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Corporate Payout Policy and Credit Risk: Evidence from CDS Markets

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Abstract

We examine whether and how payout policy affects credit risk using evidence from the credit default swap (CDS) market. CDS spreads increase substantially in response to announcements of dividend cuts, especially during recessions and among firms experiencing financial distress. CDS spreads also react more strongly to permanent and less anticipated dividend cuts. The size of CDS reaction is more pronounced for financial firms, which are inherently more opaque. In contrast, CDS spreads react weakly to dividend raises and share repurchases. The results show that the information effect of dividend changes dominates the wealth transfer effect.

Keywords: Dividend announcements, Credit default swaps, Industrial firms, Financial firms, Troubled Asset Relief Program

JEL Classification: G12, G14, G1

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1. Introduction

Dividend policy and stock repurchase policy are important corporate decisions in the real world where Miller-Modigliani conditions are not satisfied. Despite the tax disadvantage, dividend payouts remain economically significant and resilient.[1] Theoretically, there are two main hypotheses concerning the effect of dividend policy (and stock repurchase as a substitute of dividend raise) on the firm value and its distribution between equity and debt. The wealth transfer hypothesis postulates that dividend raises transfer wealth from debtholders to equityholders, especially when the firm is near financial distress, and vice versa for dividend cuts. The information hypothesis, on the other hand, suggests that dividend changes are credible ways for firm executives to convey information regarding the firm value to outside investors. Since both hypotheses imply that dividend raises increase whereas dividend cuts decrease equity value, empirical tests of the two hypotheses are typically not performed on stock prices, but instead on corporate bond prices, which react to dividend changes in opposite directions under the two hypotheses. The evidence so far, however, is mixed because trading of corporate bonds is illiquid.

In this paper, we use the reaction of credit default swap (CDS) spreads to announcements of dividend changes to adjudicate on the two hypotheses. A CDS is a contract in which the seller will compensate the buyer in the event of a debt default of the underlying firm. The spread of a CDS is the annualized rate that the buyer pays the seller periodically before the expiration of the CDS or the event of default. In the absence of bond trading frictions, CDS spreads should equal the bond yield spreads over risk-free rates. But because of bond trading frictions, CDS spreads have several advantages over bond prices. First, CDS spreads primarily reflect credit risk, while bond prices are affected by various non-credit risk factors such as liquidity and funding costs. Second, CDS markets reflect changes in credit risk more quickly and timely than bond markets. Contractual and institutional features facilitate continuous trading in CDS markets,

[1] A prominent empirical regularity documented by previous literature is that firms usually increase dividends gradually and rarely cut them (See Lintner (1956), Allen and Michaely (1995), Brav, Graham, Harvey, and Michaely (2005)).

while secondary bond markets are much less liquid due to the buy-and-hold strategy of many institutional investors. Third, CDS contracts are standardized and homogeneous, while corporate bonds are associated with heterogeneous features such as embedded options, guarantees, and covenants. Thus, CDS spreads serve as a better and cleaner measure of firm credit risk than do secondary corporate bond prices. Of course, CDS spreads are not perfect, as will be explained later, and we will take several steps to alleviate potential problems.

We perform our empirical work on 12,716 dividend announcements made by firms during the sample period of 2001 to 2014. We find that dividend cuts tend to be less frequent but larger in magnitude than dividend raises. CDS spreads increase significantly around announcements of dividend cuts and decrease modestly around announcements of dividend raises. This result suggests that on average the information effect of dividend changes dominates the wealth transfer effect for debtholders. In addition, CDS reactions to dividend cuts are generally stronger for financial firms than for industrial firms, consistent with the notion that the informational role of dividend cuts is more important for financial firms because of their more opaque nature.

We provide two sets of results to support our main findings. The first set pertains to the asymmetric effects of dividend changes on CDS spreads. We find that CDS spreads react much more strongly to dividend cuts than to dividend raises. Similarly, CDS reactions to share repurchases, which can be viewed as a substitute for dividend raises, are also weak. In particular, we find that the increase in CDS spreads during announcements of dividend cuts is economically and statistically significant during recessions, but insignificant at other times. We also show that the increase in CDS spreads in response to dividend cuts is stronger among firms with high credit risk and negative past stock performance. Our findings can be explained by two notions widely accepted in financial economics. First, the debt value is a concave function of a firm's asset value (hereafter, the concavity feature of debt), and thus debt reacts more strongly when the asset value is low whereas equity reacts more strongly when the asset value is high. Second, dividend decisions are not exogenous. Dividend cuts are more likely to occur when firms are experiencing distress and closer to the default boundary, while dividend raises or share repurchases are more likely to occur when firms are performing well. To complete the picture, we also show that stock price reactions to dividend changes are the exact opposite of CDS spread reactions. Stock prices react more strongly to dividend raises and less strongly to dividend cuts, as equity value is a convex function of firm value and dividend raises are more likely to occur when the value of a firm is far above its default boundary.

The second set of results pertains to the relation between CDS market reactions and the amount of information contained in dividend policy, holding the magnitude of dividend change constant. We show that the CDS reaction to dividend cuts is stronger when a firm's history of dividend payout is less volatile so that the current dividend cut is more likely to be interpreted by the market as a permanent cut, and when a firm cuts dividends for the first time so that the dividend cut is less anticipated by the market. Similarly, the weak information effect of share repurchases on CDS spreads can partly be explained by the fact that share repurchases reflect transient rather than permanent cash flow shocks. Furthermore, we exploit the government's introduction of the Troubled Asset Relief Program (TARP) during the 2008 financial crisis as an exogenous shock to the information content of dividend policy, and show that TARP-related dividend cuts do not cause significant, negative CDS market reactions because these cuts are mandatory and less informative.

We contribute to the literature in several ways. First, our study is the first to examine the effect of payout policy in the CDS market. Using CDS spreads as a better measure of firm credit risk, we provide new evidence that dividend cuts convey important negative information to the credit market and that the information effect dominates the wealth transfer effect for debtholders. We show further that CDS reactions to dividend cuts are stronger when firms are in financial distress, both in time series when the economy is in and out of recessions and in cross sections for firms with different levels of default risk. Second, while the traditional view of dividend signaling suggests that dividend changes convey information about future cash flow, some researchers have recently proposed that dividend changes contain more information about the discount rate. We contribute to this line of research by linking dividend changes to changes in firms' default risk, confirming the latter view. Third, our results shed light on a recent policy debate regarding financial firms' dividend policy during the 2008 financial crisis. Many such financial firms were criticized for being reluctant to cut dividends while receiving bailout from the government, leaving debtholders in peril. Our results show that such a view overemphasizes the wealth transfer effect of dividend changes and overlooks the information effect. An unnecessary dividend cut may mislead the market and cause the CDS spreads to rise and debt value to fall, hurting debtholders much more than the wealth transfer would benefit them.

2. Literature Review

Our paper is closely related to several strands of the literature. The first is about the effect of dividend changes on the values of equity and debt. As dividend raises benefit equityholders while hurting debtholders in the event of bankruptcy, dividend changes have an obvious and direct wealth transfer effect on equityholders and debtholders. The proposition stating this as the only or main effect of dividend changes is known as the wealth transfer hypothesis. The information hypothesis articulated by Bhattacharya (1979, 1980), Miller and Rock (1985), and John and Williams (1985), previously known as the signaling hypothesis, states that firms change dividend levels to signal the change in its future prospects. If the market interprets the signal correctly, then dividend raises (cuts) will lead to increases (decreases) in both equity value and debt value. Therefore, the two hypotheses imply the same effect on the value of equity, but opposite effects on the value of debt. Woolridge (1983) finds that unexpected dividend increases (decreases) are associated with positive (negative) bond returns. Handjinicolaou and Kalay (1984) show that bond prices react negatively to dividend decreases, but do not respond to dividend increases. Both studies suggest that the information content effect dominates the wealth transfer effect of dividend announcements. In contrast, Dhillon and Johnson (1994) find that large dividend decreases (increases) are associated with positive (negative) bond excess returns, which suggests that the wealth transfer effect dominates the information content effect in the bond market. In addition, Maxwell and Stephens (2003) show that bond prices decrease around announcements of open market repurchases, which also supports a wealth transfer effect. A recent study by Tsai and Wu (2015), who use bond transaction data, provides evidence that the information content effect dominates the wealth transfer effect in the bond market. The mixed results are potentially due to the limited sample coverage of bond trading data in earlier studies and the lack of liquidity in the secondary bond markets, such that the change in firm credit risk cannot be reflected in a timely and accurate manner around announcements of dividend changes.[2] Given these mixed results, the results in this paper based on CDS spreads, which dominate bond returns or bond yields in terms of data quality, help better understand how debt markets evaluate dividend decisions.

Second, what dividend changes actually signal is a long-debated issue. Early theoretical work suggests that dividend changes signal future profits but the empirical evidence is mixed. While Nissim and Ziv (2001) find a positive relation between dividend changes and future profitability, DeAngelo, DeAngelo, and Skinner (1996), Benartzi, Michaely, and Thaler (1997), and Grullon, Michaely, Benartzi, and Thaler (2005) find no relation or even a negative relation. Grullon, Michaely, and Swaminathan (2002) and Michaely, Rossi, and Weber (2017) argue that, rather than signaling changes in future profitability, dividend changes signal changes in firms' discount rates. Charitou, Lambertides, and Theodoulou (2011) infer from stock prices using Merton's (1974) model that firms' default risk declines after dividend increases and initiations. Our results based on CDS spreads provide direct evidence that dividend changes contain useful information about firms' default risk.

Third, there is a recent literature pertaining to the debate on the dividend decisions of financial firms during financial crises. Scharfstein and Stein (2008) argue that banks receiving direct federal support should be forbidden from paying dividends in order to protect creditors and the health of the banks and the economy. Acharya, Gujral, Kulkami, and Shin (2011) present evidence that during the 2007-2009 financial crisis, the composition of bank capital radically shifted from common equity to debt-like claims. The

[2] Handjinicolaou and Kalay's (1984) sample consists of 255 straight bonds randomly chosen from those traded on the NYSE during 1975-1976, with 42 dividend decreases and 143 dividend increases during the sample period. Dhillon and Johnson's (1994) sample is limited to bonds traded on the NYSE or AMEX from 1978 to 1987 with 70 dividend decreases and 61 dividend increases during the sample period.

erosion of common equity is exacerbated by large-scale dividend payouts in spite of anticipated credit losses, which reflects a transfer of wealth from creditors to shareholders. Acharya, Le, and Shin (2016) theoretically show that when banks have contingent claims on each other, one bank's dividend policy will affect the equity value and default risk of the other banks. When such externalities are large, the private equilibrium will feature excessive dividends. These studies mainly hinge on the wealth transfer effect of dividend changes.

Lastly, extensive studies have shown that CDS spreads provide a better alternative to bond yields for capturing firm credit risk. CDS spreads are mainly driven by default probability and default risk premium, while bond yields are also affected by other factors such as liquidity. Chen, Lesmond, and Wei (2007), Covitz and Downing (2007), Bao, Pan, and Wang (2011), Lin, Wang, and Wu (2011), and Acharya, Amihud, and Bharath (2013), for example, find that liquidity and liquidity risk play a substantial role in determining bond yields. A CDS is much more liquid than a bond and thus provides more timely information about companies' credit risk. Blanco, Brennan, and Marsh (2005), Daniels and Jensen (2005), Augustin, Subrahmanyam, Tang and Wang (2014), and Lee, Naranjo and Velioglu (2018) find that the CDS market leads the bond market in the discovery of credit risk. Besides being widely used to estimate credit risk, CDS spreads are also used to measure firms' financial strength, and CDS trading has been linked to asset prices and corporate policies. [3] Our work adds to this literature by showing how CDS spreads react to dividend changes.

