market does not react to frequency decrease as soon as it is announced.

This study tests for the significance of CAARs difference between increases and decreases in cash dividend payment frequency as shown in the last column. The results find, in exception of CAARs in [-20;+10], [-20;+5] and [-10;+5] event period, the CAARs in two separate sample are significantly different from each other with a roughly 6% gap in average. This provides evidence on the information content of dividend payment frequency changes that investors regard frequency change announcements as valuable information about firm's future prospects. In addition, frequency decrease related CAARs are marginally larger in magnitude compared with the frequency increase findings in Panel 1. This implies that the market reacts optimistically toward frequency increase; however, the market is more pessimistic in response to the announcements of frequency decreases. Thus, giving reasons why firms are reluctant to switch to lower payout frequency if possible.[8]

− Please insert Table III about here –

Overall, the optimal window should look at, most likely one with short number of days before event date and longer period thereafter to account for information leakage. Even though CAARs of -20 to +10 days, -20 to +5 days, -10 to +10 days and -10 to +5 days appear to be relatively weakly due to the lack of significance, the correctly predicted positive sign for the announcements of dividend frequency increases and negative CAARs surrounding the disclosure of frequency decline provide compelling evidence to support our *Hypothesis 1*. With respect to *investor preference*, the positive share price reactions during frequency increase period reveal the market preference for higher payout frequency and vice versa. This preference could be interpreted by the "bird-in-the-hand" hypothesis that investors obtain higher degree of certainty about future cash flow and stock investment. In the meanwhile, in agreement with the usefulness of *signaling hypothesis,* the favorable (unfavorable) market response to the announcement of frequency increase (decrease) makes dividend payment frequency change informative about the company's future prospects and cash flow. The investors may perceive the firm's decision to

[8] We also calculated the CAARs using expected market return based on Market model and Carhart model as robustness check and results remain stable.

increase their dividend payment frequency as positive managerial expectations about firm's future performance while interpret the announcements of frequency decline as bad news in regard to firm's future performance.

Moreover, additional robustness tests are performed using the extended sample including 100 confirmed announcements and 48 unconfirmed announcements (5 observations are dropped due to insufficient return data during estimation period). Appendix D contains the results of univariate analysis of CAARs. Panel 1 of Appendix D shows higher CAARs which are statistically significant at the 1% or 5 % level for all chosen event windows, indicating stronger market reactions to frequency increases. CAARs in Panel 2 remain stable with relatively higher significance. This confirms our findings that the market treats significantly positively to frequency increase announcements and vice versa.

Notice, the presented analysis is based on the complete sample of frequency changes. However, we observe that dividend frequency changes often coincide with other changes in dividend payout policy such as increases or decreases in annual cash dividend payments. The next sections discuss what may be the may driver for the observed stock market reactions.

5.2 Simultaneous Dividend Payment Change Effect

If the frequency change announcements coincide with a change in total cash amount payed in annual dividends, the market reactions reflected in the CAARs during the announcement period might be dominated by overall dividend payments change rather than a frequency change. Since we cannot really distinguish both effects and can only get a first idea by splitting the sample. To control for the potential effect resulting from a change in dividend payment amount, we further break down the full sample of frequency increase and frequency decrease into three different sub-sample based on the total annual dividend change. In panel 1, the full sample of frequency increase (low to high) is divided into three sub-samples where 1) dividend amount is increased at the same time, 2) divided amount is decreased at the same time and 3) dividend amount remains unchanged. Similarly, the full sample of frequency decrease (high to low) is separated into three sub-samples accordingly. Panel 1 and Panel 2 of Table IV report the respective CAARs.

Panel 1 of Table IV shows, the frequency increases accompanied with an increase in dividend payment result in larger CAARs as compared to the results of full sample displayed in Table III,

which are also significant at the 10% level for most event windows. Conversely, the sub-sample of dividend decrease in Panel 1 show us negative CAARs although none are statistically significant at the 10% level except for the [-1;+3] event window with CAAR of -1.57%, which represents the immediate market reactions to dividend amount decrease together with an increase in payment frequency. This is an indication that the effect of reduction in dividend payment is stronger than the frequency increase. In terms of the observations with no change in dividend amount, most reported CAARs are positive, with the exception for the event windows [-5;+20], [-20;+5] and [-20;+20] which are slightly negative. However, none of the CAARs are statistically significant at the usual levels even though the event windows [-10;+10] and [-5;+10] report larger CAARs as compared to the sub-sample where dividend increases coincide with increases in payment frequency. Overall, the results are not conclusive due to the low number of observations.

Similarly, the results reported in the "dividend increase" section of Panel 2, are affected by the low sample size. Overall, all observed CAARs are negative but not statistically significant from zero for both sub-samples: Dividends amount increase and no change in amount of dividend payment together with frequency changes. We find statistically significant negative CAARs for most event windows when dividend amount decreases together with a decrease in payment frequency. Thus, the market adversely reacts to dividend decrease in a significantly higher magnitude, indicating that the dividend payment reduction strengthens the pessimistic market reactions to frequency reduction.

Therefore, the findings in Panel 1 and 2 prove that given the total number of times a firm pay dividends, a rise in overall dividend payments enhance the positive value effect from frequency increase. Meanwhile, a drop in total amount of dividends decrease the CAARs during announcement period. The empirical results using extended sample in Appendix E strengthen our results, illustrating stronger positive CARs among frequency increase announcements coincided with dividend increases and negative CARs in larger magnitude if firms cut dividends at the same time with frequency decreases. However, since it is only a univariate test with limited number of observations, we cannot fully grasp the complete effect. We shed further light on the cumulative abnormal returns related to the frequency change and dividend amount variations separately in the multivariate analysis.

− Please insert Table IV about here –

5.3 Multivariate Analysis

The results in preceding section reveal that the dividend change accompanied with frequency conversion and adjustment to the overall payout exert observable influence on firm's stock price and thus market valuations. In fact, in addition to the overall dividend change, there exists a set of firm specific characteristics that might be able to account for the announcement period significant cumulative average abnormal returns. To ascertain whether the relation between dividend policy change and excess stock returns also persists in competition with other influencing variables, we further implement a multivariate analysis by regressing event period cumulative abnormal returns on dividend change related variables with the control of firm-level factors.

