Central Bank Expectation Management and Analyst Forecast Performance

Wen Lin
Central University of Finance and Economics
w.lin@cufe.edu.cn

Yang Wang
Lancaster University
yang.wang@lancaster.ac.uk

Xiaoyong Wu
University of Bristol
xiaoyong.wu@bristol.ac.uk

October 2022

Abstract: Managing market expectations about monetary policy through communication is important for central banks. However, this expectation management often shows inefficiency in practice, leading to the policy misalignment between central banks and market participants. In this paper, we examine the impact of this misalignment on financial analysts' performance. The macroeconomic theory predicts central banks have intensive public visibility so that the monetary policy is outweighted by the public. Consistent with the prediction, using Fed's monetary policy surprise as a proxy for the misalignment, we find that this policy surprise worsens analysts' forecasts and leads to their overreaction to the Fed's monetary policy surprise. Moreover, analysts' inefficient response is amplified by the level surprise, FOMC meetings with reverse direction in monetary policy, and unscheduled FOMC meetings. Next, we find that the improved FOMC post-meeting disclosure exacerbates analysts' inefficient responses. Finally, we find that analysts' overreaction to Fed's monetary policy surprise can be moderated by firms' information disclosure. Overall, our results indicate the influential impacts of central bank expectation management on analysts.

Key terms: Central banks, financial analysts, monetary policy surprise
JEL: E52, E58, G24

We appreciate helpful comments from Igor Goncharov, Xi Chen, Xiaochi Ge and the seminar participants at University of Bristol, and Central University of Finance and Economics.

1. Introduction:

Managing financial market participants' expectations about monetary policy has been viewed by central banks as a critical policy tool in influencing the economy. Though central banks are devoted to improving the effectiveness of their communication to facilitate the transmission of monetary policy, both the academics and anecdotal evidence show that their expectation management is often ineffective so that makes market participants misalign with the central banks, leading to policy surprises in the financial market (Blinder et al. [2008]).[1] As an important part of the financial markets, analysts play a crucial role in processing value-relevant information, shaping the expectations of other market participants and further influencing their decisions (e.g., Loh and Stulz [2011]). In this paper, we study the impact of misalignment between the central bank and market participants with regard to the monetary policy on the analysts' performance in the U.S. Relying on the Federal Open Market Commission (FOMC) monetary policy meetings, we investigate whether and how monetary policy surprise affects the performance of the analysts.

Central bank monetary policy can significantly affect firms' performance through different transmission channels. In recent years, the non-exclusive credit channel has attracted the most attention.[2] Following this particular channel, the central bank monetary policy can be transmitted to firms through two channels—the bank lending channel and the balance sheet

[1] For instance, "[T]he message sent by investors in stormy financial markets is clear: the global economic expansion could be in trouble. But the Federal Reserve remains optimistic, publishing strong growth forecasts for the U.S. and plotting out more interest rate rise (*Financial Times*, 30th December, 2018)." Apart from the anecdotal evidence, prior empirical studies provide quantitative evidence of this misalignment between central banks and market participants (e.g., Kuttner [2001], Bernanke and Kuttner [2005], Lakdawala and Schaffer [2019]).

[2] In addition to the credit channel, the central bank monetary policy can also influence firms' earnings through the traditional interest rate (e.g., Kuttner and Mosser [2002]). This particular channel assumes no market friction. However, the deviation from this critical assumption is evident in the real world due to the fact of the imperfect information in the market (Bernanke and Gertler [1995]).

channel. The bank lending channel shows that monetary policy affects the supply of loans to other commercial banks, which in turn influences firms' financing and performance.[3] The balance sheet channel posits the monetary policy affects both net income and net worth of firms, thereby determining the external financing premium and firm performance(e.g., Bernanke and Gertler [1995], Mishkin [1995]). Consistent with these theories, prior studies have documented the significant stock market reaction to the central bank monetary policy (e.g., Bernanke and Kuttner [2005], Armstrong et al. [2019]). Furthermore, by verifying the association between the Fed's monetary policy and firms' monthly earnings, we find the influential impact of the monetary policy on firms' performance.[4]

Because of the material impact on firms' performance, the central bank monetary policy rate is viewed by the market participants, including the analysts, as a major indicator of macroeconomic conditions for their investment assessment.[5] Before central banks disclose monetary policy rates, market participants usually form their expectations about the monetary policy rates (e.g., Kuttner [2001], Bernanke and Kuttner [2005]) and trade financial assets based on their expectations (Armstrong, et al. [2019]). This market expectation plays a key role in the implementation of monetary policy in real economies, such as intermediate and long-

[3] We notice that the bank lending channel assumes the critical role of the banks to alleviate the information asymmetry between firms and capital providers, and constrained the ability of the bank to replace its lost deposit. However, given the supplier of marginal credits, sources of loanable funds and bank lending channels have changed since the deregulation and innovation in the banking industry (e.g., Bernanke and Gertler [1995], Woodford [2010], Drechsler et al. [2017]), this assumption might not fully hold in the U.S. in recent years.

[4] We regress firms' monthly earnings on the Fed monetary policy surprise across industries and the mean adjusted R-squared from this regression ranges from 8.78% for Chemicals to 14.65% for Telecom. For more detailed information, please check Table 3.

[5] For instance, anecdotal evidence can be found in newspaper such as "U.S. stock markets fell sharply for a second session on Wednesday after the Federal Reserve indicated it was finished with rate-cuts…an analyst downgrade knocked Nucor 4.8 per cent to $76.01. (*Financial Times*, 21st May, 2008)". "Wall Street analysts have taken an axe to profit forecasts for the biggest U.S. banks, fearing that the U.S. Federal Reserve…will hold off on pushing up interest rate (*Financial Times*, 10th July, 2016)". "Ten minutes after Federal Reserve chair Jay Powell insisted that the central bank restarting its Treasury purchases…one Wall St analyst sent a note to his client saying that new strategy sure sounds like QE. He was not the only one (*Financial Times*, 9th October, 2019)"

term interest rates (Eggertsson and Woodford [2003], Bernanke et al. [2004], Blinder, et al. [2008]). The market expectation can be influenced by central bank communication. Through different communication channels, central banks can shape market expectations for future policy rates and paths (Woodford [2005], Blinder, et al. [2008]). Thus, for central bankers, managing the expectations of the market participants and ensuring them to be aligned with the central banks are necessary to implement their monetary policy effectively (Bernanke, et al. [2004], Blinder, et al. [2008]).

Though the importance of expectation management has been widely recognized by the central banks, in practice, this is never an easy task. The desired communication levels and appropriate strategies are still in ongoing debate (e.g., Woodford [2005], Ehrmann and Fratzscher [2007], Blinder, et al. [2008]). Prior studies have well documented that central banks often fail to manage market expectations. For instance, by using the changes in Fed funds futures rate around the FOMC meetings as a measure of the market expectation about the Fed funds rate (hereafter, FFR), the misalignment between the Fed and market participants is evident (e.g., Kuttner [2001], Bernanke and Kuttner [2005], Gorodnichenko and Weber [2016], Armstrong, et al. [2019]). The ineffective expectation management creates uncertainty and policy surprises in the financial market.

As a crucial part of the financial market, this monetary policy surprise is likely to affect the forecasting behavior of financial analysts. First, monetary policy surprise might affect analysts' response to the central bank information in a systematic tendency. On the one hand, the heightened market uncertainty after central bank policy meetings makes analysts overweight the private information and underweight the public information (e.g., Zhang [2006],

Hann et al. [2012], Amiram et al. [2018]) so that analysts may underreact to the monetary policy surprise. On the other hand, due to the unique position of the central bank in a local economy, its disclosed information is the focal point and can crowd out other sources of information (Amato et al. [2002], Morris and Shin [2002]), leading analysts to overact to the monetary policy surprise.