3. Data

[3] Studies using CDS to measure credit risk include EIkamhi, Jacobs and Pan (2014) for recovery rates, Friewald, Wagner, and Zechner (2014) for credit risk premiums, and Giglio (2014) for counterparty risk of financial institutions. Studies using CDS to measure firms' financial strength include Carlson and Lazrak (2010) on compensation structure, Hortacsu, Matvos, Syverson and Venkataraman (2013) on firms' financial distress and its indirect costs, and Adelino and Dinc (2014) on lobby activities. CDS is used by Das, Kalimipalli and Nayak (2014)) on the market for corporate bonds, by Subrahmanyam, Tang, and Wang (2014) on the measurement of credit risk, by Amiram, Beaver, Landsman and Zhao (2017) on information asymmetry in syndicated loans, by Li and Tang (2016) on firm leverage, by Subrahmanyam, Tang, and Wang (2017) on corporate liquidity management, and by Danis and Gamba (2018) on firm value.

We obtain CDS data for the period from 2001 to 2014 from Markit. We focus on CDS contracts with maturities of one, three, and five years as they are the most liquid ones. In addition, to enhance the homogeneity of the sample, we limit our analysis to CDS contracts that are denominated in US dollars and that include the no-restructuring (XR) or modified-restructuring (MR) clause (Friewald, Wagner, and Zechner (2014)).[4] Data on daily stock returns and dividend announcement dates are collected from the Center for Research in Security Prices (CRSP). Financial statement information and credit rating data are extracted from Compustat. We restrict our sample to common stocks traded on the NYSE, AMEX, and NASDAQ, and ordinary quarterly, semi-annual, and annual cash dividends paid in US dollars. In addition, we exclude dividend announcements that are made on the same day as earnings announcements. Our final sample consists of 10,748 dividend announcements by 412 industrial firms and 1,968 dividend announcements by 88 financial firms (i.e., firms with one-digit SIC code of 6) from 2001 to 2014.[5] We distinguish between industrial and financial firms because financial firms are inherently more opaque as suggested by Morgan (2002), Floyd, Li, and Skinner (2015), and many others, making dividend changes an important signaling device for them.

To ensure the dividend changes we measure are economically significant, we follow the literature to treat any *percentage* change in absolute value below 5% as no change. *CutD* and *RaiseD* are dummy variables using 5% as the cutoff. We also use dollar change scaled by stock price as one of our key variables. Dividend cut, *Cut,* is the absolute dollar change scaled by stock price if *CutD* equals one and zero otherwise. Dividend raise, *Raise,* is the absolute dollar change scaled by stock price if *RaiseD* equals one and zero otherwise.

[4] Under the XR clause, restructuring credit events are eliminated from a CDS contract. Under the MR clause, any restructuring is defined as a credit event, but the deliverable obligations are limited to bonds maturing within 30 months of the CDS contract's remaining term.

[5] Respectively 98.5%, 0.5%, and 1% of all the announcements in the sample concern quarterly, semi-annual, and annual dividend payments. We keep dividend payments of all frequencies for completeness, but our results are qualitatively the same when we restrict the sample to quarterly dividend payments.

In the Internet Appendix (Table IA.1), we present the frequency of dividend announcements by year for industrial and financial firms. For industrial firms, 123, 1,496, and 9,129 announcements are related to dividend cuts, dividend raises, and no dividend changes, respectively. For financial firms, 41, 318, and 1,609 announcements are related to dividend cuts, dividend raises, and no dividend changes, respectively. In general, we observe more dividend cuts during the financial crisis in 2008 and 2009 than at other times.

Figure 1 plots the average cumulative changes in CDS spreads surrounding dividend announcement dates for dividend cuts (Panel A), dividend raises (Panel B), and no dividend changes (Panel C). For both industrial and financial firms, CDS spreads react strongly to announcements of dividend cuts but weakly to announcements of dividend raises and no dividend changes. In addition, CDS spreads start reacting as early as seven trading days before the actual announcement date for dividend cuts. The preannouncement drift is not due to concurrent events as it remains robust for the subsample excluding earnings announcements, credit rating changes, and covenant violations around the event.[6] The finding that CDS changes precede dividend changes is consistent with the use of non-public information in the CDS market as suggested by the previous literature (Acharya and Johnson (2007), Qiu and Yu (2012)), which finds that there is significant incremental information revelation in the CDS market for negative credit news and that the information revelation increases with the number of relationship banks a firm has. Similar findings are also observed in other studies documenting that CDS markets usually react before event announcements. For example, Loon and Zhong (2014) show that the CDS market reacts to the announcement of central clearing 10 days before the announcement is actually made. Consequently, we use the event window of (-7, 7) days, referred to as the 15-day window, as our primary event window, in

[6] To be exact, we require there to be no earnings announcements during the (-7,7) event window, no credit rating changes in the most recent month, and no covenant violations in the most recent quarter. The cumulative changes in CDS spreads during announcements of dividend cuts for the subsample without concurrent earnings announcements, credit rating changes, and covenant violations are presented in Figure IA.1 in the Internet Appendix.

which day zero is the dividend announcement date. $\Delta Spread_{i,t}$ is the change in CDS spreads for firm *i* in the (-7, 7) event window surrounding the dividend announcement date *t*.[7]

Table 1 presents the descriptive statistics of the variables used in our analyses for industrial firms (panel A) and financial firms (panel B). We winsorize all continuous variables at the top and bottom 1% of their respective distributions. All CDS spreads are expressed in basis points (bps). On the dividend announcement date, the average CDS spreads for 1-year, 3-year, and 5-year contracts are 56.7 bps, 82.5 bps, and 107.0 bps respectively for industrial firms and 72.0 bps, 90.1 bps, and 106.1 bps respectively for financial firms. During the 15-day event window, the average spread changes of 1-year, 3-year, and 5-year CDS contracts are all about 0.5 bps for industrial firms and 1.7 bps, 1.4 bps, and 1.3 bps respectively for financial firms.

We find 123 cuts and 1,496 raises whose percentage change exceeds 5% in absolute value, accounting for 1.1% and 13.9% of all dividend changes, respectively. As a percentage of the stock price, the average dividend cut is 1.113% for industrial firms and 1.172% for financial firms, and the average dividend raise is 0.100% for industrial firms and 0.127% for financial firms. Cuts are about 10 times larger than raises in absolute value.

Table 1 also presents descriptive statistics for several variables used as control variables in later analyses. These control variables are more or less standard in the literature. The definitions and notations of these variables are summarized in Appendix A.

4. Empirical Results

4.1 CDS market reactions to dividend announcements

We first perform univariate analysis on the CDS market reactions to dividend announcements. We investigate industrial and financial firms separately. Panel A of Table 2 presents the univariate analysis of

[7] In the Internet Appendix, we show that the equity market does not display early reactions (Figure IA.2). Furthermore, we show that early reactions in the CDS market can predict future cumulative abnormal equity returns following the announcements of dividend cuts, suggesting that information flows from the CDS market to the equity market. The predictability is stronger for firms with more existing bank relationships, as banks might have special access to firm information. Detailed results are discussed in the Internet Appendix (Section IA.1 and Table IA.2).

the average changes in CDS spreads during the (-7, 7) event window surrounding the announcements of dividend cuts, raises, and no changes. The table shows three main findings. First, for both industrial and financial firms, CDS spreads of all maturities significantly increase during the announcements of dividend cuts. The result indicates that the information content effect of dividend cuts dominates their wealth transfer effect on firm credit risk.

Second, the CDS market reactions to dividend changes are highly asymmetric: dividend cuts have a much stronger impact on CDS spreads than do dividend raises. For example, the average change in one-year CDS spreads during the (-7, 7) event window is 26.9 bps (*t*-statistic = 2.09) for dividend cuts, but only -0.5 bps (*t*-statistic = -1.45) for dividend raises among industrial firms. The market reaction to dividend cuts is not only statistically significant but also economically large. As the average one-year CDS spread is 56.7 bps for industrial firms, an increase of 26.9 bps represents a 47% (26.9/56.7) jump on average around the announcements of dividend cuts. The impact is even larger for financial firms, for which the one-year CDS spread jumps by an average of 109% (78.4/72.0) around the announcements of dividend cuts.

Third, dividend changes have a greater impact on CDS contracts with a shorter maturity. In the 15-day event window of a dividend cut announcement, the 1-year, 3-year, and 5-year CDS spreads increase by 26.9 bps, 24.6 bps, and 20.6 bps respectively for industrial firms and 78.4 bps, 66.0 bps, and 55.0 bps respectively for financial firms. This finding is consistent with prior studies, which suggest that the effect of current earnings news on CDS spreads decreases with CDS maturity (Callen, Livnat, Segal (2009)). The pattern of greater reactions for shorter maturities has been observed on many financial rates that have a term structure. The common explanation is that the source of fluctuations is mean-reverting, so through expectations, long-term rates react to shocks less strongly than do short-term rates.

Next, we perform a regression analysis of CDS market reactions to dividend announcements. Our first regression model uses dummy variables indicating dividend cuts and raises, and our second regression model uses the magnitudes of the corresponding dividend changes relative to stock prices. We use both approaches to facilitate the interpretation of the results because dividend cuts tend to be larger than dividend raises in terms of size. Our regression models are as follows:

$$\Delta Spread_{i,t} = \beta_0 + \beta_1\ CutD_{i,t} + \beta_2\ RaiseD_{i,t} + \gamma\ Control_{i,t}\ + \varepsilon_{i,t}, \quad (1)$$

$$\Delta Spread_{i,t} = \beta_0 + \beta_1\ Cut_{i,t} + \beta_2\ Raise_{i,t} + \gamma\ Control_{i,t} + \varepsilon_{i,t}, \quad (2)$$

where $\Delta Spread_{i,t,}$, *Cut, CutD, Raise,* and *RaiseD* are defined in the last section. We include the following control variables: (1) *EarnSur*, earnings surprises, (2) Δ*Earnings*, earnings changes, and (3) Δ*Volatility*, change in stock return volatility during the (-7, 7) event window. We control for earnings surprises and earnings changes since they are associated with changes in CDS spreads according to Callen, Livnat, and Segal (2009). We control for volatility changes since volatility is a fundamental determinant of credit risk and it may change over the event window. We also control for year- and firm-fixed effects.

Panel A of Table 3 reports the results estimating Eq. (1) for CDS contracts of 1-year, 3-year, and 5-year maturities. We find that the coefficient on *CutD* is significantly positive for both industrial and financial firms, suggesting that CDS spreads increase during announcements of dividend cuts. The coefficient on *CutD* for financial firms is three times larger than that for industrial firms, suggesting that the information effect of dividend cuts is stronger for financial firms than for industrial firms. The coefficient on *RaiseD* is insignificant for both industrial and financial firms. Panel B reports the regression results estimating Eq. (2). We find that after considering the magnitude of dividend changes, the coefficients on *Cut* remain significantly positive for both industrial and financial firms (Panel B of Table 3). These results suggest that dividend cuts contain useful information for the credit market, while the information effect of dividend raises is limited.

We perform a series of robustness tests. As announcements of dividend changes may occur at the same time as other corporate events such as earnings announcements, credit rating changes, and covenant violations, the CDS spread changes reported in Panel A of Table 2 may be attributed to corporate events other than dividend changes. To isolate the information effect of dividend announcements from that of other events, we report in Panel B of Table 2 the changes in CDS spreads for the subsample without concurrent earnings announcements, credit rating changes, and covenant violations. In the Internet Appendix (Table IA.3), we also report the changes in CDS spreads over a 10-day event window of (-5, 5) days and over a shorter post-event window of (-7, 3) days. The results reported in Panel A of Table 2 remain robust under these different event window specifications.