We design a multivariate cross-sectional model using the cumulative abnormal returns obtained over two popular event windows [-5;+5], [-10;+10] as dependent variable. In addition, CARs within [-5;+20] and [-10;20] event windows are used as well since the univariate tests show that 20 days the market may take until the information is fully processed. This study uses three explanatory variables to research the effects of dividend policy change on stock price reaction: 1) dividend payment frequency change (*FreqChange*), referring to the changes in total number of time that firms distribute dividends annually; 2) monthly dividend (*Monthly*) is created aims at frequency increasing sample who elect to pay monthly dividends. Relying on the *clientele effect*, firms converting to pay monthly dividends may influence the portfolio choices of investors with different clientele structure looking for regular income. In other words, market reactions to the disclosures of monthly dividend distribution are expected to be differently from other frequency change announcements; 3) *Total annual dividend payment change* (*DivChange*) implies the change rate of total annual dividend payment amount relative to the market capitalization. This study further controls for relevant firm specific factors that might be responsible for the generation of the announcements period abnormal return introduced as control variables in Section 4.2.3. None of the predictors VIF value exceeds 10 with the mean value less than 2, which ensures no multicollinearity problem exists in a multivariate context. Finally, this research includes industry fixed effects to account for differences in industries which lead to changes in market reactions.

The multivariate estimations using industry fixed effects are shown in Table V. After explicitly controlling for the other influence factors, the correlation between announcements of frequency change and CAARs remain statistically significant and positive for all four event windows. The robustness check using extended sample comes to the same conclusion in Appendix F. This is in line with Ferris et al.'s (2010) findings and provides confirmatory evidence on this study's first hypothesis that market react favorably to frequency from low to high and vice versa. As suggested by Ferris et al. (2010), this could be explained by *investor preference theory* that investors prefer more frequent dividend payments, which are reflected in higher valuations of the company's security. Combined with the *bird-in-the-hand hypothesis*, rational investors are in favor of frequent dividend payment as they pursue reduced uncertainty about future cash flow and investment decision. From the standpoint of *signaling hypothesis,* the significant positive coefficient on the frequency change suggest the informativeness of the frequency change announcement. Investors probably value the firm's decision to change its payout frequency as worthy information about firm's future prospects, thus react on the basis of information revealed. As such, the rise in dividend payment frequency will be considered as good news and stimulate positive abnormal returns generated nearing announcement period. Consistent with findings in Section 5.1, the coefficient on frequency change become greater and more statistically significant as we prolong the post-announcement period, indicating that the investors take longer time to absorb the information contained in frequency change announcements.

Consistent with *Hypothesis 1(a)* and work of Ferris et al. (2010), the annual dividend change is positively related to the cumulative abnormal returns. However, the test statistics suggest the correlation is not significant. This results probably tell us that the frequency change announcements have stronger short-term effect on CAARs than the concurrent dividend payout amount changes. Based on the univariate results, we are however of the view that an increase in overall dividend amount enhance the generation of abnormal returns while a decrease in overall dividend adversely affect the announcement period CAARs. We have to admit that there is only a limited number of observations where frequency increases (decreases) coincided with dividend amount decreases (increases). The robustness results in Appendix F using a larger but unconfirmed sample show that the annual dividend amount change becomes significant for the [-5;+5] window which hints it may a problem with sample size. In contrast to *Hypothesis 2*, CAARs in [-5;+5] and[-5;+20] event windows are not significantly related to the monthly

dummy variable, suggesting that investors value the frequency increase to monthly equally as other types of frequency change and there are no new clienteles will be attracted by monthly dividends. Unexpectedly, there is significant negative sign on monthly coefficient during [-10;+20] event window, not but close to significant negative sign during [-10;+10] event window, which provide no evidence for the prediction that new clienteles are attracted by monthly dividends which form new clientele structure and lead to higher valuations of monthly dividend payer. This could be linked to taxation reason that higher rates taxed at frequent dividends reduce the after-tax return thus weaken the demand for monthly dividends. Moreover, the main investors in firms who change to pay monthly dividends are probably reinvesting investment funds or institutional investors with no high payout preference.

Besides, we observe that the coefficient for the free cash return on assets is statistically significant and positive in all multivariate models. In this paper, we view this variable as the level of permanent cash flow where the dividends are generally paid from. As argued by Ferris et al. (2010) that the level of permanent cash flow determines not only the firm's ability to pay dividend, but also the dividend frequency the firm elect to pay. Therefore, the result may suggest that the high-level permanent cash flow increases the chance for firms to pay more dividends with higher frequency, in turn, to create excessive stock returns. The extended sample results presented in the Appendix F demonstrate that the *Free Cash* remain positive but are only significant for the [-5;+5] event window. Instead the *Book-to-Market* becomes significant in [-5;+20], [-10;+10] and [-10;+20] and close to significant in the shortest [-5;+5] event window. This is in agreement with the findings of Fama and French (1992) that value firms tend to earn a higher excess return relative to growth firms which could be due to the lower dividend yields in high growth firms. At the same time, The proxy for profitability (ROA) has a negative and significant coefficient in [-5;+5] event window although no significance can be found for the extended sample. This is in agreement with our prior comments that higher profitability means higher investment thus reduce the firm's propensity to pay dividends due to cash constraint. Therefore, the adversely market reactions might be attributed to less dividend distribution.

− Please insert Table V about here –

6. Conclusion

The paper considers only cash dividends and investigates the significance of dividend payment frequency change by examining a sample of firms declaring to change their dividend payment frequency in U.S. listings. As expected under hypothesis, the initial univariate analysis report significant cumulative average abnormal returns surrounding the announcement of a change in dividend payment frequency. But the subsequent classified analysis reveals that the announcement period CAARs vary greatly with the simultaneous changes in dividend payment amount. As further evidence of the market reactions related to announcements of frequency change, the multivariate results demonstrate that the positive relationship between announcements of dividend payment frequency change and market value remain significantly positive after controlling for other firm specific factors. This implies that dividend policy regarding to the payout frequency change does have an impact on the share price of the firm.