Second, the monetary policy surprise might influence analysts' reactions conditional on the sign of the monetary policy, resulting in an asymmetric response. The monetary policy surprise can vary from expansionary (i.e., monetary easing) to contractionary (i.e., monetary tightening).[6] The market perspective toward these two types of surprises is complicated (Lakdawala and Schaffer [2019]). Although the easing (tightening) policy intends to expand (contract) the economy, the market participants may believe that the central bank endorses the weak (strong) economic condition. Therefore, the perspective of the *contractionary* and *expansionary* surprise is mixed.

As an important market participant, analysts may overreact to the good news and underreact to the bad news in order to justify their ex-ante optimistic views on firms and generate economic income for the brokerage (e.g., Easterwood and Nutt [1999], Hann, et al. [2012], Hugon et al. [2015]). Because of the divergent signals, the monetary policy surprise generates such kinds of opportunities for analysts to exploit their interests. Hence, the analysts' reactions may vary across the sign of the monetary policy surprise.

Based on the above arguments, we predict the misalignment between the central bank and

[6] Besides, during the sample period, we find cases that the market expectations on the future monetary policy are same as the actual policy. In these cases, there is no surprise on the market when the Fed releases their policy action.

market expectations about monetary policy influences analysts' forecasting behavior, but the direction of this impact is uncertain. To examine the impact of unexpected monetary policy on analysts' forecasts, we use the surprise component of the FFR. Following prior studies (e.g., Kuttner [2001], Bernanke and Kuttner [2005], Armstrong, et al. [2019]), we construct the FFR surprise as the changes in the Fed funds rate futures contracts around FOMC announcements multiplied by -1, so that a positive (negative) surprise reflects an unexpected decrease (increase) in FFR, suggesting expansionary (contractionary) monetary policy.[7]

Our empirical analysis is based on the quarterly earnings forecasts for the firms spanning from 1989 to 2008, which includes 176 FOMC meetings. We end our sample in 2008 as this is the last year for the Fed to use the target FFR as the main policy instrument.[8] To examine the effects of the FFR surprise on the analysts' forecasts, we start with the regression of the non-directional forecast error (i.e., absolute forecasts error) on the absolute FFR surprise from the most recent FOMC meeting. We find that the analysts' forecast errors increase with the FFR surprise. In particular, relative to the average absolute forecast error, one basis point FFR surprise increases the analysts' forecast errors by 0.18%.[9]

Furthermore, we use the directional forecast errors and split the FFR surprise into positive (i.e., expansionary) and negative (i.e., contractionary) ones. We find that, on average, analysts significantly overreact to the FFR surprise. This significant overreaction is driven by the positive surprise, but not the negative surprise. These results indicate analysts are more

[7] We also notice that the FFR surprise can be 0. In this case, it is implied that the market expectation about monetary policy is aligned with the central bank.

[8] Fed switched from disclosing a target rate to a range for the rate, and used unconventional monetary policy tools (e.g., quantitative easing) after 2008. Furthermore, the choice of ending test sample in 2008 is consistent with prior studies (e.g., Gallo et al. [2016], Ozdagli [2018]).

[9] Our results still hold if we use the alternative measurement of the proportional absolute mean forecast error, which further controls for the difference in firm, time and industries (e.g., Clement [1999], Ke and Yu [2006]).

sensitive to the expansionary policy than the contractionary policy. Overall, our findings tend to suggest that analysts pay excessive attention to the Fed and crowd out other sources of information, leading to worse forecast performance (Amato, et al. [2002], Morris and Shin [2002]).

Next, we explore whether analysts respond asymmetrically to the different FFR surprises. First, we distinguish between policy actions that affect the market expectations on future interest rates, with those that affect only the timing of rate changes. In this analysis, we categorize FFR surprises into the ones that are viewed by markets as changing the expected policy path in the following months (i.e., level surprise) and the ones that are merely regarded as timing differences in having information on current monetary policy (i.e., timing surprise). After further splitting the FFR surprise and re-running the regression, we find that the analysts particularly overreact to the level surprise. This result indicates that analysts respond strongly to policy actions that have a persistent impact on the economy.

Second, we analyze the possible asymmetric response to the direction of FFR changes. There are 8 FOMC meetings that reverse the direction of FFR changes compared with the previous ones. These turning point meetings are expected to have a larger impact on the future economy than other "usual" meetings, and elicit a larger response (Bernanke and Kuttner [2005]). We include interactive dummies for turning point meetings with FFR surprise, and find that these meetings significantly exacerbate the analysts' overreaction.[10]

Third, we distinguish FFR surprises that occurred in the scheduled and unscheduled

[10] Apart from that, we find there are 20 FOMC meetings that the FFR surprise changes from 0 to expansionary, and 9 FOMC meetings that the FFR surprise changes from 0 to contractionary. Alternatively, if we define the turning point meetings as the FFR surprise changes from 0 to expansionary or contractionary, the results are qualitatively similar.

FOMC meetings. In contrast to the scheduled meetings, unscheduled meeting calendars are not available to the public in advance.[11] These unscheduled meetings may convey an urgency to the economy. This further exploration shows that the policy surprises from the unscheduled FOMC meetings have significantly incremental impacts on the analysts' inefficient response, indicating that the non-disclosure of the meeting timetable amplifies the misalignment between the Fed and market participants.

Furthermore, we investigate how these inefficient responses of analysts vary with Fed's communication strategies. The Fed has mandated disclosure of target FFR explicitly through the post-meeting statement since 1994. Hence, we examine the impact of the revised Fed's communication on analysts' forecasts by separately considering the pre-1994 and post-1994 periods. Findings show that the analysts' overreaction to the FFR surprise is mainly driven by the post-1994 FOMC meetings, suggesting that the current central bank communication is still inefficient to the financial markets, even though the Fed aims to improve it. Additionally, we find that, though more efforts have been made to further improve post-meeting disclosure between 1997 and 2002, it still cannot alleviate analysts' inefficient responses.[12]

Finally, we examine whether the following firms' information disclosure can moderate the analysts' inefficient response. Prior studies have shown that the firms' information disclosure can benefit analysts' forecasts (e.g., Hope [2003], Chen et al. [2015]). Therefore, we examine whether good firms' earnings disclosure quality can alleviate the analysts' overreaction to the FFR surprise. Consistent with our prediction, we find that overreaction to the FFR surprise is

[11] Generally, the FOMC hosts 8 scheduled meetings for each year and these meeting schedules are open to the public in advance. However, as a necessary response to the economic and financial conditions, the FOMC may also host the unscheduled meetings.
[12] For more detailed information on changes in FOMC post-meeting disclosure, please check Table 8.

insignificant for firms with low absolute discretional accruals or absolute current accruals (i.e. good disclosure quality).

We make three contributions to the literature. First, we contribute to the literature of central bank communication by examining how ineffective market expectation management would affect financial analysts (e.g., Bernanke and Reinhart [2004], Woodford [2005], Blinder, et al. [2008]). Our results indicate that the monetary policy surprise associated with the Fed's communication strategies could significantly influence analysts' forecasting behaviors. These findings document the importance of central bank communication and expectation management (e.g., Cukierman and Meltzer [1986], Sibert [2006], Crowe and Meade [2008], Ehrmann and Fratzscher [2009]).

Second, we add the literature that examines the impact of macroeconomic factors on the analysts' forecasts by using the unexpected FFR change. Our findings of inefficient response to the Fed's policy surprise add to the literature on the association between financial analysts and crucial macroeconomic factors (e.g., Hope and Kang [2005], Basu et al. [2010], Hugon, et al. [2015]).