Our results may be confounded by debt covenant violations, which are likely to trigger dividend cuts. A violation of debt covenants reveals substantial information about the firm's credit condition and leads to debt contract renegotiation. To address this concern, we identify the occurrence of debt covenant violations following Nini, Smith, and Sufi (2012), who obtain information directly from 10-K and 10-Q Securities and Exchange Commission (SEC) fillings based on a text-search algorithm. We obtain the data from 1996 to 2008 from Amir Sufi's website, and use the same search algorithm to obtain the data from 2009 to 2014 for our sample of industrial firms.[8] We then repeat the analysis in Panel A of Table 3 by further controlling for *CurrentViolation* and *PastViolation*. *CurrentViolation* equals one if the firm violates debt covenants in the current quarter and zero otherwise. *PastViolation* equals the frequency of debt covenant violations in the past three quarters. The results, reported in the Internet Appendix (Panel A of Table IA.4), show that the coefficients on *CutD* remain significantly positive. This finding suggests that dividend announcements provide robust incremental information above and beyond that reflected in debt covenant violations.

We perform additional robustness checks as follows. First, we control for the change in the number of price contributors, which is a measure of CDS liquidity that may change, for example, due to capital shocks of financial intermediaries (Panel B of Table IA.4). Second, we control for equity returns during the announcement window to test whether dividend announcements convey incremental information to the credit market in addition to that reflected in the equity market (Panel C of Table IA.4). Third, instead of clustering standard errors at the firm and year levels, we cluster them at the industry and year levels to further take into account cross-correlations within industries (Panel D of Table IA.4). For all specifications, our results remain qualitatively similar.

[8] We restrict the sample of this analysis to industrial firms due to the limitation of debt covenant violation data.

Furthermore, in order to investigate whether CDS markets overreact to the news of dividend cuts, we consider CDS spread changes in extended event windows. Specifically, we regress CDS spread changes over the (8, 15) and (16, 30) extended event windows on dividend change dummies. The results are reported in Table IA.5 in the Internet Appendix. We show that CDS spreads are not significantly different in these extended event windows and do not revert over time.

In sum, our analyses in Tables 2 and 3 and those in the Internet Appendix show that CDS spreads increase significantly during announcements of dividend cuts, indicating that the information effect of dividend cuts dominates the wealth transfer effect for debtholders. Moreover, CDS markets react more strongly to dividend cuts than to dividend raises, consistent with the concavity feature of debt payoff and the notion that dividend cuts reveal a firm's severe financial weakness.[9] While all the results hold for both industrial and financial firms, dividend cuts have a stronger impact on CDS spreads for financial firms than for industrial firms, potentially due to the inherent opacity of financial firms.

4.2 Analyses conditional on the macroeconomic environment

Due to its concavity feature, debt value should respond little when the value of a firm is far above its default boundary, as payoffs of debt are fixed and unaffected by variations in the firm's cash flows. In such circumstances, dividend raises are more likely than dividend cuts, but the effect is absorbed by equity value. When the value of a firm falls close to its default boundary, the concavity feature dictates that debt value responds more strongly to changes in firm value, while equity value responds less strongly in absolute terms. Thus, the CDS market reaction to dividend changes should be greater when firm value is low and credit risk is high. In this subsection, we explore market-wide time-series variations in firm default risk and test the prediction by conditioning the analysis on the macroeconomic environment. The next two

[9] In untabulated results, we also investigate dividend omissions and initiations, which we define in the same way as Michaely, Thaler, and Womack (1995) do. Our sample consists of 58 omissions and 81 initiations. In the univariate analysis, we find that CDS spreads increase when firms omit dividends and decrease when firms initiate dividends. Moreover, the CDS market reaction to dividend omissions is larger than that to dividend initiations. In the regression analysis with fixed effects and control variables, however, the coefficient on dividend omissions becomes insignificant, potentially due to the small sample size and the estimation error in the dividend omission data.

subsections are devoted to the analyses of the same phenomenon in the cross-sections of firms with heterogeneous degrees of credit risk. The subsection after that aims to complete the picture by showing the stock price reactions to dividend changes, which exhibit the convexity feature as opposed to the concavity feature of bonds.

We define the years 2001, 2002, 2008, and 2009 as the recession periods.[10] Panel A of Table 4 reports the univariate analysis. We find that on average CDS spreads respond significantly to dividend cuts only during the recession periods, with the 1-year, 3-year, and 5-year CDS spreads increasing by 49.9 bps, 46.5 bps, and 38.3 bps, respectively, for industrial firms. Given that the average one-year CDS spread is 56.7 bps, an increase of 49.9 bps amounts to an 88% jump on average during the 15-day event window of dividend cuts. The CDS spreads increase by even more—138.4 bps, 112.9 bps, and 92.5 bps for 1-year, 3-year, and 5-year CDS, respectively—in response to dividend cuts for financial firms during recessions. For dividend raises, CDS spreads generally decrease, but the magnitude is much smaller than the magnitude (of increase?) for dividend cuts.

Panel B of Table 4 reports the regression analyses. Our variables of interest are the interaction terms between the dummy variables indicating dividend cuts and raises (*CutD* and *RaiseD*) and a dummy variable indicating recession periods (*Recession*). We find that the coefficient on *CutD* × *Recession* is significantly positive for both industrial and financial firms. For industrial firms, the coefficient is 41.1 for the 1-year, 38.1 for the 3-year, and 30.1 for the 5-year CDS contracts. For financial firms, this coefficient is larger—155.6 for the 1-year, 125.8 for the 3-year, and 101.1 for the 5-year CDS contracts. These results suggest that CDS spreads increase more in response to dividend cuts during recession periods than they do during non-recession periods, and this phenomenon is especially pronounced for financial firms. The coefficient on *RaiseD* × *Recession* is insignificant in all cases for both industrial and financial firms.

[10] These periods follow the peak of the NBER business cycle reference dates of March 2001 and December 2007. As in Bordo (2008), we identify 2001-2002 as the period of the dot-com bubble which saw widened Baa 10-year composite spreads, a measure of market-wide credit risk. The period of 2008-2009 is the Great Financial Crisis period commonly identified in prior studies (e.g., Lins, Servaes, and Tomayo (2017)).

Figure 2 illustrates the impact of dividend announcements on CDS spreads based on 5-year CDS contracts during 2001-2014 for industrial and financial firms. We find that CDS spreads increase the most during announcements of dividend cuts in 2002 and 2008. For industrial firms, CDS spreads on average soared by nearly 180 bps in 2002 and 60 bps in 2008 during the 15-day event window of dividend cuts. For financial firms, CDS spreads jumped by more than 110 bps during announcements of dividend cuts in 2008. It is evident from the figure that the credit market reacts strongly and unfavorably to dividend cuts, especially during periods of heightened credit risk.

4.3 Analyses conditional on firm-level credit risk

We further explore the cross-sectional variation in default risk by examining the effect of dividend changes on CDS spreads conditional on firm-level credit risk measures. We use credit ratings, leverage, and Oscore to capture firm-level credit risk. These measures are less applicable to financial firms which rarely receive speculative-grade credit ratings, tend to have a high leverage, and are subject to a different set of accounting rules. Therefore, we restrict this analysis to industrial firms. The first measure, a speculative grade dummy (*SPE)*, equals one if a firm has an S&P long-term credit rating below BBB- and zero otherwise. The second measure, *LevD*, equals one if a firm's leverage is above the sample median in the current quarter and zero otherwise. The third measure, *OscoreD*, equals one if a firm's Oscore, a measure of firm bankruptcy risk based on accounting information (Ohlson (1980)), is above the sample median in the current quarter and zero otherwise. Firms with a value of one for *SPE*, *LevD*, or *OscoreD* have higher credit risk than other firms. We interact dividend change dummies (*CutD* and *RaiseD*) with each credit risk measure and investigate the coefficients on the interaction terms in the regression of CDS spread changes during dividend announcements.

We first examine the effect of firm-level credit risk heterogeneity in the full sample. Panel A of Table 5 reports the results. The coefficients on the interaction terms between *CutD* and all three credit risk measures are significantly positive, showing that CDS spreads increase significantly more in response to dividend cuts among industrial firms with higher credit risk. These results corroborate the importance of the informational role of dividend decisions when firms are experiencing financial distress.[11]

In order to isolate the effects of macroeconomic conditions from the effects of firm-level credit risk, we further restrict our analysis to non-recession periods. Panel B in Table 5 reports the regression of CDS spread changes on firm-level credit risk during non-recession periods. We find that the coefficients on the interaction terms between *CutD* and the credit risk measures are significantly positive in most of the specifications, indicating that during non-recession periods, CDS spreads increase significantly more for firms with higher credit risk around announcements of dividend cuts. Our results provide evidence that beyond the scope of macroeconomic conditions, cross-sectional variations in firm credit risk play a distinct role in determining the information effect of dividend cuts on CDS spreads.

4.4 Analyses conditional on firm past stock performance

The concavity feature of debt and the convexity feature of equity predict that when equity value drops substantially, the value of a firm moves closer to its default boundary, and the debt value becomes more sensitive to news about firm value. In other words, firms whose equity value has seen a drop in the past, which reflects a decline in firm credit quality, will entail stronger CDS reactions to news about their value, especially negative news such as dividend cuts. To test this prediction, we investigate the effect of dividend changes on CDS spreads conditional on a firm's past stock performance. We define a dummy variable, *NegPastRet*, which equals one if the firm's stock return in the past quarter is negative and zero otherwise. We interact the dummy variables indicating dividend changes (*CutD* and *RaiseD*) with *NegPastRet* and investigate the coefficients on the interaction terms.

Table 6 reports the results. For both industrial and financial firms, we find that the coefficient on *CutD* × *NegPastRet* is significantly positive for 1-year, 3-year, and 5-year CDS contracts. The results support our

[11] For parsimony, we only present results using dividend change dummies in this and subsequent analyses. The use of dummy variables facilitates the interpretation of the coefficients on the interaction terms and avoids the assumption of a linear relation between CDS spread changes and dividend changes. The results using magnitudes of dividend changes (untabulated) are qualitatively the same.

prediction that the CDS market responds to negative news more after firms have already received negative shocks, as reflected in the past stock return performance. The coefficient is also larger for financial firms than for industrial firms. In addition, we find that the coefficient on *RaiseD* × *NegPastRet* is generally insignificantly, suggesting that past stock performance is less important for dividend raises than for dividend cuts.

4.5 Stock price reactions to dividend changes

So far we have tested the information hypothesis of dividend decisions in the credit market. A natural question is: what is the informational role of dividend changes in the equity market? The information hypothesis implies that equity value should respond more strongly to a dividend raise than to a dividend cut because the payoff of equity is a convex function of the underlying firm value.[12] In this subsection, we attempt to test this prediction and provide a unified explanation for the information content effect of dividend decisions in both credit and equity markets.

Panel A of Table 7 reports the univariate analysis of cumulative abnormal equity returns during dividend announcements. Cumulative abnormal returns (CARs) are calculated from the Fama and French three-factor model.[13] We present the results for the (-7, 7), (-5, 5), and (-3, 3) event windows. The results show that stocks have significant negative abnormal returns during announcements of dividend cuts and significant positive abnormal returns during announcements of dividend raises. More importantly, the CARs during dividend raises are comparable to (or even larger than) those during dividend cuts. It is worth noting that dividend cuts are on average 10 times larger than dividend raises in terms of magnitude, which means that given the same level of dividend change, equity returns respond more strongly to dividend raises than to

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[12] More precisely, stock price responds to news about the firm much more strongly when the firm's value is far above its default boundary than when it is close to its default boundary, no matter whether the news is good or bad. However, dividend changes are not exogenous, dividend raises tend to occur when the firm's value is far above its default boundary, and dividend cuts tend to occur when the firm's value is close to its default boundary, hence the implication.