The positive (negative) market reactions to frequency change from low to high (from high to low) can be interpreted as dividend signaling effect that investors perceive the firm's choice of frequency change as managerial expectations about firm's future performance. Since dividends are generally paid from future earnings. It is natural that managers are more likely to pay dividend frequently when they have positive expectations about firm's continuously growth. Additionally, firm value is an increasing function of the investor preference of the firm. The implications of the *bird-in-the-hand hypothesis* predict that the stockholders prefer to invest in stocks with more frequent dividend distributions as the more often the dividends are paid, the lower uncertainty about future cash payments and their investment decisions. From a business perspective, managers are expected to convert to pay more frequent dividends with a view to enhancing value. This finding probably explains the large concentration of frequency increase in our sample. The annual dividend change is found to be positively associated with event period CARs, which is consistent with our initial hypothesis that increases in overall dividend improve the market valuations of firms. While the positive correlation is unpersuasive due to the lack of significance. We find no support that the investors value the firms who elect to pay monthly dividends higher than other types of frequency change our expectations. Instead, the frequency change to monthly negatively affects the announcement period CARs. This is probably linked to

taxation reason or that main investors are reinvesting investment funds or institutional investors with no high payout preference.

While this analysis contributes to the literature on corporate dividend policy concerning frequency change, it has some limitations that could be addressed by further researchers. We suspect the limitations with regards to possible firm related variables which have been omitted and limited number of observations may lead to our insignificant results. Therefore, this study recommends that a similar study be undertaken on an expanded sample data with more firm characteristics as control variables. Moreover, since this paper focuses on short-term effect of dividend payment frequency changes, future researcher could further extent this study from a long-term perspective, thus examine whether firms perform as same as what investors expect over time and the type of information contained in dividend frequency changes.

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Figure and Tables

Figure I: Event Distribution

This table report the distribution of entire and sub-sample events. The entire sample covers all confirmed events (100) from 1970 until 2019, which are distributed into 82 low-to-high frequency change events occurred in 78 firms and 18 high-to-low frequency change events occurred in 18 firms. The sub-sample is reduced for all events relating to monthly dividend payment and is distributed into 14 low-to-monthly events occurred in 14 firms and 7 monthly-to-low events occurred in 7 firms.

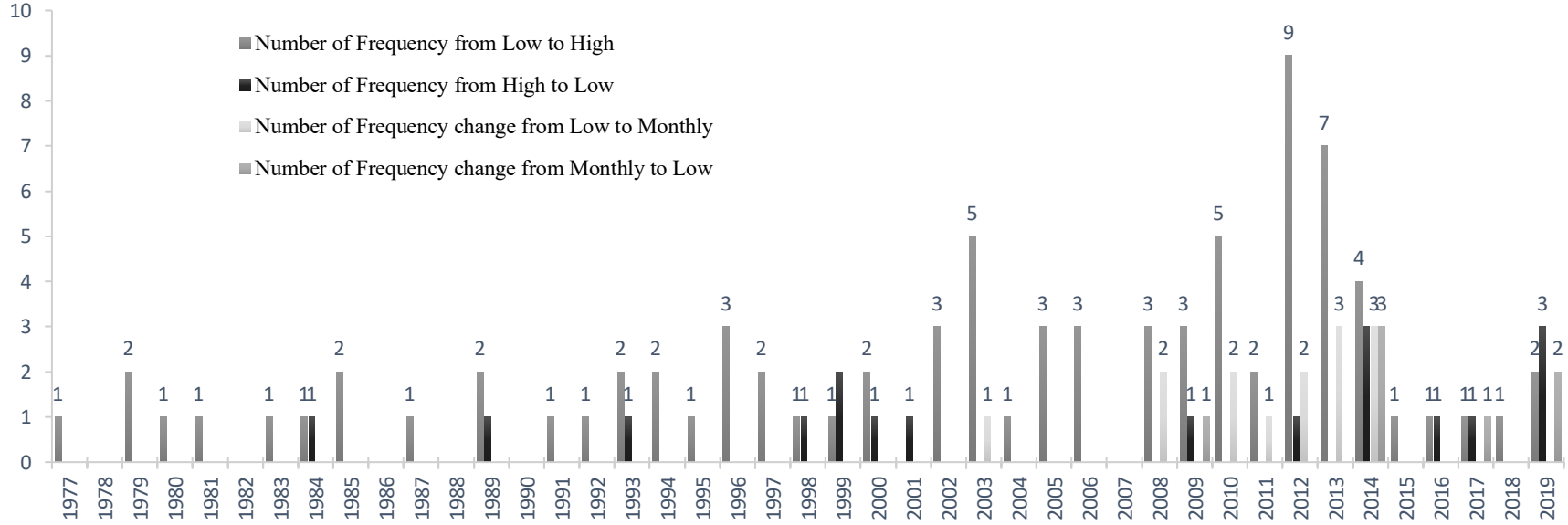


Figure II: Timeline of Event Study

The following graph illustrates the event study timeline with a 41-days event window [-20;+20].

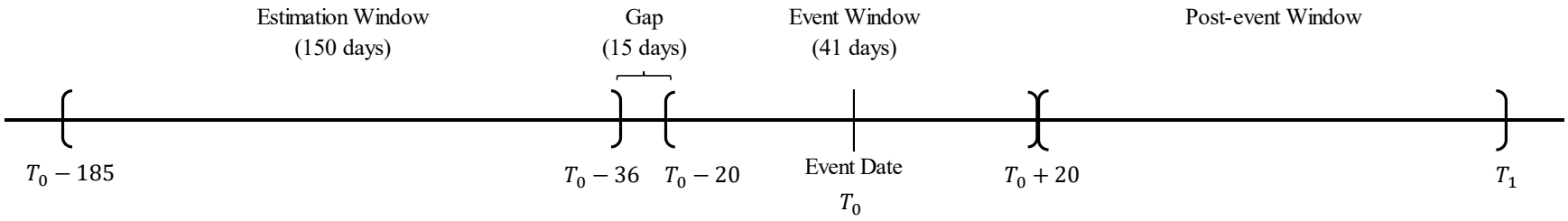


Figure III: CARs Around the Disclosure of Frequency Increase

Graphical illustration of the confident range of cumulative abnormal returns with 95% confidence limits from Day -20 through Day +20. There are 78 confirmed events of dividend payment frequency from low to high in total with non-missing returns.