Third, we extend the understanding of the information in formulating analysts' forecasts. Our findings document that the central bank information crowds out other sources of information, leading to worse analysts' forecasts and inefficient responses (Amato, et al. [2002], Morris and Shin [2002]). However, this crowding-out effect can be alleviated by firm-level disclosure (e.g., Hope [2003], Chen, et al. [2015]). These results provide new insights into how analysts utilize information in their forecasts (e.g., Lang and Lundholm [1996], Hutton et al. [2012]).

The paper proceeds as follows. Section 2 provides the theoretical underpinning and prediction. Section 3 outlines the data selection. Section 4 discusses the main research design. Section 5 reports the results and findings, and section 6 concludes.

2. Theoretical underpinning and prediction

2.1 Central bank monetary policy and communication

In most countries, the primary policy goal of central banks is to implement appropriate monetary policy so that maintain price and financial stability (Bank for International Settlements [2009]). To achieve this policy goal, central banks utilize different types of policy instruments. Our study primarily focuses on the open market operations by the Fed through the purchase and sale of securities to reach a target FFR, with the recent exception of December 2008 to December 2015 when the FFR reached the "zero lower bound".[13] The FOMC sets the Fed's target FFR during 8 regularly scheduled meetings per year (i.e., scheduled meetings). Moreover, the FOMC may arrange additional meetings to adjust the target FFR as a necessary response to the economic conditions (i.e., unscheduled meetings). Through these open market operations, the Fed significantly affects the short-term interest rate.[14]

However, over the past decade, the effective control of the overnight interest rate is not a single criterion to judge the success of the monetary policy. Rather, the far-reaching expectation

[13] Other two instruments are: 1. Discount rate of short-term loan to depositionary institution; 2. Requirement of reserve that banks must maintain by themselves or with the Fed. After the FFR reaches the 0% since the Global Financial Crisis of 2008, the Fed also began using interest on required reserve balances and overnight purchase as additional policy tools (For more details, please see: https://www.federalreserve.gov/econresdata/notes/feds-notes/2016/the-federal-reserves-new-approach-to-raising-interest-rates-20160212.html)

[14] According to the conventional macroeconomic models, the central bank monetary policy is transmitted to financial markets and real economies via the traditional interest rate channel by assuming perfect information environment. Taking the information asymmetry between borrowers and lenders into consideration, the credit channel, which includes sub-types of *bank lending* and *balance sheet*, explains the potency of monetary policy (e.g., Bernanke and Gertler [1995], Kuttner and Mosser [2002], Armstrong, et al. [2019]).

of long-term interest rates is so much matter. Blinder [1998] argues that managing market expectations of central bank actions is also the essence of monetary policy. Through guiding the market expectation in line with the central bank, it can facilitate the implementation of monetary policy. This view has become widespread in central bankers (Woodford [2001]). Therefore, expectation management through central bank communication is valuable for the effective conduction of monetary policy.

By using formal communication (e.g., official press, forward guidance) and informal communication channels (e.g., public speaking, interview), the central banks can disclose objectives, strategies, policy decisions, economic outlook and future policy paths to the public (Blinder, et al. [2008]). This information disclosure can help market participants understand a central bank's policy stance and further shape their expectations. Extensive evidence has documented that central bank communication can guide the directions of the financial markets (e.g., Ehrmann and Fratzscher [2007], Brand et al. [2010]) and improve the market prediction of the interest rate decision (De Haan [2008]).

Aiming to improve its expectation management, the Fed has adjusted its communication and disclosure strategies since the 1990s. The milestone of these adjustments began in February 1994 when the FOMC first started announcing its decisions on the target FFR.[15] These real-world developments have spawned a huge academic literature on central bank communication. Some studies argue that central bank communications "*create news*" and "*reduce noise*" in financial markets so that market participants make more efficient decisions when they can

[15] Prior to 1994, the financial market has to estimate the current target FFR based on the open market operation conducted by the Fed before it is disclosed after the next FOMC meeting (e.g., Bernanke and Kuttner [2005], Ehrmann and Fratzscher [2005]).

correctly predict central bank actions (Poole [2001]).

Though central bank communication might bring benefits, other studies raise one major concern of the appropriateness of the communication, e.g., how much they should disclose, in what form, and how often. First, the theoretical papers fail to reach a consistent conclusion about the optimal level of central bank communication (e.g., Geraats [2002], Van der Cruijsen and Eijffinger [2010]). Talking more is not always better. Second, the recent empirical evidence shows central bank communication bringing unexpected volatility and speculation to the financial markets (Ehrmann and Fratzscher [2009])[16].

Anecdotal evidence of inefficient central bank communication is evident in practice. Figure 1 shows the stock market in response to the Fed's actions. On the 27th April 2006, markets misinterpreted the comments by Federal Reserve Chairman Mr. Bernanke to mean that the Fed may take a break from its steady series of interest rate rises in the next FOMC meeting. As a result, the Standard & Poor's 500 stock index, the Dow Jones industrial stock index and the Nasdaq Stock Market composite index rose immediately after this public talk. However, on the 10th May 2006, the next FOMC meeting, the Fed kept raising the interest rates, which is opposite to the market expectation, so all stock indexes declined more seriously than the normal interest rate raise.

Notwithstanding that central bank communication has improved remarkably in recent decades, it is still far from ideal with regard to expectation management. As reported in the studies of market response to the disclosure of monetary policy, the market expectations about

[16] For instance, based on the Fed's disclosure, an analyst of Standard Charted stated that "The Federal Reserve's pension fund asset allocation appears to reflect the Fed's caution about the reflation trade: it seems to underweight equities." However, given the natural of the Fed pension management, this argument hardly holds in reality. (*Financial Times*, March 30, 2017)

the monetary policy are not often in line with the central banks (e.g., Kuttner [2001], Gorodnichenko and Weber [2016], Armstrong, et al. [2019]). In our study, we find that the market participants fail to predict the correct target FFR in 122 out of 176 FOMC meetings from 1989 to 2008. This misalignment between central banks and market participants indicates that the central banks fail to manage the market expectation. This ineffective expectation management induces additional uncertainty in the financial market and could further influence the behavior of the market participants.

2.2 Monetary policy surprise and analyst forecast

Monetary policy is crucial to analyst forecasts. In Figure 2, EVERCORE ISI, an investment advisory firm, released a forecast of Ford Motor on the next day of the FOMC meeting that occurred on the 4th May 2022. In this forecast, the monetary policy hits the headlines, and analysts mentioned that "we are not blind to the impact of the Fed…". Thus, ineffective expectation management, which leads to the misalignment between central banks and market participants regarding monetary policy, is likely to affect analyst forecasts. Some prior studies have shown the analysts' inefficient reaction to macroeconomic news and leading to underreaction or overreaction behaviors (e.g., Hann, et al. [2012], Hugon, et al. [2015]). To what extent the monetary policy surprise affects analysts' forecasts is unclear.

Financial analysts might show a systematic tendency of overreacting or underreacting to monetary policy surprises. On the one hand, prior studies have generally documented that the analysts cannot incorporate all value relevant information (e.g., Elliot et al. [1995], Abarbanell and Bushee [1997]) and especially show a systematic underreaction to the public information

(e.g., Abarbanell [1991], Abarbanell and Bernard [1992]). More recent studies further show that the heightened market uncertainty makes analysts place excessive weight on private information and less weight on public information (e.g., Zhang [2006], Hann, et al. [2012], Amiram, et al. [2018]). This treatment is likely to lead to the insufficient incorporation of central bank information and, therefore, underreact to the monetary policy surprise.

On the other hand, the central bank communication literature suggests that analysts may place more weight on the information disclosed by central banks, leading to overreaction to monetary policy surprise. Because of the unique position of the central bank in a local economy, its disclosed information is the focal point for the beliefs of the market participants (Amato, et al. [2002], Morris and Shin [2002]). The analysts might pay over-attention to the information disclosed by the central bank and crowd out other sources of information. This is because the prevailing conventional wisdom believes that the key economic indicators (i.e., GDP, outputs, and unemployment rate) are linked to the target policy rate, which is determined by the central bank. Given this fact, the central bank information is too effective at shaping the expectations of analysts, resulting in overreaction to the monetary policy surprise.

