A COMPARATIVE STUDY OF THE MARKET REACTION TO DIVIDEND CHANGES BY BANKING FIRMS AND INDUSTRIAL FIRMS

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DEDICATION

I would like to dedicate this thesis to my father **Md. Mashiar Rahman** and my mother **Rabeya Begum** , the living angel of my life . I also want to dedicate this thesis to my loving son **Mahran Ali**.

ABSTRACT

This study compares the market reaction to dividend changes (increases and decreases) by banking firms and industrial firms from 1980 to 2017. Our findings show that there is no statistically significant difference between the abnormal returns associated with dividend changes by banks and industrial firms over the last 37 years. Several different categories of the sample were tested. The majority of the scenarios show that the market reaction to dividend changes by banks was not different from the industrial firms. This result is inconsistent with previous literature that identified during short-run or crisis periods, abnormal return to dividend changes is higher for banks than industrial firms. This is the first study that uncovers that the market does not necessarily react differently to dividend change announcements by the two groups. The distinct characteristics of banks do not result in a different market reaction to their dividend changes compared to those of the industrial firms.

Keywords: dividends, stock prices, abnormal return, banks, financial firms, stock market, dividend announcements

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CHAPTER 1: INTRODUCTION

Dividend policy is an essential corporate policy for publicly listed firms because investors expect return on their investments. Dividend payment is a form of compensation to shareholders for investing in the firm. More importantly, a dividend payment signals the financial health of a firm to potential investors and stakeholders of the firm. The signaling hypothesis suggests that dividend increases (decreases) signals positive (negative) information to the market about the prospects of a firm, which is reflected in the stock price (Bhattacharya, 1979; John & Williams, 1985; Miller & Rock, 1985). In an efficient market, the announcement of dividend changes is reflected in stock price and dividend increases result in positive abnormal returns, while dividend decreases attract negative abnormal returns (Pettit, 1972).

While it is evident that dividend changes affect a stock's abnormal return, it is unclear whether the effects on financial firms and non-financial firms are similar. The fact that financial firms differ from non-financial firms in several ways does not necessarily mean the market will react differently to dividend changes by these two groups. One of the most common forms of financial institutions are banks. Banks take deposits in the form of cash, and they rely mostly on depositors and short-term financing. Therefore, bank customers can be anxious about the financial condition of the firm, and any unfavorable information may cause deposit runs and financial distress (black & Nohel, 1996). Banks also use dividends to signal the financial health of the firm to their potential customers, e.g., depositors and short-term creditors (Floyd et al., 2015). The literature identifies that higher levels of information asymmetry is associated with banks, for example, Boldin and Leggett (1995) pointed out that banks do not present the market value of assets on a continuous basis to external financial agents as they only report the book value of assets in their financial statements[1]. Banks are highly monitored and controlled by

[1] Financial Accounting Standard 107 now requires the publicly listed bank and bank holding companies to report the fair market value of assets and liabilities in the annual financial statement (effective from December 15, 1992).

regulatory bodies than are non-banks. Banks and bank holding companies are periodically monitored by the Federal Reserve System to maintain the capital ratios, loan loss reserve, and the overall financial health of the banks. Bank regulatory bodies pressure banks to retain earnings and strengthen the capital base, which affects the dividend payout. Bank dividend changes can, therefore, be viewed as *certified* dividend changes which have been verified thoroughly by regulatory bodies (Filbeck & Mullineaux, 1993)[2]. This leads to structural and regulatory differences between banks and non-banks.

Prior studies on dividends exclude financial organizations because they are highly leveraged and highly regulated (Foerster & Sapp, 2005). Thus, financial organizations are considered as belonging to a different industry category with a very distinct organizational structure and excluded from numerous empirical works. Accordingly, in the literature, banks are considered distinctly within a separate study (Slovin et al., 1992), or they are the field of an individual study (Horvitz et al., 1991). Thus, a motivation for this study is that it is unclear whether excluding financial firms from the prior work on market reaction to dividend changes is justified or not. A further query is how does the market react to the same information (dividend changes) by banks and by industrial firms (non-banks)? This study is the first to take a comprehensive look at the market reaction to dividend changes by banks and non-banks to address these questions.

Very few studies compare banks and non-banks dividend policy or examine whether the market reacts differently to their dividend changes. Filbeck and Mullineaux (1993) examined bank holding companies' (BHCs) unexpected dividend increase announcements and effects on stock returns from 1973 to 1987. Their study confirmed that even small dividend increases by BHCs provides information to the market because regulatory bodies certify them.

[2] "We argue that Bank Holding Companies allow for a stronger test of signaling theory because regulatory monitors, in effect, "certify" dividend signals" (p. 403).

Black, Ketcham, and Schweitzer (1995) research assessed the stock market effect of dividend cuts by banking firms in two time periods (1974-1977 and 1978-1987). They discovered that the 1974-1977 time period was the initial period of learning about dividend cuts for the investors and the market experienced high negative abnormal returns. Subsequently, during the 1978-1987 period, market reaction for dividend reduction was lower than before, as investors had learned about dividend cuts in the market. Bessler and Nohel (1996) reported that dividend reduction was more severe for banks than non-financial firms during the 1974-1991 period. They found a significant abnormal return of -8.02% for a two-day event window and -11.46% for a two-week period. They tested dividend change announcements by banks only and compared the abnormal returns to the returns of non-financial firms documented in other studies.

This thesis is a comprehensive study covering a long period and comparing the market reaction to dividend changes by banks and non-banks. Previous studies are for shorter periods, and banks were excluded when selecting the sample. However, there is no study which performed an actual comparison of banks and industrial firms' reaction to dividend changes. Therefore, it is reasonable to check whether previous studies are justified in excluding banks and to investigate the market reaction to dividend changes by banks and industrial firms to see if they are similar. This will be the first study to fill this gap by comparing market reaction (abnormal return) to dividend changes (increases and decreases) by banks and non-banks (all industries expect utility firms) over the last 37 years (1980-2017).

To examine whether there is any difference between the market reaction to dividend changes between banks and industrial firms, we calculated the difference between the mean abnormal returns associated with dividend changes by banks and industrial firms and assessed whether the difference was statistically significant. Furthermore, a panel regression analysis to study the difference in abnormal returns using the fixed effect, random effect, and ordinary least square methods was utilized. Initially, we ran a panel regression without controlling for other independent factors. Our results indicated that dividend increases by banks attract a lower market reaction than dividend increases by industrial firms, while dividend decreases attract similar market reaction by banks and industrial firms. Next, we included the control variables (firm and dividend characteristics) that might cause different abnormal returns. The results show that there is no significant difference between the market reaction to dividend changes by banks and by industrial firms. After controlling these variables, no evidence for different market reactions to dividend changes appeared between banks and industrial firms. We ran the model in different sample categories to check the robustness. Furthermore, we investigated the market reaction to dividend change events by banks according to the regulatory changes.

The rest of the paper is organized as follows: Chapter 2 Literature Review; Chapter 3 Research question, Sample selection, and Methodology; Chapter 4 Descriptive Statistics and Preliminary Analysis; Chapter 5 Results and Discussion; Chapter 6 Conclusion.

CHAPTER 2: LITERATURE REVIEW

Overview of Dividend Theory

In theory, there are two segments of thought; dividend relevance and dividend irrelevance. One segment of thought believes that under certain assumptions, dividends are irrelevant for firm value, dividend irrelevance (Miller & Modigliani, 1961), and the other perspective is that dividends are an essential factor for firm value, dividend relevance (Gordon, 1963; Lintner, 1962).

Miller & Modigliani (1961) espouse that in a perfect capital market with zero taxes, no bankruptcy cost, and rational investors, firm value does not depend on a dividend decision. Thus, the choice of a dividend policy is irrelevant. They argued that firm value depends on the riskiness of investments and future earnings. The central lesson commonly drawn from dividend irrelevancy theory is that given a value-maximizing investment program, investment policy alone determines stockholder wealth in frictionless markets; therefore, leverage and payout decisions have no impact on firm value (Allen & Michaely, 2003; Black & Scholes, 1974; Denis & Osobov, 2008).

Lintner (1962) and Gordon (1963) shared a different view of dividend irrelevancy theory. They argued that firms' stock prices are not independent of dividend payments. Gordon developed a model in support of dividend relevance, in which investors prefer certain dividends and high dividend policy, rather than uncertain capital gain from fickle future investments. Gordon mentioned that some shareholders are risk-averse by nature, and they prefer immediate earnings over capital appreciation that will only happen in the future with some degree of uncertainty. According to dividend relevance theory by Walter (1963), when the cost of capital of investment is higher than the rate of return, firms should distribute dividends instead of investing. Thus, the choice of dividend policy affects the value of the firm and is, hence, relevant. At the beginning of the 21st-century various researchers were in favor of the dividend relevancy theory (Baker et al., 2002; Dong et al., 2005; Travlos et al., 2001).

The most cited dividend signaling theory was developed by Bhattacharya (1979), Miller and Rock (1985), and John and Williams (1985), which assumes that managers disclose their information about expected future earnings by adjusting the cash dividend. Dividend payment involves cost; it can be an additional tax liability for dividend payment than capital gain (Bhattacharya, 1979), or transaction cost for raising external financing (John & Williams, 1985), or the price for optimal decision making (Miller & Rock, 1985). A firm uses dividends to signal higher future earnings even though it might have to increase external capital, withhold some investment options, or causing additional taxes on shareholders.

Another theory developed as an explanation for dividend distribution is free cash flow hypothesis. Jensen (1986) developed a free cash flow hypothesis in which dividends are paid to shareholders to prevent the management from investing in unnecessary projects for their own interest. Managers tend to spend in size increasing non-profitable projects, whereas stockholders prefer to get dividends, which will increase their payout and prevent the managers from investing in unnecessary projects. Agency theory states that dividend increases minimize the possibility of misusing a firm's free cash flow by the managers and acts as a discipline tool to the management (Easterbrook 1984; Jensen 1986).

Empirical Evidence on Dividend Changes and Stock Prices

Stock prices are not independent of dividend announcements because, in an efficient capital market, announcements of dividend changes convey useful information to the investors. Several studies examined whether dividend changes communicate information to the market by studying whether the market price responds to dividend changes. Pettit (1972) tests the speed and accuracy of quarterly dividend change announcements and the effect on stock prices by holding the impact of reported earnings constant. He concluded that changes in dividends convey important information to market participants. Aharony and Swary (1980) further analyzed the relationship between dividend and earnings announcements. They tested the market's reaction to changes in quarterly cash dividends announcements, separating the effect of earnings announcements. To isolate the dividend effect from earning announcements, they consider only quarterly dividend and earnings announcements, which were published on different dates within any given quarter. This distinctive sample was grouped according to dividend announcements that preceded or followed quarterly earnings announcements by at least eleven trading days. They identified that quarterly dividend announcements offer useful information beyond the quarterly earnings announcements and provided a new result that the stock market holds the semi-strong form of efficient capital market hypothesis.

However, Kane, Lee, and Marcus (1984) examined how the market evaluates dividend and earnings information, jointly or separately, and whether there was an interaction effect between them. They found that dividend and earnings announcements had a corroborative impact, and the exact nature of the relation between them is unknown. They mentioned that empirical results of dividends and earnings signals are mixed, and they are a noisy signal of firm value. They agreed on the empirical result that unexpected dividend and earnings announcements induce abnormal stock returns. Further, Leftwich, and Zmijewski (1994) tested the information content of the dividends in the presence of contemporaneous earnings announcements (dividends and earnings are announced on the same day). Their findings indicated that quarterly dividend announcements convey information beyond that contained in contemporaneous quarterly earnings announcements. Their paper also confirms that dividends convey little information beyond the earnings news, when both dividend and earnings announcements are made.

Asquit and Mullins' (1983) study on first-time dividend payments or initiations after a 10-year gap, exhibited larger positive excess return than any previous studies. They demonstrated that dividend initiations or subsequent increases convey unique and valuable information to the investors over and above other announcements (e.g., earnings reports). Woolridge (1983) corroborated that unexpected dividend changes and stock price change relationships demonstrated that sudden dividend increases (decreases) are associated with positive (negative) stock returns, thus confirming that the primary factor influencing the stock return is market signaling. A vast majority of the studies identify a significant abnormal return to changes in dividends and the direction and magnitude of the abnormal returns are positively related to the sign and degree of the dividend surprise (Asquith & Mullins, 1983; Bajaj & Vijh, 1995). There is a shared understanding that if firms increase dividends, they experience positive excess returns and firms that cut dividends, experience negative returns on the announcement date.

Watts (1973) tests the information hypothesis by Miller and Modigliani (1961)[3] that dividends contain information about the future earnings of a firm. Watts assesses future earnings on current and past yearly earnings and dividend changes to test whether dividends add anything to current and past earnings in predicting next year's earnings. The results showed that there is a positive relationship between dividend changes and future earnings; however, Watts concluded that the information content of dividend is minimal. Laub (1976) disagrees with the result of Watts and argues that Watts ignores the information provided by quarterly reports. Laub developed a model of the quarterly dividend-earnings relationship and regressed future dividend changes on quarterly earnings and quarterly dividends. Laub's analysis shows that dividend announcements convey information about future earnings prospects, and it improves the forecasting ability as it moved from an annual to quarterly forecasting model. On the contrary, Watts argued about the shortfall of the quarterly model by Laub stating that

[3] According to Miller and Modiglian (1961), "if earnings consist of permanent and transitory components and if dividends depend on the former, dividends would serve as a surrogate for expected future earnings, and such a surrogate relationship might explain the results of the cross-sectional studies. This hypothesized relationship was labeled as the information content of dividends" (p. 667).

accounting procedures follow the yearly earnings basis thus, the annual earnings model conveys more efficient information than quarterly earnings model because of lesser extrapolations of expenses. Watts also mentioned that there is a seasonal component on quarterly earnings and expenses as well. Benartzi, Michaely, and Thaler (1997) gave evidence on the argument about whether dividends signal future or past earnings. Their study found that firms that increase dividends in the current year, are associated with past and present earning increases and no future earnings increases. They did not find evidence for a relationship between dividend changes and future earnings changes. They further discovered a permanent shift in earnings rather than future earnings growth. Their results are consistent with Watts findings that information content of dividend announcements has no impact on future earnings changes and dividend changes are the result of past and concurrent change in earnings. Contrary to the previous results, Nissim and Ziv (2001) reexamined the relation between dividend changes and future earnings and concluded that dividend changes are positively related to future earnings changes, future earnings, and future abnormal earnings. They modified the regression model to the estimation of unexpected future earnings. Their paper followed an alternative measure of profitability, earnings, abnormal earnings, and controlled the omitted correlated variables.