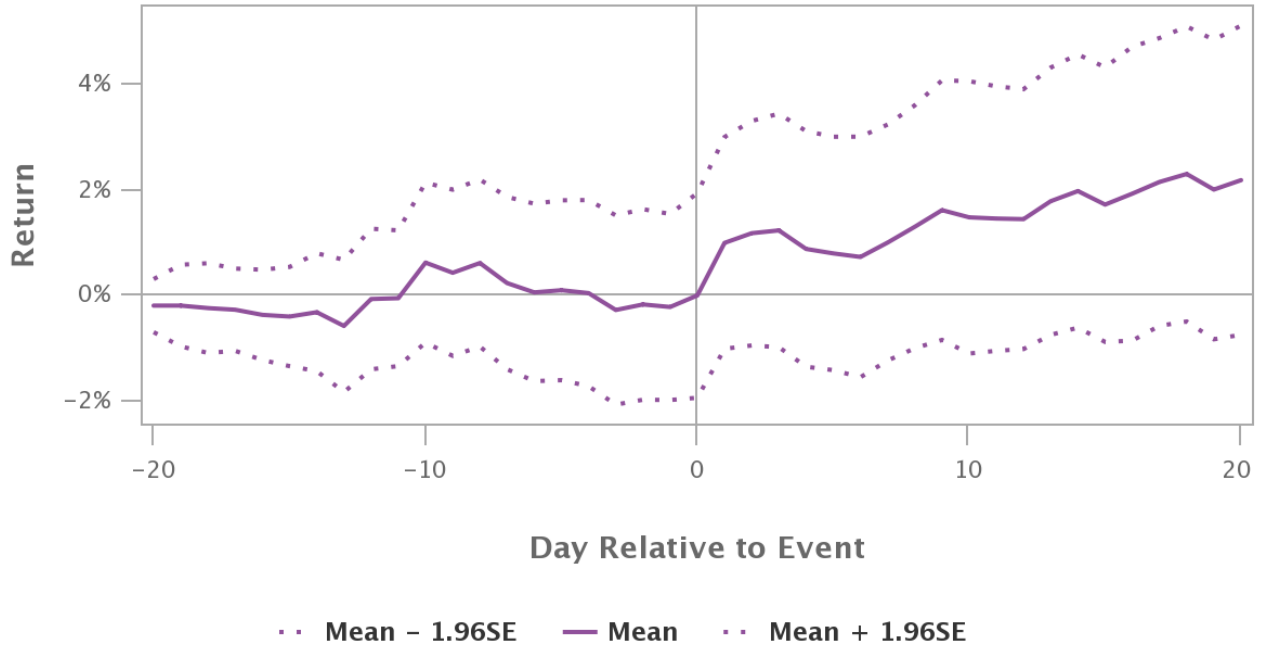


Figure IV: CARs Around the Disclosure of Frequency Decrease.

Graphical illustration of the confident range of cumulative abnormal returns with 95% confidence limits from Day -20 through Day +20. There are 18 confirmed events of dividend payment frequency from high to low in total with non-missing returns.

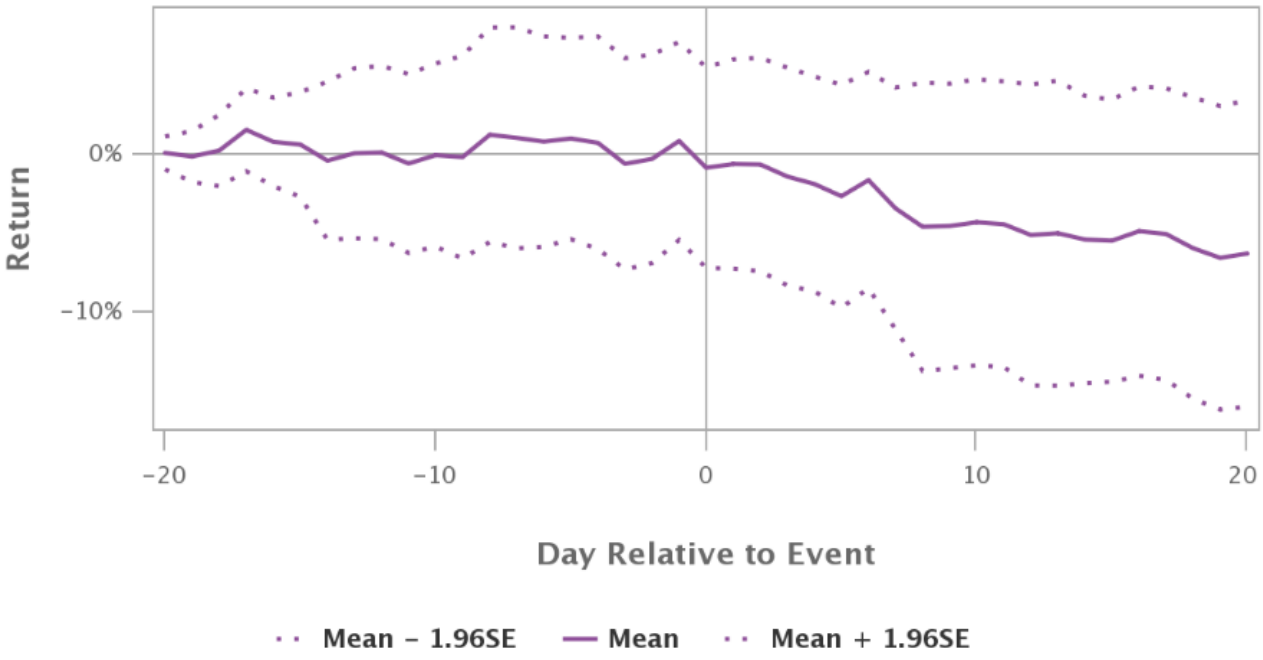


Table I: Headquarter Overview

This table provides an overview of the countries where the headquarters of confirmed sample are located.

	Panel 1: Total Events		Panel 2: Low to High		Panel 3: High to Low	
Headquarters	No. Of observations	Percent	No. Of observations	Percent	No. Of observations	Percent
Canada	13	13%	8	10%	5	28%
United Kingdom	2	2%	0	0%	2	11%
Ireland	1	1%	1	1%	0	0%
Israel	2	2%	2	2%	0	0%
Panama	1	1%	1	1%	0	0%
United States of America	80	80%	69	84%	11	61%
South Africa	1	1%	1	1%	0	0%
Total	100	100%	82	100%	18	100%

Table II: Industry Classification

This table summarizes the different industries of the confirmed sample that change their dividend payment frequency. The full sample of are divided into two groups: frequency change from low to high, and frequency change from high to low respectively. Each firm is classified to one of the SIC Divisions according to its 4-digit SIC.