In addition to the systematic tendency, analysts may react to monetary policy surprises depending on the sign of this surprise. Prior studies show that, in order to justify ex-ante optimistic views on firms and generate economic income for the brokerage, analysts might overreact to the good news and underreact to the bad news (e.g., Easterwood and Nutt [1999], Hann, et al. [2012], Hugon et al. [2015]). The monetary policy surprise provides such kinds of opportunities for analysts to exploit their interests.

The monetary policy surprises can vary from expansionary (i.e., monetary easing) to

contractionary (i.e., monetary tightening). The market interpretation of these two types of surprises is mixed. While the expansionary surprise suggests an easing policy to expand the economy, it also implies that the central bank endorses the weak economic condition. Similarly, the tightening policy could signal a strong overall economic growth, even though the aim of this action is to contract an economy. Due to the divergent signals and incentive of exploiting private interest, the analysts' reaction to the monetary policy surprise might vary across the sign of the monetary policy surprise.

However, forecast accuracy is vital to financial analysts. With accurate forecasts, analysts are awarded benefits for reputation, career development, and compensation (e.g., Mikhail et al. [1999], Hong et al. [2000], Irvine [2004]). These benefits would induce financial analysts to devote more attention to the analysis work to improve their forecast accuracy (Barron et al. [2008]). The monetary policy surprise would further reinforce the benefits of forecasting accuracy, in which investors rely more on professional opinions under complex market conditions (Amiram, et al. [2018]). Hence, to some extent, the impact of monetary policy surprises on financial analysts can be mixed.

3. Sample selection

Table 1 shows the sample selection procedure. Our sample period begins in 1989 as the federal funds futures market was established in 1989 at the Chicago Board of Trade, and we require federal funds future rate to measure monetary policy surprise. The target federal funds rate was the explicit policy instrument until the zero lower bound after the financial crisis.[17]

[17] Electively in 2009, the Fed replaced the target FFR by using the large-scale purchases of Treasury and agency securities (i.e., "quantitative easing") as its primary policy tool in response to the global financial crisis in 2008.

Therefore, we end our samples in 2008.[18] Following Bernanke and Kuttner [2005], we exclude the FOMC meeting date on 17th September 2001, which was an unscheduled meeting that was held after the 911 terror attacks.

We obtain our analyst forecast and actual earnings data from the I/B/E/S Detail File. To be included in the sample, each firm must issue earnings forecasts in U.S. dollars, with no missing data for analysts' identifiers, analysts' forecasts and actual earnings. To examine the response of analysts' forecast errors to the monetary policy surprise and avoid any bias in the relation between forecast performance and monetary policy due to other concurrent macroeconomic news, we focus on analysts' initial one-quarter-ahead quarterly earnings forecasts issued between the current and next FOMC meeting date. We also retain firms with stock price data from CRSP, analysts-related information from I/B/E/S, and financial statement data from Compustat. Given the effect of monetary policy on financial firms and utilities could be compounded by other regulation policies, we exclude these two types of firms from our sample. Finally, we use analysts' forecasts occurring between the last and current actual earnings announcement dates. This sample selection leaves us 1,004,953 firm-quarter observations.

[Insert Table 1]

4. Research design

We end our sample in June 2008 before the occurrence of the financial crisis to avoid the high uncertainty around this period, even though the main policy pool at that moment was the target FFR.

[18] We notice that the target FFR is above the zero bound since Dec 2015. In contrast with the policy tools in our sample, the Fed uses target funds rate range after 2015. To maintain the sample consistency and reduce the noise from different disclosure mechanism, we don't include the observations after 2015.

4.1 Measuring monetary policy surprises

In this paper, monetary policy surprises are measured by following the method of Kuttner [2001] and Bernanke and Kuttner [2005], who measure the unexpected changes in the FFR on the FOMC announcement dates using the expectations embedded in the current federal funds futures contracts. In particular, federal funds futures capture the market's expectations about future Federal Reserve actions. Daily changes in the trading prices of these futures contracts between the FOMC announcements date and the previous trading day serve as a measure of the change in the Fed's policy that is unanticipated by the market.[19]

We define this daily surprise (*Surprise*) as the measure of monetary policy surprise. See Appendix A for details on the construction of this variable. To make this directional monetary policy surprise intuitive to be interpreted, we define it throughout this paper as the unexpected change in the FFR multiplied by -1. Therefore, a positive (negative) surprise indicates an unexpected reduction (increase) in the FFR, suggesting an unexpected expansionary (contractionary) monetary policy. Furthermore, we construct a non-directional monetary policy surprise, which is the absolute value of *Surprise* (*Abs_Surprise*). The larger the value of *Abs_Surprise* implies that the FFR surprise is more significant.

4.2 Model specification

The analyst forecast error (*FE*) is defined as actual earnings per share (*EPS*) minus the analysts' earnings forecasts, scaled by the price at the beginning of the quarter. We examine analysts' performance with respect to monetary policy surprise by regressing the absolute

[19] If the information regard to the Fed's policy is fully captured by the market, the daily changes in federal funds futures around FOMC announcement dates would be 0.

forecast errors (*Abs_FE*) on the absolute monetary policy surprise (*Abs_Surprise*) from the most recent FOMC meetings and control variables.[20] Furthermore, we use the directional forecast errors (*FE*) and directional monetary policy surprise (*Surprise*) to explore the analysts' attitude toward the FFR surprise. Specifically, we estimate the following regression model:

$$Abs\_FE\ (or\ FE) = \beta_0 + \beta_1 \cdot Abs\_Surprise\ (or\ Surprise) + Analyst\ Controls + Broker\ Controls + Firm\ Controls + \delta_i + \gamma_t + \theta_j + \varepsilon_0 \quad (1)$$

Following prior papers (e.g., Hugon, et al. [2015]), there are three classes of controls in our model. First, there are analyst-specific variables that are associated with forecast error, including forecast horizon (*HORIZON*), forecast frequency (*FREQ*), the number of industries covered (*NIND*), number of firms covered (*NFIRM*), and firm-specific experience (*FEXP*). Second, we use broker firm size (*BSIZE*) to capture the effect of broker-related information on the analysts' forecast performance. Third, we control for firm-specific variables to affect the forecast error, including total accruals (*LAG_TACC*), annual profitability (*LAG_PROFIT*), and firm size (*LAG_SIZE*). All continuous variables are winsorized at the top and bottom 1 percent, and detailed definitions of all variables are included in Appendix B. We also include Fama-French 48 industries fixed effects, δ_i, year fixed effects, γ_t, and firm fixed effects, θ_j.

For the regression of absolute forecast errors on the absolute FFR surprise, we expect the coefficient on *Abs_Surprise*, β_1, is positive and significant, suggesting that the FFR surprises

[20] The median length between analysts' forecast dates and most recent FOMC meetings dates is 22 days. To alleviate the concerns that our results might be affected by the next FOMC meeting, we constrain the sample that the analysts' forecasts must be within 22 days following the most recent FOMC meetings and the main results still hold. Alternatively, we include an additional control variable of the length between analysts' forecast dates and most recent FOMC meetings dates, the main results still hold.

worsen analysts' forecasts. As for the regression of directional forecast errors on the directional FFR surprise, given the signed forecast errors, a positive (negative) coefficient on *Surprise*, β_1, indicates analysts' underreaction (overreaction) to the FFR surprises.

