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Do FOMC Actions Speak Loudly?

Evidence from Corporate Bond Credit Spreads[☆]

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Abstract

We find that Federal Open Market Committee (FOMC) actions (especially rate cuts) narrowed corporate credit spreads during the pre-crisis period of 2002-2007. During the 2008 crisis period, we find that both conventional cuts and quantitative easing decreased spreads. But FOMC inactions caused significant widening of spreads. The effects are especially large for speculative-grade and short-maturity bonds. Overall, the policy uncertainty during the crisis and macroeconomic theories during the pre-crisis period help to explain why FOMC announcements impacted credit spreads. The Fed's actions targeted at promoting growth and/or providing systemic liquidity were especially noted by the corporate bond market.

Keywords: Fed Fund Rate, FOMC, Corporate Bonds, Credit Spreads, Monetary Policy Actions

JEL Classification: G14; E52; G20; C53

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1. Introduction

A large and burgeoning body of work documents the pertinence of monetary policy in asset pricing. Among many, Jensen et al. (1996), Jensen and Mercer (2002), Rigobon and Sack (2004), and Bernanke and Kuttner (2005) analyze the impact of monetary policy shocks on stock returns. Kuttner (2001), Rigobon, and Sack (2004) and Faust et al. (2007) analyze the relationship between monetary policy and Treasury bond yields. Kim et al. (1998), Beckworth et al. (2010), and Cenesizoglu and Essid (2012) find that corporate bond yield spreads react significantly to monetary policy shocks. As Bernanke and Kuttner (2005) note, the reason for this great interest in the impact of monetary policy on asset prices lies with the quandary of unobservable goals versus observable prices. Since the impact of monetary policy on its ultimate goals—output, employment, and inflation—is at best indirect, the direct and immediate impact of the policy on asset prices is quite visible and thus readily assessable. By observing and understanding the link between monetary policy and asset prices, policymakers can modify transmission mechanisms to achieve their ultimate objectives.

We argue here, however, that the reaction of corporate bonds to monetary policy actions provides an excellent laboratory to examine the efficacy of the policy actions in addressing the stalwart mandated monetary policy objectives: enhancing employment, increasing growth, and combating inflation.[1]
The asymmetric nature of corporate bonds' payoff to cash flow risk (detrimentally affected by economic downturns) and discount rate risk (adversely affected by high inflation) create an excellent setup to utilize asset price reactions to more sharply assess whether various monetary policy actions (rate cuts, hikes, and

[1] A growing body of work has recently brought to light the pertinence of corporate bond prices in evaluating monetary policy and the study of the macroeconomy. Gilchrist et al. (2009) find that prices of individual corporate bonds traded in the secondary market are highly informative financial indicators. Gilchrist and Zakrajšek (2012: p. 1693) construct index-based corporate bond prices and find that "… the predictive ability of the GZ credit spread for future economic activity significantly exceeds that of the widely used default-risk indicators such as the standard Baa–Aaa corporate bond credit spread and the 'paper–bill' spread."

no-actions) exerted their intended impacts. To that end, we first examine whether Federal Open Market Committee (FOMC) actions at the time of the announcements manifest unique action-related fixed effects independent of conventional measures of change in market anticipation and other known determinants. We then further examine whether extant literatures can explain observed policy action fixed effects in an effort to identify channels through which actions map into their intended policy goals.

To do so, we first perform an event study of credit spread changes vis-à-vis FOMC actions at the time of the policy announcements. We employ Trade Reporting and Compliance Engine (TRACE) intra-day data on corporate bonds to construct our sample. Since TRACE data is only available from January 2002, we focus on the 72 policy announcements (cuts, hikes, no-actions, and quantitative easing) in the period June 2002 through December 2010. To measure announcement effects, we use the intra-day methodology of Bessembinder et al. (2009). Since FOMC announcements are almost always made late in the trading day (2:30 pm EST), the daily-based event evidence offers an accurate measure of the impact of the announcements. We then merge the daily data with Mergent's Fixed Income Securities Database (FISD) to obtain bond characteristics (age, rating, maturity). We only consider plain-vanilla corporate bonds with valid information for our analyses.

Using a battery of panel regressions that correct for typical clustering and fixed effects, we find that FOMC actions indeed affect corporate credit spread changes, even after we control for known determinants and market expectations (Fed fund futures reactions). Our tests control for possible confounding effects of other contemporaneous macroeconomic announcements. Rate cuts on the whole are associated with a statistically significant 8-basis point narrowing of credit spreads in both the pre-crisis and crisis periods. Rate hikes that only occurred during the pre-crisis period, on the other hand, correspond with a statistically significant 1.4-basis point narrowing of credit spreads. The Fed's no-actions are associated with a statistically significant 16.6-basis point widening in spreads during the crisis period. Lastly, during the crisis period, quantitative easing (QE) announcements are correlated with a 12-basis point narrowing of credit spreads. Clearly our results indicate that beyond unanticipated policy shocks, the nature of the policy action itself carries great weight in market participants' reactions. What remains to be answered is how the above regularities conform to our current theoretical understanding of the role of monetary policy and whether transmission mechanisms vary across actions.

As such, we extend our analysis and re-examine FOMC announcements' effects within credit quality and time-to-maturity subsamples. The intuition is straightforward. By cutting rates, the Fed attempts to promote growth, which consequently should greatly benefit risky borrowers. But raising rates in an effort to combat inflation should affect long-term bonds in particular. We find that a rate cut on average correspond, respectively, with 9.5- and 7.6-basis-point narrowing of spreads in the pre-crisis and crisis periods. Pre-crisis, a rate cut is associated with 4.0- and 16.3-basis-point narrowing in spreads of investment and speculative bonds, respectively. Pre-crisis, a cut is associated with 7.4- and 12.9-basis-point narrowing of spreads of long- and short-term bonds, respectively. During the crisis period, a cut is associated with 7.6- and 7.9-basis-point narrowing in spreads of investment and speculative bonds, respectively. During the crisis period, a cut is associated with 6.1- and 9.8-basis-point narrowing in spreads of long- and short-term bonds, respectively. Rate hikes—which only occurred during the pre-crisis period—mainly affect speculative and short-term bonds: a rate hike is associated with 3.0- and 2.4-basis-point decreases in spreads of speculative and short-term bonds. We further find that the quantitative easing announcement's effect is greater for speculative grade bonds at 22.6 basis points, as opposed to 7.7 basis points for investment-grade bonds. The effect is also greater for short-term bonds at 15.1 basis points, as opposed to 9.1 basis points for long-term bonds. FOMC no-actions have no significant impact during the pre-crisis period but have a pronounced, significantly adverse effect on spreads during the crisis. During the crisis period, a no-action is associated with 10.8- and 23.6-basis-point increases in spreads of investment and speculative bonds, respectively. During the crisis period, a no-action is associated with 13.3- and 21.1-basis-point increases in spreads of long- and short-term bonds, respectively.

Our results overall are consistent with conjectures by Collin-Dufresne et al. (2001). In their influential work, they find that changes in credit spreads are mostly driven by factors other than those within structural models because these factors leave a large portion of heterogeneity in the spreads unexplained.[2] They suggest that the nonliquidity-related supply/demand shocks—segmented perhaps along the fault lines of bond and equity markets—are the culprit. Monetary policy can indeed be a pertinent source of such supply/demand shocks. Except for the post-financial crisis period of 2008, the U.S. Federal Reserve Bank's open market operations historically concentrated on trading short-term Treasury securities,[3] leaving the remaining spectrum of government, municipal, and corporate fixed income markets uncircumscribed. Further, the U.S. Federal Reserve Bank by mandate cannot invest in equities. Given the critical role the Fed plays as "the lender of last resort" and its inherent unlimited ability to change the money supply, one can easily envision monetary policy as a potential candidate for systematic supply and demand shocks. Our results demonstrate that the various FOMC actions do exert differential impacts (in magnitude and significance) across credit quality and maturity classes.

[2] Since Merton's (1974) seminal paper, structural models have grown to a larger body of work with powerful machinery to price corporate credit instruments (e.g., see Leland and Toft, 1996; Collin-Dufresne et al., 2001; Eom et al., 2004; Huang and Huang, 2012). Yet despite tremendous progress, these model remain mute on how monetary policy may fit into the mix. Beyond influence on the risk free rate, there are no formal predictions from extant structural models of corporate credit pricing concerning the role of monetary policy. The notable near-exception is Piazzesi (2005). In her influential work modeling risk-free term structures, Piazzesi (2005) directly accounts the impact of monetary policy using a quadrature model. However, the question remains as to whether and how such a framework can glean insight into the impact of monetary policy on corporate bonds.

[3] A long-held view is that the Fed affects short-term rates in anticipation of long-term rates following suit. However, while the Fed raised the benchmark overnight rate from 2004 to 2006, long-term borrowing costs failed to increase. As the former Fed chairman, Alan Greenspan, explained in his 2005 Congressional testimony, during that period "… [the Fed] wanted to control the federal funds rate, but ran into trouble because long-term rates did not, as they always had previously, respond to the rise in short-term rates …". In the same year, then Fed Governor Ben Bernanke said a glut of investment dollars from overseas was holding down U.S. interest rates as savers in economies such as China sought safe places to stash their export earnings.

Our results are also consistent with prominent macroeconomic theories of monetary policy. The so-called "credit view" of monetary policy contends that monetary policy has a significant impact on credit spreads. Whether the models belong to the "balance sheet channel" (Bernanke and Gertler, 1989; Kiyotaki and Moore, 1997) or to the "bank lending channel" views (Bernanke and Blinder, 1988; Kashyap et al., 1993), they suggest that an increase in the interest rate leads to a decline in credit demand as well as in credit supply. By affecting aggregate supply and demand for credit, particularly short-term credit, monetary policy then can influence the price of credit, i.e., credit spreads. By increasing (decreasing) the excess supply of credit through rate cuts (hikes), the Fed can decrease (increase) spreads, particularly for short-term and low-rated bonds.

Another strand of macro literature underlies the idea that the Federal Reserve possesses relevant information about the economy that is unknown to the public (see, e.g., Romer and Romer, 2000; Amato et al., 2002; and Chun, 2011). These studies point out the significant role that such an information asymmetry between the Fed and public plays in understanding the relationship between monetary policy and bond yields. To mitigate the information asymmetry, the Fed can utilize policy actions to signal information about the prospects of the economy. Depending on the degree of information asymmetry and how informative the policy actions are, the Fed's monetary policy actions thus can affect credit spreads. For instance, a rate cut can indicate that the Fed intends to promote growth or provide liquidity. If the action is perceived to be effective by investors, the rate cuts or quantitative easing lead to a narrowing of spreads. This could be even more pronounced for speculative grade and/or short-term maturity bonds, which are disproportionately affected by an economic slowdown. We find that for most part, the predictions of macro theories hold true: short-term and speculative bonds respond in larger magnitude to the FOMC rate cuts and hikes.