	Panel 1: Total Events		Panel 2: Low to High		Panel 3: High to Low	
	No. Of observations	Percent	No. Of observations	Percent	No. Of observations	Percent
Agriculture, Forestry and Fishing	1	1%	0	0%	1	6%
Construction	2	2%	1	1%	1	6%
Finance, Insurance and Real Estate	46	46%	39	48%	7	39%
Manufacturing	10	10%	9	11%	1	6%
Mining	18	18%	14	17%	4	22%
Nonclassifiable	5	5%	5	6%	0	0%
Services	10	10%	8	10%	2	11%
Transportation,Communications,Electric,Gas and Sanitary Service	6	6%	4	5%	2	11%
Wholesale Trade	2	2%	2	2%	0	0%
Total	100	100%	82	100%	18	100%

Table III: CAARs Around the Announcement of Changes in Dividend Payment Frequency

This table reports the cumulative average abnormal return (CAARs) around the announcement of changes in dividend payment frequency for various event windows in confirmed sample, followed by the test statistics including the "standardized cross-sectional test" of Boehmer et al. (1991) and the Patell's Z (see Patell (1976)). We have 96 announcements of dividend payment frequency with minimum of 120 non-missing returns for estimation and separate them into two groups: frequency change from low to high and frequency change from high to low. Panel 1 covers all frequency increasing events (n=78) occurred in 74 firms; and Panel 2 covers all frequency declining events (n=18) happened in 18 firms. The last two columns report and statistical tests for differences between the CAARs of Panel 1 and Panel 2. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level respectively. Moreover, we perform the same univariate analysis of CAARs using the extended sample in Appendix D.

	Panel 1: Low to High					Panel 2: High to Low					Test for Difference	
Event window	CAAR	SCS test	Patell Z	Rank test	No. Events	CAAR	SCS test	Patell Z	Rank test	No. Events	Mean	t-Test
[-20;+20]	2.16%	1.49	1.34	1.37	78	-6.40%	-1.55	-2.08**	-1.68*	18	8.55%	1.66*
[-20;+10]	1.46%	1.16	1.15	1.1	78	-4.42%	-1.19	-1.67*	-1.47	18	5.87%	1.22
[-20;+5]	0.77%	0.57	0.51	0.77	78	-2.77%	-0.93	-1.28	-1.64	18	3.54%	0.94
[-10;+20]	2.17%	1.83*	1.67*	1.45	78	-6.24%	-2.02**	-1.93*	-1.41	18	8.42%	2.78***
[-10;+10]	1.55%	1.59	1.60	1.18	78	-4.04%	-1.38	-1.50	-0.74	18	5.59%	1.66*
[-10;+5]	0.89%	1.05	0.92	0.8	78	-2.17%	-1.18	-1.00	-0.69	18	3.06%	1.59
[-5;+20]	2.33%	2.02**	1.95*	1.6	78	-6.98%	-2.46**	-2.37**	-1.64	18	9.30%	3.36***
[-5;+10]	1.63%	1.95*	1.87*	1.38	78	-4.82%	-1.74*	-2.06**	-0.98	18	6.45%	2.12**
[-5;+5]	0.93%	1.32	1.19	0.99	78	-3.08%	-1.60	-1.67*	-0.98	18	4.01%	2.51**
[-1;+3]	1.44%	1.93*	2.22**	0.99	78	-0.99%	-0.62	-0.45	-0.54	18	4.01%	2.51**

Table IV: Dividend Change Related CAARs

This table reports the cumulative average abnormal return (CAARs) around the announcements of changes in dividend payment frequency for various event windows in confirmed sample, followed by the test statistics including the "standardized cross-sectional test" of Boehmer et al. (1991) and the Patell's Z (see Patell (1976)). The 78 announcements of frequency increase are further separated into 60 dividend-increase, 13 dividend-decrease and 5 no dividend change in Panel 1. The 18 confirmed announcements of frequency decrease are further separated into 6 dividend-increase, 11 dividend-decrease and 1 no dividend change in Panel 2. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level respectively. Moreover, we analyze the same dividend change effect using the extended sample in Appendix E.

Panel 1: From Low to High

	Dividend Increase				Dividend Decrease				Dividend No Change			
Event window	CAAR	SCS test	Patell Z	No. Events	CAAR	SCS test	Patell Z	No. Events	CAAR	SCS test	Patell Z	No. Events
[-20;+20]	3.16%	1.66*	1.53	60	-1.33%	-0.19	-0.16	13	-0.85%	0.24	0.23	5
[-20;+10]	2.20%	1.43	1.48	60	-2.18%	-0.75	-0.67	13	1.96%	0.68	0.51	5
[-20;+5]	1.34%	0.92	0.87	60	-1.52%	-0.90	-0.69	13	-0.08%	0.21	0.12	5
[-10;+20]	2.77%	1.74*	1.58	60	-0.10%	0.32	0.28	13	0.93%	0.55	0.69	5
[-10;+10]	1.92%	1.60	1.64	60	-0.85%	-0.27	-0.24	13	3.31%	0.94	1.03	5
[-10;+5]	1.13%	1.10	1.03	60	-0.24%	-0.46	-0.30	13	0.95%	0.70	0.56	5
[-5;+20]	3.26%	2.39**	2.13**	60	-1.02%	-0.17	-0.17	13	-0.12%	0.36	0.63	5
[-5;+10]	2.28%	2.40**	2.30**	60	-1.82%	-0.78	-0.89	13	2.79%	0.72	1.16	5
[-5;+5]	1.42%	1.96**	1.68*	60	-1.30%	-1.31	-1.15	13	0.78%	0.56	0.73	5
[-1;+3]	2.16%	3.00***	3.11***	60	-1.57%	-2.48**	-1.98**	13	0.66%	0.52	1.19	5