5. Results

5.1 Descriptive statistics

Panel A in Table 2 presents descriptive statistics for the Fed's monetary policy surprise (*Surprise*) in our analysis. There are 176 FOMC meetings held during the sample period, including scheduled and unscheduled meetings. Out of 176 meetings, 77 meetings release unexpected expansionary news to the capital market with positive monetary policy surprise, and 45 meetings release unexpected contractionary news to the market with negative monetary policy surprise. The rest of the 54 meetings do not issue surprise rate changes to the capital market. The mean values of *Surprise* for total observations, positive surprise and negative surprise are 3.13%, 10.22% and -5.27%, respectively. Relatively, the divergence between market participants and Fed is server in the case of unexpected expansionary policy than the contractionary policy. Finally, the mean value of *Timing surprise* is 0.97%.

Panel B in Table 2 presents descriptive statistics for the key variables in our tests separately after positive surprise and negative surprise. The absolute forecast errors (*Abs_FE*) are similar across different samples. The negative mean forecast errors (*FE*), either for a positive or negative surprise, show that analysts are optimistic on average. Descriptive statistics for these control variables look similar between positive and negative shocks.

[Insert Table 2]

5.2 Link between monetary policy surprise and firm earnings

Before presenting the main results, we test the existence of a link between monetary policy surprise and firm earnings. Table 3 presents the descriptive statistics of the adjusted R-square from estimating firm-specific ordinary least squares (OLS) regressions of monthly earnings changes on monetary policy surprise during the 1989 to 2008 period. Industries are based on the Fama-French 12 industry classification. We exclude the Finance industry and the Utility industry since both of these sectors are affected by the monetary policy differently from other sectors.

In Table 3, we show the mean value of individual firms adjusted R-square sorted by 10 industries. The Business Equipment industry accounts for the largest portion of total observations, while the Chemicals industry accounts for the least. The mean adjusted R-square ranges from 8.78% for the Chemicals industry to 14.65% for the Telecom industry. The cross-sector variation is small. These findings support our study that the monetary policy affects analyst earnings forecasts across industries.

[Insert Table 3]

5.3 Multivariate results

Table 4 column 1 reports the results of the regressions of Equation (1) by using the whole sample. After controlling for the firm, analyst and broker characteristics, as well as industry, firm and year fixed effects, we find that the coefficients on *Abs_Surprise* are positive and significant (coef=0.0019; t-stat=2.34). This result suggests that the FFR surprises increase

analysts' forecast errors, leading to worse analysts' performance. In economic terms, relative to the mean of the absolute forecast errors, one basis point FFR surprise increases the analysts' forecast errors by 0.18%. To further control for the difference in the firm, time and industries, we use the alternative measurement of the proportional absolute mean forecast error in column 2, and the results still hold (e.g., Clement [1999], Ke and Yu [2006]).

Next, we use the directional forecast errors and split the FFR surprises into positive (i.e., expansionary) and negative (i.e., contractionary) ones in columns 3-5. This further exploration shows that the coefficients on *Surprise* are still negative across these 3 columns, but this overreaction is statistically significant in total values of surprise and positive surprise samples (coef=-0.0014; t-stat=-2.64; coef=-0.0037; t-stat=-4.33). These estimates suggest that analysts overreact to expansionary policy surprise. Consistent with the theories in Amato, et al. [2002] and Morris and Shin [2002], this overreaction seems to indicate that the analysts pay excessive attention to the Fed and crowd out other sources of information.

Alternatively, in the untabulated analysis, we aggregate the observations to examine the overall U.S. analysts' response to the Fed's monetary policy surprise. The results from these aggregated level regressions still indicate that analysts overreact to expansionary surprise. This aggregation helps us to address the concern of possible bias from the micro-level (e.g., analyst, brokerage house, etc.) to some extent.

[Insert Table 4]

5.4: FFR surprise types

The FFR surprises from different FOMC meetings are not homogenous. In this section, we examine whether analysts have asymmetric responses to different types of FFR surprises.

First, the FFR surprises differ in terms of the impact on the market expectation of future interest rates. While some FFR surprises are viewed by the market as changing the expected path of the FFR in the next few months (i.e., level surprises), others are regarded as purely timing differences in having information on current monetary policy (i.e., timing surprises). We expect that, compared with the timing surprises, the level surprises will have more influential impacts on analysts. Following Bernanke and Kuttner [2005], we measure the timing surprise as the difference between the change in the 3-month-ahead futures rate and the current FFR surprise (*Timing surprise*). By adding the variable of the *Timing surprise* to Equation (1), the original variable of the *Surprise* in the regression model will now capture the level surprise:

$$FE = \beta_0 + \beta_1 \cdot Surprise + \beta_2 \cdot Timing\ Surprise + Analyst\ Controls + Broker\ Controls + Firm\ Controls + \delta_i + \gamma_t + \theta_j + \varepsilon_0 \quad (2)$$

Timing surprise is the difference between the change in the 3-month-ahead futures rate and the current FFR surprise. Following Equation (1), we include the same control variables and the same set of fixed effects.

As reported in Table 5 column 1 and 2, coefficients on *Surprise* are negative and significant, but the coefficients on *Timing surprise* are insignificant. These results indicate that the analysts' overreactions are mainly driven by the level surprise, suggesting that analysts have a strong response to monetary policy actions that have a persistent impact on the economy.

[Insert Table 5]

Second, the FFR surprises differ in the direction of FFR changes. Specifically, we find 8 FOMC meetings that reverse the direction of FFR changes to the previous meetings. These turning point FOMC meetings are likely to make the market participants revise their

expectations of the future policy path. Therefore, we predict these FFR surprises from turning point FOMC meetings will have greater impacts on analysts than those "usual" FOMC meetings. Empirically, we specify the following regression model:

$$FE = \beta_0 + \beta_1 \cdot Surprise + \beta_2 \cdot Reverse\ direction + \beta_3 \cdot Surprise \cdot Reverse\ direction + Analyst\ Controls + Broker\ Controls + Firm\ Controls + \delta_i + \gamma_t + \theta_j + \varepsilon_0 \quad (3)$$

Reverse direction is a dummy variable that equals 1 if the target FFR in the current FOMC meeting reverses the direction of the previous ones, 0 otherwise. Following Equation (1), we include the same control variables and the same set of fixed effects.

Table 6 column 1 and 2 shows that, the interaction term between the dummy variable of the turning point FOMC meetings (*Reverse direction*) and *Surprise* are negative and significant, suggesting that these meetings amplify analysts' overreaction. Alternatively, in untabulated analysis, we find 20 FOMC meetings that the FFR surprise changes from 0 to positive and 9 FOMC meetings that the FFR surprise changes from 0 to negative. By defining these 29 meetings as the turning point, we have qualitatively similar results.

[Insert Table 6]

Third, the FFR surprises differ in terms of whether the FOMC discloses meeting schedules to the public in advance. While the FOMC normally hosts 8 scheduled meetings per year and information on these meeting schedules is publicly available in advance, it may also host unscheduled meetings, which are not informed to the public until they are finished. These unscheduled meetings are necessary responses to the urgent call of the economic and financial conditions, and therefore, we expect that analysts have a larger response to unscheduled

meetings. To examine this prediction, we use the following regression model:

$$FE = \beta_0 + \beta_1 \cdot Surprise + \beta_2 \cdot Scheduled + \beta_3 \cdot Surprise \cdot Scheduled + Analyst\ Controls + Broker\ Controls + Firm\ Controls + \delta_i + \gamma_t + \theta_j + \varepsilon_0 \quad (4)$$

Scheduled is a dummy variable that equals 1 if an FOMC meeting is scheduled, 0 otherwise. Following Equation (1), we include the same control variables and the same set of fixed effects.