Koch and Sun (2004) examined the role of dividend changes in signaling the persistence of past earning changes. They used price responses to dividend changes and past earnings news and concluded that the market interprets dividend changes as information about the persistence of the past earning changes. They added that part of the dividend change announcements effect is a delayed reaction to past earnings news.

A study on stock prices and dividend changes revealed that there is a decline in the information content of dividend announcements (Amihud & Li, 2006). The sensitivity of abnormal returns to dividend change announcements has declined because of large institutional investors who are more sophisticated and more informed about the firm's value. Another explanation for declining announcement returns upon dividend changes is sequential structure of dividend payout (Andres & Hofbaur, 2017). The results of this study pointed out that firms that increase dividends in a four-quarter circle experience less market reaction than random dividend increases.

U.S. Bank Holding Company

A bank holding company (BHC) is a company that takes possession of one or more banks and does not engage in banking activities. In the United States, according to the Bank Holding Company Act of 1956, "a bank holding company is any company that has control over a bank." (p. 12 U.S. Code § 1841**).** All BHCs are registered with the Board of Governors of the Federal Reserve System. They have the responsibility to regulate and supervise the bank holding companies' activities, such as examining the operations, setting the capital standards, and authorizing mergers and acquisitions.

The scope of a BHC is limited to the Bank Holding Companies Act (BHCA) of 1956. A key feature of BHCA is to limit the extent to which BHCs and their subsidiary companies can engage in nonfinancial activities. This law intended to prevent the extra risk-taking by nonfinancial affiliation, which will hamper the core banking activities like lending and depositing (Klebaner, 1958; Kroszner & Rajan 1997). Bank holding companies are also required to maintain a minimum capital ratio and increase the capital base strength while acting as a source of funds for banking subsidiaries during distress. After the subsequent amendment in the act, BHCs now work within a broader range. The amendment allows for BHCs to invest in nonfinancial firms but cannot exceed the five percent voting stock of the company. After passing the Gramm-Leach-Bliley Act (GLBA) of 1999 and further amendments of the BHCA, permits BHCs to register as a financial holding company (FHC). These days, all large BHCs are registered as FHCs. Financial holding companies can engage in a broad range of financial activities such as merchant banking, securities underwriting, insurance underwriting, and security dealings activities.

In late 1991, two significant changes happened in the Unites States commercial banking regulatory framework. The Federal Deposit Insurance Corporation Improvement Act (FDICIA) was endorsed and the Prompt Corrective Action (PCA) scheme was announced. Nearly two decades later another necessary act was also approved due to the capital fall in 2008. The Troubled Asset Relief Program (TARP) was introduced as a way of supplying equity to the banking sector directly during financial distress.

Previous Studies on Banks' Dividends

The payout policy for banks is different from industrial firms because banks have several features that separate them from industrial firms. Banks have a distinctive form of corporate governance (Adams & Mehran, 2003) with more stakeholders than industrial firms, including depositors, insurers, and regulators. Effective bank monitoring activities limit dividend payouts that, unlike industrial firms, banks and BHCs are regularly monitored by the Federal Reserve System to maintain the capital ratios, loan loss reserve, and the overall financial health of the firms (Filbeck & Mullineaux, 1993). According to the Federal Reserve Board policy statement, "BHCs with earnings weaknesses should not pay cash dividends that exceed their net income" (p. 405).

Keen (1978) examines the dividend reductions by banks from 1974 to 1977 on deposits, stock prices, and operating performances. They found an excess return of -15% in the next week after dividend cuts. Keen also mentioned that dividend cuts are unthinkable for banks, and a reduction in dividends is perceived as a liquidity crunch. Black, Ketcham, and Schweitzer (1995) compare the stock market effect of dividend cuts in two time periods (1974-1977 and 1978-1987). They called 1974-1977 the initial period of learning of dividend cuts by the investors and sent adverse signal of financial distress to the market. However, by the late 1970's

(1978-1987), bank investors had somehow learned why banks cut dividends and have adjusted to dividend cuts announcements (so is reactionless in this period). Black et al., stated that highly leveraged firms are affected adversely and more substantial price reductions when dividend reductions announced.

Filbeck and Mullineaux (1993) examine signaling theory in the context of banks and test the signaling impact of smaller dividend changes, as most of the empirical studies only consider the large dividend changes. They show that even small changes (ten percent or less) in dividends by banks send statistically significant signals because of the regulatory monitoring *certifications* of these dividend changes. Boldin and Leggett (1995) test the signaling hypothesis and found that banks use dividends as signaling instruments for their investors. Boldin and Leggett investigated 207 listed BHCs and found that dividend payouts positively affected external ratings[4] and are consistent with the dividend signaling argument.

Bessler and Nohel (1996) extend the empirical study of Keen (1978) on dividend reductions by banks for a longer period, and they focused on immediate stock price reaction by using daily data instead of weekly. They postulate that banks experience significant stronger abnormal returns than non-financial firms because when any negative information is released by banks, bank customers will avoid institutions that seem financially weak. Bessler and Nohel further found that abnormal returns are stronger for large banks as large banks might lose corporate customers when they suspect financial difficulties.

Contrary to this result, investors did not react negatively to the dividend cuts by United States banks during the financing crisis in 2007-2008 (Zia & Kochan, 2017). Zia and Kochan compared dividend reduction effects on stock prices during the Great Recession of 2007 and 2008, along with reductions in the years before and after the crisis. Their findings were different

[4] Sheshunoff's Presidential Rating as the measure of bank quality. The Presidential Rating is a weighted ordinal composite CAEL (Capital, Asset, Earnings, Liquidity) percentile ranking of institutions within a peer group.

from all previous studies on bank’s dividend cuts and implies that investor's perception of dividend decreases signaled changes during the Great Recession (2007-2008).

CHAPTER 3: RESEARCH QUESTION, DATA, & METHODOLOGY

Research Question

Bank's dividend-paying behavior indicates that dividends are more important for banks than non-bank institutions (Floyd et al., 2015). Moreover, information asymmetry is more noticeable in the banking industry because of the opaque nature of banks. Boldin and Leggett (1995) mentioned that banks do not present market value continuously to the external parties such as depositors, investors, and creditors. Therefore, it is difficult to determine the performance of banks and to evaluate the market value of banks assets. Bessler and Nohel (1996) found evidence that banks stock prices react more than industry stock prices when firms reduce dividends. Bank customers avoid financially weak institutions and they may discontinue their relationship when any negative information is released. Existence of panic by customers in the banking industry might gear up the market reaction when dividend cuts are announced.

In contrast, the Efficient Market Hypothesis (EMH) suggests that the market's reaction to public information should be similar irrespective of the industry (Malkiel & Fama, 1970). Thus, if the dividend information from the banks and industrial firms are the same, the market reaction to the events should be similar if the market is efficient. Consequently, if banks and industrial firms convey the same information of dividend changes to the market, the market's reaction to these events should be similar. This thesis empirically examines whether the market reacts stronger to dividend changes by banks as prior literature reports or whether the reaction is similar as the EMH suggests.

The effect of dividend changes on stock prices has been researched extensively in the literature. Prior literature in this area mostly argues that banks and industrial firms are different and thus one should expect the market to react differently towards dividend changes of these two groups of firms; yet, market efficiency theory argues that there should not be any difference. This paper will focus on the empirical matter of whether, when we explicitly compare banks vs. industrial firms, there are any significant differences. We examine the impact of dividend changes on stock prices considering both the banking sector and the industrial sector using the dividend announcement sample covering the period 1980 to 2017. This paper will explain whether the market reaction to dividend changes is similar for banks and industrial firms or not.

Sample and Data

The sample includes announcements of dividends from 1980 to 2017 by the industrial sector and banking sector. Dividend amounts and dividend announcement dates were extracted from the Center for Research in Security Prices (CRSP). For selecting the sample of industrial firms, we consider all industrial firms except utility firms (SIC code 4900-4949), and for selecting banking sectors, we consider all firms with SIC code 6020. Accounting data such as Earnings, Return on Asset, Total Debt, Total Asset, Total Dividend, Price, EBIT, and Market Value to Book Value were pulled from COMPUSTAT. Our sample data set is constructed from the following conditions:

i) Firms must have data in CRSP.
ii) Dividend announcements must be quarterly, semi-annual, and annual.
iii) Must be ordinary common shares events only.
iv) Firms must be listed in NYSE, AMEX, and NASDAQ.
v) Dividend change announcements that appeared within ±15 days of other distributions are removed from the sample.
vi) Events with announcement gaps of more than 180 days for quarterly dividend, 360 days for semi-annual dividends, and 720 days for annual dividend must be excluded.
vii) Return data must be taken from the CRSP Daily Return file for the period 01/01/1980-31/12/2017.

Considering the above criteria, our initial sample contained 3,753 industrial firms with 143,237 observations, and 382 banks with 14,005 observations. Dividend change is the difference between current dividends and previous quarter dividends scaled by the previous quarter dividends. Positive value for change indicates dividends increase; negative value indicates dividends decrease, and zero indicates there was no change. Our initial sample contained 22,511 dividend-increase events and 2,404 dividend-decrease events by industrial firms, and 3,562 dividend-increase events and 229 dividend-decrease events by banks.

Furthermore, we merged our CRSP dataset of dividends with the COMPUSTAT dataset of accounting variables. We extracted accounting information on the independent variables of our model from COMPUSTAT for banks and industrial firms. The final data set contained 3,137 industrial firms with 124,399 observations, and 229 banks with 10,618 observations.

Methodology

Measuring Abnormal Returns

To test the impact of dividend surprises on stock prices, we calculated abnormal returns around dividend announcement days. We used the Standard Event Analysis for this study as it is a widely applied method used in the finance literature to measure the response of a security price around the announcement of an event. Following Amihud and Li (2006), we calculated abnormal return as:

$$AR_{i,t} = r_{i,t} - r_{m.t} \quad (1)$$

Here $\boldsymbol{r_{i,t}}$ is the return of firm i on day t and $\boldsymbol{r_{m,t}}$ is the return on the decile capitalization-based market portfolio of NYSE/AMEX/NASDAQ stocks on day t. We did not use the standard market model because, for short window event studies, this method does not significantly improve estimation.[5] We calculated Cumulative Abnormal Returns (CAR3 and CAR5) for the

[5] Brown & Warner (1980) "a simple methodology based on the market model performs well under a wide variety of conditions and misuse of any of the methodologies can result in false inferences about the presence of abnormal performance" (p.205).

3-day period [-1,+1] and 5-day period [-2,+2] respectively around the dividend announcement date. Cumulative abnormal return (CAR) from day –n to n is calculated by the sum up of the daily abnormal returns over these days as follows:

$$CAR_{i,t} = \sum_{t=-n}^{t=n} AR_{i,t} \quad (2)$$

Differences Between Abnormal Return to Dividend Changes by Banks and Industrial Firms

Initially we started with the mean test to check whether there is any difference between the average abnormal return associated with dividend changes by banks and industrial firms. We applied the t-test statistic to test the difference in means as follows:

$$t = \frac{\bar{x}_B - \bar{x}_I}{\sqrt{\frac{S_B^2}{n_B} + \frac{S_I^2}{n_I}}} \quad (3)$$

Here $\bar{x}_B$ and $\bar{x}_I$ are the means of the dividend-change abnormal return for banks and industries; and S_B^2 and S_I^2 are the corresponding standard deviations; n_B and n_I number of dividend changes by banks and industries in the sample.

Next, we ran a panel regression to test whether there was any significant difference between the market reaction to dividend changes by banks and by industrial firms using the following equation:

$$CAR(-1,+1) = \alpha_0 + \alpha_1(Dummy) + \beta_0(\Delta D) + \beta_1(\Delta D*Dummy), \quad (4)$$

where, the dependent variable *CAR(-1,+1)* is the 3-days cumulative abnormal returns; *ΔD* is the change in dividends; and *Dummy* is a variable set to 1 when the firm is a bank and 0 otherwise. The coefficient on *Dummy*, α_1, represents the difference between the intercept of banks and industrial firms. A positive estimate of β_0 implies that dividend increases (reductions) by industrial firms attract a positive (negative) market response. β_1 is the incremental response in market reaction to dividend changes by banks compared to that of the industrial firms. If β_1 is positive it indicates that the market response to a dividend change announcement is higher for banks than the industry. We used Fixed Effect, Random Effect, and Ordinary Least Square method. We did the Hausman Test to find out which model best fits our data set.

Difference Between the Abnormal Return to Dividend Changes by Banks and by Industrial Firms Including the Controlling Factors

We ran another panel regression controlling firm-specific factors that might influence the abnormal returns. The set of explanatory variables used in this study are described in Table 1. Based on previous literature, these variables can affect a firm's abnormal returns. The regression model is as follows:

$$CAR(-1,+1) = \alpha_0 + \alpha_1(Dummy) + \beta_0(\Delta D) + \beta_1(\Delta D*Dummy) + \beta_2(DivYield) + \beta_3(Profitability) + \beta_4(Earn\_Change) + \beta_5(Leverage) + \beta_6(Payout) + \beta_7(Size) + \beta_8(MTB) + e_i \quad (5)$$

Table 1

Explanatory Variables

Variable	Abbreviation	Used in	Definition
Dividend Characteristics			
Dividend Change	Change	Andres and Hofbaur (2017)	Current dividend minus previous dividend scaled by previous dividend
Dividend Yield	DivYield	Andres and Hofbaur (2017)	Dividend scaled by price.
Firm Characteristics			
Earn_change	ΔEarnings	Andres and Hofbaur (2017)	Change in earnings from previous year
Profitability	ROA	Zia and Kochan (2017)	The ratio of net income to total assets
Leverage	Debt	Andres and Hofbaur (2017)	Total debt scaled by total assets.
Payout	Payout	Andres and Hofbaur (2017)	Total dividend paid scaled by earnings before extraordinary items.
Size	LogAsset	Bessler and Nohel (1996)	The natural logarithm of total asset for the reference period
Growth			
MTB	Market to Book	Andres and Hofbaur (2017)	Ratio of market to book value of equity

CHAPTER 4: DESCRIPTIVE STATISTICS

Changes in Dividends

From the preliminary descriptive analysis, we found that from 1980 to 2017 the bank's average dividend increase was 16.27% and the average dividend decrease was 42.23%. Industrial firm's average dividend increase was 24.90%, with the average dividend decrease being 37.72%. From Table 2, we can see that industrial firms increase dividends more than the banks, and the banks decrease dividends more than industries.