While policy actions can be influential, a FOMC no-action can also be critical for markets. Through open-market activities and by changing the aggregate supply of Treasuries, the Fed aims to meet its dual mandate of controlling inflation and promoting full employment. From this perspective, a no-action can be interpreted as the Fed's acquiescence with current conditions and previous actions without cause for further action. However, a no-action—particularly during times of crisis—can also be viewed as decision-making paralysis. Such policy uncertainties can lead to severe distortions in the deployment of fixed and human capital (Bloom, 2009; Bloom et al., 2007). In a general equilibrium setting, the economic policy uncertainty should command a premium whose magnitude is larger in weaker economic conditions (Pástor and Veronesi, 2013). As such, a FOMC no-action, particularly during times of distress and crisis, can lead to adverse reactions and widening of spreads. Our results clearly bear witness to this prediction. We summarize our findings vis-à-vis the predictions of extant theories in Table I.

[Insert Table I about here]

Overall, our paper makes a number of contributions. First and foremost, our findings demonstrate that beyond monetary policy surprises, the mere nature of an action (cuts, hikes, no-actions) matters gravely. This is consistent with our fundamental intuitions: a rate cut targeted toward promoting growth and greater employment should primarily and positively affect the cash flow risk of corporate bonds. If successful, rate cuts should thus have a particularly attenuating impact on the credit spreads of high-risk, short-term borrowers. On the other hand, when effective, a rate hike geared toward combating inflation should be especially beneficial for long-term bonds and risky borrowers. Our evidence further confirms the Bernanke and Kuttner (2005) contention that the asset markets' reactions to monetary policy can be a useful mechanism to guide the policy. We show that when conditioned on the nature of action itself, the corporate bond market's reaction can have an especially telling story regarding the efficacy of the intention of an action.

Third, as noted, our findings lend credence to the Collin-Dufresne et al. (2001) conjecture that a measure of segmented supply/demand shocks across bonds and equities can be a pertinent determinant of credit spread changes. We identify FOMC actions—which by design affect the supply/demand of bonds but not equities—as pertinent determinants of changes in credit spreads surrounding the announcements. Our results thus hint at monetary policy as a factor outside the extant structural models that can have a profound impact on credit spreads. Models of contingent credit claims pricing could benefit from incorporating monetary policy. We also add to a voluminous literature documenting why structural models fail to empirically predict credit spreads (Eom et al., 2004; Huang and Huang, 2012). Interestingly though, we find that existing structural models can still offer valuable predictions. In these models, a risk-free rate is the drift in the underlying asset value stochastic process; thus a decline (rise) in the drift—perhaps as in the case of a Fed fund rate cut (hike)—should make assets less (more) valuable, resulting in greater (lower) default probability and hence larger (smaller) credit spreads. While overall we find exactly the opposite, the fact that both rate cuts and hikes affect speculative and short-term spreads with greater magnitude is not inconsistent with predictions of some of the existing models. Leland and Toft (1996) find a greater impact exerted from the risk-free rate onto a short-term bond's spread simply because the repayment of a large face value in the near-term is gravely affected. He and Xiong (2012) arrive at same comparative static during times of crisis because rolling over short-term debt is particularly hard.

Fourth, we add to a growing literature on the impact of economic policy uncertainty on corporate activities and asset prices. In his influential work, Bloom (2009) shows that greater economic uncertainty causes firms to temporarily pause their investment and hiring. Baker et al. (2015) develop an economic policy uncertainty index and find that positive shocks to their index are associated with significant decreases in industrial production, employment, GDP, and real investment for at least two to three years. They also associate a number of large swings in the S&P 500 index to policy-related events. Pástor and Veronesi (2013) find that the policy uncertainty index negatively correlates with economic conditions, industrial production growth, the Shiller price-earnings ratio, and the default spread. They also find that stock returns are more volatile and more correlated when policy uncertainty is higher, especially in bad economic times. Ulrich (2016) develops an equilibrium model and shows that uncertainty about future government spending is a first-order risk factor in the bond market, leading to rising real and nominal interest rates, a steeper term spread, an increase in bond market volatility, and bond premia. We extend the current literature and find that the economic policy uncertainty index is highly affected by FOMC inactions. Furthermore, we find that FOMC inactions lead to large widening of corporate bond spreads.[4]

Lastly, we contribute to a large body of research that examines how monetary policy is transmitted and where the effects are felt (Kayshap and Stein, 2000; Bhamra et al., 2011; Gertler and Karadi, 2015). Kashyap and Stein (2000: 407) find that "… the impact of monetary policy on lending is stronger for banks with less liquid balance sheets … [especially] smaller banks." Bhamra et al. (2011) show that corporate default decisions depend on monetary policy through its impact on expected inflation. Gertler and Karadi (2015) show that even modest movement in short-rates—due to monetary policy actions—can lead to large movements in credit cost. We provide evidence that the corporate bond market is more concerned about the Fed's action targeted at promoting economic growth and/or provision of systemic liquidity—that is FOMC rate cuts and quantitative easing. The Fed's rate hikes intended to return to normalcy or fighting inflation are of less interest for the corporate bond market.

The remainder of our paper is organized as follows. Section 2 describes the data and explains the research design. Section 3 describes our empirical approach and presents our empirical findings. Section 4 provides a battery of robustness checks, including the impacts of FOMC actions on financials and on the implied default probabilities as viewed through the prism of the CDS market. Lastly, Section 5 concludes.

2. Data and Research Design

To construct our sample of FOMC announcements, we start with scheduled FOMC meetings. From 13 August 2002, until 16 December 2010, the FOMC had 67 scheduled meetings. Out of these 67 meetings, there were 37 no-change announcements (NOACT), 16 increase announcements (HIKE), and nine decrease announcements (CUT). Moreover, there were three unscheduled meetings during this period that we judge to be relevant. (None of the other unscheduled meetings involved policy announcements.) On 21 January 2008, and 7 October 2008, the FOMC met by conference call. These meetings concluded with statements about FOMC's intention to cut the target Fed funds rate by 75 and 50

[4] In a separate analysis, we show that the widening is persistent for at least five days after FOMC meetings and is also coupled with increased volatility in the FOMC action-related component of corporate bond spreads. For more detail of this analysis see the accompanying internet appendix of the paper available on the journal's website.

basis points, respectively. These two announcements are also included in our sample, since they are associated with announcements concerning monetary policy. On 7 February 2009, in a joint meeting, the FOMC and Board of Governors discussed the potential role of the Fed in stabilizing the financial system. Although this meeting did not conclude with an announcement about the target fed funds rate, we include it our sample as we believe this meeting has significant information content regarding the Troubled Asset Relief Program (TARP), future economic development, monetary policy, and the recently launched Quantitative Easing program. (For summaries of these FOMC meetings, see the Appendix.) It is noteworthy that in December 2008, the fed funds rate hit the zero bound. In its statement released to the press immediately after the meeting on 16 December 2008, the FOMC communicated the following to the public: "… [T]he Federal Open Market Committee decided today to establish a target range for the federal funds rate of 0 to 1/4 percent."[5] After this date, the Federal Reserve employed a new monetary policy tool that it had never used before: Quantitative Easing (QE). The timeline of quantitative easing is as follows.

QE 1 announcements

- Nov 25, 2008 Initial announcement
- Dec 1, 2008 Bernanke speech
- Dec 16, 2008 Program formally launched by the FOMC
- Jan 28, 2009 FOMC statement
- Mar 18, 2009 Announcement of additional purchase

QE 2 announcements

- Aug 10, 2010 FOMC statement
- Sep 21, 2010 FOMC statement
- Nov 3, 2010 FOMC statement

All the above dates are included in the sample. The first two announcements, however, are not part of a FOMC meeting statement. The first one is an announcement by the Federal Reserve that was later

[5] http://www.federalreserve.gov/newsevents/press/monetary/20081216b.htm

followed by Bernanke's speech about the details on 1 December. The FOMC statement on 16 December 2008 reported the official launch of the program.

We studied all the minutes of all the meetings, both scheduled and unscheduled; not surprisingly, we found that announcements after this date involve a no change in the target Fed funds rate (as the zero bound was hit). Instead, the policy was geared towards quantitative easing. Therefore, categorizing announcements after this day as a "no change" policy is misleading.[6] In fact, in all of the statements released to media following the meetings on 16 December 2008, the FOMC communicated its extensive QE policy as clearly as possible. After including all the relevant event dates and taking into account the distinction between no-change and QE, a more accurate distribution of monetary policy announcements by the FOMC is as follows: 12 CUT announcements, 16 HIKE announcements, 25 NOACT announcements, and 20 announcements related to the QE program—a total of 72 announcements.[7] Table II summarizes time series data on FOMC announcements and the corresponding changes in the target rate. Moreover, we split our sample into crisis period and per-crisis period. According to the Federal Reserve, the recent crisis began in December 2007 and ended in June 2009. This period corresponds to eight CUTs, no HIKEs, three NOACTs, and eight announcements related to QE—a total of 19 announcements.

[Insert Table II here]

Our sample represents all the scheduled meetings within our timeframe, three unscheduled meetings that we believe are relevant to this study, and two announcements about QE programs not already included in the scheduled or unscheduled meetings. We collect data for traded corporate bonds surrounding each of these announcement dates. We collect data two days surrounding each announcement

[6] We are grateful to Olesya Grishchenko for pointing this out.

[7] The FOMC announcement on 16 December 2008 included a cut as well as the official launch of the QE1 program.

date, the day before and the day after (-1, +1).[8] Hence, announcement effects are measured over a one-day window to avoid contamination of our results with any other event. We collect bond yield data from the TRACE database. TRACE provides intra-day price and yield information on individual bond transactions with the associated execution time. Bessembinder et al. (2009) find that the results of corporate bond event studies based on frequently used methods and data sources are biased. They show that the bias stems from the low power of these tests (number of Type II errors). They argue that employing the newly available daily TRACE data significantly improves the power of the tests. The major disadvantage of TRACE is that the data start only from 1 July 2002; our sample covers the period from 13 August 2002 (the first time that the Fed announcement date fell inside the TRACE coverage) through 14 December 2010. It also provides unique bond identifiers, namely CUSIP (Committee on Uniform Securities Identification Procedures) and National Association of Securities Dealers (NASD) symbols as well as trade size. For investment (noninvestment) grade bonds, the actual figure is reported if the par value of the transaction is less than or equal to \$5 (\$1) million; otherwise it is reported as an indicator variable 5MM+ (1MM+). As the literature shows, relative to the equity market, the bond market is illiquid and dominated by institutional investors. To account for this fact, Bessembinder et al. (2009) suggest eliminating any trade with size less than \$100,000 as it may be a noninstitutional trade. Thus following Bessembinder et al. (2009), we create daily bond yield from intra-day TRACE data by first eliminating trades below \$100K and then computing a volume-weighted average of the remaining transaction yields. As Bessembinder et al. (2009) argue, this minimizes the effect of large bid-ask bounces associated with small trades.