Table IV: Dividend Change Related CAARs – *Continued*

Panel 2: From High to Low												
	Dividend Increase				Dividend Decrease				Dividend No change			
Event window	CAAR	SCS test	Patell Z	No. Events	CAAR	SCS test	Patell Z	No. Events	CAAR	SCS test	Patell Z	No. Events
[-20;+20]	-0.39%	0.20	0.27	6	-9.43%	-2.00**	-2.70***	11	-9.12%	-	-0.52	1
[-20;+10]	-0.52%	0.20	0.32	6	-6.75%	1.73*	-2.33**	11	-2.17%	-	-0.14	1
[-20;+5]	-1.40%	0.03	0.06	6	-3.18%	-1.22	-1.54	11	-6.53%	-	-0.46	1
[-10;+20]	-2.48%	-0.28	-0.27	6	-7.73%	-2.07**	-2.03**	11	-12.46%	-	-0.80	1
[-10;+10]	-2.65%	-0.31	-0.33	6	-4.70%	-1.31	-1.55	11	-5.18%	-	-0.40	1
[-10;+5]	-3.44%	-0.64	-0.74	6	-0.87%	-0.68	-0.50	11	-8.86%	-	-0.79	1
[-5;+20]	-2.04%	-0.31	-0.26	6	-10.13%	-2.83***	-2.79***	11	-1.94%	-	-0.13	1
[-5;+10]	-2.19%	-0.31	-0.31	6	-7.06%	-1.95*	-2.51**	11	4.06%	-	0.36	1
[-5;+5]	-3.02%	-0.72	-0.80	6	-3.36%	-1.39	-1.53	11	-0.32%	-	-0.03	1
[-1;+3]	-0.99%	-0.07	-0.11	6	-0.53%	-0.29431	-0.3224	11	-6.08%	-	-0.94	1

Table V: Determinants of CARs

This table reports the correlation between the announcements of frequency change and the event period cumulative abnormal returns (CARs) in [-5;+5], [-5;+20], [-10;+10] and [-10;+20] four event windows within confirmed sample. All models include industry fixed effects (11 singleton observations are dropped from the 96 total observations). The definitions of all variables can be found in Section 4.2.1 ~ 4.2.3. T-statistics are reported in parentheses and are based on standard errors that are clustered at the firm level. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level respectively. Variance inflation factors are also calculated as supplementary tests for multicollinearity issues. Same multivariate analysis of CARs using the extended sample is performed in Appendix F.

	CAR[-5;+5]	CAR[-5;+20]	CAR[-10;+10]	CAR[-10;+20]
Intercept	-0.0041095	-0.0032295	-0.0167832	-0.041045
	（-0.11）	(-0.05)	（-0.28）	（-0.61）
FreqChange	0.0045477*	0.0119692***	0.0103975**	0.0137406***
	（1.81）	(2.61)	（2.55）	（2.97）
Monthly	-0.0277746	-0.0630059	-0.0819501	-0.1023943*
	（-0.90）	(-1.12)	(-1.63)	（-1.80）
DivChange	0.4726814	0.7063816	0.4339435	0.725415
	（1.49）	(1.22)	(0.84)	（1.24）
Firm Size	-0.0009746	-0.0032522	-0.0003174	-0.0020891
	（-0.24）	(-0.43)	(-0.05)	（-0.27）
Book-to-Market	-0.0000188	0.0104287	0.0211471	0.0364002
	（-0.00）	(0.36)	(0.82)	（1.25）
Return Volatility	-0.0887807	-.3789283	-0.4238227	-0.1136323
	（-0.12）	(-0.27)	(-0.34)	（-0.08）
ROA	-0.2810994**	-0.2663116	-0.2738641	-0.1782165
	(-2.17)	(-1.12)	(-1.30)	（-0.75）
Free Cash	0.3296361***	0.4223279**	0.3423607**	0.4043503**
	(3.11)	(2.18)	(1.99)	（2.07）
Industry Fixed Effects	Yes	Yes	Yes	Yes
Observations	85	85	85	85
Max VIF	3.45	3.45	3.45	3.45
Mean VIF	1.95	1.95	1.95	1.95
Adj R-squared	0.08	0.07	0.19	0.16
F-Statistics	2.21	2.24	1.65	2.56

Appendix A. 2-digit SIC Industry Classification

This table summarizes the different industries of the confirmed sample that change their dividend payment frequency, including the frequency change from low to high and frequency change from high to low respectively. Each firm is classified to one of the following industries according to its 2-digit SIC.

2-digit SIC	Description	Total	Low to High	High to Low
10	Metal Mining	12	9	3
13	Oil and Gas Extraction	6	5	1
15	Construction - General Contractors & Operative Builders	2	1	1
18	N/A	1	0	1
20	Food and Kindred Products	2	1	1
28	Chemicals and Allied Products	1	1	0
30	Rubber and Miscellaneous Plastic Products	1	1	0
36	Electronic & Other Electrical Equipment & Components	4	4	0
38	Measuring, Photographic, Medical, & Optical Goods, & Clocks	2	2	0
45	Transportation by Air	1	1	0
48	Communications	1	1	0
49	Electric, Gas and Sanitary Services	4	2	2
50	Wholesale Trade - Durable Goods	1	1	0
51	Wholesale Trade - Nondurable Goods	1	1	0
60	Depository Institutions	19	19	0
61	Nondepository Credit Institutions	1	1	0
62	Security & Commodity Brokers, Dealers, Exchanges & Services	7	5	2
63	Insurance Carriers	7	4	3
67	Holding and Other Investment Offices	12	10	2
70	Hotels, Rooming Houses, Camps, and Other Lodging Places	1	1	0
72	Personal Services	1	1	0
73	Business Services	3	3	0
79	Amusement and Recreation Services	2	0	2
80	Health Services	1	1	0
87	Engineering, Accounting, Research, and Management Services	2	2	0
99	Nonclassifiable Establishments	5	5	0
Total		100	82	18