[13] We use a 150-day pre-event window to estimate the Fama and French three-factor model coefficients and require return data to be available for at least 30 days. We use a 30-day gap between the pre-event estimation period and the event window in order avoid any microstructure effects and mechanical results. We also use the market model and the Carhart four-factor model, and our results remain qualitatively the same.

dividend cuts. We further clarify this point in the following regression analysis based on the magnitude of dividend change.

Specifically, we run the following multivariate regression of CARs on dividend changes:

$$CAR_{i,t} = \beta_0 + \beta_1\, CutD_{i,t} + \beta_2\, RaiseD_{i,t} + \gamma\, Control_{i,t} + \varepsilon_{i,t}, \quad (3)$$

$$CAR_{i,t} = \beta_0 + \beta_1\, Cut_{i,t} + \beta_2\, Raise_{i,t} + \gamma\, Control_{i,t} + \varepsilon_{i,t}, \quad (4)$$

where $CAR_{i,t}$ is the CAR in basis points of firm i based on the Fama and French three-factor model during the (-7, 7) event window of a dividend announcement at time t and other variables are defined the same as before. Columns 1 and 2 in Panel B of Table 9 report the results for the regression of CARs on dividend change dummies. Consistent with our univariate analysis, the coefficient on *RaiseD* is comparable to (or slightly larger than) the coefficient on *CutD*. Columns 3 and 4 in Panel B of Table 9 report the results for the regression of CARs on the absolute value of dividend change scaled by stock price. In column 3, the coefficient on *Cut* is -24.9, which means that a decrease of one percentage point in the dividend-to-price ratio leads to a decrease of 24.9 bps in CARs during the 15-day dividend announcement window. The coefficient on *Raise* is 160.3, which means that an increase of one percentage point in the dividend-to-price ratio leads to an increase of 160.3 bps in CARs during the 15-day dividend announcement window. Furthermore, after controlling for earnings news and change in equity volatility in column 4, we find that the coefficient on *Cut* and its significance are reduced, while the coefficient on *Raise* remains significantly positive with a large magnitude. The results show that the coefficient on *Cut* is much smaller than that on *Raise*, meaning that stock prices react much more strongly to dividend increases than to dividend decreases given the same magnitude of dividend change. Our analyses thus provide evidence that dividend raises contain a larger amount of important information in addition to that reflected in equity value than dividend cuts do.

In sum, our studies in the equity market suggest that given the same level of dividend change, equity value responds more strongly to dividend raises than to dividend cuts during our sample period. This result is consistent with the convexity feature of equity and the information hypothesis of dividend decisions. Our results thus unify the evidence from both the credit and equity markets by showing that dividend policy contains important information for valuing both debt and equity. Consistent with their different payoff structures, the credit market responds more strongly to dividend cuts, while the equity market reacts more to dividend raises. This is so because firms tend to raise dividends when they are in good shape and cut dividends when they are in bad shape.

4.6 CDS market reactions to dividend cuts conditional on past dividend changes

CDS market reactions to announcements of dividend cuts should also depend on the information contained in the announcements. In this subsection and the next we present evidence on this proposition. CDS spread changes in response to dividend changes may depend on firms' past dividend policy. If a firm's past dividend payout is stable with little volatility, the announcement of a dividend cut is more likely to represent a permanent cut and the CDS market would likely react strongly. In contrast, if a firm's past dividend payout is highly volatile, the announcement of a dividend cut may be interpreted by the market as transitory and the CDS market would probably not react much.

We partition dividend cuts into subsamples of low and high dividend volatility (*DivVol*) based on the median value of *DivVol* in the same fiscal quarter, where *DivVol* is defined as the standard deviation of the quarterly percentage changes of dividends over the past 20 dividend payments. The sample is slightly reduced as we require the previous 20 quarterly dividend payments to be available. The results are reported in Panel A of Table 8. It is evident that the CDS market reaction to dividend cuts is particularly strong for firms with low dividend volatility. The market reaction is weak for firms with high dividend volatility.

Dividend cuts are more likely to be unanticipated if they are happening for the first time, while recurring dividend cuts may be less of a surprise to investors. Thus, we split dividend cuts into subsamples of first and recurring dividend cuts using the full dividend payment records in CRSP since 1960. The results are reported in Panel B of Table 8. We show that the CDS market reacts strongly to first dividend cuts. The market reaction is weaker for recurring dividend cuts.

4.7 CDS market reactions to TARP-related versus non-TARP-related dividend cuts

Lehman Brothers fell in September of 2008 amid the financial crisis triggered by the subprime debt problem. On October 3, 2008, the US government launched the Troubled Asset Relief Program (TARP), which authorized the Treasury to spend up to $700 billion to purchase “troubled assets” from financial institutions. Amid wide concerns over the risk-shifting behavior of bank holding companies (Scharfstein and Stein (2008); Acharya, Gujral, Kulkami, and Shin (2011); Acharya, Le, and Shin (2016)), the TARP recipients were required to consult with the Federal Reserve on payout plans and to obtain approval from the Treasury for common stock dividends and share repurchases.[14] Beyond refraining from raising dividends or repurchasing shares, a number of financial institutions participating in the TARP cut dividends under the increasing pressure from the government.[15] Because the decisions to cut dividends by TARP recipients are considerably influenced by government interventions rather than solely determined by the firms’ own economic fundamentals and financial solvency, TARP-related dividend cuts do not necessarily signal deteriorating credit conditions of financial institutions, but rather gestures of complying with the government policy. As a result, investors do not necessarily view the announcements of TARP-related dividend cuts as negative information about firms’ financial health, so we expect attenuated CDS market reactions to TARP-related dividend cuts.

We test this prediction by analyzing dividend cut announcements of financial firms conditional on whether these cuts are related to the TARP. We identify TARP-related dividend cuts as those announced from the purchase date to the final disposition date for the TARP recipients.[16] Among the 41 dividend cuts of financial firms, 11 are TARP related.

Panel A of Table 9 reports the univariate analysis of CDS market reactions to TARP-related and non-TARP-related dividend cuts. First, we find that on average CDS spreads increase significantly in response

[14]See https://www.federalreserve.gov/boarddocs/srletters/2009/sr0904.htm for Supervisory Guidance and Regulations on the Payment of Dividends, Stock Redemptions, and Stock Repurchases at Bank Holding Companies.
[15] In early 2009, the Federal Reserve increased the pressure on all bank holding companies. According to the guidance letter of SR 09-4, bank holding companies were strongly advised to eliminate, defer, or significantly reduce dividends to avoid using bailout money for dividend payout and to maintain capital adequacy. Also see the news article “Fed to banks: don't use bailout funds for dividends” from www.reuters.com on February 25, 2009.
[16] See https://projects.propublica.org/bailout/list for the TARP participants and their programs.

to non-TARP-related dividend cuts during the (-7, 7) event window. The CDS market reaction is particularly strong during recession periods but is insignificant during non-recession periods. Second, we show that CDS spreads do not change significantly in response to TARP-related dividend cuts. Panel B of Table 8 presents alternative event windows and alternative news dates for TARP-related dividend cuts.[17] We continue to find insignificant CDS market reactions to TARP-related dividend cuts. Overall, the findings on TARP-related dividend cuts serve as apagogic evidence that the CDS market reaction to the dividend cuts in the usual, non-TARP situations, presented in previous tables, is predominantly an information phenomenon related to the firms' own fundamentals.

5. Additional Analyses

In this section, we report various additional robustness checks of the main results presented in the last section. We first address identification issues related to the CDS spread changes in response to dividend changes. In particular, we address the issue of the liquidity component in CDS spreads, because CDS spreads may at times increase due to capital crunch faced by financial institutions. We then examine CDS spread changes in response to share repurchases as an alternative to dividend changes. We find little CDS spread changes, consistent with the previous result on dividend raises. Next, we examine bond market reactions to dividend changes. As expected, we find qualitatively the same, but much weaker, evidence of bond price changes. We also show that dividend cuts predict future rating downgrades. Finally, we attempt to estimate the wealth transfer effect of dividend changes on CDS changes to better understand the net effect. In all these cases, the results lend support to the main results presented in the last section.

5.1 Identification concerns

[17] The dividend cuts of financial firms during the TARP period were usually announced beforehand in press releases. In our sample, 8 out of 11 cuts were announced before they were actually implemented. Thus, we use the date of the earliest piece of news mentioning the dividend cuts as an alternative announcement date to re-examine the CDS market reaction over the (-7, 7) event window. We exclude the dividend cut of Citigroup proposed on November 23, 2008 from this analysis because this early announcement coincides with the announcements of the planned layoff of more than 50,000 workers and the second bailout from the US government.

Generally speaking, dividend decisions are not exogenous and are potentially influenced by many factors that may also affect a firm's default risk. We are not at all claiming that dividend cuts cause an increase in firm credit risk. Instead, we identify the informational role of dividend announcements in investors' reassessment of firm credit risk. During a short event window, it is more likely to be the announcements of dividend decisions *per se* than changes in firm fundamentals that lead to CDS market reactions.

However, we do realize that even in a short event window, CDS spreads may change due to other concurrent events happening around announcements of dividend changes. In order to alleviate this concern, we present robustness tests by restricting our sample to dividend announcements without concurrent earnings announcements, credit rating changes, and covenant violations. The results remain qualitatively the same and are presented in Table 2.

While CDS spreads primarily reflect firm credit risk, they may also be influenced by certain non-credit risk factors, such as the capital crunch of financial intermediaries (He, Kelly, and Manela (2017), Siriwardane (2018)). As discussed in the introduction, we perform several tests to address this concern. First, we additionally control for the number of price contributors, which measures the liquidity of the CDS market that may change due to the capital shocks of financial intermediaries. Our results remain robust as discussed in Section 4.1 and are reported in Panel B of Table IA.4.

Second, we calculate market-adjusted CDS spread changes to control for market-wide shocks around dividend announcements. Specifically, we calculate the daily market-adjusted CDS spread as the difference between a firm's CDS spread and the equal-weighted average market CDS spread. We use the change in a firm's market-adjusted CDS spread around dividend announcements in our main analysis. The results are reported in the Internet Appendix (Table IA.6). Panel A of Table IA.6 presents the univariate analysis and Panel B the regression analysis. All the results based on changes in market-adjusted CDS spreads indicate that the CDS market reacts negatively to the announcements of dividend cuts for both industrial and financial firms, consistent with our previous conclusions.

Third, we match each firm announcing a dividend change with a similar firm that make no such announcements during the event quarter based on propensity score matching (PSM). We then employ the difference-in-differences approach to identify the effects of dividend announcements on CDS spreads, which effectively control for the same shocks experienced by similar firms. We implement PSM by first estimating a logit regression to model the probability that firms cut/raise dividends. We then match each treatment firm to a control firm using the nearest-neighbor matching technique with no replacement. The control firm is required to be in the same industry according to the two-digit classification and to have no dividend changes and no concurrent earning announcements in the event quarter.[18] We report estimates of the logit regression and tests of the differences in firm characteristics between treatment and control groups in the Internet Appendix (Table IA.7). The results reveal no significant differences in major firm characteristics between the treatment and control firms after propensity score matching. Table IA.8 in the Internet Appendix reports the difference-in-differences regression analysis. The dependent variable is CDS spreads before (on day -8) and after (on day +7) the (-7, 7) event window for both treatment and control firms. *Post* is a dummy variable that equals one for CDS spreads after the event window and zero otherwise. Panels A and B of Table IA.8 report the results for dividend cuts and dividend raises, respectively. The coefficient on *CutD* × *Post* is significantly positive for both industrial and financial firms, indicating that firms announcing dividend cuts experience larger increases in CDS spreads than do firms not announcing any dividend changes. The coefficient is larger for financial firms than for industrial firms. The coefficient on *RaiseD* × *Post* is insignificant in most specifications for both industry and financial firms. The results obtained via the difference-in-differences approach are in general consistent with our previous findings.