To get the bond characteristic information (rating and time-to-maturity), we merge our sample from TRACE with Mergent FISD using CUSIP. We remove utilities and any bonds with embedded options, at default, with convertibility features, denominated in a foreign currency, or being an asset-backed issue.

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[8] Our results are robust to alternative lengths of event window. We have also conducted the analyses using (-2, +2) window and the results are virtually identical.

Although our major focus is on plain-vanilla corporate bonds, we keep financials in our sample and distinguish them from nonfinancials by introducing a dummy. Given the data availability, it would be interesting to see how robust our results are for financials. Credit spread (CSPRD) is defined as the difference between the yield of a particular bond issue and the constant maturity Treasury rates collected from Federal Reserve Economic Data (FRED) provided by Federal Reserve Bank of Saint Louis.

$$CSPRD_{i,t} = Yield_{i,t} - (Treasury\ Rate)_{i,t} \tag{1}$$

where $Yield_{i,t}$ is the yield for bond *i* at time *t* and is computed by using the TRACE data as explained above, and $Treasury\ Rate_{i,t}$ is the constant maturity Treasury rate that matches time-to-maturity of bond *i*. Following Collin-Dufresne et al. (2001) and Eom et al. (2004), we first construct the Treasury term structure on day *t* using the reported yields for 1-, 3-, and 6-month bonds as well as 1-, 2-, 3-, 5-, 7-, 10-, 20-, and 30-year bonds. We then interpolate between these rates on day *t* to find the Treasury yield-to-maturity with matching time-to-maturity to that of the bond *i* transacted on day *t*.

The credit spread change, $\Delta CSPRD_{i,t}$, is then defined as the difference between the spread of a particular transacted bond after a given announcement and the spread of the same bond prior to the announcement.

$$\Delta CSPRD_{i,t} = CSPRD_{i,t+1} - CSPRD_{i,t-1} \tag{2}$$

We then create bond portfolios based on maturity alone, credit rating alone, and their interactions. We divide the bonds in our sample into investment grade and noninvestment grade using the credit rating data provided by the FISD database. Any credit rating of BBB or better is considered investment grade. Any bond with rating below BBB is considered speculative or noninvestment grade. Since credit rating can be upgraded or downgraded during the life of a particular bond, we use the most recent rating relative to the announcement date. Any bond for which rating cannot be determined is removed from the sample.

To form bond portfolios based on time-to-maturity, we divide the sample into long-term and short-term issues. To distinguish between long- and short-term bonds, we used the median time-to-maturity of the two credit rating portfolios as the cut-off. Median time-to-maturity for investment groups and noninvestment groups are 4.94 and 6.13 years, respectively. Thus, any bond issue that belongs to the investment (noninvestment) group on a given announcement date and has a time-to-maturity more than 4.94 years (6.13 years) is considered long-term. Otherwise, they are considered short-term. Overall, we find 55,149 valid bond-days surrounding the 72 announcement dates. Financials account for 38% of the data, and the remainder, 34,011 observations, represents corporate bond issues.

3. Empirical Analyses

Our main conjecture is that monetary policy is a pertinent determining factor for credit spreads. As Bernanke and Kuttner (2005) point out, the unexpected component of FOMC announcements is of grave interest. Macro variables (e.g., interest rates) and even market prices (e.g., Fed fund futures reactions) can potentially capture the expected FOMC actions. As such, we perform a multivariate analysis of changes in credit spreads surrounding the FOMC announcements, controlling for macro-level determinants and market expectations.

To capture FOMC actions, we employ four indicator variables: *CUT*, *HIKE*, *NOACT*, and *QE*. *CUT* is a dummy variable that takes value of 1 if the FOMC cut the Fed fund target rate, 0 otherwise; *HIKE* is a dummy variable that takes value of 1 if the FOMC raises the Fed fund target rate, 0 otherwise; *NOACT* is a dummy variable that takes value of 1 if the FOMC left the Fed fund target rate unchanged, 0 otherwise; and lastly, *QE* is a dummy that is equal to 1 if a particular announcement corresponds to a quantitative easing program. As argued earlier, we distinguish between a NOACT announcement made after hitting the zero boundary of the Fed funds rate and a no-change prior to the zero bound regime. Since the Fed funds rate is bounded by 0, categorizing announcements during this period as NOACT is misleading. Instead, we categorize them as QE if either the meeting's minutes or the public statement contains clear statements about the QE program.

Following Collin-Dufresne et al. (2001), Nejadmalayeri and Singh (2012), and Nejadmalayeri et al. (2013), we then include a host of control variables and estimate the following panel OLS regressions of changes in credit spreads with cluster robust standard errors.

$$\Delta CSPRD_{i,t} = \beta_1 CUT_t + \beta_2 HIKE_t + \beta_3 NOACT_t + \beta_4 QE_t$$

$$+ \delta_1 \Delta RF_t^{\dagger} + \delta_2 \, \Delta Slope_t^{\dagger} + \delta_3 \, SP_t^{\dagger} + \delta_4 \, \Delta VIX_t^{\dagger} + \delta_5 \, \Delta FF_t^{\dagger} + \epsilon_{i,t} \tag{3}$$

where $\Delta CSPRD_{i,t}$, is the credit spread change for the *i*th bond surrounding a FOMC announcement at time *t*. The FOMC actions dummies (i.e, *CUT*, *HIKE*, *NOACT*, *QE*) are as defined above.

Gilchrist and Zakraijšek (2013) and D'Amico and King (2013) find that the Fed's quantitative easing overall reduces long-term Treasury yields. Thus, it is reasonable to believe that policy announcements could affect our control variables. To overcome these confounding effects, we orthogonalized our control variables to the policy indicators. These orthogonalized control variables consist of the following. $\Delta RF^{\dagger}$ is the orthogonal changes of the 10-year constant maturity Treasury yield. $\Delta SLOPE^{\dagger}$ is the orthogonal changes of the Treasury yield curve slope. We define slope of the yield curve as the difference between 10-year and 2-year constant maturity Treasury yields. We interpret this yield curve variable as a proxy for changes in market expectations about the future state of the economy. $SP^{\dagger}$ is the orthogonal S&P500 index return. This variable is used to proxy for expected recovery rate. $\Delta VIX^{\dagger}$ is the orthogonal Chicago Board Options Exchange (CBOE) Volatility Index (VIX) volatility index changes. Dubbed as the "fear index," we use the VIX index to control for changes in overall market uncertainty. Lastly, $\Delta FF^{\dagger}$ is the orthogonal Fed fund futures price changes. Following Bernanke and Kuttner (2005), we use Fed fund futures price reaction as a proxy for market expectations about FOMC actions. Standard errors of coefficient estimates are also corrected for heteroskedasticity, autocorrelation, and firm-clustering.

3.1. Multivariate Regression Results

Panels A, B, and C of Table III report the results of regression, respectively, for the entire sample period, the pre-crisis period (August 2002 – November 2007) and the crisis period (December 2007 – June 2009) using all bonds as well as different bond portfolios. The coefficients on our FOMC action dummies (CUT, HIKE, QE) are for the most part consistent with predictions of macroeconomic theories (i.e., credit channel and information asymmetry).. In general, a Fed rate cut (hike) is associated with a 7.9- (1.5-) basis-point decrease in credit spreads—statistically significant at the 1% (5%) level. Quantitative easing (a recent monetary tool post crisis) is associated with a 12-basis point decrease in credit spreads during crisis period—statistically significant at the 1% level. Our results regarding FOMC no-actions (NOACT), significant only during the crisis period, support recent theories of policy uncertainty. The FOMC no-action increases credit spreads by 16.6 basis points (significant at 1% level) during crisis period as opposed to by an insignificant 0.1 basis points during pre-crisis period. As predicted, these effects do vary widely across portfolios sorted based on bond quality and maturity.

A Fed rate cut affects all bond portfolios but particularly speculative and short-term bonds. The coefficient estimate on the CUT dummy is largest for speculative, short-term bonds. Overall, a rate cut is associated with 9.9- and 10.2-basis-point decreases in speculative spreads and short-term spreads, respectively. A rate cut corresponds to a 13.3-basis-point decrease in spreads of speculative, short-term bonds. Additionally, we find that rate cuts had a greater impact during the pre-crisis period, especially among the riskier bonds—speculative and short-term bonds. The overall decrease in spreads due to a rate cut was 9.5 basis points during the pre-crisis period as opposed to 7.6 basis points during the crisis period. On the occasion of a rate cut, the riskiest bonds—speculative short-term bonds—faced a 22.8-basis point drop in their spreads during the pre-crisis period. This is more than double the 11.1-basis-point drop in spreads they experience upon a rate cut during the crisis. These results could hint of a possible explanation: A rate cut during a crisis is not perceived to be an effective means of liquidity provision. In which case, the Fed resorting to unconventional means such as quantitative easing during crisis period should not be of much surprise.

Since Fed rate hike only occurred during pre-crisis period, we focus on the results for this period. Based on results in panel B of Table III, the coefficient on the HIKE dummy is insignificant for investment-grade bonds (irrespective of their maturity). A Fed rate hike, however, corresponds to a 3.0-basis-point decrease of speculative grade spreads—significant at the 5% level. This effect is particularly large among short-term speculative bonds. A Fed rate hike is associated, respectively, with 1.6 (at 10% of significance) and 4.8 (at 10% of significance) basis-point decreases in long-term speculative and short-term speculative spreads. Since quantitative easing is a recent monetary innovation, we focus on the results for the crisis period. Based on results in panel C of Table III, the coefficient estimate on the QE dummy is negative and statistically significant for all portfolios. This coefficient is particularly large for speculative and short-term bonds—surprisingly, the largest for speculative, short-term bonds. The announcement of quantitative easing corresponded to a 12-basis-point decrease in average spreads. This impact was especially large among speculative and short-term bonds, which respectively faced 22.6- and 15.1-basis-point decreases in their spreads. The largest effect on spreads—a 24.7-basis-point decrease—was on speculative, short-term bonds.