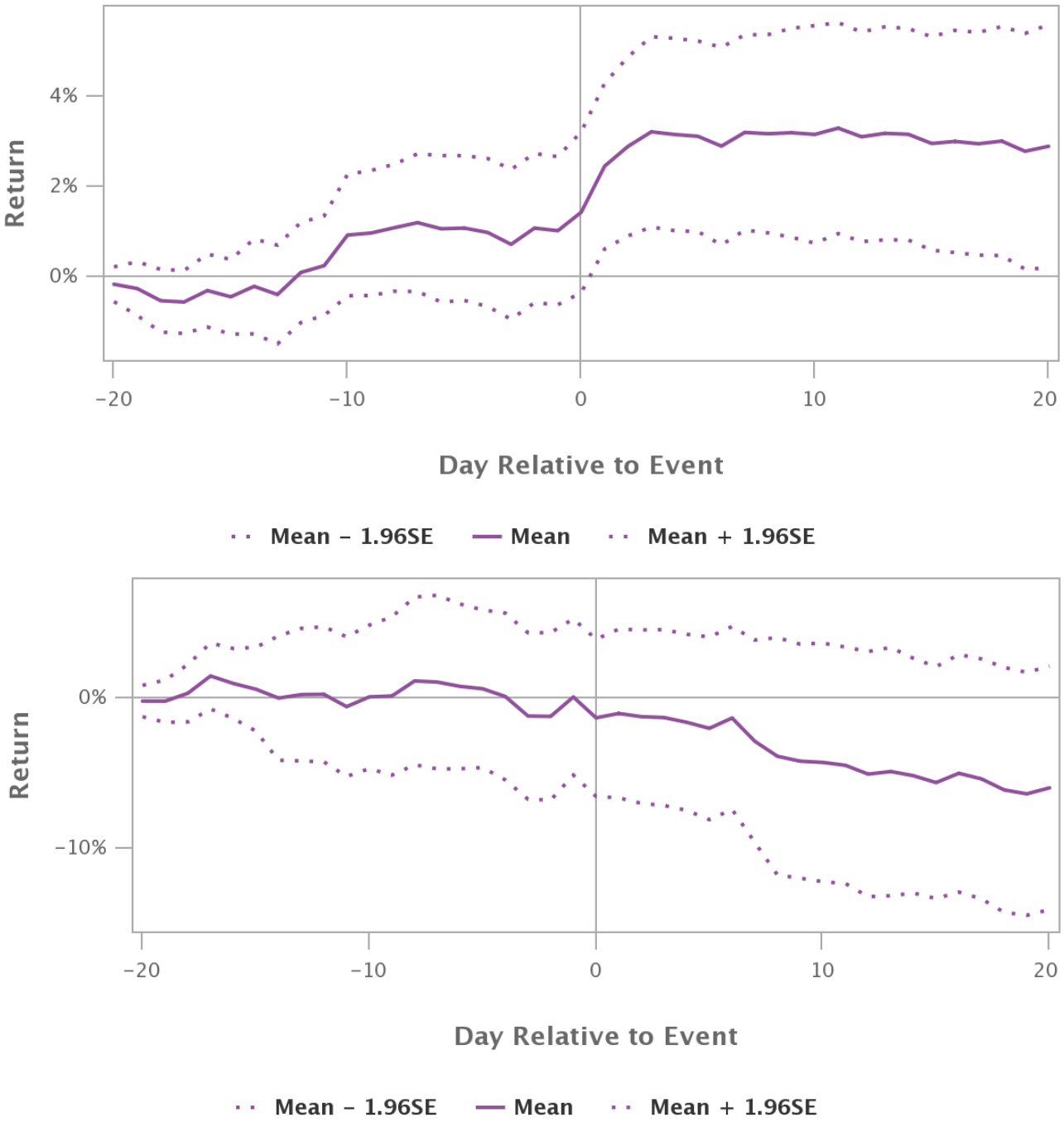
Appendix B. Industry Classification (*Extended Sample*)

This table summarizes the different industries of the extended sample that change their dividend payment frequency. The full sample of are divided into two groups: frequency change from low to high, and frequency change from high to low respectively. Each firm is classified to one of the SIC Divisions according to its 4-digit SIC.

	Panel 1: Total Events		Panel 2: Low to High		Panel 3: High to Low	
	No. Of observations	Percent	No. Of observations	Percent	No. Of observations	Percent
Agriculture, Forestry and Fishing	1	1%	0	0%	1	5%
Construction	5	3%	4	3%	1	5%
Finance, Insurance and Real Estate	55	37%	46	37%	9	41%
Manufacturing	33	22%	31	25%	2	9%
Mining	18	12%	14	11%	4	18%
Nonclassifiable	6	4%	6	5%	0	0%
Retail Trade	3	2%	3	2%	0	0%
Services	16	11%	13	10%	3	14%
Transportation,Communications,Electric,Gas and Sanitary Service	7	5%	5	4%	2	9%
Wholesale Trade	4	3%	4	3%	0	0%
Total	148	100%	126	100%	22	100%

Appendix C. CARs Around the Disclosure of Frequency Changes (*Extended Sample*)

The same graphical illustration as shown in Figure III and Figure IV using extended sample. There are 121 events of dividend payment frequency change from low to high and 22 from high to low in total with non-missing returns.



Appendix D. Univariate Analysis (*Extended Sample*)

This table reports the same univariate analysis as shown in Table III using the extended sample including 143 announcements of dividend payment frequency with minimum of 120 non-missing returns for estimation and separate them into two groups: frequency change from low to high and frequency change from high to low. Panel 1 covers all frequency increasing events (n=121) occurred in 113 firms; and Panel 2 covers all frequency declining events (n=22) happened in 22 firms. The last two columns report and statistical tests for differences between the CAARs of Panel 1 and Panel 2. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level respectively.

	Panel 1: Low to High				Panel 2: High to Low				Test for Difference	
Event window	CAAR	SCS test	Patell Z	No. Events	CAAR	SCS test	Patell Z	No. Events	Mean	t-Test
[-20,+20]	2.85%	2.42**	2.58***	121	-6.08%	-1.89*	-2.37**	22	8.93%	2.44**
[-20,+10]	3.11%	2.46**	2.94***	121	-4.40%	-1.53	-2.07**	22	7.51%	1.79*
[-20;+5]	3.07%	2.46**	2.88***	121	-2.14%	-1.13	-1.50	22	5.22%	1.83*
[-10,+20]	2.51%	2.67***	2.86***	121	-5.88%	-2.39**	-2.15**	22	8.39%	2.85***
[-10,+10]	2.81%	2.94***	3.42***	121	-3.98%	-1.70*	-1.82*	22	6.79%	2.58***
[-10;+5]	2.79%	3.20***	3.49***	121	-1.54%	-1.27	-1.10	22	4.34%	2.17**
[-5;+20]	1.96%	2.38**	2.55**	121	-6.66%	-2.84***	-2.58**	22	8.62%	3.21***
[-5;+10]	2.19%	2.70***	3.14***	121	-4.74%	-2.00**	-2.35**	22	6.94%	2.38**
[-5;+5]	2.14%	2.93***	3.24***	121	-2.36%	-1.65*	-1.70*	22	4.51%	2.67***
[-1;+3]	2.13%	3.21***	4.51***	121	0.00%	-0.38	-0.49	22	2.13%	1.42

Appendix E. Dividend Change Related CAARs (*Extended Sample*)

This table reports the same dividend change related CAARs as shown in Table IV using extended sample. The 121 announcements of frequency increase are further separated into 95 dividend-increase, 18 dividend-decrease and 8 no dividend change in Panel 1. The 22 confirmed announcements of frequency decrease are further separated into 8 dividend-increase, 12 dividend-decrease and 2 no dividend change in Panel 2. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level respectively.