In order to investigate the effects of concurrent events or common shocks over time, we plot the CDS spread changes under alternative specifications around announcements of dividend cuts from 2001 to 2014 in the Internet Appendix. Figure IA.3 plots the annual average change in five-year CDS spreads surrounding

[18] For financial firms, we require the control firm to be in the same industry according to the one-digit classification to avoid a substantial sample loss.

the (-7,7) event window of dividend cut announcements during 2001-2014 for industrial and financial firms. Panel A excludes dividend cuts with concurrent earnings announcements, credit rating changes, and covenant violations. Panel B plots CDS spread changes in excess of changes in equal-weighted market spreads. Panel C plots the CDS spread changes in excess of the spread changes of the propensity-score-matched sample. After eliminating concurrent events or adjusting for common shocks, we continue to observe substantial increases in CDS spreads around announcements of dividend cuts in recession periods when firms are distressed.

5.2 CDS market reactions to share repurchases

Instead of paying out dividends, firms can also distribute cash to shareholders through share repurchases. According to the information hypothesis, we do not expect CDS markets to react strongly to share repurchases for the following reasons. First, due to the concavity feature of debt, CDS spreads should naturally react less to dividend raises or share repurchases than to dividend cuts. In addition, managers are more likely to repurchase shares when firms are heathy and not financially distressed. When the firm is nowhere near default, debt value is less sensitive to changes in the underlying asset value as signaled by share repurchases.

Second, unlike dividend payments, which are usually repeated, share repurchases are less regular. A number of studies suggest that firms choose dividend raises to distribute permanent cash flow but use share repurchases to distribute transient cash flow (Guttman, Kadan, and Kandel (2010)). Evidence in the equity market also suggests that stock prices react more positively to dividend raises than to share repurchases (e.g., Guay and Harford (2000)). Given our finding that the CDS market reacts weakly to dividend raises, we expect the information effect of share repurchases to be even weaker for the credit market.

We perform a comprehensive analysis of CDS market reactions to share repurchases announcements. The detailed results are presented in the Internet Appendix (Section IA.2, Table IA.9 and Table IA.10). For both industrial and financial firms, we find insignificant changes in CDS spreads around share repurchase announcements, even in recession periods. Our analyses suggest that the announcements of share repurchases exhibit a weak information effect on firm credit risk, which is consistent with the view that CDS markets should not react much to payout announcements when firms are financially sound and when the announcements signal transient cash flow changes with little effect on firm value.

5.3 Bond market reactions to dividend announcements

We take advantage of the recently available TRACE dataset to examine daily bond returns. TRACE reports individual bond transactions, which can be used to construct daily (or more short-term) bond returns. TRACE was first implemented in July 2002 and expanded in stages until it became fully implemented in February 2005. TRACE now covers all publicly traded bonds. Tsai and Wu (2015) also examine bond returns over a 17-day window of dividend changes. But besides having a shorter sample period, they show average returns on each day rather than returns over a window and they do not distinguish between industrial firms and financial firms. A comparison with CDS reactions therefore cannot be made with their results.

We follow the standard procedures to screen out erroneous trades and calculate daily bond returns. The detailed results and discussions are reported in the Internet Appendix (Section IA.3 and Table IA.11). We find that bond prices react negatively during announcements of dividend cuts, but the results are weaker than those found in the CDS markets when CDS spread changes are converted to returns. This is especially true for 3- and 5-year CDS spreads. The weak reactions in the bond market are potentially due to the fact that bond prices are affected by various non-default risk factors such as liquidity and funding costs. In addition, bond contracts are less standardized and homogeneous. Various types of noise in bond prices may prevent us from identifying the impact of dividend announcements on measurements of firm credit risk.

5.4 Dividend cuts and future credit rating downgrades

Both CDS spreads and credit ratings represent ex ante measures of firm default probability. However, while CDS spreads respond to credit information more quickly and efficiently, credit ratings are generated by rating agencies and incorporate changes in credit risk in a less timely manner than do market-based risk measures. If dividend cuts indeed convey information about increased credit risk, we expect them to predict future credit rating downgrades. We confirm this prediction in the data and the detailed results are reported in the Internet Appendix (Section IA.4 and Table IA.12).

5.5 Contrasting the information and wealth transfer effects

Our analyses so far measure the net effect of information content and wealth transfer on CDS spreads. While the findings suggest that the information effect dominates the wealth transfer effect, it does not rule out the existence of the latter effect. Because the two effects impact CDS spreads in opposite directions, the net effect provides a lower bound of the information content effect.

The precise magnitude of the wealth transfer effect is difficult to gauge. We make an attempt here to estimate it via approximation. In the Internet Appendix (Section IA.5 and Table IA.13), we provide a detailed description of the estimation procedure for calculating the net effect, the wealth transfer effect, and the information effect due to dividend changes. Our estimation suggests that the information effect is the predominant effect of dividend announcements for both industrial and financial firms. Our estimation shows that during the announcements of dividend cuts, the average debt return is -76.4 bps for industrial firms and -208.0 bps for financial firms. The estimated wealth transfer and information effects are 254.1 bps and -331.2 bps respectively for industrial firms and 322.8 bps and -534.4 bps respectively for financial firms. Confirming our previous inferences, dividend cuts have larger economic consequences for debt value than do dividend raises. In addition, the change in debt value and the information effect of dividend cuts are stronger during recessions.

6. Conclusions

This paper identifies the information effect of payout policy in the credit market. We show that CDS spreads increase substantially in response to dividend cuts for both industrial and financial firms. The information effect of dividend cuts is particularly strong for financial firms, potentially due to their inherent opaque nature. Further, using the TARP during the recent financial crisis as an exogenous shock to the information content of financial firms' dividend decisions, we show that the information effect is stronger when dividend cuts reflect more of the firms' own economic conditions but is weakened when dividend decisions are influenced by government interventions.

The negative CDS market reaction to dividend cuts is more pronounced during recession periods and among firms with high credit risk and negative past stock performance. These results support the dominant information effect of dividend cuts on credit risk, especially among firms in financial distress. We further show that the information content effect of dividend cuts is stronger when firms' past dividend payout policy is less volatile so that the announcement of a dividend cut is more likely to be interpreted as permanent, and when firms cut dividends for the first time so that the dividend cut is less anticipated by the market.

Maintaining the existing dividend level has been widely perceived by managers as a priority on par with investment decisions. However, the impact of a dividend cut on credit risk has not been well documented. We take a fresh look at this issue using evidence from the CDS market. Our study also adds to the debate on dividend policies by separately examining the effect on industrial firms and financial firms.

In addition, instead of inferring firm systematic risk from factor models or estimating default risk from option- or accounting-based models, we use CDS spreads to capture the change in firm default risk in a timely manner. Our results support the view that changes in dividends signal changes in firm risk. We provide further evidence that dividend cuts contain useful information in predicting future credit rating downgrades.

Appendix A: Variable Definitions

CDS variables

Spread1Y: The premium of the CDS contract with one year to maturity at dividend announcement date (in bps).

Spread3Y: The premium of the CDS contract with three years to maturity at dividend announcement date (in bps).

Spread5Y: The premium of the CDS contract with five years to maturity at dividend announcement date (in bps).

Δ*Spread1Y:* The change in premium of the CDS contract with one year to maturity during the 15-day dividend announcement window (in bps).

Δ*Spread3Y:* The change in premium of the CDS contract with three years to maturity during the 15-day dividend announcement window (in bps).

Δ*Spread5Y:* The change in premium of the CDS contract with five years to maturity during the 15-day dividend announcement window (in bps).

Dividend variables

CutD: A dummy variable that equals one if dividend *percentage* change is equal to or less than -5% and zero otherwise.

RaiseD: A dummy variable that equals one if dividend *percentage* change is equal to or larger than 5% and zero otherwise.

Cut: The absolute value of dividend cuts scaled by stock price if ***CutD*** = 1 and zero otherwise (in %).

Raise: The absolute value of dividend raises scaled by stock price if ***RaiseD*** = 1 and zero otherwise (in %).

Conditioning variables

Recession: A dummy variable that equals one for the years 2001, 2002, 2008, and 2009 and zero otherwise.

SPE: A dummy variable that equals one if a firm's S&P long-term credit rating is lower than BBB- and zero otherwise.

LevD: A dummy variable that equals one if a firm's market leverage is above the median leverage in the current quarter and zero otherwise.

OscoreD: A dummy variable that equals one if a firm's Oscore is above the median Oscore in the current quarter and zero otherwise.

***NegPastRet**:* A dummy variable that equals one if a firm's stock return in the quarter immediately before dividend event window (-7, 7) is negative and zero otherwise.

Other credit risk variables

Downgrade: A dummy variable that equals one if a firm's S&P long-term credit rating is downgraded in the next year and zero otherwise

Control variables

EquityRet: Cumulative equity return during a 15-day dividend announcement window.

EarnSur: Earnings surprise, defined as the quarterly actual earnings per share (EPS) minus the median of quarterly EPS forecasts, scaled by the stock price at current quarter end (in %).

Δ*Earnings:* Earnings change, defined as actual EPS in the current quarter minus actual EPS in the previous quarter, scaled by stock price at current quarter end (in %).

Δ*Volatility* **$(\times 10^6)$:** change in stock return volatility, defined as the average stock intraday volatility over the (-7, 7) event window minus the average stock intraday volatility over the (-22, -8) pre-event window. The stock intraday volatility is the second-by-second, trade-based volatility (during market hours) obtained from the WRDS Intraday Indicator Database.

CurrentViolation*:* A dummy variable that equals one if the firm violates a debt covenant in the current quarter and zero otherwise.

PastViolation: The frequency of debt covenant violations in the past three quarters.

SIZE: The natural logarithm of the book value of assets.

BM: Book-to-market equity ratio, defined as the book value of equity divided by the market value of equity at the end of the current quarter. The definition of the book value of equity follows Fama and French (2002).

LEV: Market leverage, defined as the sum of long-term debt and debt in current liability scaled by total market value of equity in the current quarter.

PROFIT: Operating income scaled by total sales in the current quarter.

CASH: Total cash and marketable securities scaled by total assets in the current quarter.

TANG: Tangibility, defined as the ratio of property, plant, and equipment to total assets in the current quarter.

VROE: Standard deviation of quarterly ROE for the previous three years. We require at least eight observations.

RDA: Research and development (R&D) expenditure scaled by total assets in the current quarter. We treat missing values of R&D expenditure as zero.

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Table 1. Summary Statistics

This table presents descriptive statistics for industrial (Panel A) and financial firms (Panel B). See Appendix A for variable definitions.