Overall, these results indicate that the easing of monetary policy (as measured by a CUT or QE)—in an attempt to promote growth/employment or provide liquidity—is received positively by the market. The decrease in spreads is particularly large for risky bonds, those with low quality and short maturity where repayment of coupons (default risk) as well as a sizable principle (recovery risk) are at grave risk when the economy falters. In contrast, an attempt to tighten monetary policy in general doesn't seem to phase out investors unless default and inflation risks are ex ante high.

As noted before, the impact of a no-action is economically material and statistically significant only during the crisis period. As is evident in panel C of Table III, The impact of a no-action by the FOMC is significantly adverse on credit spreads for all bonds. A no-action announcement produces significant impact during the crisis period: it corresponds with a 16.6-basis-point increase in overall spreads. This adverse impact is especially large among speculative and short-term bonds, which respectively face 23.6- and 21.1-basis-point increases in their spreads. The largest adverse effect on spreads—31.8 basis points—is on speculative, short-term bonds. Given that these results are only significant during crisis period, we interpret the larger, significant adverse reaction to a FOMC no-action during crisis as an empirical evidence of policy uncertainty aversion. When clarity is of short supply, corporate bond investor demand policy conviction and despise FOMC no-actions.

[Insert Table III here]

The explanatory power of our model varies between different bond portfolios. It ranges from a little over 4% for short-term, investment-grade bonds to a little above 14% for long-term, noninvestment bonds. The low explanatory power of our model is not surprising. Literature points out the inability of current models of credit risk to explain the variation in credit spreads. Even regressions of credit spreads using large panel data over long periods at best produce R^2 in the twenties (Collin-Dufresne et el., 2001). Given the nature of this study, a relatively low R^2 is expected. Control variables have the expected sign and are consistent with previous findings (see, e.g., Collin-Dufresne et al., 2001). What is noteworthy is that overall the explanatory power of model during crisis periods (R^2 of 10%) is almost three times larger than that during pre-crisis period (R^2 of 3.5%). Even the best-fit models of long-term bonds (Models (4), (6), and (8)) have R^2 that are twice as larger during crisis. One interpretation is that the policy uncertainty-related impact of no-actions combined with the liquidity enhancing impact of the unconventional quantitative easing seem to have larger marginal power in explaining heterogeneity of corporate bonds reactions surrounding FOMC announcements.

3.2. Financial Firms' Results

The financial system is the conduit through which monetary policy is transmitted to the broader economy. Various types of financial institutions are affected drastically differently by monetary policies (Kashyap and Stein, 2000). This can make financial institutions—and by extension their credit spreads—particularly susceptible to FOMC actions. Yet financial institutions suffer from opacity and as such are subjected to myriad regulations (Flannery, 1998). Opaqueness undermines effective market discipline on banks, since even the most sophisticated investor is unable to have an accurate appraisal of a financial institution's fundamental value. It is the opaque nature of financial institutions and banking in particular that makes them susceptible to runs. Morgan (2002) shows that banks are more opaque relative to other firms. Opacity emanates from information asymmetry, the quality and credibility of the available information, and also from the complexity of the assets. Sources of opacity include loans and the complexity of their traded assets. Asset complexity comes in two guises. It could be the complex nature of the asset itself (CDOs, CMOs, etc.), or it could be the ability of the manager to rapidly move some assets (more liquid ones) on and off the books, making them difficult for investors to monitor (Morgan, 2002). If policy uncertainty aversion is the reason why FOMC inactions so significantly adversely affect credit spreads during crises, then for financials that suffer from opacity, FOMC inactions should be markedly graver.

To examine our main ideas vis-à-vis expected heightened sensitivity of financials to FOMC announcements, we re-estimate our baseline model (3) and run similar regressions as in Table III for financials. Table IV reports the multivariate regression results. What we find is that neither rate cuts nor rate hikes affect financials significantly differently. This implies that in transmission of monetary policy, the financial system is not a bottleneck that is affected differently from the rest of the economy. What we find about no-actions and quantitative easing, however, is of great interest. Looking at the results for the crisis period of panel B in table IV, the ameliorating effect of QE announcements on spreads is about 1.5 times larger for financials. The coefficient on the interaction between the QE dummy and the financial dummy is -0.058 (significant at the 5% level), one-half of the coefficient on the QE dummy of -0.100 (significant at the 1% level). We also find virtually no significant or measurable impact from a no-action announcement during the pre-crisis period. But during the crisis period, we find an adverse effect exerted by no-action announcements that is almost five times larger for financials. The coefficient on the interaction between the NOACT dummy and the financial dummy is 0.613 (significant at the 1% level), about five times larger than the coefficient on the NOACT dummy of 0.126 (significant at the 1% level).

[Insert Table IV here]

4. Robustness Checks

4.1. Ex Ante Uncertainty About FOMC Actions

A central point of our conjectures here is that FOMC no-actions can add to uncertainty, thus leading policy uncertainty-averse investors to demand greater compensation for risk. However, if a priori, the uncertainty is heightened—due for instance to adverse conditions in global banking system during the 2008 financial crisis—we then can expect our results for FOMC no-actions to suffer from the confluence of other factors. To address this concern, we include a measure of ex ante Fed policy uncertainty into our Models (3) and (4). In the spirit of Flannery and Protopapadakis (2002) and Green (2004), we use analyst forecast dispersion about the FOMC announcement. The data on the analyst forecast about the FOMC announcement is hand collected from Bloomberg.[9] We then define the ex-ante market uncertainty as the standard deviation of the analyst forecast, $\sigma_{forecast}$.

Table V reports the multivariate regression results. Our results show that analyst forecast dispersion adversely affects corporate credit spreads where it has a statistically significant impact. This adverse effect is mainly felt during the crisis period and is largest among short-term and investment bonds. While one percentage increase in forecast dispersion increases average spreads by 35.5 basis points, the short-term, investment-grade spreads increase by 97.1 basis points. As for the FOMC action dummies, what we find is qualitatively identical to our benchmark results. During the pre-crisis period, the coefficient on the CUT dummy is significant for all but investment grade bonds. These effects are especially large among short-term and speculative grade bonds. A rate cut corresponds to a 24.9-basis point decrease in spreads of short-term speculative grade bonds (significant at 1% level). During crisis period, the coefficient on the CUT dummy is significant for all but speculative grade bonds. A rate cut corresponds to a 19.7-basis-point decrease in spreads of short-term investment-grade bonds (significant at 1% level). The coefficient on the HIKE dummy is significant for all but investment grade bonds. A Fed rate hike corresponds to a 5.2-basis-oint decrease of short-term speculative grade spreads (significant at the 5% level). The coefficient estimate on the QE dummy is negative and statistically significant for all bonds. These effects are especially larger among short-term and speculative grade bonds. Quantitative easing corresponds to a 24.3-basis point decrease in spreads of short-term speculative grade bonds (significant at 1% level).

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[9] On Jan 21, 2008 and Oct 7, 2008, the FOMC met by conference call. It concluded with statements about FOMC's intention to cut the target Fed funds rate by 75 and 50 basis points, respectively. For these dates there is no analyst forecast observation; however, Bloomberg uses the most recent forecast standard deviation. November 25, 2008, December 1, 2008, and February 7, 2008 are dates associated to quantitative easing. Thus, there's no analyst forecast or forecast standard deviation. For our regression specifications, we follow the methodology employed by Bloomberg and use the most recent forecast standard deviation. Results are robust and do not change if these three observations are excluded.

During the pre-crisis period, a no-action was virtually ineffectual. However, during the crisis period, the impact of a no-action by the FOMC was significantly adverse on credit spreads for all bonds. This is particularly true for speculative and short-term bonds. A no-action announcement corresponds with a 29.9-basis-point increase for speculative, short-term bonds. It is noteworthy that these results are obtained after we control for the ex-ante uncertainty. During crisis periods, when investors' uncertainty aversion ought to be acute, a FOMC no-action leads to a large, adverse impact on corporate spreads. This impact is almost three times larger for speculative bonds with a priori high levels of risk than investment grade bonds.

[Insert Table V here]

4.2. Economic Policy Uncertainty and FOMC Announcements

As pointed out by Bernanke (1983), Dixit (1989), Bloom et al. (2007), Bloom (2009), and Pástor and Veronesi (2013) the uncertainty associated with economic policies has significant ramifications for market participants and their behavior. Baker et al. (2015) develop a measure of economic policy uncertainty (EPU). This is a news-based measure of economic policy uncertainty that "reflects the frequency of articles in 10 leading U.S. newspapers that contain the following triple: "economic" or "economy," "uncertain" or "uncertainty," and one or more of "congress," "deficit," "Federal Reserve," "legislation," "regulation" or "White House" "(Baker et al., 2015: 1).[10] This measure is widely used in finance literature to capture economic policy uncertainty (Mian and Sufi, 2014; Brogaard and Detzel, 2014; Da et al. 2014; Kahle and Stulz, 2013; and Pástor and Veronesi, 2013, to name a few). Our conjecture is that a no-action announcement exacerbates the asymmetric information, which could lead to a situation of policy uncertainty aversion, especially during the crisis period.

To verify the veracity of this assumption, we regress the changes in the economic policy uncertainty (EPU) index surrounding the FOMC announcement on our dummies and a series of control variables. If

[10] http://www.policyuncertainty.com/media/BakerBloomDavis.pdf and http://www.policyuncertainty.com/index.html

our conjecture is correct, the NOACT coefficient should be positively associated with changes in EPU. Results in Table VI confirm our conjecture and earlier findings that a no-action announcement increases market uncertainty. After controlling for market expectation, ex-ante uncertainty about the FOMC announcement, and a series of macroeconomic variables and confounding effects of other macro announcements, a no-action announcement increases the EPU index by about 78.5 units (significant at 5% level).

[Insert Table VI here]

4.3. Possible Confounding Effects of Other Macro Announcements

In our analysis so far, we implicitly assumed that FOMC announcements were exogenous events that are unrelated to other events in the economy. It is a legitimate concern that our results may be contaminated by other macroeconomic announcements. In fact Huang and Kong (2005) show that scheduled macroeconomic announcement affect corporate bond yields. Following Green (2004) and Ederington and Lee (1993), we add announcements of nine macroeconomic variables to control for possible confounding effects. These variables are Unemployment, Producer Price Index (PPI), Consumer Price Index (CPI), Durable Goods Orders, Housing Starts, Lead, Trade Balance, NonFarm Payrolls, and Retail Sales. Since our event window is (-1,+1 days), announcement of any of these variables that falls inside our window is considered an event overlap. We find that there are a total of 47 event overlaps: 10 for CPI, 15 for Durable Goods, 16 for Housing Starts, five for Lead, two for NonFarm Payrolls, eight for PPI, eight for Retail Sales, eight for Trade Balance, and two for Unemployment. Of course, some of these announcements are contemporaneous. To control for possible confounding effects, first we define indicators for each of these macro variables. The indicator for any of the macro variables is equal to 1 on any announcement date of that particular macro variable if it overlaps with the event window of an FOMC announcement. Then, we orthogonalize other control variables—RF, SLOPE, VIX, SPX—to FOMC announcements as well as to these nine macroeconomic announcements. Then we run regressions similar to Model (3), but we add these macro variables to the model to control for possible contamination.