Panel 1: From Low to High

	Dividend Increase				Dividend Decrease				Dividend No Change			
Event window	CAAR	SCS test	Patell Z	No. Events	CAAR	SCS test	Patell Z	No. Events	CAAR	SCS test	Patell Z	No. Events
[-20;+20]	3.40%	2.34**	2.67***	95	1.10%	0.30	0.22	18	0.25%	0.63	0.50	8
[-20;+10]	3.86%	2.60***	3.31***	95	0.74%	-0.12	-0.10	18	-0.42%	0.23	0.19	8
[-20;+5]	3.58%	2.46**	3.11***	95	1.86%	0.18	0.14	18	-0.22%	0.51	0.26	8
[-10;+20]	2.72%	2.37**	2.64***	95	1.18%	0.58	0.50	18	3.02%	1.22	1.26	8
[-10;+10]	3.23%	2.88***	3.49***	95	0.91%	0.20	0.19	18	2.09%	0.94	0.97	8
[-10;+5]	2.98%	2.92***	3.39***	95	2.08%	0.62	0.51	18	2.14%	1.53	1.15	8
[-5;+20]	2.08%	2.27**	2.45**	95	0.85%	0.18	0.17	18	2.97%	0.91	1.22	8
[-5;+10]	2.50%	2.90***	3.37***	95	0.49%	-0.26	-0.28	18	2.41%	0.74	1.03	8
[-5;+5]	2.21%	2.89***	3.27***	95	1.55%	-0.03	-0.03	18	2.74%	1.34	1.36	8
[-1;+3]	2.53%	3.71***	5.21***	95	0.87%	-0.83	-0.93	18	0.19%	0.56	0.98	8

Panel 2: From High to Low

	Dividend Increase				Dividend Decrease				Dividend No Change			
Event window	CAAR	SCS test	Patell Z	No. Events	CAAR	SCS test	Patell Z	No. Events	CAAR	SCS test	Patell Z	No. Events
[-20;+20]	0.47%	0.28	0.32	8	-10.00%	-2.18**	-2.81***	12	-8.72%	-1.81*	-1.63301	2
[-20;+10]	1.93%	0.43	0.58	8	-8.49%	-2.04**	-2.66***	12	-5.14%	-1.15	-1.52	2
[-20;+5]	1.31%	0.26	0.39	8	-3.64%	-1.35	-1.62	12	-7.00%	-1.6	-1.76*	2
[-10;+20]	-1.79%	-0.25	-0.22	8	-8.10%	-2.27**	-2.13**	12	-8.90%	-4.15***	-1.49	2
[-10;+10]	-0.28%	-0.01	-0.01	8	-6.26%	-1.64	-1.92*	12	-5.11%	-1.74	-1.35	2
[-10;+5]	-0.80%	-0.28	-0.3	8	-1.19%	-0.83	-0.58	12	-6.64%	-3.22***	-1.62	2
[-5;+20]	-1.15%	-0.23	-0.17	8	-10.93%	-3.15***	-2.98***	12	-3.12%	-1.26	-0.92	2
[-5;+10]	0.44%	0.13	0.12	8	-9.00%	-2.33**	-3.00***	12	0.06%	-0.58	-0.71	2
[-5;+5]	-0.08%	-0.19	-0.2	8	-3.97%	-1.62	-1.71*	12	-1.87%	-1.05	-1.03	2
[-1;+3]	1.06%	0.36	0.52	8	0.16%	-0.03	-0.04	12	-5.23%	-2.08**	-2.58***	2

Appendix F. Multivariate Analysis (*Extended Sample*)

This table reports the same multivariate analysis results reported in Table V using extended sample including 143 frequency change announcements. 2 observations are missed during firm characteristics gathering process. All models include industry fixed effects (19 singleton observations are dropped). The definitions of all variables can be found in Section 4.2.1 ~ 4.2.3. T-statistics are reported in parentheses and are based on standard errors that are clustered at the firm level. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level respectively. Variance inflation factors are also calculated as supplementary tests for multicollinearity issues.

	CAR[-5;+5]	CAR[-5;+20]	CAR[-10;+10]	CAR[-10;+20]
Intercept	-0.0158595	-0.0426238	-0.013691	-0.0410854
	(-0.41)	(-0.66)	(-0.24)	(-0.64)
FreqChange	0.0056139**	0.0151864***	0.0132173***	0.016178***
	(1.97)	(3.19)	(3.12)	(3.38)
Monthly	-0.0384222	-0.1016388	-0.1158857**	-0.1388298**
	(-1.03)	(-1.64)	(-2.10)	(-2.22)
DivChange	0.4125899*	0.4227752	0.3143216	0.4179965
	(1.90)	(1.17)	(0.97)	(1.15)
Firm Size	-0.003491	-0.0028066	-0.0023271	-0.0029764
	(-0.85)	(-0.41)	(-0.38)	(-0.43)
Book-to-Market	0.02653	0.0477948*	0.0421757*	0.0552975**
	(1.64)	(1.77)	(1.76)	(2.04)
Return Volatility	0.1286173	-0.4014046	-0.7671501	-0.619293
	(0.18)	(-0.34)	(-0.73)	(-0.52)
ROA	-0.0897128	0.0989775	0.0005982	0.1728513
	(-0.61)	(0.40)	(0.00)	(0.70)
Free Cash	0.195994*	0.0782975	0.0871039	0.0512316
	(1.65)	(0.39)	(0.49)	(0.26)
Industry Fixed Effects	Yes	Yes	Yes	Yes
Observations	122	122	122	122
Max VIF	3.18	3.18	3.18	3.18
Mean VIF	1.88	1.88	1.88	1.88
Adj R-squared	0.0862	0.0536	0.1288	0.1647
F-Statistics	2.08	2.04	1.84	2.36