Table 2

Descriptive Statistics of Dividend Changes by Banks and Industrial Firms

	Mean		Std. Dev		Frequency	
Change	**Bank**	**Industries**	**Bank**	**Industries**	**Bank**	**Industries**
Increase	0.16269711	0.2490285	0.3734198	0.8612404	3,562	22,511
Decrease	-0.42235504	-0.3772649	0.27936643	0.282857	229	2,404
No Change	0	0	0	0	10,214	*118*,322

In Table 3, we explore the frequency distribution of dividend changes events by banks and industrial firms. In the banking sector, dividend increases happened mostly from 1992 to 2006, while the industrial firms show fluctuating dividend increases. In 2009 just after the financial crisis, there was a sharp decline in dividend-increase events, and a sharp rise in dividend-decrease events by both the banks and industrial firms.

The graphical presentation of frequency distribution of dividend changes by banks and industrial firms is presented in Figure 1 to 4. The number of dividend change events by banks identified 3562 dividend increase events (Figure 1) and 229 dividend decrease events (Figure 2) during this period. Banks increased dividends mostly from 1992 to 2006. In 2009 after the financial crisis there was sharp drop in dividend increase events and a sharp rise in dividend reduction events. In the industrial sector there were 22511 dividend increase events (Figure 3) and 2404 dividend reduction events (Figure 4). Industrial dividend increase events seem to fluctuate over these years. Industrial firms also see a sharp rise in the dividend reduction events after the financial crisis.

Table 3

Frequency Distribution of Dividend Changes by Banks and Industrial Firms

Year	Banks						Industries					
	Increase		Decrease		No Change		Increase		Decrease		No Change	
1980	6	24.00%	0	0.00%	19	76.00%	576	18.00%	58	1.81%	2,566	80.19%
1981	10	20.00%	1	2.00%	39	78.00%	1,152	18.27%	117	1.86%	5,038	79.88%
1982	10	19.23%	0	0.00%	42	80.77%	780	13.28%	177	3.01%	4,916	83.71%
1983	11	17.19%	1	1.56%	52	81.25%	981	17.49%	162	2.89%	4,467	79.63%
1984	18	19.78%	1	1.10%	72	79.12%	889	16.56%	82	1.53%	4,396	81.91%
1985	33	28.45%	1	0.86%	82	70.69%	872	17.20%	92	1.81%	4,106	80.99%
1986	36	22.09%	1	0.61%	126	77.30%	731	15.69%	87	1.87%	3,841	82.44%
1987	43	19.72%	3	1.38%	172	78.90%	730	16.75%	61	1.40%	3,567	81.85%
1988	88	25.07%	0	0.00%	263	74.93%	760	17.97%	46	1.09%	3,423	80.94%
1989	90	21.90%	4	0.97%	317	77.13%	762	18.35%	51	1.23%	3,339	80.42%
1990	67	17.91%	8	2.14%	299	79.95%	600	14.66%	50	1.22%	3,443	84.12%
1991	55	16.77%	8	2.44%	265	80.79%	464	11.59%	84	2.10%	3,456	86.31%
1992	84	24.85%	4	1.18%	250	73.96%	544	13.47%	67	1.66%	3,428	84.87%
1993	113	28.32%	12	3.01%	274	68.67%	565	13.67%	61	1.48%	3,506	84.85%
1994	148	30.27%	7	1.43%	334	68.30%	609	14.33%	46	1.08%	3,594	84.58%
1995	182	32.73%	7	1.26%	367	66.01%	654	15.13%	56	1.30%	3,612	83.57%
1996	211	35.05%	6	1.00%	385	63.95%	618	14.69%	50	1.19%	3,538	84.12%
1997	223	35.01%	16	2.51%	398	62.48%	561	14.77%	48	1.26%	3,188	83.96%
1998	226	40.29%	4	0.71%	331	59.00%	500	15.48%	52	1.61%	2,677	82.90%
1999	197	28.72%	3	0.44%	486	70.85%	403	12.00%	57	1.70%	2,898	86.30%
2000	164	28.82%	7	1.23%	398	69.95%	323	11.99%	45	1.67%	2,327	86.35%
2001	155	26.54%	4	0.68%	425	72.77%	272	10.15%	64	2.39%	2,343	87.46%
2002	173	27.07%	4	0.63%	462	72.30%	296	10.52%	47	1.67%	2,471	87.81%
2003	176	28.76%	5	0.82%	431	70.42%	406	14.35%	29	1.02%	2,395	84.63%
2004	135	23.68%	3	0.53%	432	75.79%	544	17.24%	19	0.60%	2,593	82.16%
2005	139	24.96%	9	1.62%	409	73.43%	572	17.30%	26	0.79%	2,708	81.91%
2006	134	25.09%	3	0.56%	397	74.34%	563	16.78%	26	0.77%	2,767	82.45%
2007	104	20.97%	3	0.60%	389	78.43%	535	16.63%	18	0.56%	2,665	82.82%
2008	56	13.97%	17	4.24%	328	81.80%	434	14.17%	65	2.12%	2,563	83.70%
2009	17	4.87%	51	14.61%	281	80.52%	274	9.82%	107	3.83%	2,410	86.35%
2010	28	9.09%	10	3.25%	270	87.66%	467	16.45%	28	0.99%	2,344	82.56%
2011	50	17.92%	0	0.00%	229	82.08%	548	18.43%	56	1.88%	2,370	79.69%
2012	63	23.08%	5	1.83%	205	75.09%	622	19.60%	56	1.76%	2,496	78.64%
2013	67	24.91%	6	2.23%	196	72.86%	646	19.93%	91	2.81%	2,505	77.27%
2014	67	24.01%	5	1.79%	207	74.19%	657	18.79%	63	1.80%	2,776	79.41%

2015	69	24.13%	3	1.05%	214	74.83%	618	17.58%	59	1.68%	2,838	80.74%
2016	66	23.16%	3	1.05%	216	75.79%	593	17.22%	61	1.77%	2,790	81.01%
2017	48	23.53%	4	1.96%	152	74.51%	390	16.30%	40	1.67%	1,962	82.02%
Total	3,562	25.43%	229	1.64%	10,214	72.93%	22,511	15.72%	2,404	1.68%	118,322	82.61%

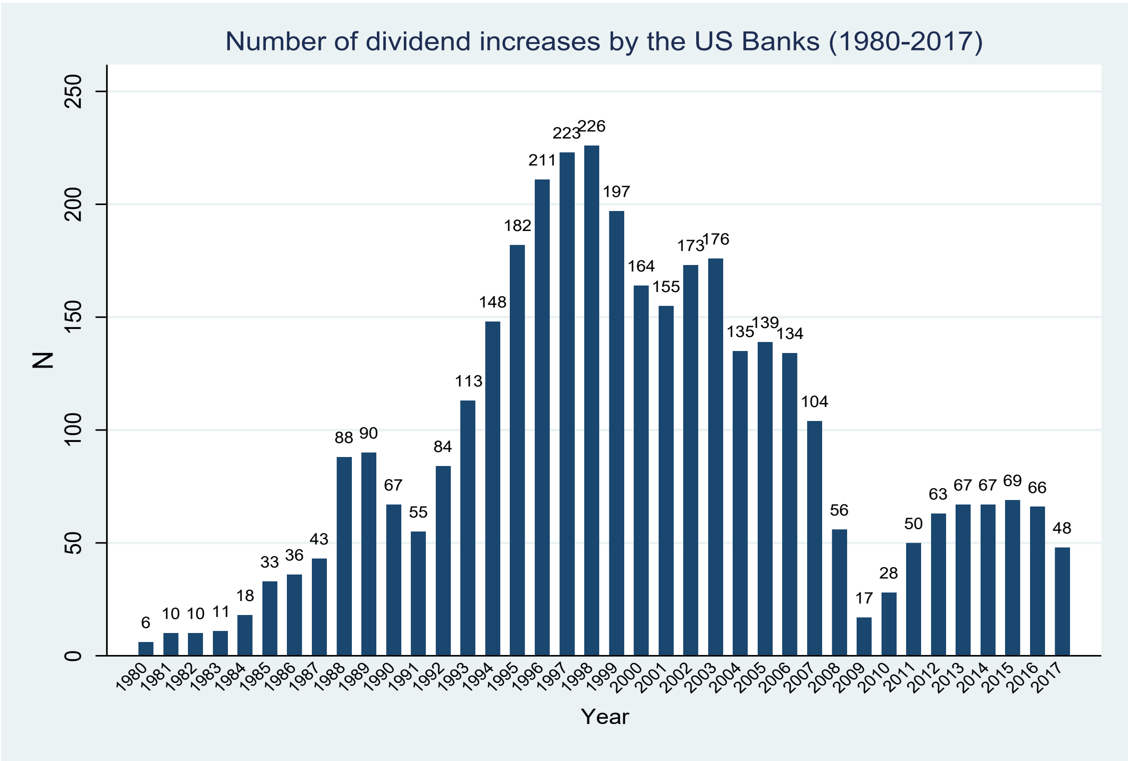

Figure 1: Number of Dividend Increase Events (Banks, 1980-2017)

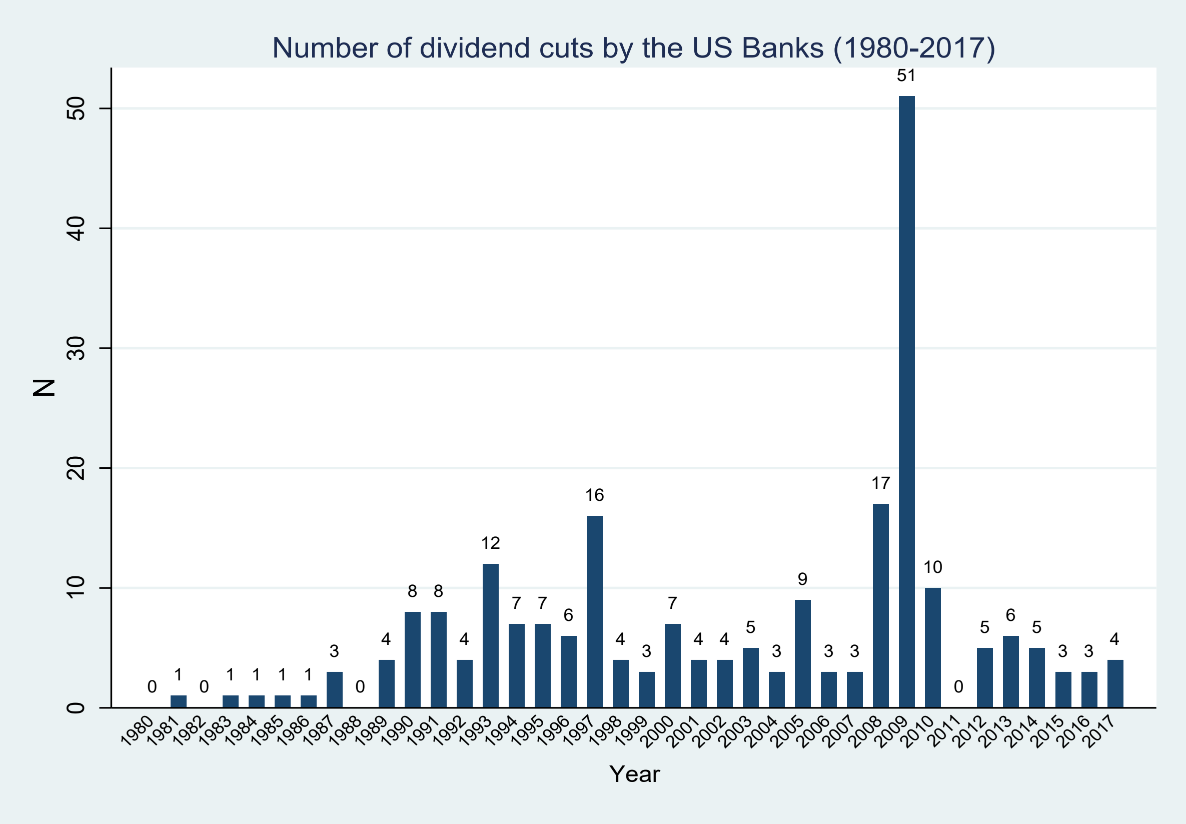

Figure 2: Number of Dividend Cuts by the Banks (1980-2017)

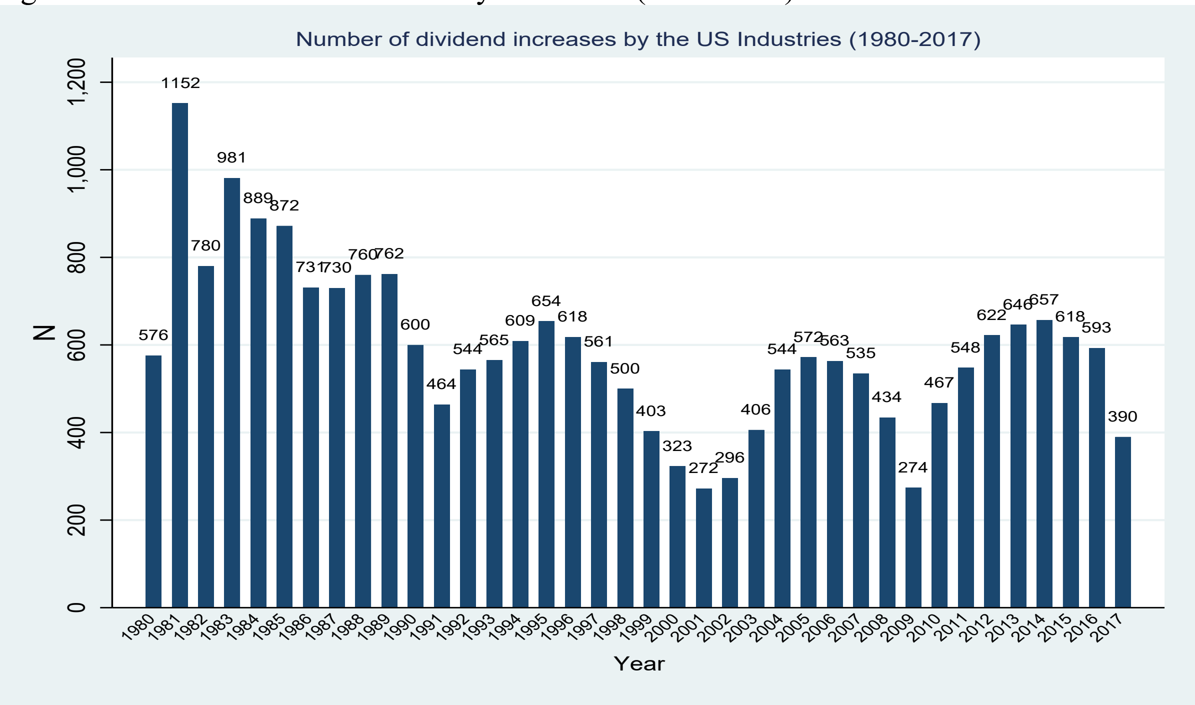

Figure 3: Number of Dividend Increase Events (Industrial Firms, 1980-2017)