Table VII confirms our previous findings. We find that overall rate cuts, rate hikes, and quantitative easing correspond to statistically significant decreases in spreads. Moreover, controlling for other macro announcements, all these announcements show larger impacts on spreads than we previously assessed. A rate cut corresponds, respectively, to 12.6- and 14.8-basis-point drops in spreads during the pre-crisis and crisis periods. A rate hike during the pre-crisis period is associated with a 2-basis-point drop in spreads. A QE announcement during the crisis period corresponds with a 23.6-basis-point drop in spreads. However, we find that while FOMC no-actions still exert significant adverse impacts on spreads, the magnitude of their impacts is smaller than we previously assessed. A no-action corresponds with a 9.5-basis-point increase in spreads during the crisis period. Overall, the results of this section suggest that our findings are robust to different specifications even after controlling for possible confounding effects due to other simultaneous macroeconomic announcements[11].

[Insert Table VII here]

4.4. Default Probabilities vis-à-vis Recovery Rates

In a separate analysis (available in the internet appendix) we find that recovery risk proxies don't change our baseline results. This leaves us to believe that our results are driven by changes to the perceived default risk around FOMC announcements.[12] This then begs a pertinent question: can we actually measure the changes to the default probability surrounding FOMC announcements? To answer this question, we follow the convention of recent studies and use CDS spreads as measures of risk-neutral probabilities (Friewald et al., 2014).[13] We then replicate our original analysis (as best we can) and then use the analysis to report possible changes to the implied default probability.

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[11] We have conducted a series of other robustness checks that are available in the internet appendix of this paper.

[12] Based on data from Markit, for the period of 2002-2010, the median recovery rate is 40%. On the occasions of FOMC announcements, the majority of 29,659 CDS day-trades, that is 25,730 or roughly 86.7%, report no change. These patterns also present on other periods.

[13] In the absence of rich option data, theoretically we should be able to fit a credit spread model and ask what the model implies about the changes in the implied default probabilities. Such an approach, however, opens up the

[Insert Table VIII here]

As is evident in Table VIII, using CDS data, we find qualitatively identical results. Among nonfinancials, CUTs are associated with statistically significant (1% level) 6.3 and 4.8 basis point drops in spreads in the pre-crisis and crisis periods, respectively. NOACTs are associated with a statistically significant (1% level) 6.9 basis point rise in spreads only during the crisis period. QEs are associated with a statistically significant (10% level) 6.7 drop in spreads only during the crisis period. HIKEs have no significant impact. Among financials, CUTs are associated with a statistically significant (1% level) 5.7 basis point drop in spreads only during the crisis period. NOACTs are associated with a 8.2 basis point rise (albeit insignificant) in spreads only during the crisis period. QEs and HIKEs have no significant impact.

Given that exact CDS contract characteristic are not at our disposal, we are left with our results in hypothetical frameworks to provide a more intuitive sense of how implied default probabilities change during FOMC announcements. Let's consider a hypothetical five-year credit default swap that pays par value upon default in any year during the next five years. Furthermore, the swap payments are made quarterly. Within a simple probability framework, akin to a risk-adjusted NVP model for real options, the present value of CDS payments should be equated to the sum of the probability weighted recovered par upon default at the end of quarters. Assuming that the recovery rate, α, is fixed, then at time t for the next Δt, a simple exponentially time-decaying no-default probability, p_t, is as follows:

$$p_t = \exp[-s_t \, \Delta t/(1-\alpha)]$$

Consider an average nonfinancial firm. The CDS spreads are roughly 200 basis points. Assuming an average A-rating, we can set the recovery rate for the next quarter, i.e., 90 days, to be 90%. This implies that the no-default probability is 95.12%. As noted, we find that a CUT corresponds to 6.3 basis point drop in spreads. The implied no-default probability would be:

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conundrum of joint hypotheses: the validity of the model vis-à-vis the "informativeness" of the data. As Eom et al. (2004) demonstrated, extant models can lead to vastly different predicted spreads even when most assumptions, particularly the recovery rates, are held constant.

$$p_t = \exp\left[-\frac{200-6.3}{10000}\times\frac{90/360}{1-0.9}\right] = 95.27\%$$

In other words, the implied probability of default decreases by 0.1%.

5. Conclusion

In this paper, we show that beyond the monetary policy surprises (typically measured by the Fed fund futures surprise moves), the nature of policy actions (cuts, hikes, no-actions) also plays a crucial role. Conditioned on the nature of the announcement, corporate bonds' reactions vary and reflect the efficacy of the policy action. We show that overall, and particularly during the pre-crisis subsample, policy announcements affect credit spreads in line with predictions of macroeconomic theories of monetary policy. Investors seem to react to FOMC actions (especially rate cuts) as if they perceive the intended policy to be effective (e.g., promoting growth via a rate cut). However, during the crisis period when information asymmetry (between the Fed and public) is perhaps at its highest, a no-action leads to a large adverse market reaction, widening spreads markedly and significantly. During the crisis period, policies geared toward the provision of liquidity, such as quantitative easing, seem to matter more for the market.

Results contribute to a nascent yet rapidly growing empirical literature that studies the impact of policy uncertainty on asset prices. We see the large widening of spreads subsequent to a no-action announcement during the crisis period as evidence of market-wide policy uncertainty aversion. According to the literature, when investors perceive themselves to be in a significantly inferior state of knowledge, their confidence is substantially undermined, heightening their aversion to policy uncertainty. In such a scenario, a no-action announcement that does not resolve nor alleviate the information asymmetry leads to a policy uncertainty premium, thus widening the spreads.

The findings in this paper also add to a voluminous credit risk literature. Our evidence points to monetary policy as a factor outside the structural credit risk framework that affects credit spreads. Confirming the so-called market segmentation hypothesis as dubbed by Collin-DuFresne et al. (2001), we posit that monetary policy is a reason for nonliquidity-related supply/demand shocks—exclusive to bond markets—that determines the unexplained heterogeneity in credit spreads.

Our results partially support the idea that bond market participants are more sensitive to economic growth and provision of liquidity. Hence, a Fed fund rate cut—most likely targeted at promoting economic growth and providing systemic liquidity—narrows credit spreads by a larger absolute magnitude than rate hikes. A rate hike, most likely intended to fight inflation, has a small albeit ameliorating impact on credit spreads. From a theoretical standpoint, these results call for structural models that can accommodate nuances of monetary policy vis-à-vis asset growth and inflation. Furthermore, from a policy viewpoint, our results highlight the importance of the Federal Reserve and its crucial role in managing public expectations during a crisis. Our results show that policy actions should be consistent and completely transparent, especially during periods of distress,—as Kydland and Prescott's (1977) seminal work demonstrates—in order to mitigate the severity of information uncertainties.; a vague no-change announcement does not reveal the Fed's intention, at least not to bond market participants, and only exacerbates the situation in times of crisis.

Appendix: Summaries of FOMC meetings

- Summary of minutes for 1/21/2008: The Committee again met by conference call. Incoming information since the conference call on January 9 reinforced the view that the outlook for economic activity was weakening. All members judged that a substantial easing in policy in the near term was appropriate to foster moderate economic growth and reduce the downside risks to economic activity. Most members judged that an immediate reduction in the federal funds rate was called for to begin aligning the real policy rate with a weakening economic situation. The vote encompassed approval of the text below for inclusion in the statement to be released at 8:30 a.m. on Tuesday, January 22: "The Federal Open Market Committee has decided to lower its target for the Federal funds rate 75 basis points to 3½ percent..."
- Summary of minutes for 10/07/2008: The Committee again met by conference call. Stresses in financial markets continued to increase: Interest rate spreads in interbank funding markets widened markedly, corporate and municipal bond yields rose, and equity prices dropped sharply. For the first time in many years, the net asset value of a major money market fund fell below $1 per share; this event sparked a flight out of prime money market funds and caused a severe impairment of the functioning of the commercial paper market. All members judged that a significant easing in policy at this time was appropriate to foster moderate economic growth and to reduce the downside risks to economic activity. To further its long-run objectives, the Committee in the immediate future sought conditions in reserve markets consistent with reducing the Federal funds rate to an average of around 1½ percent.
- Summary of minutes for 02/07/2009: The Committee met by conference call in a joint session with the Board of Governors to discuss the potential role of the Federal Reserve in the Treasury's forthcoming financial stabilization plan. After hearing an overview of the version of the plan envisioned at the time of the meeting, meeting participants discussed its principal elements and shared a range of perspectives on its implications for financial markets and institutions. The Federal Reserve's primary direct role in the plan would be through an expansion of the previously announced

the Term Asset-Backed Securities Loan Facility (TALF), which would be supported by additional funds from the Troubled Asset Relief Program (TARP). Participants agreed it would be important to work with the Treasury to obtain tools to ensure that any reserves added to the banking system through this program could be removed at the appropriate time.

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Table I. FOMC actions and predictions of extant theories

	CUT	HIKE	NOACT	QE
Panel A. Predicted sign of a FOMC action dummy on corporate credit spreads				
Structural models	+	–	N/A	N/A
Credit channel theories	–	+	N/A	–
Information asymmetry	–	~	N/A	N/A
Policy uncertainty	N/A	N/A	+	N/A
Our findings	–	–	+	–
Panel B. The absolute value of the coefficient estimate on FOMC action dummies for crisis periods relative to that for non-crisis periods				
Structural models	N/A	N/A	N/A	N/A
Credit channel theories	>	>	N/A	>
Information asymmetry	>	~	N/A	N/A
Policy uncertainty	N/A	N/A	>	N/A
Our findings	≤	N/A	>	N/A
Panel C. The absolute value of the coefficient estimate on FOMC action dummies for short-term bonds relative to that for long-term bonds				
Structural models	>	>	N/A	N/A
Credit channel theories	>	>	N/A	>
Information asymmetry	>	<	N/A	?
Policy uncertainty n	N/A	N/A	>	N/A
Our findings	>	>	>	>
Panel D. The absolute value of the coefficient estimate on FOMC action dummies for speculative-grade bonds relative to that for investment-grade bonds				
Structural models	>	>	N/A	N/A
Credit channel theories	>	>	N/A	>
Information asymmetry	>	?	N/A	?
Policy uncertainty	N/A	N/A	>	N/A
Our findings	>	>	>	>

Table II. FOMC actions and Fed fund targets

This table reports the dates, FOMC actions, and corresponding target rate changes for the period of January 2002 to December 2010. The data is from the Federal Reserve Bank of New York. FOMC action announcement dummies reflect a rate cut (CUT), a rate hike (HIKE), a pure no-action (NOACT), and quantitative easing (QE). The bold dates are either unscheduled FOMC meetings or QE-only announcements. † FOMC met via conference call; ‡ Joint meeting of FOMC of the Board of Governors when Troubled Asset Relief Program (TARP) and the future of quantitative easing was discussed.