As shown in Table 7 column 1 and 2, the coefficients on the interaction term between the dummy variable of the scheduled meetings (*Scheduled*) and *Surprise* are positive and significant, indicating that the non-disclosure of FOMC meeting schedules amplifies analysts' overreaction. This finding is consistent with prior studies that the FFR surprises from unscheduled FOMC meetings have a greater impact on the financial market than scheduled ones (e.g., Lakdawala and Schaffer [2019]).

[Insert Table 7]

5.5: Fed's communication strategies

The Fed has significantly improved its communication strategies, especially its FOMC post-meeting disclosure in the past decades. Table 8 shows the changes in FOMC post-meeting disclosure. Though the Fed tended to keep silent in the past, it has implemented a variety of methods to improve its communication (Blinder, et al. [2008]). In this section, we examine the possibility of different responses conditional on the FOMC post-meeting disclosure strategies. First, since February 1994, the FOMC has significantly improved communication by releasing a post-meeting statement to disclose the target FFR immediately. This is a historical milestone

for the Fed to improve its communication with the public. To investigate the analysts' asymmetric responses in pre and post-1994, we use the following regression model:

$$FE = \beta_0 + \beta_1 \cdot Surprise + \beta_2 \cdot Surprise \cdot Post\_1994 + Analyst\ Controls + Broker\ Controls + Firm\ Controls + \delta_i + \gamma_t + \theta_j + \varepsilon_0 \quad (5)$$

Post_1994 is a dummy variable that equals 1 if an observation is obtained after February 1994, 0 otherwise. Following Equation (1), we include the same control variables and the same set of fixed effects. The variable of *Post_1994* itself has been omitted from the regression model due to it is fully absorbed by year fixed-effects.

In Table 9, column 1, 3 and 5 give the results for the total sample, positive and negative surprise samples. The results appear to show that the analysts' overreaction can be traced to the post-1994 period for the total values of surprise and positive surprise. The coefficients on the *Surprise* itself are insignificant; that on the surprise interacted with the *post_1994* dummy are significant. These results indicate that releasing the target FFR through the post-meeting statement might not be an efficient communication strategy with the market in the sense that it exacerbates analysts' inefficient response to the FFR surprise. The above finding is also consistent with prior studies that improved central bank information disclosure might be detrimental to the markets (e.g., Ehrmann and Fratzscher [2009]).

Second, since FOMC started to disclose target FFR immediately after meetings in 1994, more efforts have been made to further improve the FOMC post-meeting disclosure during 1997 and 2002. As shown in Table 8, these further improvements include explicitly aligning monetary policy with the target FFR, providing information on the future direction of the monetary policy, further improving the disclosure of the economic outlook as well as the

balance of the risk, and providing information on the votes of FOMC members. To capture these 4 improvements in FOMC post-meeting disclosure, I create a factor variable which value ranges from 0 to 4 (*post_1994_change*). A higher value of *post_1994_change* indicates better post-meeting disclosure. To examine the impact of these further improvements in FOMC post-meeting disclosure, we narrow the sample to observations obtained since 1994 and use the following regression model:

$$FE = \beta_0 + \beta_1 \cdot Surprise + \beta_2 \cdot Post\_1994\_change + \beta_3 \cdot Surprise \cdot Post\_1994\_change + Analyst\ Controls + Broker\ Controls + Firm\ Controls + \delta_i + \gamma_t + \theta_j + \varepsilon_0 \quad (5)$$

$Post\_1994\_change$ is a factor variable that measures the improvements in FOMC post-meeting disclosure. Its value ranges from 0 to 4, and a higher value indicates better post-meeting disclosure. Following Equation (1), we include the same control variables and the same set of fixed effects.

The results in Table 9 column 2 and 4 show that, while the coefficients on *Surprise* are negative and significant, the coefficients on the interaction term between the *Surprise* and *post_1994_*change are insignificant. These results suggest that further enhanced post-meeting disclosure still cannot alleviate analysts' overreaction caused by the disclosure of target FFR.

[Insert Table 8 and 9]

5.6: Following firms' disclosure qualities

After observing analysts' overreaction to the Fed in section 5.3, we turn our attention to what might alleviate this inefficient response. In this section, we examine the moderating

effects of following firms' disclosure qualities. The firms' information is crucial to the analysts' forecasts. The literature has well documented that good firms' disclosure is beneficial to the analysts' forecasts (e.g., Hope [2003], Chen, et al. [2015]). Hence, we posit that good firms' information disclosure can alleviate the analysts' overreaction to the FFR surprise.

Given the importance of earnings information in analysts' forecasts, in this section, we measure firms' disclosure qualities by using the proxies of the accruals. Specifically, following prior studies (e.g., Irani and Oesch [2016]), we calculate absolute discretional accruals based on the modified Jones model (Dechow et al. [1995]) and absolute current accruals proposed by Sloan [1996] and Hribar and Collins [2002].

Table 10 reports the regressions in Table 4 column 3 by using the sub-samples with large or low values of disclosure quality measurements. The results show that coefficients on *Surprise* in the sub-samples with low absolute discretional accruals or low absolute current accruals are insignificant and statistically smaller than the coefficients in the sub-samples with large absolute discretional accruals or large absolute current accruals. These results are consistent with our prediction that good firms' disclosure can alleviate the analysts' overreaction to the FFR surprise.

[Insert Table 10]

6. Conclusion:

This study examines the impact of misalignment between the central bank and the financial market with regard to monetary policy on the financial analysts' forecast performance. Relying on the FOMC meetings, the empirical results show that analysts' forecast errors

increase with the FFR surprise. Furthermore, the results show that analysts overreact to the FFR surprise and this overreaction is mainly driven by the unexpected expansionary surprise (i.e., the positive surprise). We further investigate analysts' asymmetric responses to different types of FFR surprises, and we find that FFR surprises with persistent impacts on economies (i.e., level surprises), from the FOMC meetings that reverse the direction of FFR changes, and occurred during the unscheduled FOMC meetings can exacerbate the analysts' overreaction.

Next, we examine the impacts of Fed's communication strategies on the analysts' inefficient responses. We find that, though the Fed tries to improve its communication to the public by disclosing target FFR in the FOMC post-meeting statement, it is not efficient in the sense that analysts' overreaction is amplified. Additionally, the further improvements in post-meeting disclosure between 1997 and 2002 still cannot alleviate this inefficient response.

Finally, we examine the moderating effects of following firms' disclosure on analysts' overreaction to the FFR surprise. By splitting the samples based on the absolute discretional accruals or absolute current accruals, we find that the good information disclosure of the following firms can alleviate analysts' inefficient responses.

Collectively, the above evidence indicates that ineffective central bank expectation management has a significant impact on the analysts' forecast performance. We believe our findings have policy implications for the central bankers and other regulators in terms of central bank communication and expectation management.

Reference:

ABARBANELL, J. S. “Do Analysts' Earnings Forecasts Incorporate Information in Prior Stock Price Changes?” *Journal of Accounting Economics* 14 (1991): 147-165.

ABARBANELL, J. S. AND V. L. BERNARD. “Tests of Analysts' Overreaction/Underreaction to Earnings Information as an Explanation for Anomalous Stock Price Behavior.” *The journal of finance* 47 (1992): 1181-1207.

ABARBANELL, J. S. AND B. J. BUSHEE. “Fundamental Analysis, Future Earnings, and Stock Prices.” *Journal of accounting research* 35 (1997): 1-24.

AMATO, J. D.; S. MORRIS AND H. S. SHIN. “Communication and Monetary Policy.” *Oxford Review of Economic Policy* 18 (2002): 495-503.

AMIRAM, D.; W. R. LANDSMAN; E. L. OWENS AND S. R. STUBBEN. “How Are Analysts’ Forecasts Affected by High Uncertainty?” *Journal of Business Finance Accounting* 45 (2018): 295-318.