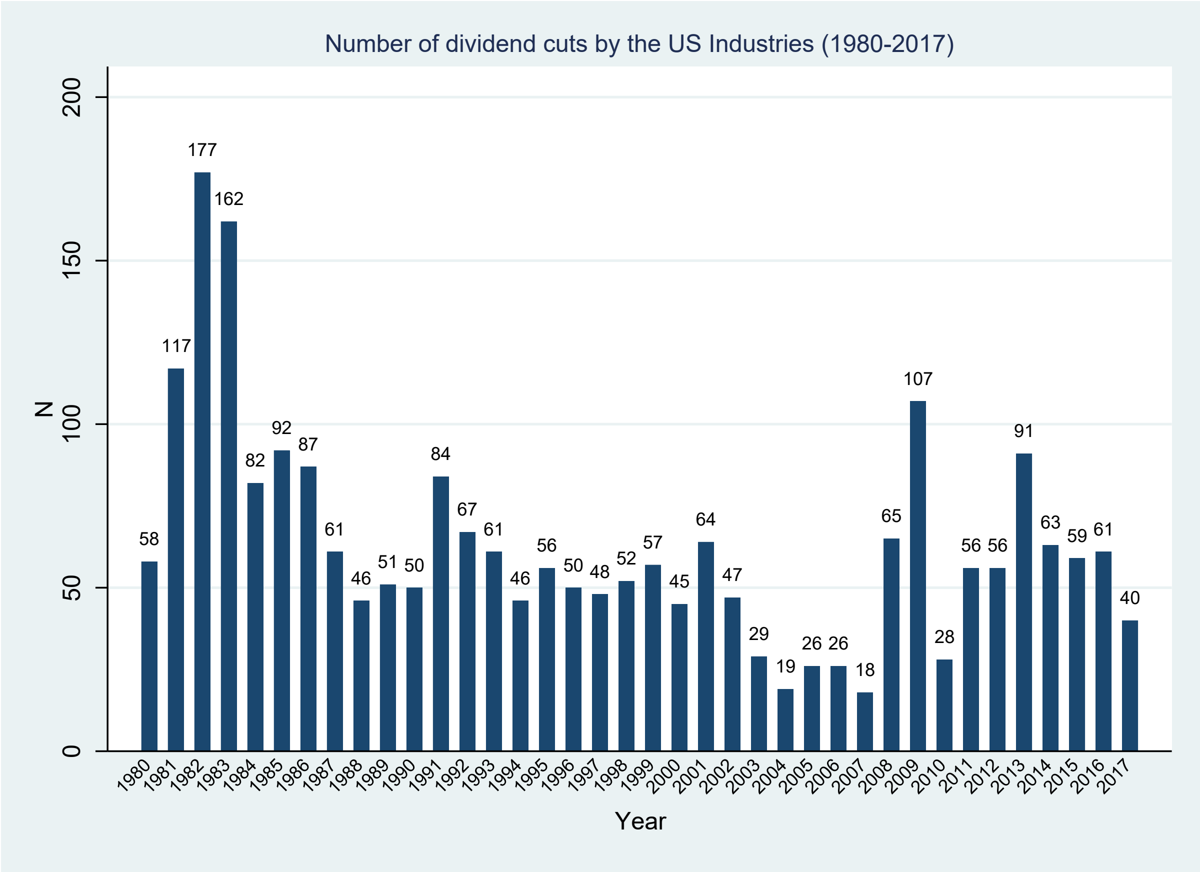

Figure 4: Number of Dividend Decrease Events (Industrial Firms, 1980-2017)

Change in Dividends-Year Categorized

In Table 4 we categorized the year to study the financial crisis period in detail. During the crisis period (2007-2009), there were 11.16% and 29.56% average increases in dividends by banks and industries, respectively. A significant dividend cut occurred during this period, with the mean dividend cut of 56.57% for banks and 53.26% for industries. After this financial crisis, the dividend cut was still high with the mean cut of 49.86% for banks and 54.09% for the industries from 2010 to 2017. The clustered column chart in Figure 5 presents decade wise percentage of dividend increases, and Figure 6 presents percentage of dividend decreases.

Table 4

Descriptive Statistics of Dividend Changes by Banks and Industrial Firms – Year Categorized

Year Categorized	Change	Mean		Std. Dev		Frequency	
		Bank	Industries	Bank	Industries	Bank	Industries
1980-1989	Increase	0.19699288	0.17810596	0.28630577	0.26227563	345	8,233
	Decrease	-0.20217153	-0.25188538	0.25818643	0.25348585	12	933
	No Change	0	0	0	0	1,184	39,659
1990-1999	Increase	0.16095657	0.19119797	0.32675839	0.42022994	1,506	5,518
	Decrease	-0.35296418	-0.38339789	0.27291714	0.26868997	75	571
	No Change	0	0	0	0	3,389	33340
2000-2006	Increase	0.12325593	0.28416078	0.20068624	0.66787741	1,076	2,976
	Decrease	-0.27728321	-0.41497764	0.25053917	0.24486183	35	256
	No Change	0	0	0	0	2,954	17,604
2007-2009	Increase	0.11165387	0.29563676	0.31561933	1.9136564	177	1,243
	Decrease	-0.56573835	-0.53269053	0.23781923	0.23710977	71	190
	No Change	0	0	0	0	998	7,638
2010-2017	Increase	0.25497352	0.41210422	0.72527462	1.4152715	458	4,541
	Decrease	-0.49857214	-0.54090303	0.24540333	0.27197628	36	454
	No Change	0	0	0	0	1,689	20,081
Total	Increase	0.16269711	0.24902852	0.3734198	0.86124043	3,562	22,511
	Decrease	-0.42235504	-0.37726485	0.27936643	0.28285702	229	2,404
	No Change	0	0	0	0	10,214	143,237

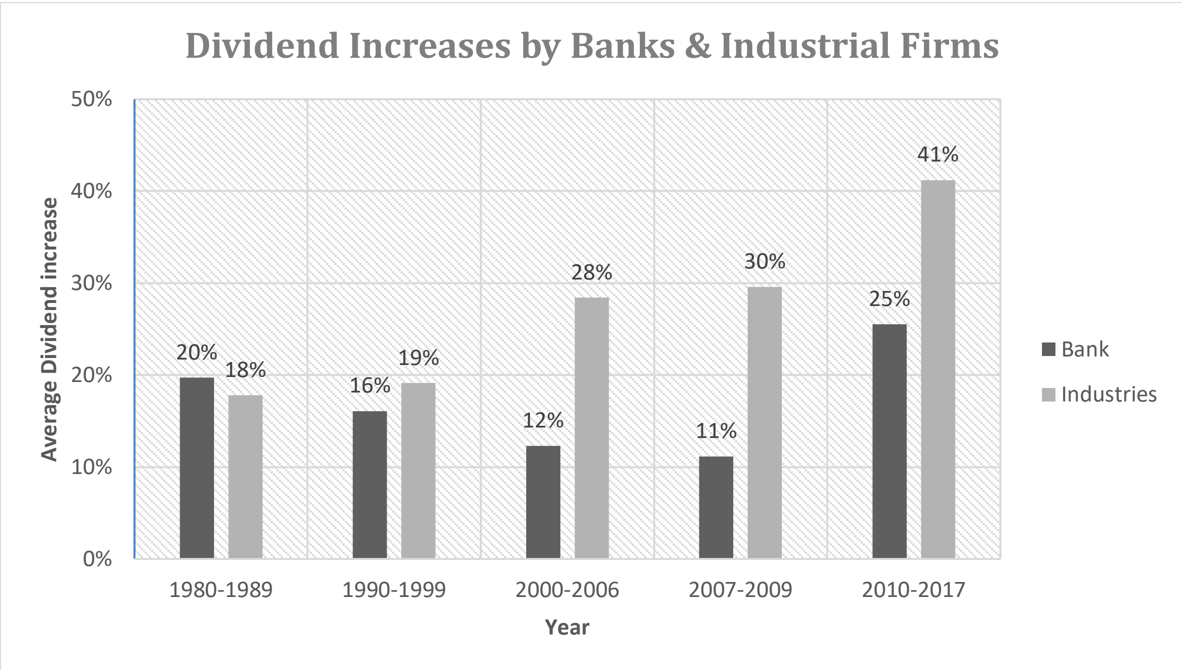

Figure 5: Percentage of Dividend Increases (Year Categorized: Bank & Industrial Firms)

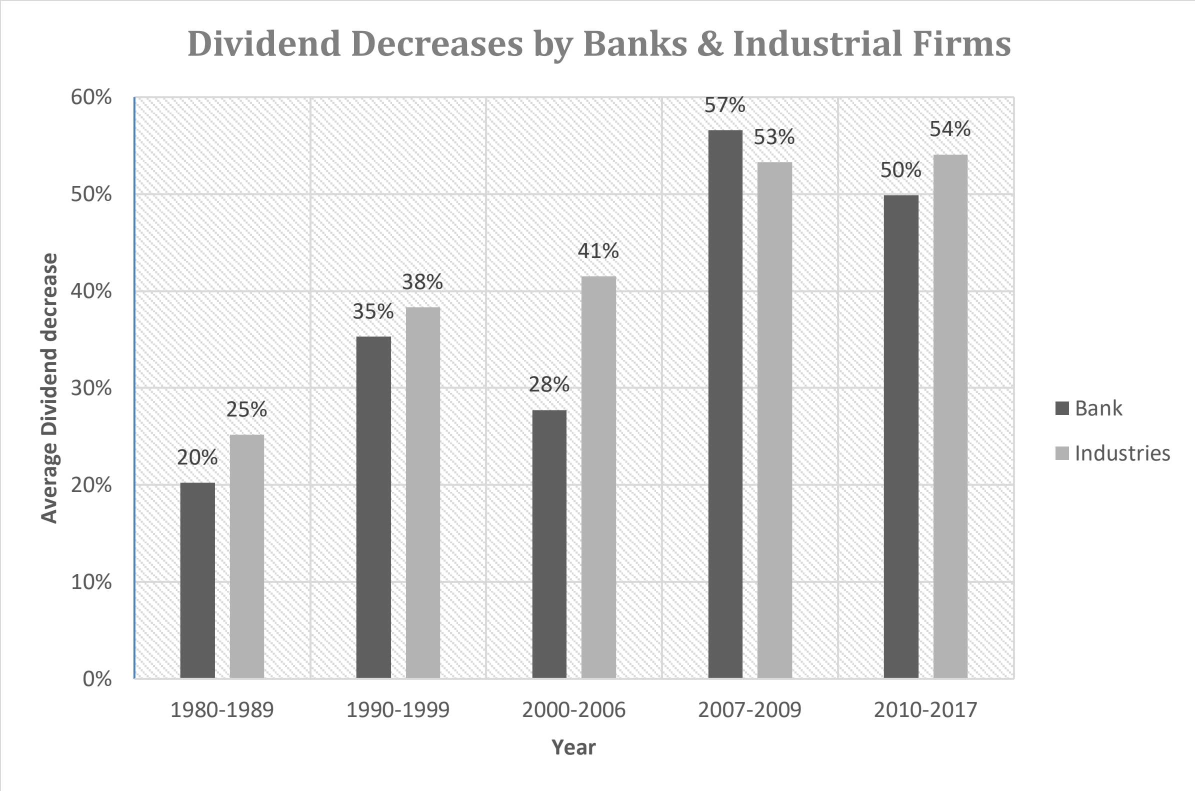

Figure 6: Percentage of Dividend Decreases (Year Categorized: Bank & Industrial Firms)

Dividend Changes and Abnormal Returns

From the preliminary analysis of dividend changes and abnormal returns (see Table 5), we find that the market reaction was positively associated with dividend changes by the banks and industrial firms. Announcement of dividend increases are associated with positive abnormal returns and announcements of dividend decrease are associated with negative abnormal returns. Bank's CAR3 for dividend increases is 0.49% and for dividend decreases is -1.05%, and the corresponding values for industries are 0.87% and -1.55%. Comparing banks and industrial firms, industries see higher abnormal returns when they change dividends than banks. Graphical representation of dividend changes and abnormal return is plotted in Figure 7. This simple descriptive study of dividend changes and abnormal returns pictures that AR is higher for industries both in dividend increases and decreases.