Date	Target Rate Change	FOMC Announced Action	Market Expectation	Forecast Dispersion	FOMC Action Dummy	Date	Target Rate Change	FOMC Announced Action	Market Expectation	Forecast Dispersion	FOMC Action Dummy
13-Aug-02	0.00	No Change	No Change	0.07	NOACT	21-Mar-07	0.00	No Change	No Change	0.00	NOACT
24-Sep-02	0.00	No Change	No Change	0.02	NOACT	9-May-07	0.00	No Change	No Change	0.00	NOACT
6-Nov-02	-0.50	Decrease	Decrease	0.16	CUT	28-Jun-07	0.00	No Change	No Change	0.00	NOACT
10-Dec-02	0.00	No Change	No Change	0.00	NOACT	7-Aug-07	0.00	No Change	No Change	0.00	NOACT
29-Jan-03	0.00	No Change	No Change	0.04	NOACT	18-Sep-07	-0.50	Decrease	Decrease	0.12	CUT
18-Mar-03	0.00	No Change	No Change	0.08	NOACT	31-Oct-07	-0.25	Decrease	Decrease	0.09	CUT
6-May-03	0.00	No Change	No Change	0.05	NOACT	11-Dec-07	-0.25	Decrease	Decrease	0.07	CUT
25-Jun-03	-0.25	Decrease	Decrease	0.14	CUT	**21-Jan-08†**	**-0.75**	**Decrease**	**N/A**	0.07	**CUT**
12-Aug-03	0.00	No Change	No Change	0.00	NOACT	30-Jan-08	-0.50	Decrease	Decrease	0.19	CUT
16-Sep-03	0.00	No Change	No Change	0.00	NOACT	18-Mar-08	-0.75	Decrease	Decrease	0.21	CUT
28-Oct-03	0.00	No Change	No Change	0.00	NOACT	30-Apr-08	-0.25	Decrease	Decrease	0.09	CUT
9-Dec-03	0.00	No Change	No Change	0.00	NOACT	25-Jun-08	0	No Change	No Change	0.00	NOACT
28-Jan-04	0.00	No Change	No Change	0.00	NOACT	5-Aug-08	0	No Change	No Change	0.00	NOACT
16-Mar-04	0.00	No Change	No Change	0.00	NOACT	16-Sep-08	0	No Change	No Change	0.13	NOACT
4-May-04	0.00	No Change	No Change	0.00	NOACT	**7-Oct-08†**	**-0.5**	**Decrease**	**N/A**	0.13	**CUT**
30-Jun-04	0.25	Increase	Increase	0.05	HIKE	29-Oct-08	-0.5	Decrease	Decrease	0.19	CUT
10-Aug-04	0.25	Increase	Increase	0.07	HIKE	**25-Nov-08**	**N/A**	**N/A**	**N/A**	0.19	**QE**
21-Sep-04	0.25	Increase	Increase	0.04	HIKE	**1-Dec-08**	**N/A**	**N/A**	**N/A**	0.19	**QE**
14-Dec-04	0.25	Increase	Increase	0.02	HIKE	16-Dec-08	-0.75	Decrease	Decrease	0.13	CUT & QE
2-Feb-05	0.25	Increase	Increase	0.00	HIKE	28-Jan-09	0.00	No Change	No Change	0.01	QE
22-Mar-05	0.25	Increase	Increase	0.05	HIKE	**7-Feb-09‡**	**N/A**	**N/A**	**N/A**	0.01	**QE**
3-May-05	0.25	Increase	Increase	0.00	HIKE	18-Mar-09	0.00	No Change	No Change	0.07	QE
30-Jun-05	0.25	Increase	Increase	0.03	HIKE	29-Apr-09	0.00	No Change	Decrease	0.07	QE
9-Aug-05	0.25	Increase	Increase	0.00	HIKE	24-Jun-09	0.00	No Change	No Change	0.03	QE
20-Sep-05	0.25	Increase	Increase	0.10	HIKE	12-Aug-09	0.00	No Change	No Change	0.00	QE
1-Nov-05	0.25	Increase	Increase	0.04	HIKE	23-Sep-09	0.00	No Change	No Change	0.00	QE
13-Dec-05	0.25	Increase	Increase	0.00	HIKE	4-Nov-09	0.00	No Change	No Change	0.00	QE
31-Jan-06	0.25	Increase	Increase	0.03	HIKE	16-Dec-09	0.00	No Change	No Change	0.00	QE
28-Mar-06	0.25	Increase	Increase	0.00	HIKE	27-Jan-10	0.00	No Change	No Change	0.00	QE
10-May-06	0.25	Increase	Increase	0.00	HIKE	16-Mar-10	0.00	No Change	No Change	0.00	QE
29-Jun-06	0.25	Increase	Increase	0.03	HIKE	28-Apr-10	0.00	No Change	No Change	0.00	QE
8-Aug-06	0.00	No Change	No Change	0.11	NOACT	23-Jun-10	0.00	No Change	No Change	0.00	QE
20-Sep-06	0.00	No Change	No Change	0.00	NOACT	10-Aug-10	0.00	No Change	No Change	0.00	QE
25-Oct-06	0.00	No Change	No Change	0.00	NOACT	21-Sep-10	0.00	No Change	No Change	0.00	QE
12-Dec-06	0.00	No Change	No Change	0.00	NOACT	3-Nov-10	0.00	No Change	No Change	0.00	QE
31-Jan-07	0.00	No Change	No Change	0.00	NOACT	14-Dec-10	0.00	No Change	No Change	0.00	QE

Table III. Multivariate regressions analysis of the effect of FOMC actions on corporate (U.S. non-financial) credit spreads

This table reports the coefficients of regressing changes in credit spreads on FOMC action dummies and a host of orthognalized control macro-level variables for the entire sample, the pre-crisis and crisis periods. Pre-crisis period is defined as August 2002 to November 2007. Crisis period is defined as December 2007 to June 2009. FOMC policy action stances are denoted by dummy variables that indicate: rate decrease (CUT), rate increase (HIKE), no change (NOACT), and quantitative easing (QE). Control variables include changes in the 10-year constant maturity Treasury yield (RF), Treasury yield curve slope—the difference between 10-year and 2-year constant maturity Treasury yields (SLOPE), VIX index, and S&P500 return (SP). All control variables are orthogonalized to FOMC action dummies in that they are residuals of regressions in which respective macro-level variables are regressed against FOMC dummies. Robust (heteroskedasticity and autocorrelation corrected) standard errors (see White, 1980) corrected for firm clustering are used to calculate the t-values that appear in parentheses below the coefficient estimates. Coefficients that are statistically different from zero at the 1%, 5%, and 10% levels are marked with ***, **, and *, respectively.

	(1) All Bonds	(2) Investment	(3) Speculative	(4) Long-Term	(5) Short-Term	(6) Long-Term Investment	(7) Short-Term Investment	(8) Long-Term Speculative	(9) Short-Term Speculative
Panel A. For the entire period of Aug. 2002 – Dec. 2010									
CUT	-0.079***	-0.068***	-0.099***	-0.063***	-0.102***	-0.061***	-0.078***	-0.074***	-0.133***
	(-7.870)	(-7.930)	(-4.990)	(-8.180)	(-4.650)	(-8.450)	(-4.350)	(-4.580)	(-3.230)
HIKE	-0.015**	0.000	-0.031***	-0.008*	-0.024*	-0.001	0.003	-0.017*	-0.052**
	(-2.520)	(0.120)	(-2.640)	(-1.870)	(-1.760)	(-0.340)	(0.350)	(-1.800)	(-1.990)
NOACT	0.018***	0.012***	0.022***	0.014***	0.021**	0.011***	0.013	0.016**	0.029*
	(4.290)	(2.640)	(2.980)	(3.520)	(2.420)	(2.680)	(1.280)	(2.200)	(1.910)
QE	-0.041***	-0.036***	-0.051***	-0.033***	-0.050***	-0.030***	-0.046***	-0.044***	-0.057***
	(-8.650)	(-7.710)	(-5.830)	(-7.580)	(-5.670)	(-7.140)	(-4.820)	(-5.130)	(-3.820)
ΔRF†	-0.804***	-0.495***	-1.202***	-0.750***	-0.947***	-0.502***	-0.558***	-1.128***	-1.307***
	(-23.130)	(-15.650)	(-17.460)	(-26.120)	(-13.780)	(-17.430)	(-8.620)	(-20.660)	(-10.380)
ΔSLOPE†	0.233***	0.200***	0.262***	0.307***	0.121	0.269***	0.120	0.326***	0.166
	(4.880)	(4.510)	(2.600)	(8.000)	(1.460)	(7.530)	(1.520)	(3.970)	(1.010)
SP†	-3.388***	-2.119***	-4.831***	-2.927***	-4.086***	-1.364***	-3.262***	-4.825***	-4.959***
	(-9.340)	(-5.820)	(-6.870)	(-9.350)	(-5.770)	(-5.260)	(-4.200)	(-7.470)	(-3.920)
ΔVIX†	0.741	10.952	7.397	25.343	-41.160	43.858**	-45.551	32.747	-31.962
	(0.030)	(0.410)	(0.150)	(1.180)	(-0.850)	(2.280)	(-0.810)	(0.670)	(-0.360)
ΔFFF†	0.261***	0.071**	0.423***	0.215***	0.304***	0.080***	0.029	0.314***	0.570***
	(6.520)	(2.380)	(5.070)	(7.300)	(3.300)	(3.150)	(0.450)	(5.090)	(3.160)
F-stat. for joint test H_0: CUT = HIKE = NOACT = QE = 0	(40.960)	(34.270)	(18.450)	(32.330)	(16.020)	(28.660)	(11.730)	(12.170)	(8.150)
N. Obs.	34,011	18,555	15,456	19,704	14,307	11,251	7,304	8,453	7,003
Adj. R^2	0.058	0.057	0.071	0.110	0.041	0.103	0.041	0.144	0.048