Panel A: Descriptive statistics of industrial firms

Variables	N	Mean	Std. dev.	P25	Median	P75
Spread1Y (bps)	9,679	56.7	106.5	10.7	23.4	55.6
Spread3Y (bps)	10,136	82.5	112.6	23.5	44.1	93.6
Spread5Y (bps)	10,748	107.0	119.2	36.6	65.9	128.7
ΔSpread1Y (bps)	9,947	0.5	23.3	-2.7	-0.0	2.5
ΔSpread3Y (bps)	10,284	0.5	23.3	-3.3	-0.1	2.5
ΔSpread5Y (bps)	10,748	0.5	22.9	-3.8	-0.0	2.8
CutD	10,748	0.011	0.106	0.000	0.000	0.000
RaiseD	10,748	0.139	0.346	0.000	0.000	0.000
Cut (%), non-zero value	123	1.113	1.290	0.316	0.706	1.232
Raise (%), non-zero value	1,496	0.100	0.157	0.042	0.061	0.096
ΔEarning (%)	10,609	0.027	0.495	-0.033	0.042	0.162
EarnSur (%)	10,589	0.012	1.137	-0.289	0.049	0.377
ΔVolatility	10,640	0.316	0.947	0.036	0.095	0.225
EquityRet (in %)	10,688	0.800	7.156	-2.881	0.865	4.498
CurrentViolation	10,748	0.012	0.111	0.000	0.000	0.000
PastViolation	10,748	0.038	0.264	0.000	0.000	0.000
SPE	10,513	0.143	0.350	0.000	0.000	0.000
LevD	10,748	0.473	0.499	0.000	0.000	1.000
OscoreD	9,789	0.497	0.500	0.000	0.000	1.000

Panel B: Descriptive statistics of financial firms

Variables	N	Mean	Std. dev.	P25	Median	P75
Spread1Y (bps)	1,788	72.0	146.7	10.8	26.9	73.5
Spread3Y (bps)	1,869	90.1	126.0	22.1	46.9	104.0
Spread5Y (bps)	1,968	106.1	121.9	33.1	63.9	132.0
ΔSpread1Y (bps)	1,838	1.7	43.2	-2.9	-0.0	2.2
ΔSpread3Y (bps)	1,903	1.4	35.8	-3.5	-0.1	2.2
ΔSpread5Y (bps)	1,968	1.3	32.3	-3.5	-0.1	2.5
CutD	1,968	0.021	0.143	0.000	0.000	0.000
RaiseD	1,968	0.162	0.368	0.000	0.000	0.000
Cut (%), non-zero value	41	1.172	0.780	0.547	1.047	1.891
Raise (%), non-zero value	318	0.127	0.219	0.039	0.060	0.113
ΔEarning (%)	1,956	-0.026	0.771	-0.052	0.044	0.222
EarnSur (%)	1,953	0.073	1.391	-0.160	0.042	0.270
ΔVolatility	1,949	0.262	0.690	0.034	0.080	0.192
EquityRet (%)	1,948	0.301	7.209	-3.167	0.404	3.981
SPE	1,915	0.027	0.163	0.000	0.000	0.000

Table 2. Univariate Analysis of CDS Market Reactions to Dividend Announcements

This table reports analyses of CDS market reactions to dividend announcements for industrial firms and financial firms, respectively. Panel A reports the univariate results of cumulative spread changes (Δ*Spread*) in 1-year, 3-year, and 5-year CDS contracts over the event window of (-7, 7) trading days. Panel B presents CDS spread changes for the subsample excluding concurrent earnings announcements, credit rating changes, and covenant violations. To be specific, we require no earnings announcements during the (-7, 7) event window, no credit rating changes in the most recent month, and no covenant violations in the most recent quarter. All CDS spreads are given in basis points. The *t*-statistics based on robust standard errors clustered at both the firm and year levels are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% two-tailed levels, respectively. See Appendix A for variable definitions.

Panel A: Analysis over (-7, 7) event windows

	Firm type =	**Industrial firms**			**Financial firms**		
		(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Maturity =	**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**
Div. cuts	ΔSpread (bps)	26.9**	24.6**	20.6**	78.4*	66.0**	55.0**
	t-stat.	(2.09)	(2.28)	(2.25)	(1.87)	(2.01)	(2.04)
	N	114	120	123	39	40	41
Div. raises	ΔSpread (bps)	-0.5	-0.4	-0.4	-0.6	-0.4	0.3
	t-stat.	(-1.45)	(-1.07)	(-1.11)	(-0.99)	(-0.76)	(0.45)
	N	1,397	1,444	1,496	294	308	318
No change	ΔSpread (bps)	0.0	0.3	0.3	0.1	0.1	0.1
	t-stat.	(0.02)	(0.41)	(0.47)	(0.11)	(0.10)	(0.07)
	N	8,436	8,720	9,192	1,505	1,555	1,609

Panel B: Alternative subsample excluding concurrent earnings announcements, credit rating changes, and covenant violations

	Firm type =	**Industrial firms**			**Financial firms**		
		(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Maturity =	**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**
Div. cuts	ΔSpread (bps)	31.6*	26.1*	18.4**	109.2**	81.1**	73.8**
	t-stat.	(1.69)	(1.70)	(2.05)	(2.00)	(2.12)	(2.38)
	N	60	64	66	24	25	25
Div. raises	ΔSpread (bps)	-0.3	-0.4	-0.4	-1.1**	-0.9**	-0.0
	t-stat.	(-0.74)	(-0.85)	(-0.79)	(-2.35)	(-2.03)	(-0.01)
	N	918	950	980	217	226	235

Table 3. Regression Analysis of CDS Market Reactions to Dividend Announcements

This table reports the regression analysis of CDS market reactions to announcements of dividend changes. Panel A presents the regression of CDS spread changes over the (-7, 7) event window on dividend change dummies:

$$\Delta Spread_{i,t} = \beta_0 + \beta_1\, CutD_{i,t} + \beta_2\, RaiseD_{i,t} + \gamma\, Control_{i,t} + \varepsilon_{i,t}.$$

Panel B presents the regression of CDS spread changes over the (-7, 7) event window on the absolute value of dividend change scaled by stock price:

$$\Delta Spread_{i,t} = \beta_0 + \beta_1\, Cut_{i,t} + \beta_2\, Raise_{i,t} + \gamma\, Control_{i,t} + \varepsilon_{i,t}.$$

The dependent variable is $\Delta Spread_{i,t}$, the CDS spread change for firm *i* during the (-7, 7) trading days around dividend announcement date *t*. All CDS spreads are given in basis points. $CutD_{i,t}$ ($RaiseD_{i,t}$) is a dummy variable that equals one if dividend payment is cut (raised) and zero otherwise. $Cut_{i,t}$ ($Raise_{i,t}$) is the absolute value of dividend change scaled by stock price if dividend payment is cut (raised) and zero otherwise. The *t*-statistics based on robust standard errors clustered at both the firm and year levels are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% two-tailed levels, respectively. See Appendix A for definitions of other variables.

Panel A: Regression analysis using dividend change dummies

Firm type=	**Industrial firms**			**Financial firms**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Maturity=	**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**
CutD	26.7**	23.5**	19.4**	82.7*	71.5**	57.6**
	(2.03)	(2.31)	(2.24)	(1.93)	(2.12)	(2.09)
RaiseD	-0.2	-0.4	-0.5	-1.3	-1.2	-0.4
	(-0.35)	(-0.66)	(-0.81)	(-0.85)	(-0.81)	(-0.31)
EarnSur	-6.1***	-6.4***	-5.6***	0.6	2.5	1.1
	(-5.63)	(-4.47)	(-4.26)	(0.37)	(1.19)	(0.85)
Δ*Earnings*	-0.5	-0.7*	-0.7*	-2.9	-1.9	-1.1
	(-0.90)	(-1.66)	(-1.65)	(-1.37)	(-1.11)	(-0.88)
Δ*Volatility*	5.0**	6.1***	5.4**	0.6	1.1	1.4
	(2.09)	(2.65)	(2.46)	(0.28)	(0.64)	(0.77)
Fixed Effects		Year, Firm			Year, Firm	
Adjusted R^2	0.078	0.085	0.074	0.086	0.091	0.075
N	9,774	10,104	10,530	1,812	1,876	1,934

Panel B: Regression analysis using absolute value of dividend change scaled by stock price

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Maturity=	**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**
Cut	18.7*	19.9*	16.5*	39.3**	33.9**	25.7**
	(1.70)	(1.82)	(1.79)	(2.20)	(2.11)	(2.05)
Raise	1.3	-0.4	-2.4	-4.6	-2.8	-0.3
	(0.41)	(-0.13)	(-0.79)	(-0.72)	(-0.78)	(-0.08)
Controls		Included			Included	
Fixed Effects		Year, Firm			Year, Firm	
Adjusted R^2	0.085	0.098	0.083	0.047	0.050	0.040
N	9,774	10,104	10,530	1,812	1,876	1,934

Table 4. Analysis Conditional on the Macroeconomic Environment

This table reports the subsample analysis during recession and expansion periods for industrial firms and financial firms. Panel A presents the univariate analysis and Panel B the regression analysis of CDS spread change on dividend change dummies. The dependent variable is $\Delta Spread_{i,t}$, the CDS spread change for firm i during the (-7, 7) event window around dividend announcement date t. All CDS spreads are given in basis points. *CutD* (*RaiseD*) is a dummy variable that equals one if dividend payment is cut (raised) and zero otherwise. *Cut* (*Raise*) is the absolute value of dividend change scaled by stock price if dividend payment is cut (raised) and zero otherwise. *Recession* is a dummy variable that equals one for years 2001, 2002, 2008, and 2009 and zero otherwise. The *t*-statistics based on robust standard errors clustered at both the firm and year levels are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% two-tailed levels, respectively. See Appendix A for definitions of other variables.

Panel A. Univariate analysis conditional on the macroeconomic environment

	Firm type=		**Industrial firms**			**Financial firms**		
			(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Maturity=		**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**
Recession=1	Div. cuts	ΔSpread	49.9**	46.5**	38.3**	138.4**	112.9**	92.5***
		t-stat.	(1.99)	(2.19)	(2.05)	(2.40)	(2.49)	(2.71)
		N	56	58	58	23	24	25
	Div. raises	ΔSpread	-1.0	-0.5	-0.3	-4.1*	-3.0**	-0.8
		t-stat.	(-0.80)	(-0.39)	(-0.28)	(-1.72)	(-2.12)	(-0.50)
		N	206	215	228	34	35	37
Recession=0	Div. cuts	ΔSpread	4.8	4.1	4.7	-8.0	-4.3	-3.7
		t-stat.	(0.87)	(0.87)	(1.21)	(-1.27)	(-1.42)	(-1.50)
		N	58	62	65	16	16	16
	Div. raises	ΔSpread	-0.4	-0.4	-0.4	-0.1	-0.1	0.5
		t-stat.	(-1.20)	(-1.00)	(-0.97)	(-0.19)	(-0.14)	(0.53)
		N	1,191	1,229	1,268	260	273	281

Panel B: Regression analysis conditional on the macroeconomic environment

Firm type=	**Industrial firms**			**Financial firms**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Maturity=	**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**
CutD	5.3	4.0	4.5	-10.1	-3.4	-3.2
	(0.97)	(0.92)	(1.25)	(-1.26)	(-0.83)	(-1.07)
RaiseD	-0.2	-0.4	-0.6	-1.9	-1.8	-0.9
	(-0.38)	(-0.82)	(-1.22)	(-1.30)	(-1.40)	(-0.83)
CutD × *Recession*	41.1*	38.1**	30.1*	155.6***	125.8***	101.1***
	(1.71)	(1.96)	(1.77)	(2.75)	(3.03)	(3.07)
RaiseD × *Recession*	-1.1	-0.8	0.1	-1.0	-0.0	-0.1
	(-0.82)	(-0.75)	(0.10)	(-0.53)	(-0.00)	(-0.07)
Controls		Include			Include	
Fixed Effects		Year, Firm			Year, Firm	
Adjusted R^2	0.086	0.092	0.078	0.145	0.148	0.120
N	9,774	10,104	10,530	1,812	1,876	1,934

Table 5. Analysis of Industrial Firms Conditional on Firm-level Credit Risks

This table reports the CDS changes conditional on a firm's credit ratings, leverage, and Oscore for industrial firms in the full sample (Panel A) and in the subsample of non-recession periods (Panel B). The dependent variable is $\Delta Spread_{i,t}$, the CDS spread change for firm ***i*** during the event window of (-7, 7) days around dividend announcement date *t*. All CDS spreads are given in basis points. *CutD* (*RaiseD*) is a dummy variable that equals one if dividend payment is cut (raised) and zero otherwise. *SPE* is a speculative grade dummy variable that equals one if a firm has a S&P long-term credit rating below BBB- and zero otherwise. *LevD* is a dummy variable that equals one if firm leverage is above the median leverage and zero otherwise. *OscoreD* is a dummy variable that equals one if firm Oscore is above the median Oscore and zero otherwise. Firms with a value of one for *SPE*, *LevD*, or *Oscore* have high credit risk. The *t*-statistics based on robust standard errors clustered at both the firm and year levels are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% two-tailed levels, respectively. See Appendix A for definitions of other variables.