ARMSTRONG, C. S.; S. GLAESER AND J. D. KEPLER. “Accounting Quality and the Transmission of Monetary Policy.” *Journal of Accounting Economics* 68 (2019): 101265.

BANK FOR INTERNATIONAL SETTLEMENTS. “Issues in the Governance of Central Banks: A Report from the Central Bank Governance Group.” 2009. Available at: https://www.bis.org/publ/othp04.pdf.

BARRON, O. E.; D. BYARD AND Y. YU. “Earnings Surprises That Motivate Analysts to Reduce Average Forecast Error.” *The Accounting Review* 83 (2008): 303-325.

BASU, S.; S. MARKOV AND L. SHIVAKUMAR. “Inflation, Earnings Forecasts, and Post-Earnings Announcement Drift.” *Review of Accounting Studies* 15 (2010): 403-440.

BERNANKE, B.; V. REINHART AND B. SACK. “Monetary Policy Alternatives at the Zero Bound: An Empirical Assessment.” *Brookings Papers On Economic Activity* 2004 (2004): 1-100.

BERNANKE, B. S. AND M. GERTLER. “Inside the Black Box: The Credit Channel of Monetary Policy Transmission.” *Journal of Economic perspectives* 9 (1995): 27-48.

BERNANKE, B. S. AND K. N. KUTTNER. “What Explains the Stock Market's Reaction to Federal Reserve Policy?” *The Journal of finance* 60 (2005): 1221-1257.

BERNANKE, B. S. AND V. R. REINHART. “Conducting Monetary Policy at Very Low Short-Term Interest Rates.” *American Economic Review* 94 (2004): 85-90.

BLINDER, A. S. *Central Banking in Theory and Practice*. Cambridge: The MIT Press, 1998.

BLINDER, A. S.; M. EHRMANN; M. FRATZSCHER; J. DE HAAN AND D.-J. JANSEN. “Central Bank Communication and Monetary Policy: A Survey of Theory and Evidence.” *Journal of Economic Literature* 46 (2008): 910-945.

BRAND, C.; D. BUNCIC AND J. TURUNEN. “The Impact of Ecb Monetary Policy Decisions and Communication on the Yield Curve.” *Journal of the European Economic Association* 8 (2010): 1266-1298.

CHEN, S.; B. MIAO AND T. SHEVLIN. “A New Measure of Disclosure Quality: The Level of Disaggregation of Accounting Data in Annual Reports.” *Journal of Accounting Research* 53 (2015): 1017-1054.

CLEMENT, M. B. “Analyst Forecast Accuracy: Do Ability, Resources, and Portfolio

Complexity Matter?" *Journal of Accounting and Economics* 27 (1999): 285-303.
CROWE, C. AND E. E. MEADE. "Central Bank Independence and Transparency: Evolution and Effectiveness." *European Journal of Political Economy* 24 (2008): 763-777.
CUKIERMAN, A. AND A. H. MELTZER. "A Theory of Ambiguity, Credibility, and Inflation under Discretion and Asymmetric Information." *Econometrica* 54 (1986): 1099-1128.
DE HAAN, J. "The Effect of Ecb Communication on Interest Rates: An Assessment." *The Review of International Organizations* 3 (2008): 375-398.
DECHOW, P. M.; R. G. SLOAN AND A. P. SWEENEY. "Detecting Earnings Management." *Accounting review* (1995): 193-225.
DRECHSLER, I.; A. SAVOV AND P. SCHNABL. "The Deposits Channel of Monetary Policy." *The Quarterly Journal of Economics* 132 (2017): 1819-1876.
EASTERWOOD, J. C. AND S. R. NUTT. "Inefficiency in Analysts' Earnings Forecasts: Systematic Misreaction or Systematic Optimism?" *The Journal of Finance* 54 (1999): 1777-1797.
EGGERTSSON, G. AND M. WOODFORD. "The Zero Bound on Interest Rates and Optimal Monetary Policy," Brookings Papers on Economic Activity." *Brookings Papers On Economic Activity* 2003 (2003): 139-211.
EHRMANN, M. AND M. FRATZSCHER. "Transparency, Disclosure and the Federal Reserve." *Available at SSRN 677434* (2005).
EHRMANN, M. AND M. FRATZSCHER. "Communication by Central Bank Committee Members: Different Strategies, Same Effectiveness?" *Journal of Money, Credit Banking* 39 (2007): 509-541.
EHRMANN, M. AND M. FRATZSCHER. "Purdah—on the Rationale for Central Bank Silence around Policy Meetings." *Journal of Money, Credit Banking* 41 (2009): 517-528.
ELLIOT, J. A.; D. R. PHILBRICK AND C. I. WIEDMAN. "Evidence from Archival Data on the Relation between Security Analysts' Forecast Errors and Prior Forecast Revisions." *Contemporary Accounting Research* 11 (1995): 919-938.
GALLO, L. A.; R. N. HANN AND C. LI. "Aggregate Earnings Surprises, Monetary Policy, and Stock Returns." *Journal of Accounting and Economics* 62 (2016): 103-120.
GERAATS, P. M. "Central Bank Transparency." *The Economic Journal* 112 (2002).
GORODNICHENKO, Y. AND M. WEBER. "Are Sticky Prices Costly? Evidence from the Stock Market." *American Economic Review* 106 (2016): 165-199.
GÜRKAYNAK, R. S.; B. P. SACK AND E. T. SWANSON. "Do Actions Speak Louder Than Words? The Response of Asset Prices to Monetary Policy Actions and Statements." *The Response of Asset Prices to Monetary Policy Actions and Statements (November 2004)* (2004).
HANN, R. N.; M. OGNEVA AND H. SAPRIZA. "Forecasting the Macroeconomy: Analysts Versus Economists." (2012).
HONG, H.; J. D. KUBIK AND A. SOLOMON. "Security Analysts' Career Concerns and Herding of Earnings Forecasts." *The Rand journal of economics* (2000): 121-144.
HOPE, O.-K. AND T. KANG. "The Association between Macroeconomic Uncertainty and Analysts' Forecast Accuracy." *Journal of International Accounting Research* 4 (2005): 23-38.
HOPE, O. K. "Disclosure Practices, Enforcement of Accounting Standards, and Analysts'