Table 5

Descriptive Statistics: Dividend Changes and Abnormal Returns by Banks and Industrial Firms

		Bank			Industries		
		Increase	Decrease	NoChange	Increase	Decrease	NoChange
AR	Mean	0.0021532	-0.002962	0.0009466	0.0044876	-0.007285	0.0006867
	Std. Dev.	0.0255931	0.040651	0.0261165	0.0268499	0.0449857	0.0259796
	Min	-0.301725	-0.2806491	-0.230543	-0.3090572	-0.405253	-0.4236273
	Max	0.2282669	0.1444539	0.4098294	0.4787602	0.6323191	0.503558
CAR3	Mean	0.0049595	-0.0104677	0.0025823	0.0087663	-0.015455	0.0014276
	Std. Dev.	0.0345531	0.0631751	0.0378936	0.0432907	0.0699716	0.0424781
	Min	-0.214494	-0.3422117	-0.232342	-0.4416192	-0.545545	-0.4241338
	Max	0.3526514	0.2969287	0.743627	0.6891717	0.6457158	0.5255416
CAR5	Mean	0.0062804	-0.0135226	0.0033126	0.010649	-0.017292	0.0019105
	Std. Dev.	0.0416628	0.0822805	0.0448286	0.0514514	0.081277	0.0520223
	Min	-0.236825	-0.2662274	-0.301475	-0.3723293	-0.689991	-0.5184972
	Max	0.3037628	0.4607853	0.7208891	0.6024948	0.6217098	0.8872069

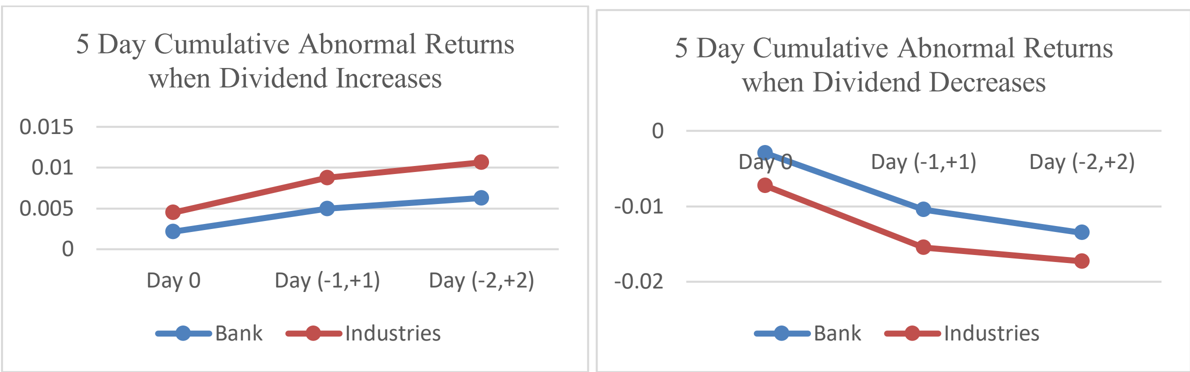

Figure 7: Five Day Cumulative Abnormal Returns When Dividend Changes

Overview of Explanatory Variables

Here, we discuss the overall view of our data set including the control variables (see Table 6). We observed that *change* and *CAR* are higher for industrial firms than banks during our study period. *Earn_change* is higher for banks when dividend increases, and for dividend decreases it is higher for industrial firms. *ROA* and *size* are higher for banks compared to industries. However, industries have more *leverage* and higher *market to book* ratio than banks.

Banks that increase dividends display higher *payout* ratio than industrial firms that do so, but for dividend decrease events, industrial firms display a higher *payout* ratio. These differences suggest that it is important to control for these characteristics when analyzing the difference in the market reaction to dividend changes by banks and industrial firms.

Table 6

Descriptive Statistics: Explanatory Variables

Variables	**Mean**		**Std. Dev.**		**Min**	**Max**
	Increase	Decrease	Increase	Decrease		
CAR3	0.003844	-0.00833	0.031045	0.047356	-0.09187	0.104541
Change	0.122286	-0.25438	0.10804	0.129954	6.57E-08	-6.21E-08
Divyield	0.51675	0.541321	0.292377	0.380498	0.054113	1.56503
Earn_change	0.108405	-0.24885	0.257117	0.749476	-1.66895	1.108084
ROA	1.086592	0.445017	0.372595	0.87042	-1.021	2.247
Leverage	11.33896	10.82679	8.079102	6.605468	0	33.973
Payout	0.376885	0.323267	0.217158	0.498498	-0.36915	2.209556
Size	7.344665	7.623625	1.172051	1.31766	5.06554	10.90325
MTB	1.070754	1.024739	0.055265	0.055351	0.957693	1.236288

Note. Panel A: Banks

Variable	**Mean**		**Std. Dev.**		**Min**	**Max**
	Increase	Decrease	Increase	Decrease		
CAR3	0.008694	-0.01176	0.039232	0.053863	-0.11698	0.133613
Change	0.166837	-0.22528	0.134941	0.133882	5.99E-08	0.5
Divyield	0.458919	0.617258	0.512282	0.694587	0.011308	3.512194
Earn_change	0.895999	-1.08146	3.664484	6.274483	-18.3391	14.69777
ROA	0.081795	0.040704	0.051596	0.072497	-0.12816	0.238692
Leverage	20.66272	22.85815	15.57075	17.45803	0	69.52014
Payout	0.369244	0.407192	0.599442	1.141256	-2.59498	5.861111
Size	6.717087	5.967223	2.002598	1.929663	2.589192	11.3403
MTB	1.902572	1.52639	0.985623	0.918446	0.713971	5.769436

Note. Panel B: Industrial firms

CHAPTER 5: RESULTS AND DISCUSSION

Our first result represents the mean test of the abnormal returns to dividend changes by banks and industrial firms (see Table 7). The t-test result showed that industries have significantly higher abnormal return associated with their dividend increases than banks, and the results are significant at 1% level. With dividend increase announcements, industrial firms experience 0.0023% higher abnormal return than banks on the event day, 0.0038% on 3-days CAR, and 0.0043% on 5-days CAR. While the market reaction to dividend decreases is also higher for industries than banks, the difference is not statistically significant. Thus, we conclude that the price reaction to dividend reductions by banks and industrial firms are similar.

Table 7

Mean Test of the Abnormal Returns by Banks and Industrial Firms

	Dividend Increases			**Dividend Decreases**		
	diff_ar	Std. Err	t-test	diff_ar	Std. Err	t-test
AR	-0.0023344***	0.0004811	4.8519	-0.004323	0.0030863	-1.4008
CAR3	-0.0038068***	0.000761	5.0021	-0.004987	0.0048002	-1.039
CAR5	-0.0043686***	0.0009057	4.8235	-0.003769	0.005627	-0.6699

Next, we ran panel regression analysis and used three models to study the difference in the market reaction to dividend changes by banks and industrial firms; fixed effect (FE), random effect (RE), and ordinary least square (OLS). Our results are the same across all three models. To choose the most suitable model for our dataset, we performed the Hausman test and the Breusch and Pagan Lagrangian multiplier test. For dividend increase events, the RE model and for dividend decrease events the OLS model best suits our data. The following are the results based on these two models. Permo is the number of firms in our sample observation. At first, we estimate equation (4) and report the results in Table 8. From the results, the estimate of β_0 is positive and significant in each model.

Table 8

Panel Data Regressions of the Cumulative Abnormal Returns on Dividend Changes

CAR3 (-1,+1)	Dividend Increases			Dividend Decreases		
	FE	RE	OLS	FE	RE	OLS
ΔD	0.0259***	0.0249***	0.0257***	0.0390**	0.0617***	0.0613***
	(0.00311)	(0.00255)	(0.00245)	(0.0161)	(0.00912)	(0.00909)
Dummy		0.000439	0.000151		0.00708	0.00533
		(0.00232)	(0.00214)		(0.00961)	(0.00946)
ΔD*Dummy	-0.0150**	-0.0133**	-0.0140**	-0.0238	-0.0196	-0.0221
	(0.00737)	(0.00612)	(0.00596)	(0.0569)	(0.0274)	(0.0260)
Constant	0.00747***	0.00243	-0.000849	0.00341	-0.0122	-0.0162
	(0.00222)	(0.00569)	(0.00515)	(0.0148)	(0.0115)	(0.0110)
Observations	22,636	22,636	22,636	2,220	2,220	2,220
R-squared	0.010		0.015	0.063		0.051
Number of permo	2,691	2,691	2,691	1,259	1,259	1,259
Industry FE	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Hausman Test	Not Significant	Significant		Not Significant	Significant	
LM Test			Not Significant			Significant

Note. Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; CAR3(-1,+1) = $\alpha_0 + \alpha_1(\text{Dummy}) + \beta_0(\Delta D) + \beta_1(\Delta D*\text{Dummy}) + e_i$

For instance, the estimate from the RE model for dividend increases is 0.0249 (p-value = 0.00) and for dividend reductions it is 0.0617 (p-value = 0.01). This means that a 1% increase in dividends by industries is associated with 0.0249% increase in the abnormal return and a 1% decrease in dividends is associated with a 0.0617% drop in the abnormal return. The result signifies that, for dividend increase events, the estimate of β_1 is negative and significant across all models. For example, the estimate of β_1 from RE model for dividend increases is -0.0133 (p-value = 0.05), suggesting that a 1% increase in dividends by industrial firms attracts a 0.0133% abnormal return more than banks. The estimate of β_1 for dividend decreases is not statistically significant, suggesting there is no significant difference between the market reaction to dividend decreases by banks and industries.

In the following discussion, we study further detail of this relationship while controlling the dependent variables. We estimate equation (5) and present the result in Table 9, with the result similar across all models. When we introduced the control factors, the result was not consistent with the previous table, and all significant differences between the abnormal return to dividend changes by banks and industrial firms disappeared. The estimates of β_1 are not statistically significant, suggesting that the abnormal returns associated with dividend changes are not significantly different between banks and industrial firms. We get an insignificant result for both dividends increase and decrease announcements. This suggests that the difference in market reaction, reported earlier, is driven by the control factors.

The control variables that affect the abnormal return when firms increase dividends are earning changes, size of the firms, dividend yield, leverage, and market to book ratio. When firms reduce dividends, the variables are earning changes, return on assets, size of the firms, and market to book ratio. Previously, the descriptive statistics identified that asset *size* is larger for banks compared to industries (see Table 6), and in Table 9 the coefficient for *size* is -0.00144 for dividend increases and -0.00128 for dividend decreases. Announcements of a dividend increase or cut attract stronger reaction for small firms than larger ones (Ghosh & Woolridge, 1988). Thus, the smaller the size of the firm, the stronger the price response to the dividend change. Since the banks are larger than the industrial firms, controlling for size reduces the difference in reaction to dividend changes by the two groups. Likewise, *earn_changes* are higher for industrial firms, and the coefficient on *earn_change* is positively associated with abnormal returns. Thus, controlling for the change in earnings also reduces the difference in abnormal returns associated with dividend changes by banks and industrial firms.

Table 9

Panel Data Regressions of the Cumulative Abnormal Returns on Dividend Changes and Firm-Specific Information

CAR (-1,+1)	**Dividend Increases**			**Dividend Decreases**		
	FE	RE	OLS	FE	RE	OLS
ΔD	0.0234***	0.0205***	0.0207***	0.0122	0.0386***	0.0381***
	-0.00316	-0.00259	-0.00248	-0.0168	-0.00965	-0.00972
Dummy		0.00203	-8.40E-05		-0.00278	-0.00361
		-0.00356	-0.00329		-0.0125	-0.012
ΔD*Dummy	-0.0117	-0.00719	-0.00661	-0.0211	-0.0413	-0.0426
	-0.00729	-0.006	-0.00593	-0.0707	-0.0307	-0.0283
Divyield	-0.00274**	0.00079	0.00151**	0.00171	-0.00175	-0.00195
	-0.00117	-0.000767	-0.000707	-0.00418	-0.0021	-0.00206
ROA	-0.00101	0.000577	0.00163	0.0113	0.0156***	0.0152***
	-0.00243	-0.00197	-0.00187	-0.00829	-0.00445	-0.00433
Earn_change	0.000693***	0.000750***	0.000784***	0.000685**	0.000639***	0.000633***
	-9.66E-05	-9.22E-05	-9.25E-05	-0.000315	-0.000237	-0.000238
Leverage	7.14e-05*	2.81E-05	2.76E-05	-8.34E-05	-0.000118	-0.000116
	-3.77E-05	-2.41E-05	-2.16E-05	-0.000218	-8.99E-05	-8.76E-05
Payout	-7.36E-05	8.37E-05	0.000185	-5.18E-06	-0.00144	-0.00156
	-0.000597	-0.000569	-0.000609	-0.00184	-0.00115	-0.00114
Size	-0.00221**	-0.00144***	-0.00124***	0.000108	-0.00141*	-0.00128*
	-0.000876	-0.000217	-0.000181	-0.00489	-0.000788	-0.000766
MTB	0.00114*	0.000679*	0.000413	0.00828**	0.00368**	0.00348**
	-0.000586	-0.000388	-0.000339	-0.00413	-0.00151	-0.00141
Constant	0.0150*	0.00676	0.00349	-0.0699**	-0.0253*	-0.0242*
	-0.00816	-0.00799	-0.00765	-0.0325	-0.0142	-0.0139
Observations	21,901	21,901	21,901	2,132	2,132	2,132
R-squared	0.016	0.0148	0.023	0.076	0.0463	0.07
Num of permo	2,622	2,622		1,219	1,219	
Industry FE	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Hausman Test	Significant	Not Significant		Not Significant	Significant	
LM Test						Significant

Note. Robust standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$; $CAR(-1,+1) = \alpha_0 + \alpha_1(Dummy) + \beta_0(\Delta D) + \beta_1(\Delta D*Dummy) + \beta_2(\text{DivYield}) + \beta_3(\text{Profitability}) + \beta_4(\text{Earn\_change}) + \beta_5(\text{Leverage}) + \beta_6(\text{Payout}) + \beta_7(\text{Size}) + \beta_8(\text{MTB}) + e_i$

The market to book ratio (MTB) measures the growth opportunity of a firm and our result is consistent with the growth hypothesis (Ghosh & Woolridge, 1988). A 1% increase in market to book ratio is associated with a 0.0011% increase in abnormal return for dividend increases and 0.0034% increase in abnormal return for dividend decreases. Since the industrial firms have higher market-to-book ratios than the banks, controlling for the market-to-book ratio also reduces the difference in reaction to dividend changes by the two groups. Return on assets does not show any significant results for dividend increase events. We find a statistically significant result for *roa* for dividend decreases. The coefficient for *roa* is 0.0152 (p-value = 0.00) which confirms that dividend cut announcements by profitable firms attract higher abnormal returns, consistent with Che et al. (2017) study.

Next, we estimate equation (5) in the crisis period sample (2007-2008) (see Table 10). The market reaction during this period is quite unpredictable. The OLS regression is the best suited model for this period. Dividend increase is positively and significantly correlated with abnormal returns. The estimate for β_0 *is* 0.0238 (p-value = 0.05) for dividend increases. However, β_0 for dividend cut events does not show any significant result during the crisis period. The estimate for β_0 for dividend cut is -0.0544 and is not significant, which indicates that the market did not perceive the dividend cuts as a negative signal (Zia & Kochan, 2017). The estimate of β_1 does not show any significant results for both dividend increase and decrease events, which indicates that the market reacts similarly to dividend changes by banks and industrial firms during crisis periods. Our control variables did not show any significant results except the earnings change when firms increase dividends.