	(1) All Bonds	(2) Investment	(3) Speculative	(4) Long-Term	(5) Short-Term	(6) Long-Term Investment	(7) Short-Term Investment	(8) Long-Term Speculative	(9) Short-Term Speculative
Panel B. For the pre-crisis period of Aug. 2002 – Nov. 2007. For brevity, only the coefficient estimates of FOMC dummies reported.									
CUT	-0.095***	-0.040***	-0.163***	-0.074***	-0.129***	-0.036***	-0.039**	-0.120***	-0.228***
	(-8.100)	(-5.090)	(-6.500)	(-7.580)	(-4.840)	(-4.540)	(-2.320)	(-5.770)	(-4.210)
HIKE	-0.014**	0.001	-0.030**	-0.008*	-0.024*	-0.001	0.002	-0.016*	-0.048*
	(-2.470)	(0.160)	(-2.520)	(-1.840)	(-1.780)	(-0.230)	(0.180)	(-1.780)	(-1.820)
NOACT	0.001	0.003	-0.004	0.006	-0.008	0.009*	-0.005	0.001	-0.015
	(0.130)	(0.540)	(-0.550)	(1.540)	(-0.840)	(1.680)	(-0.400)	(0.250)	(-0.920)
F-stat. for joint test H_0: CUT = HIKE = NOACT = 0	(23.880)	(8.660)	(16.580)	(19.770)	(9.290)	(7.330)	(1.850)	(11.630)	(7.750)
N. Obs.	15,965	8,939	7,026	9,924	6,041	5,652	3,287	4,272	2,754
Adj. R^2	0.035	0.023	0.056	0.077	0.021	0.082	0.001	0.101	0.043
Panel C. For the crisis period of Dec. 2007 – Jun. 2009 . For brevity, only the coefficient estimates of FOMC dummies reported.									
CUT	-0.076***	-0.076***	-0.079***	-0.061***	-0.098***	-0.068***	-0.085***	-0.055**	-0.111**
	(-5.940)	(-7.000)	(-3.120)	(-6.280)	(-3.520)	(-7.010)	(-3.690)	(-2.580)	(-2.200)
NOACT	0.166***	0.108***	0.236***	0.133***	0.211***	0.109***	0.096***	0.186***	0.318***
	(8.380)	(6.500)	(6.220)	(6.030)	(6.200)	(8.160)	(2.860)	(4.080)	(5.330)
QE	-0.120***	-0.077***	-0.226***	-0.091***	-0.151***	-0.064***	-0.094***	-0.204***	-0.247***
	(-9.090)	(-6.790)	(-6.730)	(-6.970)	(-6.310)	(-6.870)	(-3.840)	(-4.910)	(-5.050)
F-stat. for joint test H_0: CUT = NOACT = QE = 0	(55.280)	(40.580)	(28.510)	(46.470)	(23.960)	(71.340)	(10.690)	(17.220)	(16.280)
N. Obs.	8,811	5,422	3,389	4,891	3,920	3,210	2,212	1,681	1,708
Adj. R^2	0.100	0.092	0.127	0.153	0.080	0.154	0.074	0.210	0.094

Table IV. Multivariate regressions analysis of the effect of FOMC actions on financial corporate credit spreads

This table reports the coefficients of regressing changes in credit spreads on FOMC action dummies and a host of orthognalized control macro-level variables for the entire sample, the pre-crisis and crisis periods. Pre-crisis period is defined as August 2002 to November 2007. Crisis period is defined as December 2007 to June 2009. FOMC policy action stances are denoted by dummy variables that indicate: rate decrease (CUT), rate increase (HIKE), no change (NOACT), and quantitative easing (QE). FD is dummy variable which takes on value of 1 if bond belongs to a financial firm. Control variables include changes in the 10-year constant maturity Treasury yield (RF), Treasury yield curve slope—the difference between 10-year and 2-year constant maturity Treasury yields (SLOPE), VIX index, and S&P500 return (SP). All control variables are orthogonalized to FOMC action dummies in that they are residuals of regressions in which respective macro-level variables are regressed against FOMC dummies. Robust (heteroskedasticity and autocorrelation corrected) standard errors (see White, 1980) corrected for firm clustering are used to calculate the t-values that appear in parentheses below the coefficient estimates. Coefficients that are statistically different from zero at the 1%, 5%, and 10% levels are marked with ***, **, and *, respectively.

	Financials and Non-Financials	Financials Only	Financials Only	Financials Only	Financials Only	Financials Only	Financials Only	Financials Only	Financials Only	Financials Only
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	All Bonds	All Bonds	Investment	Speculative	Long-Term	Short-Term	Long-Term Investment	Short-Term Investment	Long-Term Speculative	Short-Term Speculative
Panel A. For the pre-crisis period of Aug. 2002 – Nov. 2007. For brevity, only the coefficient estimates of FOMC dummies reported.										
CUT	-0.099***	-0.072***	-0.049***	-0.215***	-0.048***	-0.081***	-0.030***	-0.056*	-0.179***	-0.218***
	(-8.900)	(-4.07)	(-2.72)	(-4.05)	(-4.17)	(-2.90)	(-2.80)	(-1.89)	(-2.96)	(-3.08)
HIKE	-0.014**	-0.008*	0.002	-0.111***	-0.005	-0.012	-0.001	0.003	-0.045	-0.142***
	(-2.470)	(-1.71)	(0.63)	(-3.10)	(-1.02)	(-1.57)	(-0.29)	(0.60)	(-1.52)	(-2.78)
NOACT	-0.002	-0.007	-0.003	-0.033	0.011***	-0.017	0.013***	-0.013	-0.014	-0.038
	(-0.550)	(-0.90)	(-0.40)	(-1.64)	(3.70)	(-1.39)	(4.22)	(-1.00)	(-0.96)	(-1.39)
CUT×FD	0.031									
	(1.580)									
HIKE×FD	0.006									
	(0.780)									
NOACT×FD	0.001									
	(0.050)									
N. Obs.	26,816	10,851	9,825	1,026	4,262	6,589	3,949	5,876	313	713
Adj. R^2	0.028	0.0197	0.0208	0.0478	0.1231	0.0115	0.1303	0.0117	0.1685	0.0448

	Financials and Non-Financials	Financials Only	Financials Only	Financials Only	Financials Only	Financials Only	Financials Only	Financials Only	Financials Only	Financials Only
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	All Bonds	All Bonds	Investment	Speculative	Long-Term	Short-Term	Long-Term Investment	Short-Term Investment	Long-Term Speculative	Short-Term Speculative
Panel B. For the crisis period of Dec. 2007 – Jun. 2009 . For brevity, only the coefficient estimates of FOMC dummies reported.										
CUT	-0.073***	-0.069**	-0.031	-0.437***	-0.138***	-0.039	-0.104***	0.011	-0.591**	-0.386**
	(-5.600)	(-2.51)	(-1.21)	(-3.23)	(-5.49)	(-0.91)	(-5.38)	(0.26)	(-2.52)	(-2.34)
NOACT	0.126***	0.683***	0.641***	0.947***	0.354***	0.827***	0.361***	0.765***	0.261*	1.160***
	(5.740)	(7.89)	(6.82)	(4.53)	(5.05)	(6.32)	(4.80)	(5.24)	(1.78)	(4.49)
QE	-0.100***	-0.124***	-0.110***	-0.154	-0.098***	-0.127***	-0.089***	-0.113***	-0.225	-0.099
	(-7.640)	(-5.09)	(-5.33)	(-0.82)	(-4.48)	(-3.51)	(-4.97)	(-3.44)	(-0.78)	(-0.42)
CUT×FD	-0.001									
	(-0.010)									
NOACT×FD	0.613***									
	(6.490)									
QE×FD	-0.058**									
	(-2.290)									
N. Obs.	13,862	5,051	4,525	526	1,793	3,258	1,679	2,846	114	412
Adj. R^2	0.093	0.0960	0.0815	0.2552	0.1335	0.1036	0.1361	0.0861	0.3195	0.2633

Table V. The impact of forecast dispersion about FOCM action

This table reports the coefficients of regressing changes in credit spreads on FOMC action dummies and a host of orthognalized control macro-level variables for the pre-crisis and crisis periods. Pre-crisis period is defined as August 2002 to November 2007. Crisis period is defined as December 2007 to June 2009. FOMC policy action stances are denoted by dummy variables that indicate: rate decrease (CUT), rate increase (HIKE), no change (NOACT), and quantitative easing (QE). Control variables include changes in the 10-year constant maturity Treasury yield (RF), Treasury yield curve slope—the difference between 10-year and 2-year constant maturity Treasury yields (SLOPE), VIX index, S&P500 return (SP), and standard deviation of analysts forecast of upcoming FOMC announcement ($\sigma_{Forecast}$). All control variables—except for $\sigma_{Forecast}$—are orthogonalized to FOCM action dummies in that they are residuals of regressions in which respective macro-level variables are regressed against FOMC dummies. Robust (heteroskedasticity and autocorrelation corrected) standard errors (see White, 1980) corrected for firm clustering are used to calculate the t-values that appear in parentheses below the coefficient estimates. Coefficients that are statistically different from zero at the 1%, 5%, and 10% levels are marked with ***, **, and *, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All Bonds	Investment	Speculative	Long-Term	Short-Term	Long-Term Investment	Short-Term Investment	Long-Term Speculative	Short-Term Speculative
Panel A. For the pre-crisis period of Aug. 2002 – Nov. 2007. For brevity, only the coefficient estimates of FOMC dummies reported.									
CUT	-0.113***	-0.024	-0.214***	-0.101***	-0.134***	-0.023**	-0.022	-0.193***	-0.249***
	(-5.990)	(-1.630)	(-5.630)	(-6.780)	(-3.030)	(-1.960)	(-0.610)	(-6.670)	(-2.810)
HIKE	-0.016***	0.004	-0.037***	-0.013**	-0.024*	0.002	0.005	-0.027***	-0.052**
	(-2.810)	(1.070)	(-3.190)	(-2.550)	(-1.860)	(0.690)	(0.580)	(-2.780)	(-2.140)
NOACT	0.003	0.006	0.001	0.007*	-0.003	0.011**	-0.003	0.002	-0.002
	(0.670)	(0.940)	(0.180)	(1.850)	(-0.260)	(2.400)	(-0.180)	(0.350)	(-0.120)
$\sigma_{Forecast}$	0.075	-0.121	0.227	0.168*	-0.053	-0.112	-0.117	0.434**	-0.057
	(0.600)	(-1.020)	(0.930)	(1.710)	(-0.180)	(-1.340)	(-0.410)	(2.270)	(-0.100)
N. Obs.	15,965	8,939	7,026	9,924	6,041	5,652	3,287	4,272	2,754
Adj. R^2	0.036	0.024	0.061	0.081	0.022	0.083	0.004	0.110	0.048
Panel B. For the crisis period of Aug. 2007 – Jun. 2009 . For brevity, only the coefficient estimates of FOMC dummies reported.									
CUT	-0.114***	-0.164***	-0.051	-0.073***	-0.157***	-0.130***	-0.197***	-0.006	-0.097
	(-5.330)	(-7.560)	(-1.190)	(-3.680)	(-3.860)	(-6.840)	(-4.670)	(-0.120)	(-1.320)
NOACT	0.144***	0.082***	0.219***	0.121***	0.181***	0.089***	0.063*	0.174***	0.299***
	(7.460)	(5.070)	(5.750)	(5.730)	(5.250)	(6.720)	(1.850)	(3.960)	(4.810)
QE	-0.142***	-0.123***	-0.220***	-0.105***	-0.180***	-0.096***	-0.155***	-0.193***	-0.243***
	(-10.750)	(-10.830)	(-6.780)	(-8.010)	(-7.540)	(-9.000)	(-6.760)	(-5.060)	(-5.080)
$\sigma_{Forecast}$	0.355**	0.746***	-0.135	0.154	0.541**	0.517***	0.971***	-0.286	-0.038
	(2.580)	(5.260)	(-0.470)	(1.150)	(2.160)	(4.450)	(3.500)	(-0.890)	(-0.080)
N. Obs.	8,811	5,422	3,389	4,891	3,920	3,210	2,212	1,681	1,708
Adj. R^2	0.100	0.092	0.127	0.153	0.080	0.154	0.074	0.210	0.094