Panel A. Analysis of industrial firms conditional on firm-level credit risks in the full sample

High credit risk =1, if	***SPE =1***			***LevD =1***			***OscoreD =1***		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Maturity=	**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**
CutD	5.4	6.5	5.0	0.0	-2.4	-0.8	-4.1	-5.0	-3.0
	(0.39)	(0.68)	(0.57)	(0.01)	(-0.70)	(-0.22)	(-0.52)	(-0.96)	(-0.54)
RaiseD	-0.3	-0.1	-0.2	-0.2	-0.5	-0.6	-0.1	-0.3	-0.3
	(-0.67)	(-0.19)	(-0.46)	(-0.58)	(-1.08)	(-1.24)	(-0.36)	(-0.56)	(-0.59)
CutD × *High credit risk*	85.9**	73.5**	64.3**	43.0**	42.0***	32.8**	59.6***	53.5***	42.3***
	(2.36)	(2.06)	(2.19)	(2.26)	(2.77)	(2.53)	(2.92)	(3.00)	(2.80)
RaiseD × *High credit risk*	0.3	-3.8	-3.2	-0.5	-0.3	-0.2	-0.8	-1.1	-1.0
	(0.15)	(-1.55)	(-1.30)	(-0.60)	(-0.29)	(-0.22)	(-0.93)	(-1.41)	(-1.30)
High credit risk	-0.5	1.7	1.0	-1.1	-0.8	-1.0	-0.4	0.3	-0.2
	(-0.25)	(0.93)	(0.53)	(-1.28)	(-1.29)	(-1.62)	(-0.59)	(0.40)	(-0.32)
Controls		Included			Included			Included	
Fixed Effects		Year, Firm			Year, Firm			Year, Firm	
Adjusted R^2	0.104	0.106	0.090	0.086	0.093	0.079	0.101	0.107	0.092
N	9,588	9,904	10,301	9,774	10,104	10,530	8,789	9,074	9,439

Panel B. Analysis of industrial firms conditional on firm-level credit risks in the subsample of non-recession periods

High credit risk =1, if		***SPE =1***			***LevD =1***			***OscoreD =1***	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
CDS maturity=	**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**
CutD	-1.7	-3.0	-2.0	-3.0	-3.0	-2.0	-3.5	-5.2**	-3.4***
	(-0.70)	(-1.17)	(-1.01)	(-1.22)	(-1.09)	(-1.09)	(-1.42)	(-1.98)	(-3.68)
RaiseD	-0.1	-0.2	-0.3	-0.1	-0.3	-0.4	0.1	-0.2	-0.3
	(-0.46)	(-0.49)	(-0.75)	(-0.27)	(-0.90)	(-0.88)	(0.31)	(-0.49)	(-0.68)
CutD × High credit risk	34.5	32.9*	31.4**	20.3*	16.3*	14.5*	23.0	20.9*	15.9**
	(1.54)	(1.82)	(2.00)	(1.71)	(1.76)	(1.90)	(1.49)	(1.87)	(2.07)
RaiseD × High credit risk	-1.1	-3.9*	-3.3	-0.5	-0.8	-0.7	-1.1	-1.3**	-1.0
	(-0.48)	(-1.79)	(-1.57)	(-0.67)	(-0.89)	(-0.79)	(-1.63)	(-2.18)	(-1.49)
High credit risk	-0.3	1.1	-0.2	-1.3**	-0.7	-0.9	-0.4	-0.0	-0.6
	(-0.18)	(0.70)	(-0.15)	(-2.21)	(-1.45)	(-1.29)	(-0.70)	(-0.07)	(-0.86)
Controls		Included			Included			Included	
Fixed Effects		Year, Firm			Year, Firm			Year, Firm	
Adjusted R^2	0.069	0.079	0.056	0.065	0.074	0.052	0.069	0.085	0.060
N	7,142	7,351	7,586	7,309	7,527	7,787	6,584	6,779	7,009

Table 6. Analysis Conditional on a Firm's Past Stock Performance

This table reports the CDS changes conditional on a firm's past stock performance for industrial firms and financial firms. The dependent variable is $\Delta Spread_{i,t}$, the CDS spread change for firm ***i*** during the event window of (-7, 7) days around dividend announcement date *t*. All CDS spreads are given in basis points. *CutD* (*RaiseD*) is a dummy variable that equals one if dividend payment is cut (raised) and zero otherwise. *NegPastRet* is a dummy variable that equals one if firm stock return in the past quarter is negative and zero otherwise. The *t*-statistics based on robust standard errors clustered at both the firm and year levels are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% two-tailed levels, respectively. See Appendix A for definitions of other variables.

Firm type=	**Industrial firms**			**Financial firms**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
CDS maturity=	**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**
CutD	-2.6	-4.5	-4.0	-14.8	-8.4	-6.0
	(-0.57)	(-0.82)	(-0.68)	(-1.20)	(-1.01)	(-0.48)
RaiseD	-0.1	-0.1	-0.4	-0.2	-0.4	0.3
	(-0.24)	(-0.25)	(-0.70)	(-0.13)	(-0.30)	(0.20)
CutD × *NegPastRet*	50.6**	50.4**	42.1**	153.5**	126.6***	100.3**
	(2.34)	(2.31)	(2.17)	(2.43)	(2.75)	(2.48)
RaiseD × *NegPastRet*	-0.5	-1.1	-0.5	-3.4	-2.1	-2.0
	(-0.56)	(-1.04)	(-0.54)	(-1.32)	(-0.96)	(-1.01)
NegPastRet	-0.0	0.4	0.2	1.2	0.9	0.7
	(-0.01)	(0.63)	(0.27)	(0.52)	(0.39)	(0.37)
Controls		Included			Included	
Fixed Effects		Year, Firm			Year, Firm	
Adjusted R^2	0.091	0.100	0.086	0.145	0.149	0.120
N	9,774	10,104	10,530	1,812	1,876	1,934

Table 7. Dividend Changes and Cumulative Abnormal Equity Returns

This table reports the cumulative abnormal equity returns during announcements of dividend changes. Panel A reports the univariate analysis of the average cumulative abnormal equity returns during the (-7,7), (-5,5), and (-3,3) event windows of dividend announcements. Panel B presents the regression analysis of cumulative abnormal equity returns on dividend change dummies (columns 1-2) and the absolute value of dividend change scaled by stock price (Columns 3-4):

$$CAR_{i,t} = \beta_0 + \beta_1\, CutD_{i,t} + \beta_2\, RaiseD_{i,t} + \gamma\, Control_{i,t} + \varepsilon_{i,t}.$$

$$CAR_{i,t} = \beta_0 + \beta_1\, Cut_{i,t} + \beta_2\, Raise_{i,t} + \gamma\, Control_{i,t} + \varepsilon_{i,t},$$

where $CAR_{i,t}$ is the cumulative abnormal equity return of firm i based on the Fama and French three-factor model during the (-7,7) event window of dividend announcement at time t. All cumulative abnormal equity returns are given in basis points. $CutD_{i,t}$ ($RaiseD_{i,t}$) is a dummy variable that equals one if dividend payment is cut (raised) and zero otherwise. $Cut_{i,t}$ ($Raise_{i,t}$) is the absolute value of dividend change scaled by stock price. The *t*-statistics based on robust standard errors clustered at both the firm and year levels are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% two-tailed levels, respectively. See Appendix A for definitions of other variables.

Panel A. Univariate analysis of CARs over event windows of dividend announcements

	Window	(-7,7)	(-5,5)	(-3,3)
Div. cuts	CARs (bps)	-68.5*	-56.9**	-110.2**
	t-stat.	(-1.68)	(-2.52)	(-2.08)
	N	1,251	1,251	1,251
Div. raises	CARs (bps)	87.5***	79.2***	72.2***
	t-stat.	(11.15)	(11.37)	(12.05)
	N	9,073	9,073	9,073
No change	CARs (bps)	11.8*	15.1***	14.0***
	t-stat.	(1.85)	(3.40)	(5.09)
	N	57,481	57,481	57,481

Panel B. Regression analysis of CARs on dividend change dummies/absolute value of dividend change scaled by stock price

	(1)	(2)		(3)	(4)
CutD	-73.6***	-33.8	*Cut*	-24.9**	-11.9
	(-4.90)	(-1.61)		(-2.50)	(-0.81)
RaiseD	75.5***	45.4***	*Raise*	160.3***	258.3***
	(11.30)	(3.68)		(5.94)	(8.80)
EarnSur		77.9***	*EarnSur*		78.3***
		(4.39)			(4.46)
ΔEarning		13.6***	*ΔEarning*		13.5***
		(3.60)			(5.00)
ΔVolatility		-0.2	*ΔVolatility*		-0.2
		(-1.04)			(-0.62)
Fixed Effects	Year, Firm		*Fixed Effects*	Year, Firm	
Adjusted R^2	0.007	0.020	*Adjusted* R^2	0.007	0.021
N	67,659	54,133	*N*	67,659	54,133

Table 8. Analysis Conditional on Past Dividend Changes

This table reports analyses of CDS market reactions to announcements of dividend changes conditional on past dividend changes for industrial firms and financial firms. Panel A presents the average cumulative spread changes (Δ*Spread*) of 1-year, 3-year, and 5-year CDS contracts over the (-7, 7) event window conditional on past dividend volatility. We partition dividend cuts into subsamples of low and high dividend volatility (*DivVol*) based on the median value of *DivVol* in the same fiscal quarter. *DivVol* is defined as the standard deviation of dividend changes over the past 20 dividend payments. The sample is slightly reduced as we require 20 dividend payments to be available. Panel B presents the average cumulative spread changes conditional on first/recurring dividend cuts. Using the full dividend payment records in CRSP since 1960, we identify the first time that a firm cuts dividend as its first dividend cut, and any subsequent dividend cuts as recurring dividend cuts. All CDS spreads are given in basis points. The *t*-statistics based on robust standard errors clustered at both the firm and year levels are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% two-tailed levels, respectively. See Appendix A for definitions of other variables.