Table 10

Panel Data Regressions of the Cumulative Abnormal Returns on Firm-Specific Information during Crisis Period (2007-2009)

CAR (-1,+1)	**Dividend Increases**			**Dividend Decreases**		
	FE	RE	OLS	FE	RE	OLS
ΔD	0.0499**	0.0252**	0.0238*	0.955***	-0.0544	-0.0544
	-0.0239	-0.0125	-0.0126	-0.349	-0.0937	-0.0937
Dummy		0.0231	0.0211		0.106***	0.106***
		-0.0162	-0.016		-0.0385	-0.0385
ΔD*Dummy	0.0382	0.00285	0.00371		0.0484	0.0484
	-0.0523	-0.0305	-0.0313		-0.114	-0.114
Divyield	0.0172	0.00377	0.0038	0.0374	-0.00907	-0.00907
	-0.0151	-0.00301	-0.00297	-0.0264	-0.00984	-0.00984
Earn_change	0.000321	0.000828**	0.000860**	-0.0139***	-0.000901	-0.000901
	-0.000671	-0.000409	-0.000409	-0.00354	-0.00108	-0.00108
ROA	0.00906	-0.000403	0.000338	3.998***	0.0083	0.0083
	-0.00938	-0.0065	-0.00659	-0.572	-0.0233	-0.0233
Leverage	-0.000979	6.15E-05	7.81E-05	0.0399***	-6.07E-05	-6.07E-05
	-0.000641	-9.54E-05	-9.74E-05	-0.0047	-0.00059	-0.00059
Payout	0.000637	0.00297	0.00284		-0.00136	-0.00136
	-0.0032	-0.00187	-0.00179		-0.00643	-0.00643
Size	0.0227	-0.00119	-0.0012		0.00111	0.00111
	-0.015	-0.00094	-0.000948		-0.00467	-0.00467
MTB	0.0112	0.00209	0.00183		0.0115	0.0115
	-0.00771	-0.00161	-0.00163		-0.00969	-0.00969
Constant	-0.194*		-0.0202	-0.675***	-0.0961***	-0.0961**
	-0.115		-0.0327	-0.0321	-0.0372	-0.0372
Observations	1,042	1,042	1,042	94	94	94
R-squared	0.049		0.035	0.349		0.162
Number of permo	596	596		85	85	
Industry FE	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Hausman Test	Not Significant	Not Significant		Not Significant	Not Significant	
LM Test			Significant			Significant

Note. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1, CAR(-1,+1) = *α0+ α1(Dummy) + β0(ΔD) + β1(ΔD*Dummy) + β2(DivYield) + β3(Profitability) + β4(Earn_change) + β5(Leverage) + β6(Payout) + β7(Size) + β8(MTB) + ei*

Further we estimate equation (5) on the full sample except the financial crisis period (2007-2008) (see Table 11). The estimate for β_0 is for dividend increases is positive and significant across all our models. For dividend reductions, β_0 is positive and significant for RE and OLS models. A 1% increase in dividends are associated with 0.02% increase in abnormal return and 1% reduction in dividends are associated with 0.04% drop in the abnormal return. The coefficient for differentiating the abnormal return of banks and industries, β_1 does not show any significant result in Table 11 except dividend increase events in the FE model. The estimate for β_1 in FE model when dividend increases is -0.0149 (p-value = 0.05). This result indicates that for 1% increase in dividends, industrial firms experience 0.0149% additional abnormal return than banks. However, this result is not consistent with other two models (RE and OLS). The other two models show that there is no significant difference between the market reactions to dividend changes by banks and industrial firms.

Moreover, we compare market reaction to dividend change announcements by banks and industrial firms across decades (see Table A1 & Table A2). The purpose of testing decade wise performance is to check whether our results hold for shorter period as well. We categorize our samples in four decades (1980-1989, 1990-1999, 2000-2009, and 2010-2017). Dividend increases and abnormal returns are positively related across all decades; however, dividend decreases are not always significantly related to the abnormal return. Over the decades, there are no significant differences between the abnormal return associated with dividend changes by banks and industrial firms. Statistical significance aside, banks had higher market reactions during the '80s, afterward the abnormal return started to drop off, and industrial firms began to have higher market responses with dividend change events.

Table 11

Test for Panel Data Regressions of the Cumulative Abnormal Returns on Firm-Specific Information Excluding Crisis Period (2007-2009)

CAR (-1,+1)	**Dividend Increases**			**Dividend Decreases**		
	FE	RE	OLS	FE	RE	OLS
ΔD	0.0235***	0.0204***	0.0207***	0.0104	0.0421***	0.0422***
	-0.00322	-0.00264	-0.00253	-0.0181	-0.00987	-0.00986
Dummy		0.0017	-0.000296		-0.00816	-0.0085
		-0.0035	-0.00324		-0.0124	-0.0122
ΔD*Dummy	-0.0149**	-0.00881	-0.00756	-0.0413	-0.0441	-0.0439
	-0.00744	-0.00614	-0.00595	-0.0698	-0.0311	-0.0292
Divyield	-0.00258**	0.00079	0.00141**	0.00255	-0.00103	-0.00104
	-0.0012	-0.00078	-0.00072	-0.0046	-0.00214	-0.00209
Earn_change	0.000684***	0.000747***	0.000780***	0.000708**	0.000727***	0.000734***
	-0.000102	-9.66E-05	-9.67E-05	-0.000319	-0.000238	-0.000238
ROA	-0.00124	0.000429	0.00123	0.0162**	0.0191***	0.0187***
	-0.00256	-0.00202	-0.00191	-0.00783	-0.00436	-0.00428
Leverage	5.76E-05	2.17E-05	2.32E-05	-2.26E-05	-0.000121	-0.000121
	-3.85E-05	-2.45E-05	-2.19E-05	-0.000221	-8.87E-05	-8.63E-05
Payout	-0.000314	-0.000139	-7.14E-06	-0.000918	-0.00129	-0.00137
	-0.000607	-0.000585	-0.000636	-0.00194	-0.00119	-0.00118
Size	-0.00212**	-0.00141***	-0.00124***	-0.00169	-0.00164**	-0.00147*
	-0.000883	-0.000221	-0.000183	-0.00488	-0.000793	-0.00077
MTB	0.000907	0.000556	0.000378	0.00814*	0.00309**	0.00273*
	-0.000597	-0.000395	-0.000348	-0.00463	-0.00155	-0.00144
Constant	0.0152*	0.00756	0.00449	-0.0639*	-0.0220*	-0.02
	-0.00821	-0.00788	-0.00743	-0.0333	-0.0133	-0.0131
Observations	20,859	20,859	20,859	2,038	2,038	2,038
R-squared	0.016		0.023	0.084		0.077
Number of permo	2,606	2,606		1,183	1,183	
Industry FE	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES
Hausman Test	Significant	Not Significant		Not Significant	Not Significant	
LM Test						Significant

Note. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1, $CAR(-1,+1) = \alpha_0 + \alpha_1(Dummy) + \beta_0(\Delta D) + \beta_1(\Delta D*Dummy) + \beta_2(\text{DivYield}) + \beta_3(\text{Profitability}) + \beta_4(\text{Earn\_change}) + \beta_5(\text{Leverage}) + \beta_6(\text{Payout}) + \beta_7(\text{Size}) + \beta_8(\text{MTB}) + e_i$

We also pay closer attention to banks to scrutinize what could be the reason for banks lower market reactions over time. Panel regression was conducted for banks based on three Basel accords during periods of dividend increases and decreases events (see Table A3 & Table A4). Stricter banking regulations were imposed on banks to address risk management practices. There are three series of banking regulations (Basel I, Basel II, and Basel III) set by the Bank Committee on Bank Supervision (BCBS). We ran our model based on the three Basel periods. We subcategorize the data according to pre-Basel and Basel accords; year 1980-1988 pre-Basel, year 1988-2004 Basel I, year 2004-2013 Basel II and year 2014-2017 Basel III. For dividend increase events (see Table A3) the Fixed Effect model and for dividend decrease (see Table A4) the OLS model best suited our data set. We also add another independent variable *Tier1 Capital* in our model. Tier1 Capital is part of the Basel accord that is imposed on banks to hold a certain percentage of core capital to protect banks from expected losses.

Table A3 demonstrates that the relation between dividend increases and abnormal return was significantly high in pre-Basel period, and it started to cut off after implementing the Basel accords. The estimate for β_1 during pre-Basel is 0.254 (p-value = 0.05). After imposing Basel accords the abnormal return started to drop down, for instance, during Basel II period it is 0.0357 (p-value = 0.00). We can infer from Table A3 that the Basel accord surely mitigate the market reaction to dividend changes by banks.

Furthermore, when we look at the dividend decrease events (see Table A4), there was not enough observation for the pre-Basel period, and there is no significant relation between dividend decreases and abnormal returns. Moreover, as Basel accords are imposed to absorb unexpected conditions in the financial market, investors should not panic by dividend decrease announcements. Rather they can assume that this dividend cut may be for better investment opportunity or for regulatory maintenance.

Lastly to gain additional insight, we estimate our model using the same independent variable but investigate on significant dividend changes (10% or more increases/decreases) events only (see Table A5). The result was consistent, and we did not find any statistically significant differences for the market reactions to these substantial, 10% or more dividend changes by banks and industrial firms.

CHAPTER 6: CONCLUSION

We have investigated the market reaction to dividend change announcements by banks and by industrial firms for the period of 1980 to 2017. Earlier studies excluded financial organizations when they were investigating the effect of dividend changes on stock prices. Financial organizations are an essential part of an economy. This thesis examined whether it is reasonable to exclude such a vital segment of an economy when investigating the stock price sensitivity to new information released as in previous literature. This reason was the underlying motivation for this study. The initial mean test identified that industrial firms experience more abnormal returns than banks with dividend increases, but there is no difference in abnormal returns when they reduce dividends. Then we estimated panel regression without controlling independent factors. Dividend increase announcements showed that industrial firms experience significantly higher abnormal returns than banks. Dividend decrease announcements do not show any significant results. Finally, we examined our full model including independent firm specific variables. When we ran the model including control variables, the results demonstrated that there was no statistically significant difference between the abnormal return to dividend changes by banks and industrial firms. All differences disappeared after introducing the control variables. The significant correlation between the control variables and abnormal returns confirms that these variables were responsible for higher abnormal returns for industrial firms.

We further investigate our model (eq.5) excluding the financial crisis period (2007-2008) form the sample and the financial crisis period (2007-2008) itself. We received mixed results. In one scenario, we found that industrial firms experience significantly higher abnormal returns than banks with dividend increases; however, in most cases we found that there is no significant difference between the market reaction to dividend changes by banks and industrial firms. This result is inconsistent with prior research that stock prices react differently to the announcements of dividend changes by banks than non-banks. The result for the longer period

(37 years) is different. Subsequently we investigated the decade wise price reaction to dividend changes by banks and industrial firms. There was no statistically significant difference between banks and industrial firms abnormal return to dividend changes announcements.

Additional regression analyses were conducted on bank dividend change events. Banks must abide by a set of rules, which have been enforced by law since 1988. These rules are known as the Basel accords. When we test the signaling hypothesis for banks dividend change announcements, partitioning the sample by the Basel accord period, we found that during the pre-Basel period, banks were experiencing significantly high abnormal returns when they increased dividends. Just after implementing Basel I, the abnormal return started to decrease. There was not enough observation for pre-Basel period for dividend decreases, and we did not find evidence for signaling hypothesis for dividend decreases. These results suggest that the reason for lower abnormal returns for banks is the conservative rules imposed on the banks. Bank regulators are continuously working to improve procedures in response to handling financial distress.

This study is expected to contribute to the dividend announcement literature and banking literature. This is the first study that performed an actual comparison of the market reaction to dividend changes by banks and industrial firms. Additionally, this research revealed that it is not necessary to exclude financial organizations from the research sample although they have unique features. Market responses to dividend changes are similar irrespective of whether the firm is a bank or an industrial firm.

There were some limitations identified regarding this study. The fact that there are no prior studies that directly compare market reaction to dividend changes by banking firms and industrial firms is both a blessing and a challenge: a blessing in a sense that this is the first study to do an explicit comparison; a challenge as there are no prior studies that can be used as a guideline, i.e., what variables to include in our models, what results to expect, or how to interpret the results. Furthermore, in our paper we used one set of data for all banking firms and industrial firms, nonetheless one size does not fit all category. Without thorough subsample tests, the overall results could be impacted. A further categorization in the banking firms and industrial firms could have some promising results.