Table VI. FOMC no-actions and economic policy uncertainty

This table reports the coefficients of regressing changes in Economic Policy Uncertainty index (EPU) on FOMC action dummies and a host of orthognalized control macro-level variables for the entire sample. FOMC policy action stances are denoted by dummy variables that indicate: rate decrease (CUT), rate increase (HIKE), no change (NOACT), and quantitative easing (QE). Control variables include changes in the 10-year constant maturity Treasury yield (RF), Treasury yield curve slope—the difference between 10-year and 2-year constant maturity Treasury yields (SLOPE), VIX index, S&P500 return (SP) , and standard deviation of analysts forecast of upcoming FOMC announcement ($\sigma_{Forecast}$). All control variables - except for $\sigma_{Forecast}$ - are orthogonalized to FOCM action dummies as well as a host of macroeconomic variables in that they are residuals of regressions in which respective macro-level variables are regressed against FOMC dummies and dummies indicating a macroeconomic announcement is made during the FOMC meeting date. Our macroeconomic variables include unemployment, producer price index, consumer price index, durable goods orders, housing starts, leading indicators, trade balance, non-farm payroll, and retail sales. These announcements are collected from Bloomberg. Robust (heteroskedasticity and autocorrelation corrected) standard errors (see White, 1980) corrected for firm clustering are used to calculate the t-values that appear in parentheses below the coefficient estimates. Coefficients that are statistically different from zero at the 1%, 5%, and 10% levels are marked with ***, **, and *, respectively

	(1)	(2)	(3)	(4)	(5)
CUT		15.648	38.080	25.523	48.063
		(0.480)	(1.040)	(0.480)	(0.850)
HIKE		1.479	5.397	5.063	8.943
		(0.050)	(0.180)	(0.170)	(0.270)
NOACT	52.925**	52.925**	79.246***	52.596**	78.584**
	(2.370)	(2.370)	(2.710)	(2.190)	(2.530)
QE		-43.074*	-12.887	-41.122	-11.090
		(-1.720)	(-0.400)	(-1.500)	(-0.320)
CPI			-78.100		-75.666
			(-1.490)		(-1.380)
DURABLE GOODS			-78.280**		-76.875*
			(-2.070)		(-1.930)
HOUSING STARTS			28.666		32.836
			(0.650)		(0.700)
LEAD			-28.042		-33.560
			(-0.450)		(-0.510)
NONFARM PAYROLL			-38.336		-29.692
			(-0.330)		(-0.240)
PPI			26.439		19.750
			(0.460)		(0.330)
RETAIL SALES			8.691		3.757
			(0.170)		(0.070)
TRADE BALANCE			-47.215		-40.725
			(-0.900)		(-0.720)
ΔRF†				130.506	125.554
				(0.930)	(0.860)
ΔSLOPE†				-163.760	-139.938
				(-0.970)	(-0.790)
SP†				396.063	403.946
				(0.270)	(0.270)
ΔVIX†				2.740	2.384
				(0.240)	(0.200)
ΔFF†				101.698	99.666
				(0.560)	(0.540)
$\sigma_{Forecast}$				-72.180	-77.926
				(-0.230)	(-0.230)
N. Obs.	72	72	72	72	72
R^2	0.073	0.114	0.206	0.134	0.222

Table VII. Controlling for other macroeconomic announcements

This table reports the coefficients of multivariate panel regression of changes in credit spreads of U.S. non-financial firms' bonds on FOMC action dummies and a host of orthognalized control macro-level variables for the entire sample, pre-crisis and crisis periods. Pre-crisis period is defined as August 2002 to November 2007. Crisis period is defined as December 2007 to June 2009. FOMC policy action stances are denoted by dummy variables that indicate: rate decrease (CUT), rate increase (HIKE), no change (NOACT), and quantitative easing (QE). Control variables include changes in the 10-year constant maturity Treasury yield (RF), Treasury yield curve slope—the difference between 10-year and 2-year constant maturity Treasury yields (SLOPE), VIX index, and S&P500 return (SP). All control variables are orthogonalized to FOCM action dummies as well as a host of macroeconomic variables in that they are residuals of regressions in which respective macro-level variables are regressed against FOMC dummies and dummies indicating a macroeconomic announcement is made during the FOMC meeting date. Our macroeconomic variables include unemployment, producer price index, consumer price index, durable goods orders, housing starts, leading indicators, trade balance, non-farm payroll, and retail sales. These announcements are collected from Bloomberg terminal. Robust (heteroskedasticity and autocorrelation corrected) standard errors (see White, 1980) corrected for firm clustering are used to calculate the t-values that appear in parentheses below the coefficient estimates. Coefficients that are statistically different from zero at the 1%, 5%, and 10% levels are marked with ***, **, and *, respectively.

	Sample Period	Pre-Crisis Period	Crisis Period
	(1)	(2)	(3)
CUT	-0.104***	-0.126***	-0.148***
	(-8.89)	(-9.27)	(-5.55)
HIKE	-0.028***	-0.020***	
	(-4.63)	(-3.19)	
NOACT	-0.012**	-0.030***	0.095***
	(-2.08)	(-4.62)	(4.64)
QE	-0.063***		-0.236***
	(-9.32)		(-9.91)
ΔRF†	-0.800***	-0.718***	-0.577***
	(-21.40)	(-18.74)	(-6.36)
ΔSLOPE†	0.208***	0.377***	-0.268**
	(4.38)	(6.13)	(-2.06)
SP†	-2.795***	-2.574***	-5.531***
	(-6.55)	(-4.94)	(-4.18)
ΔVIX†	0.005*	0.023***	-0.015
	(1.83)	(6.23)	(-1.59)
ΔFF†	0.247***	0.039	0.700***
	(6.11)	(0.64)	(8.02)
F-Joint test H_0:			
all announcements = 0	(37.32)	(32.74)	(46.24)
N. Obs.	34,011	15,965	8,811
Adj. R^2 / Pseudo R^2	0.060	0.041	0.110

Table VIII. Multivariate regressions analysis of the effect of FOMC actions on corporate CDS spreads

This table reports the coefficients of regressing changes in CDS spreads on FOMC action dummies and a host of orthognalized control macro-level variables for the entire sample, the pre-crisis and crisis periods. Pre-crisis period is defined as August 2002 to November 2007. Crisis period is defined as December 2007 to June 2009. FOMC policy action stances are denoted by dummy variables that indicate: rate decrease (CUT), rate increase (HIKE), no change (NOACT), and quantitative easing (QE). Control variables include changes in the 10-year constant maturity Treasury yield (RF), Treasury yield curve slope—the difference between 10-year and 2-year constant maturity Treasury yields (SLOPE), VIX index, and S&P500 return (SP). All control variables are orthogonalized to FOMC action dummies in that they are residuals of regressions in which respective macro-level variables are regressed against FOMC dummies. Robust (heteroskedasticity and autocorrelation corrected) standard errors (see White, 1980) corrected for firm clustering are used to calculate the t-values that appear in parentheses below the coefficient estimates. Coefficients that are statistically different from zero at the 1%, 5%, and 10% levels are marked with ***, **, and *, respectively.

	Entire Period (1)	Pre-Crisis (2)	Crisis (3)	Entire Period (4)	Pre-Crisis (5)	Crisis (6)
CUT	-0.052***	-0.063***	-0.048***	-0.052***	-0.063***	-0.052***
	(-6.49)	(-5.12)	(-4.25)	(-6.41)	(-5.09)	(-3.86)
HIKE	0.010	0.009		0.011*	0.009	
	(1.55)	(1.41)		(1.78)	(1.41)	
NOACT	0.008	0.001	0.069***	0.009*	0.001	0.053***
	(1.58)	(0.35)	(4.74)	(1.76)	(0.35)	(2.80)
QE	-0.029**		-0.067*	-0.028**		-0.069**
	(-2.25)		(-1.90)	(-2.18)		(-2.00)
ΔRF†	-0.016	0.013	0.137	-0.021	0.018	0.142
	(-0.29)	(0.31)	(1.07)	(-0.39)	(0.43)	(1.10)
ΔVIX†	0.018	0.020	-0.212*	0.016	0.022	-0.147
	(0.33)	(0.24)	(-1.68)	(0.30)	(0.26)	(-0.95)
ΔSLOPE†	-2.096***	-1.586***	-2.348***	-2.024***	-1.623***	-1.739**
	(-4.61)	(-3.14)	(-3.44)	(-4.58)	(-3.43)	(-2.55)
SP†	-54.768*	-67.782	-83.193*	-48.988	-70.496	-26.180
	(-1.75)	(-1.46)	(-1.69)	(-1.61)	(-1.56)	(-0.46)
ΔFF†	0.099***	-0.010	0.300***	0.089***	-0.006	0.247***
	(3.92)	(-0.17)	(4.55)	(3.64)	(-0.11)	(3.65)
Δ Contributors				-0.003	-0.001	-0.008
				(-1.42)	(-0.45)	(-1.24)
Δ Recovery Rate				-2.555	0.786	-27.668
				(-1.10)	(0.71)	(-1.37)
N. Obs.	29,748	18,042	7,362	29,659	17,954	7,362
Adj. R2	0.0036	0.0016	0.0054	0.0044	0.0017	0.0188