Panel A. Analysis conditional on past dividend volatility

	Firm type=	**Industrial firms**			**Financial firms**		
		(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	CDS maturity=	**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**
Low DivVol	ΔSpread (bps)	53.2**	44.4**	32.4**	57.9***	63.9**	50.7***
	t-stat.	(2.05)	(2.06)	(2.07)	(3.20)	(2.38)	(3.27)
	N	53	55	56	16	17	18
High DivVol	ΔSpread (bps)	13.6	15.2	15.5	63.8	50.5	41.1
	t-stat.	(0.92)	(1.14)	(1.22)	(1.35)	(1.48)	(1.16)
	N	53	56	57	18	18	18

Panel B. Analysis conditional on first/recurring dividend cuts

	Firm type=	**Industrial firms**			**Financial firms**		
		(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	CDS maturity=	**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**
First	ΔSpread (bps)	31.4**	38.1**	30.6**	113.6**	98.0*	81.3*
	t-stat.	(2.32)	(2.25)	(2.22)	(2.07)	(1.89)	(1.85)
	N	55	56	58	15	16	16
Recurring	ΔSpread (bps)	22.8	12.8	11.5	56.4	44.7	38.1
	t-stat.	(1.04)	(0.91)	(0.90)	(1.58)	(1.42)	(1.27)
	N	59	64	65	24	24	25

Table 9. Univariate Analysis of CDS Market Reactions to Announcements of TARP-related versus Non-TARP-related Dividend Cuts

This table reports CDS market reactions to the announcements of TARP-related versus non-TARP-related dividend cuts. We identify TARP-related dividend cuts as those announced during the period between the purchase date and the final disposition date for the TARP recipients. Panel A reports the average cumulative spread changes (Δ*Spread*) of 1-year, 3-year, and 5-year CDS contracts over the event window of (-7, 7) trading days during all years, during recession periods, and during non-recession periods. Panel B presents CDS spread changes using alternative event windows and alternative news dates of dividend cuts. All CDS spreads are given in basis points. The *t*-statistics based on robust standard errors clustered at both the firm and year levels are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% two-tailed levels, respectively. See Appendix A for variable definitions.

Panel A: Analysis over the (-7, 7) event window

			Non-TARP related			**TARP related**		
			(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Maturity =		**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**
All years	Div. cuts	ΔSpread (bps)	97.7*	84.2*	68.3*	13.8	11.5	18.7
		t-stat.	(1.65)	(1.78)	(1.68)	(0.37)	(0.38)	(0.62)
		N	30	30	30	9	10	11
Recession=1	Div. cuts	ΔSpread (bps)	218.6***	185.4***	150.5***	13.8	11.5	18.7
		t-stat.	(2.96)	(3.40)	(3.26)	(0.37)	(0.38)	(0.62)
		N	14	14	14	9	10	11
Recession=0	Div. cuts	ΔSpread (bps)	-8.0	-4.3	-3.7	--	--	--
		t-stat.	(-1.27)	(-1.42)	(-1.50)	--	--	--
		N	16	16	16	--	--	--

Panel B: Alternative events window and alternative news date for TARP-related dividend cuts

Window=	**(-5, 5)**			**(-7, 3)**			**(-7, 7) alternative dates**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Maturity =	**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**	**1-Year**	**3-Year**	**5-Year**
ΔSpread (bps)	17.8	20.8	7.5	34.3	26.0	21.5	42.1	4.9	-0.2
t-stat.	(0.50)	(1.01)	(0.47)	(1.53)	(1.49)	(1.08)	(1.62)	(0.04)	(-0.16)
N	9	10	11	9	10	11	8	10	10

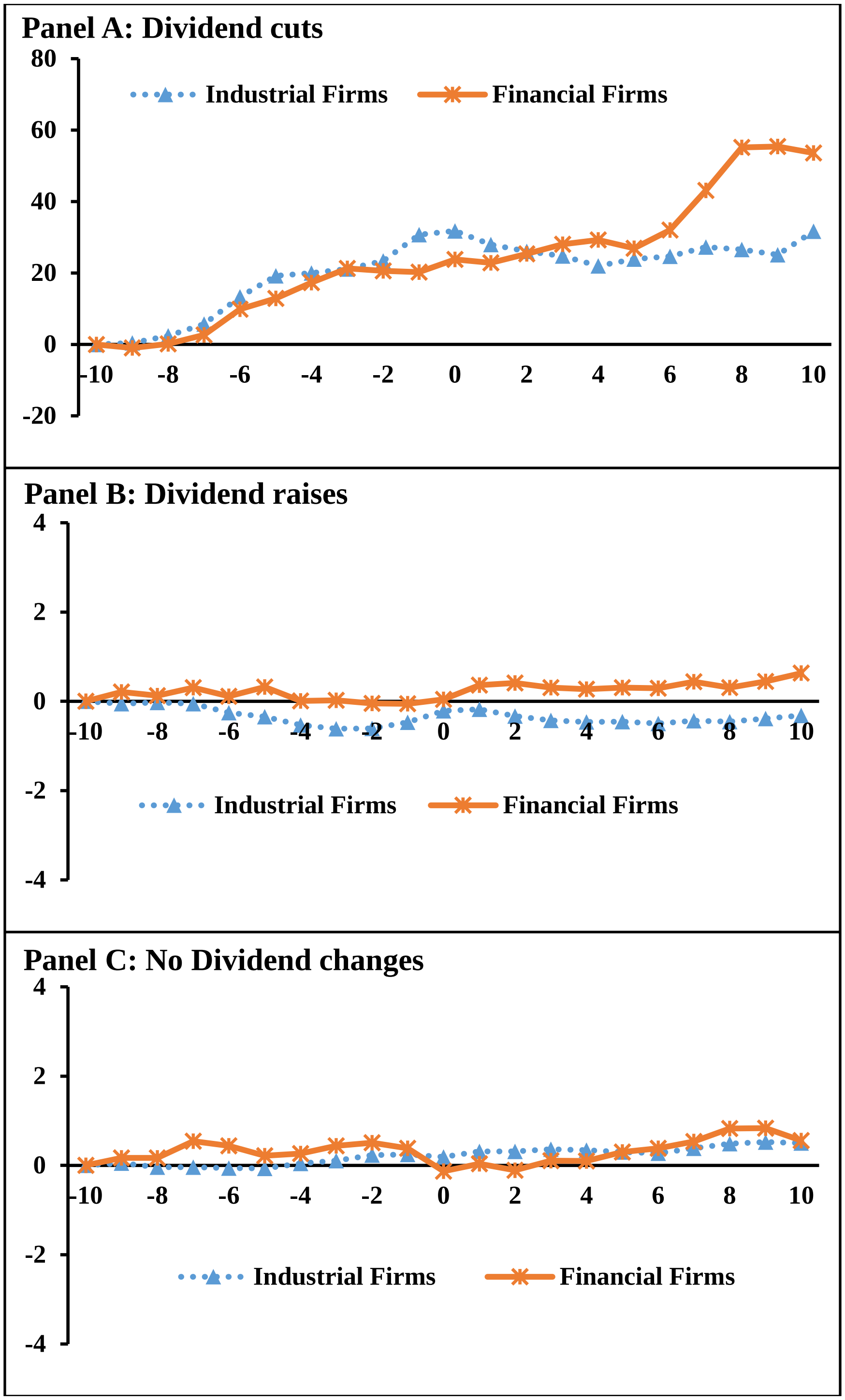

Figure 1. Cumulative CDS spread changes around dividend announcements

This figure plots the average cumulative spread changes of 5-year CDS contracts around the dividend announcement date (day 0) for industrial and financial firms. Panels A, B, and C show the CDS market reactions to dividend cuts, dividend raises, and no dividend changes, respectively. All CDS spreads are given in basis points.

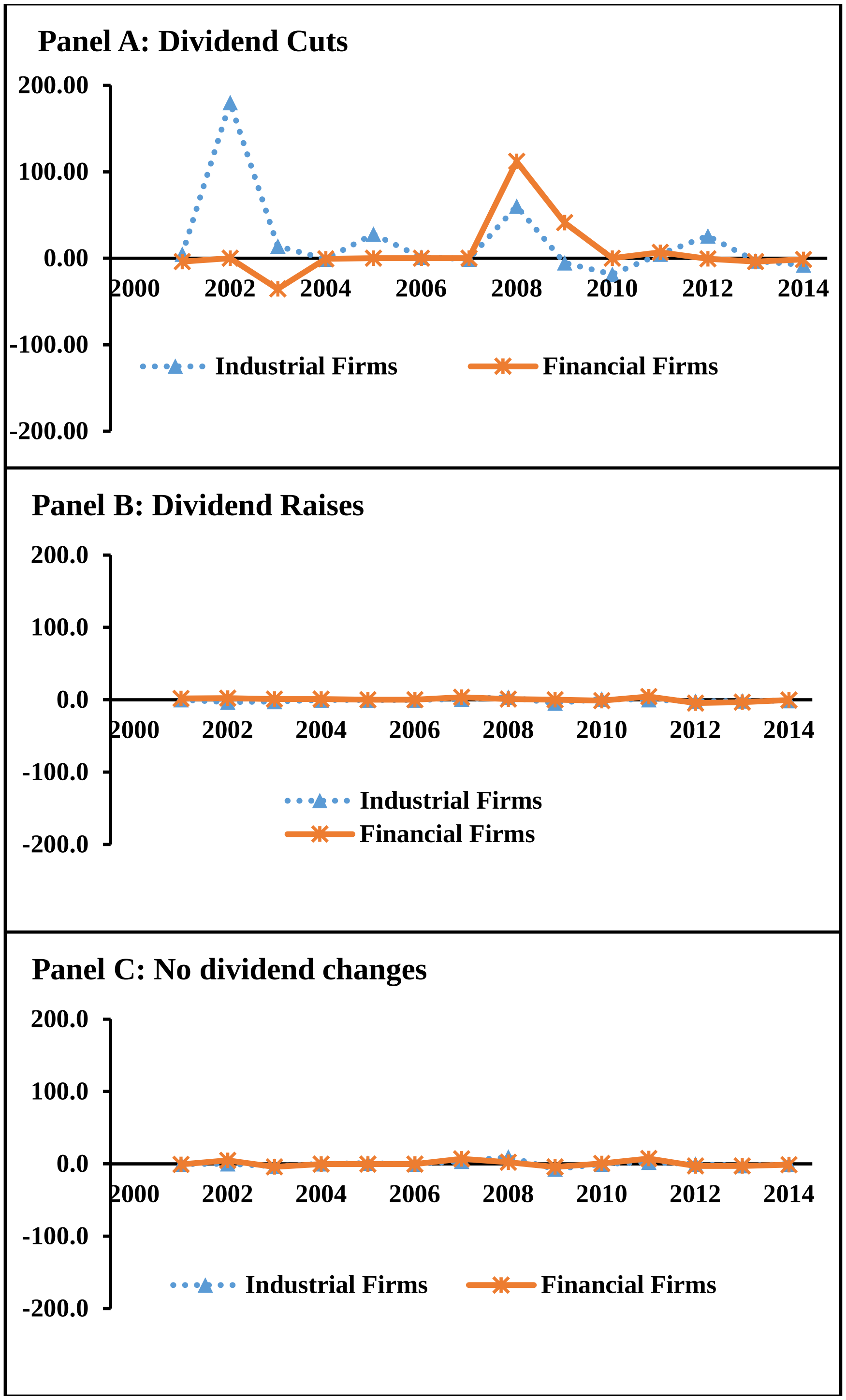

Figure 2. CDS spread changes around dividend announcements, 2001-2014

This figure plots the yearly average changes of 5-year CDS spreads over the (-7,7) event window of dividend announcements from year 2001 to 2014 for industrial (blue dotted line) and financial (orange solid line) firms. Panels A, B, and C show the CDS spread changes for dividend cuts, dividend raises, and no dividend changes, respectively. All CDS spreads are given in basis points.