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APPENDIX

Table A1

Panel Data Regressions of the Cumulative Abnormal Returns on Firm-Specific Information, Decade wise & Dividend Increases

	FE				RE				OLS			
CAR3	1980-1989	1990-1999	2000-2009	2010-2017	1980-1989	1990-1999	2000-2009	2010-2017	1980-1989	1990-1999	2000-2009	2010-2017
ΔD	0.0276***	0.0134*	0.0231***	0.0295***	0.0222***	0.0174***	0.0179***	0.0236***	0.0221***	0.0200***	0.0176***	0.0212***
	(0.00649)	(0.00786)	(0.00758)	(0.00846)	(0.00488)	(0.00530)	(0.00545)	(0.00546)	(0.00483)	(0.00515)	(0.00511)	(0.00507)
Dummy					-0.000915	-0.00824	0.00781	0.00771	-0.00434	-0.00808	0.00205	0.00173
					(0.0107)	(0.00742)	(0.00773)	(0.00695)	(0.0101)	(0.00656)	(0.00626)	(0.00663)
ΔD*Dummy	0.0591	-0.00248	-0.00117	-0.0147	0.0268	-0.00431	-0.00148	-0.0126	0.0274	-0.00674	0.000896	-0.0130
	(0.0712)	(0.0147)	(0.0178)	(0.0175)	(0.0313)	(0.0108)	(0.0118)	(0.0105)	(0.0294)	(0.0110)	(0.0113)	(0.00825)
Divyield	-0.0100**	-0.00738*	-0.000314	0.000343	0.000408	0.000815	0.00132	0.00203	0.000798	0.00117	0.00167	0.00241*
	(0.00434)	(0.00447)	(0.00357)	(0.00222)	(0.00132)	(0.00168)	(0.00160)	(0.00137)	(0.00129)	(0.00156)	(0.00141)	(0.00134)
Earn_change	0.000613***	0.000523**	0.000975***	0.000654***	0.000657***	0.000694***	0.000926***	0.000725***	0.000679***	0.000734***	0.000962***	0.000724***
	(0.000208)	(0.000232)	(0.000208)	(0.000177)	(0.000186)	(0.000211)	(0.000190)	(0.000160)	(0.000189)	(0.000212)	(0.000189)	(0.000162)
ROA	-0.00463	-0.000792	-0.00175	-0.0123	0.00470	-0.000662	0.000744	-0.00331	0.00740	0.000312	0.00216	0.00111
	(0.0153)	(0.00478)	(0.00518)	(0.00819)	(0.00848)	(0.00299)	(0.00348)	(0.00575)	(0.00782)	(0.00267)	(0.00301)	(0.00580)
Leverage	0.000112	-1.56e-05	0.000294**	4.42e-05	6.04e-05	-1.76e-05	0.000106**	1.49e-05	6.13e-05	-4.38e-06	5.75e-05	1.77e-06
	(8.79e-05)	(9.58e-05)	(0.000120)	(9.64e-05)	(4.57e-05)	(4.38e-05)	(5.27e-05)	(4.39e-05)	(4.44e-05)	(4.05e-05)	(4.69e-05)	(4.24e-05)
Payout	-0.000648	0.00176	0.000609	-0.000974	-0.000954	0.00102	0.000728	5.15e-05	-0.000853	0.00112	0.000710	0.000117
	(0.00118)	(0.00111)	(0.00145)	(0.00135)	(0.000998)	(0.00105)	(0.00115)	(0.00119)	(0.00100)	(0.00105)	(0.00106)	(0.00128)
Size	-0.00207	-0.000110	-0.00410	-6.08e-05	-0.00121***	-0.00173***	-0.00150***	-0.000726*	-0.00130***	-0.00157***	-0.00131***	-0.000748**
	(0.00277)	(0.00325)	(0.00330)	(0.00395)	(0.000346)	(0.000369)	(0.000449)	(0.000393)	(0.000318)	(0.000344)	(0.000410)	(0.000367)
MTB	0.000476	0.00166	0.00403**	0.00370**	-0.000180	0.00101	0.00175**	0.000569	-0.000505	0.000873	0.00128*	3.80e-05
	(0.00177)	(0.00155)	(0.00171)	(0.00177)	(0.000896)	(0.000720)	(0.000801)	(0.000685)	(0.000791)	(0.000654)	(0.000713)	(0.000611)
Constant	0.0157	0.00700	0.0230	-0.00296	0.0171				0.0147	-0.00175	0.0119*	-0.0115*
	(0.0162)	(0.0207)	(0.0237)	(0.0319)	(0.0115)				(0.0115)	(0.00736)	(0.00699)	(0.00695)
Observations	6,456	5,898	4,974	4,573	6,456	5,898	4,974	4,573	6,456	5,898	4,974	4,573
R-squared	0.019	0.008	0.020	0.021	1,441	1,245	1,005	963	0.023	0.027	0.023	0.025
Number of permo	1,441	1,245	1,005	963	1,441	1,245	1,005	963				

Note. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1, CAR(-1,+1) = $\alpha_0 + \alpha_1(Dummy) + \beta_0(\Delta D) + \beta_1(\Delta D*Dummy) + \beta_2(\text{DivYield}) + \beta_3(\text{Profitability}) + \beta_4(\text{Earn\_change}) + \beta_5(\text{Leverage}) + \beta_6(\text{Payout}) + \beta_7(\text{Size}) + \beta_8(\text{MTB}) + e_i$

Table A2

Test for Panel Data Regressions of the Cumulative Abnormal Returns on Firm-Specific Information, Decade wise & Dividend Decreases

	FE				RE				OLS			
CAR3	1980-1989	1990-1999	2000-2009	2010-2017	1980-1989	1990-1999	2000-2009	2010-2017	1980-1989	1990-1999	2000-2009	2010-2017
ΔD	0.0287	-0.0273	-0.0310	0.00920	0.0482***	0.0295	0.0140	-0.000225	0.0458***	0.0295	0.0129	-0.00911
	(0.0333)	(0.0568)	(0.0611)	(0.0408)	(0.0170)	(0.0181)	(0.0308)	(0.0265)	(0.0168)	(0.0181)	(0.0308)	(0.0273)
Dummy	-0.0214	0.0310	0.0211	-0.0135	-0.0214	0.0310	0.0211	-0.0135		0.0310	0.0221	-0.0119
	(0.0378)	(0.0260)	(0.0227)	(0.0254)	(0.0378)	(0.0260)	(0.0227)	(0.0254)		(0.0260)	(0.0220)	(0.0264)
ΔD*Dummy		0.0472	-0.100	-0.0206		-0.00939	-0.0391	0.00919	0.0834	-0.00939	-0.0363	0.0192
		(0.150)	(0.141)	(0.0609)		(0.0517)	(0.0554)	(0.0684)	(0.109)	(0.0517)	(0.0539)	(0.0713)
Divyield	0.00605	-0.00351	0.0159	-0.0149	-0.00295	-0.00144	-0.00193	0.00103	-0.00355	-0.00144	-0.00243	0.000338
	(0.0109)	(0.0106)	(0.0126)	(0.0170)	(0.00372)	(0.00464)	(0.00479)	(0.00502)	(0.00345)	(0.00464)	(0.00477)	(0.00503)
Earn_change	0.000754	-0.000292	0.000439	0.00159**	0.00105*	0.000422	0.000257	0.000356	0.00116*	0.000422	0.000248	0.000278
	(0.000890)	(0.000820)	(0.00124)	(0.000628)	(0.000602)	(0.000518)	(0.000542)	(0.000539)	(0.000608)	(0.000518)	(0.000541)	(0.000527)
ROA	-0.0333	0.0123	0.0123	-0.0750*	0.0731	0.0131	0.0174***	0.0157	0.0738	0.0131	0.0172***	0.0170
	(0.134)	(0.0293)	(0.0176)	(0.0403)	(0.0641)	(0.00901)	(0.00616)	(0.0106)	(0.0625)	(0.00901)	(0.00607)	(0.0106)
Leverage	-0.000324	-0.000281	-0.000983	0.000107	-0.000183	2.50e-05	-0.000256	-0.000123	-0.000175	2.50e-05	-0.000260	-6.80e-05
	(0.000537)	(0.000905)	(0.000876)	(0.000848)	(0.000159)	(0.000166)	(0.000225)	(0.000178)	(0.000154)	(0.000166)	(0.000223)	(0.000172)
Payout	-0.00301	0.00578	-0.000536	-0.00141	-0.00294	-0.00323	-4.93e-05	-5.24e-05	-0.00349	-0.00323	-2.62e-05	4.50e-05
	(0.00538)	(0.00575)	(0.00384)	(0.00290)	(0.00269)	(0.00285)	(0.00221)	(0.00188)	(0.00264)	(0.00285)	(0.00223)	(0.00190)
Size	-0.0106	-0.00772	-0.00500	-0.0368	-0.00307**	-0.00287*	0.00114	-0.000142	-0.00246*	-0.00287*	0.00104	-0.000311
	(0.0114)	(0.0247)	(0.0230)	(0.0237)	(0.00147)	(0.00153)	(0.00170)	(0.00157)	(0.00140)	(0.00153)	(0.00167)	(0.00154)
MTB	-0.00495	0.0438**	0.00825	0.0153***	-0.00509	0.00783**	0.00761**	0.00537**	-0.00570*	0.00783**	0.00765**	0.00456**
	(0.00992)	(0.0173)	(0.00991)	(0.00577)	(0.00349)	(0.00328)	(0.00379)	(0.00216)	(0.00338)	(0.00328)	(0.00368)	(0.00195)
Constant	0.0409	-0.0504	0.00351	0.251	0.00631			-0.0146	0.00890	-0.0251	-0.0616***	-0.0124
	(0.0572)	(0.127)	(0.151)	(0.166)	(0.0185)			(0.0164)	(0.0189)	(0.0370)	(0.0191)	(0.0177)
Observations	702	503	497	430	702	503	497	430	702	503	497	430
R-squared	0.066	0.170	0.120	0.181					0.110	0.089	0.087	0.066
Number of permo	497	406	361	274	497	406	361	274				

Note. Robust standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$, $CAR(-1,+1) = \alpha0 + \beta_1(\Delta D) + \beta_2(Dummy) + \beta_3(\Delta D*Dummy) + \beta_4(DivYield) + \beta_5(Profitability) + \beta_6(Earn\_change) + \beta_7(Leverage) + \beta_8(Payout) + \beta_9(Size) + \beta_{10}(MTB) + e_i$

Table A3

Test for Panel Data Regressions of the Cumulative Abnormal Returns on Firm-Specific Information Based on Basel Accords & Dividend Increases

	FE				RE				OLS			
CAR3	**Pre Basel**	**Basel I**	**Basel II**	**Basel III**	**Pre Basel**	**Basel I**	**Basel II**	**Basel III**	**Pre Basel**	**Basel I**	**Basel II**	**Basel III**
Change	0.254**	0.00879	0.0357***	-0.00314	0.149	0.0140	0.0187**	-0.000907	0.149	0.0142*	0.0187**	-0.000907
	(0.109)	(0.0108)	(0.0124)	(0.0307)	(0.118)	(0.00857)	(0.00855)	(0.0121)	(0.118)	(0.00860)	(0.00855)	(0.0121)
Divyield	-0.103	-0.00577	0.0143	-0.0113	-0.0238	-0.00162	0.00848*	-0.0130	-0.0238	-0.00179	0.00848*	-0.0130
	(0.247)	(0.00664)	(0.00870)	(0.0201)	(0.0175)	(0.00422)	(0.00488)	(0.00951)	(0.0175)	(0.00415)	(0.00488)	(0.00951)
Earn_change	0.0548	0.00851**	0.00231	0.0352	0.0258	0.00465	0.00215	0.0147	0.0258	0.00451	0.00215	0.0147
	(0.0820)	(0.00425)	(0.00767)	(0.0233)	(0.0325)	(0.00379)	(0.00565)	(0.0112)	(0.0325)	(0.00388)	(0.00565)	(0.0112)
ROA	-0.0168	-0.00898*	-0.0137*	-0.0189	-0.0133	-0.00263	-0.00856*	0.00748	-0.0133	-0.00130	-0.00856*	0.00748
	(0.082)	(0.0046)	(0.00725)	(0.0294)	(0.0245)	(0.00300)	(0.00483)	(0.0120)	(0.0245)	(0.00294)	(0.00483)	(0.0120)
Leverage	0.00137	0.000315	-0.000213	-0.000662	-0.000196	8.08e-05	-0.000129	-8.86e-05	-0.000196	5.07e-05	-0.000129	-8.86e-05
	(0.00135)	(0.000242)	(0.000409)	(0.000778)	(0.000691)	(0.000131)	(0.000219)	(0.000245)	(0.000691)	(0.000113)	(0.000219)	(0.000245)
Payout	0.0101	-0.00845	0.00361	0.0213	-0.00157	-0.00805*	-0.00271	0.0256*	-0.00157	-0.00696	-0.00271	0.0256*
	(0.0330)	(0.00525)	(0.00810)	(0.0278)	(0.0130)	(0.00449)	(0.00601)	(0.0152)	(0.0130)	(0.00463)	(0.00601)	(0.0152)
Size	-0.120**	-0.00877*	-0.0148	-0.0212	-0.00908	-0.000812	-0.000956	-0.000989	-0.00908	-0.00109	-0.000956	-0.000989
	(0.0396)	(0.00526)	(0.00907)	(0.0204)	(0.00641)	(0.00104)	(0.00113)	(0.00171)	(0.00641)	(0.000999)	(0.00113)	(0.00171)
MTB	-0.156	0.0515*	0.175**	0.264	-0.244	0.0282	0.118***	-0.0141	-0.244	0.0200	0.118***	-0.0141
	(0.303)	(0.0291)	(0.0680)	(0.183)	(0.224)	(0.0239)	(0.0339)	(0.0677)	(0.224)	(0.0230)	(0.0339)	(0.0677)
CAPT1		0.000011	0.00028	-0.00195	-0.00032	0.00001	0.000575	0.000760		0.000012	0.000575	0.000760
		(0.0000213)	(0.000727)	(0.0025162)	(0.0002172)	(0.00001)	(0.0004357)	(0.0008015)		(0.00000817)	(0.0004357)	(0.0008015)
Constant	1.075*	0.0251	-0.0723	-0.0441		-0.00323	-0.102***		0.326	0.00675	-0.120***	0.0113
	(0.486)	(0.0479)	(0.100)	(0.273)		(0.0256)	(0.0361)		(0.217)	(0.0239)	(0.0352)	(0.0674)
Observations	41	1,800	618	232	41	1,800	618	232	41	1,800	618	232
R-squared	0.360	0.024	0.067	0.056					0.214	0.020	0.053	0.027
Number of permo	9	212	127	64	9	212	127	64				
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hausman Test	S	S	S	S	NS	NS	NS	NS	NS	NS	NS	NS

Note. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1, CAR(-1,+1) = $\alpha_0 + \alpha_1(Dummy) + \beta_0(\Delta D) + \beta_1(\Delta D*Dummy) +$

$\beta_2(\text{DivYield}) + \beta_3(\text{Profitability}) + \beta_4(\text{Earn\_change}) + \beta_5(\text{Leverage}) + \beta_6(\text{Payout}) + \beta_7(\text{Size}) + \beta_8(\text{MTB}) + e_i$

Table A4

Test for Panel Data Regressions of Cumulative Abnormal Returns on Firm-Specific Information Based on Basel Accords & Dividend Decreases

	FE				RE				OLS			
CAR3	**Pre Basel**	**Basel I**	**Basel II**	**Basel III**	**Pre Basel**	**Basel I**	**Basel II**	**Basel III**	**Pre Basel**	**Basel I**	**Basel II**	**Basel III**
Change		0.960	-0.163	-2.264***			0.0194			-0.0325	0.0194	-0.222
			(0.157)	(3.02e-06)			(0.0405)			(0.0556)	(0.0405)	(0.151)
Divyield		0.0218	0.0512	1.121***			-0.00539			0.0269	-0.00539	0.165
			(0.0456)	(2.42e-06)			(0.0155)			(0.0227)	(0.0155)	(0.0888)
Earn_change		-0.337	-0.0320	0.0397***			-0.00626			0.0120	-0.00626	-0.0827*
			(0.0295)	(1.41e-06)			(0.0102)			(0.0205)	(0.0102)	(0.0377)
ROA		0.985	-0.0478	-0.147***			0.0306**			0.0143	0.0306**	0.0105
			(0.0355)	(8.31e-06)			(0.0143)			(0.0211)	(0.0143)	(0.0218)
Leverage		0.117	-0.00910	-0.0640***			0.000375			0.00158	0.000375	-0.00339
			(0.00631)	(4.76e-08)			(0.000797)			(0.00145)	(0.000797)	(0.00405)
Payout		-3.291	-0.00578	-0.591***			-0.00489			-0.0416*	-0.00489	0.0502
			(0.0577)	(7.04e-06)			(0.00902)			(0.0216)	(0.00902)	(0.0383)
Size			0.0528				0.00823**			-0.00614	0.00823*	0.0266*
			(0.103)				(0.00419)			(0.0105)	(0.00419)	(0.0139)
MTB			-0.311				0.00657			0.172	0.00657	-1.463**
			(1.304)				(0.154)			(0.260)	(0.154)	(0.455)
CAPT1			0.0048704				0.0003765			-0.000016	0.0003765	0.0081418
			-0.007891				(0.0017145)			(0.0000226)	(0.0017145)	-0.0048077
Constant		-0.868	-0.0600	0.0192***			-0.112			-0.220	-0.0785	1.038*
			(1.782)	(1.03e-05)			(0.167)			(0.256)	(0.175)	(0.526)
Observations		58	100	14			100			58	100	14
R-squared		1.000	0.307	1.000						0.247	0.242	0.946
Number of permo		52	67	8			67					
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hausman Test	NS	NS	NS	NS	NS	NS	NS	NS				
LM Test									S	S	S	S

Note. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1, CAR(-1,+1) = $\alpha_0 + \beta_1(\Delta D) + \beta_2(DivYield) + \beta_3(Profitability) + \beta_4(Earn\_change) + \beta_5(Leverage) + \beta_6(Payout) + \beta_7(Size) + \beta_8(MTB) + \beta_9(Capt1) + e_i$

Table A5

Panel Data Regressions of the Cumulative Abnormal Returns on Firm-Specific Information and Significant Dividend Changes (10% or More) Events Only

	Dividend Increase			Dividend Decreases		
CAR3	FE	RE	OLS	FE	RE	OLS
ΔD	0.0221***	0.0185***	0.0184***	0.035	0.0754***	0.0740**
	-0.00407	-0.00326	-0.00319	-0.0437	-0.029	-0.0292
Dummy		0.00453	0.00315		-0.0162	-0.0154
		-0.00508	-0.0049		-0.0213	-0.0213
ΔD*Dummy	-0.0081	-0.00348	-0.00322	-0.00912	-0.0642	-0.0625
	-0.0111	-0.00832	-0.00775	-0.1	-0.0614	-0.0612
Divyield	-0.00227	0.00123	0.0015	0.00283	-0.00228	-0.00259
	-0.0015	-0.000954	-0.000955	-0.00474	-0.00229	-0.00225
Earn_change	0.000515***	0.000634***	0.000678***	0.000428	0.000461*	0.000461*
	-0.000134	-0.000121	-0.000121	-0.00037	-0.000254	-0.000253
ROA	-0.00617	-0.00184	-0.00102	0.00533	0.0168***	0.0167***
	-0.00413	-0.0029	-0.00284	-0.0102	-0.00518	-0.00507
Leverage	7.26E-05	3.14E-05	3.40E-05	7.11E-05	-0.000144	-0.00013
	-4.96E-05	-2.83E-05	-2.74E-05	-0.00029	-0.000108	-0.000106
Payout	0.000781	0.00124	0.00143	0.000155	-0.00152	-0.00164
	-0.00084	-0.000847	-0.000879	-0.00193	-0.00121	-0.0012
Size	-0.00251**	-0.00148***	-0.00142***	-0.00376	-0.00158*	-0.00156*
	-0.00114	-0.000256	-0.000245	-0.00671	-0.000931	-0.000909
MTB	0.00202***	0.000820*	0.000514	0.0125**	0.00634***	0.00599***
	-0.000761	-0.000439	-0.000415	-0.0061	-0.00186	-0.00175
Constant	0.0178	0.000429	0.000635	0.00887	-0.0103	-0.0126
	-0.0114	-0.0097	-0.00958	-0.0493	-0.0127	-0.0124
Observations	12,845	12,845	12,845	1,597	1,597	1,597
R-squared	0.016		0.024	0.096		0.088
Number of permo	2,416	2,416		980	980	

Note. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1, CAR(-1,+1) = $\alpha_0 + \alpha_1(Dummy) + \beta_0(\Delta D) + \beta_1(\Delta D*Dummy) + \beta_2(\text{DivYield}) + \beta_3(\text{Profitability}) + \beta_4(\text{Earn\_change}) + \beta_5(\text{Leverage}) + \beta_6(\text{Payout}) + \beta_7(\text{Size}) + \beta_8(\text{MTB}) + e_i$

Table A6

Average Abnormal Returns When Dividend Changes (1980-2017)

Year	Increase		Decrease		No Change		Total	
	Bank	Ind	Bank	Ind	Bank	Ind	Bank	Ind
1980	0.00128204	0.00698573	0	-0.01471295	-0.00648142	0.00056325	-0.00461819	0.00144242
1981	0.00576775	0.0066094	-0.00345488	-0.00806459	0.00215692	0.00081966	0.00276685	0.00171237
1982	0.01759755	0.00529663	0	-0.01309599	0.00008011	0.00039193	0.00344885	0.00063683
1983	-0.0006987	0.00788297	0.00867362	-0.00355815	0.00030955	0.00106956	0.00026694	0.00212736
1984	0.00385954	0.00543486	0.00033987	-0.01208394	0.00150027	0.00027539	0.00195419	0.00094118
1985	-0.0050306	0.00284916	-0.05811775	-0.0087712	0.00288872	0.00009965	0.00010989	0.00041158
1986	0.00199926	0.00627314	0.03181688	-0.00255562	-0.00132726	0.00020108	-0.00038923	0.00110232
1987	0.00535172	0.00592497	-0.00493397	-0.00460308	-0.00087527	0.0010226	0.00029713	0.00176504
1988	0.00237137	0.00374598	0	-0.0094433	0.00014925	0.00102707	0.00070636	0.0014018
1989	0.00377825	0.00300226	-0.03074945	-0.01312836	-0.00132555	0.00011467	-0.00049429	0.00048195
1990	0.00602593	0.00511381	-0.04069727	-0.01401774	0.00049204	0.00077386	0.00060235	0.00122937
1991	-0.0048173	0.00511953	-0.03042958	-0.02138408	0.0015928	0.00095529	-0.00026311	0.0009692
1992	0.01042766	0.00553854	0.02373139	-0.01206946	-0.00393902	0.00125432	-0.00004114	0.00161033
1993	-0.0009785	0.0056712	-0.01178909	-0.00749255	0.00356929	0.00084419	0.00181941	0.00138115
1994	0.00160625	0.0054315	-0.00673885	0.00535823	0.00122599	0.00122396	0.00122706	0.00187177
1995	0.00027154	0.0044194	0.00590073	-0.01115182	0.00026799	0.00034015	0.00034007	0.00080852
1996	0.00306893	0.00512343	0.01413503	0.00251477	0.00152992	0.0002282	0.00219497	0.00097465
1997	0.00475363	0.00621061	-0.0079658	-0.01812408	0.00245706	0.00081667	0.00299924	0.00137417
1998	0.00158647	0.00409805	-0.0105919	-0.00531582	0.00142994	0.00095132	0.00140729	0.00133765
1999	9.70E-06	0.00299528	0.0052674	-0.00370262	0.00117473	0.00060232	0.00085806	0.00081643
2000	0.00441762	0.00549604	0.00301968	-0.01965503	-0.00045395	0.00241072	0.0009929	0.00241205
2001	-0.0002979	0.0038041	-0.00137513	-0.00469271	0.00132259	0.00129752	0.00087402	0.00140891
2002	0.00270161	0.00247005	0.00712089	-0.00374312	0.00148966	0.00115227	0.00185303	0.00120912
2003	0.00309236	0.00210427	-0.00093184	-0.00614697	-0.000281	0.00053484	0.0006838	0.00069152
2004	0.00078338	0.00269142	-0.00075239	-0.00277347	0.00139578	0.00116932	0.00123944	0.00140795
2005	0.00199671	0.00364305	-0.00296466	0.00142524	0.0007906	0.00082567	0.00103091	0.00131784
2006	-0.0017911	0.00235466	0.00712948	-0.0080123	0.0004353	-0.00003253	-0.00008578	0.00030612
2007	-0.0015707	0.00287275	0.01543386	0.01440244	0.00123943	0.00003777	0.00073606	0.00058944

2008	0.01112258	0.00574772	0.02600638	-0.01174456	0.01020587	0.00026344	0.01100374	0.00078586
2009	0.00103031	0.00655128	-0.00905947	-0.0152621	-0.0010453	0.00083822	-0.00211532	0.00078184
2010	0.00429547	0.00480194	0.00743625	-0.00120751	0.00055068	0.00055536	0.00111467	0.00123651
2011	0.00400092	0.0048555	0	-0.00518263	0.00131851	0.00052601	0.00179923	0.00121629
2012	0.00259682	0.00473239	0.00140606	0.00563225	-0.00119921	0.00129578	-0.00027549	0.00204684
2013	0.00062644	0.00354409	-0.00072284	0.00020046	0.00003957	-0.00006697	0.00016874	0.00066007
2014	0.00317807	0.00158785	0.00145911	-0.0016753	-0.00112284	0.0007114	-0.00004373	0.0008331
2015	0.00151833	0.00206565	-0.00039645	0.00359533	0.00043278	0.00038711	0.00068598	0.00073607
2016	0.00334696	0.00043205	0.00214495	-0.00105912	0.00211009	0.00132313	0.00239689	0.00112751
2017	0.00099355	0.0014935	0.00575025	-0.00490186	0.0016341	-0.00033478	0.00156409	-0.00011307

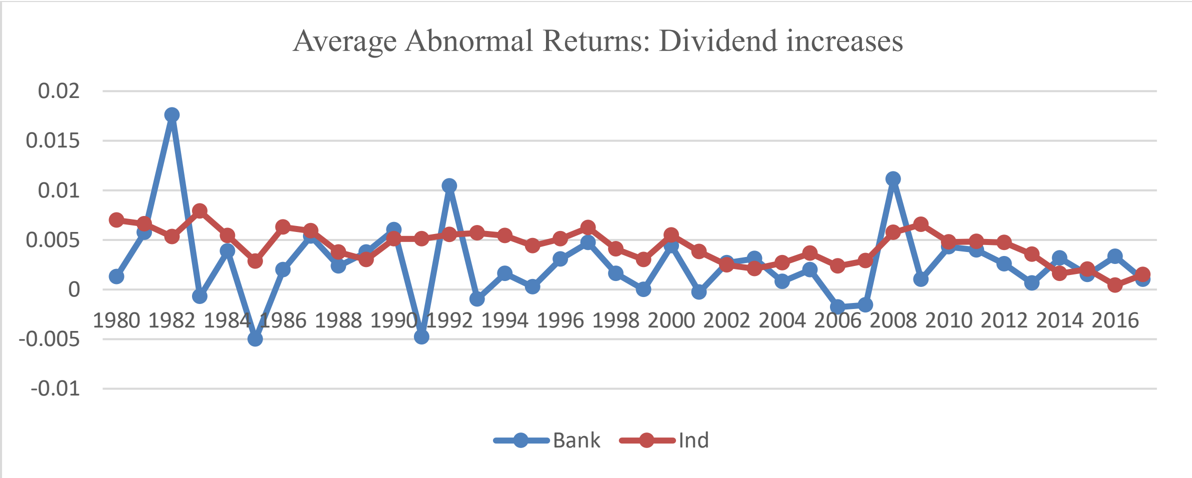

Figure A1: Average Abnormal Returns when Dividend Increases (1980-2017)

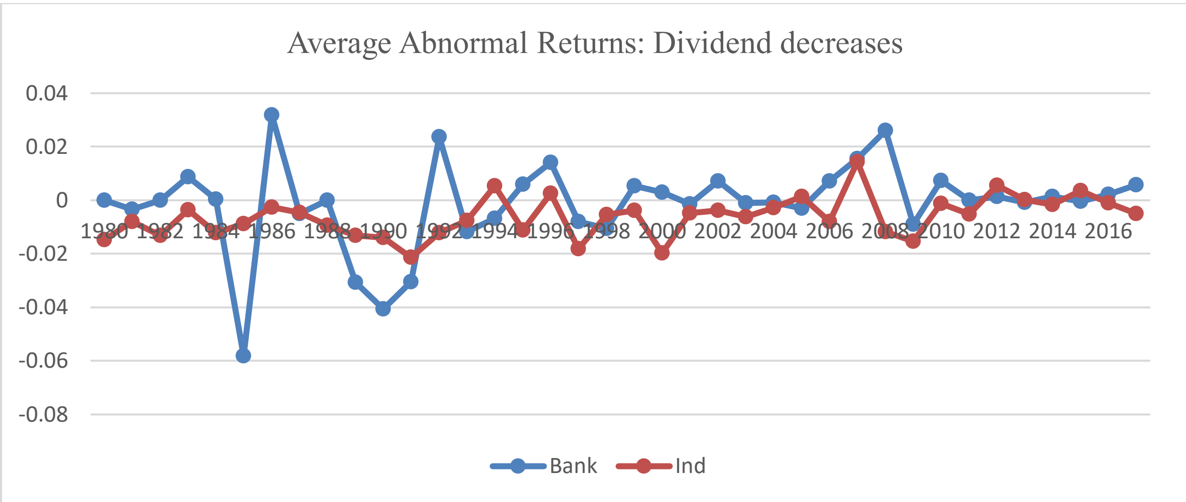

Figure A2: Average Abnormal Returns when Dividend Decreases (1980-2017)