Forecast Accuracy: An International Study." *Journal of accounting research* 41 (2003): 235-272.
HRIBAR, P. AND D. W. COLLINS. "Errors in Estimating Accruals: Implications for Empirical Research." *Journal of Accounting research* 40 (2002): 105-134.
HUGON, A.; A. KUMAR AND A.-P. LIN. "Analysts, Macroeconomic News, and the Benefit of Active in-House Economists." *The Accounting Review* 91 (2015): 513-534.
HUTTON, A. P.; L. F. LEE AND S. Z. SHU. "Do Managers Always Know Better? The Relative Accuracy of Management and Analyst Forecasts." *Journal of Accounting Research* 50 (2012): 1217-1244.
IRANI, R. M. AND D. OESCH. "Analyst Coverage and Real Earnings Management: Quasi-Experimental Evidence." *Journal of Financial and Quantitative Analysis* 51 (2016): 589-627.
IRVINE, P. "Analysts' Forecasts and Brokerage-Firm Trading." *The Accounting Review* 79 (2004): 125-149.
KE, B. AND Y. YU. "The Effect of Issuing Biased Earnings Forecasts on Analysts' Access to Management and Survival." *Journal of Accounting Research* 44 (2006): 965-999.
KUTTNER, K. N. "Monetary Policy Surprises and Interest Rates: Evidence from the Fed Funds Futures Market." *Journal of Monetary Economics* 47 (2001): 523-544.
KUTTNER, K. N. AND P. C. MOSSER. "The Monetary Transmission Mechanism: Some Answers and Further Questions." *Economic Policy Review* 8 (2002).
LAKDAWALA, A. AND M. SCHAFFER. "Federal Reserve Private Information and the Stock Market." *Journal of Banking Finance* 106 (2019): 34-49.
LANG, M. H. AND R. J. LUNDHOLM. "Corporate Disclosure Policy and Analyst Behavior." *Accounting review* (1996): 467-492.
LOH, R. K. AND R. M. STULZ. "When Are Analyst Recommendation Changes Influential?" *The review of financial studies* 24 (2011): 593-627.
MIKHAIL, M. B.; B. R. WALTHER AND R. H. WILLIS. "Does Forecast Accuracy Matter to Security Analysts?" *The Accounting Review* 74 (1999): 185-200.
MISHKIN, F. S. "Symposium on the Monetary Transmission Mechanism." *Journal of Economic perspectives* 9 (1995): 3-10.
MORRIS, S. AND H. S. SHIN. "Social Value of Public Information." *American Economic Review* 92 (2002): 1521-1534.
NAKAMURA, E. AND J. STEINSSON. "High-Frequency Identification of Monetary Non-Neutrality: The Information Effect." *The Quarterly Journal of Economics* 133 (2018): 1283-1330.
OZDAGLI, A. K. "Financial Frictions and the Stock Price Reaction to Monetary Policy." *The Review of Financial Studies* 31 (2018): 3895-3936.
POOLE, W. "Expectations." *Federal Reserve Bank of St. Louis Review* 83 (2001).
SIBERT, A. "Is Central Bank Transparency Desirable?" (2006).
SLOAN, R. G. "Do Stock Prices Fully Reflect Information in Accruals and Cash Flows About Future Earnings?" *Accounting review* (1996): 289-315.
VAN DER CRUIJSEN, C. AND S. C. EIJFFINGER 'The Economic Impact of Central Bank Transparency: A Survey!,' in *Challenges in Central Banking: The Current Institutional Environment and Forces Affecting Monetary Policy*: Cambridge University Press New

York, 2010: 261-319.
WOODFORD, M. 'Monetary Policy in the Information Economy,' in *Book Monetary Policy in the Information Economy*, edited by Editor. City: National Bureau of Economic Research Cambridge, Mass., USA, 2001.
WOODFORD, M. “Central Bank Communication and Policy Effectiveness.” Working paper, National Bureau of Economic Research, 2005. Available at: https://www.nber.org/papers/w11898.
WOODFORD, M. “Financial Intermediation and Macroeconomic Analysis.” *Journal of Economic Perspectives* 24 (2010): 21-44.
ZHANG, X. F. “Information Uncertainty and Analyst Forecast Behavior.” *Contemporary Accounting Research* 23 (2006): 565-590.

Appendix:

A. Construction of the monetary policy surprises

This method first calculates the change in the rate implied by the corresponding federal funds futures contract, given by 100 minus the futures contract price. This result is then scaled by a factor associated with the number of days of the month in which the event occurred because the payoff of the contract is determined by the average realized federal funds effective rate during the month. Accordingly, the monetary policy surprise, which is the unexpected target rate change for an event taking place on the FOMC announcement meeting date on day *d* of month *m* is given by:

$$\Delta i^u = \frac{D}{D-d}\left(f^0_{m,d} - f^0_{m,d-1}\right)$$

Where $f^0_{m,d}$ is the implied futures rate calculated as 100 minus the contract price of current-month federal funds futures, $f^0_{m,d} - f^0_{m,d-1}$ is the change in the current-month implied futures rate, and D is the number of days in the month. To suppress the end-of-month noise in the federal funds rate, the unscaled change in the 1-month futures rate is used as the measure of the target rate surprise when the event occurs during the last three days of a month. If the event happens on the first day of the month, the 1-month futures rate from the final day of the last month (i.e., $f^1_{m-1,D}$) is used instead of $f^0_{m,d-1}$ in the calculation.[21] To assist the interpretation, the above calculated surprise is multiplied by -1 to construct the variable of the Fed's monetary policy surprise.

$$Surprise = -\Delta i^u = -\frac{D}{D-d}\left(f^0_{m,d} - f^0_{m,d-1}\right)$$

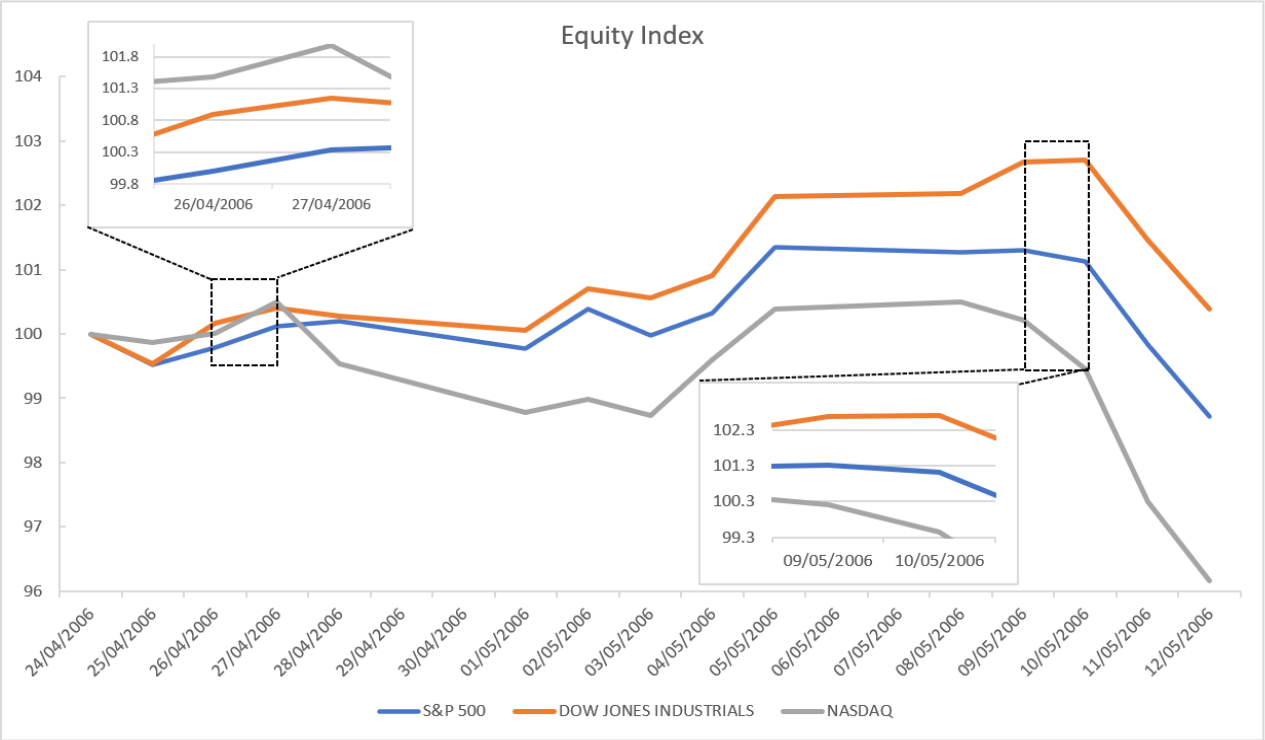
[21] The resultant data for these policy surprise are publicly available from Kenneth Kuttner's web page (http://econ.williams.edu/profile/knk1/).

B. Variable Definitions

Variables	Definition	Data source
Dependent variables		
FE	Actual earnings per share (EPS) minus the analyst earnings forecast, scaled by the price at the beginning of the quarter.	I/B/E/S and CRSP
Abs_FE	Absolute value of the forecast error.	I/B/E/S and CRSP
Proportional absolute mean FE	Difference between absolute forecast error for an analyst's forecast of a firm and mean absolute forecast error for a firm, scaled by mean absolute forecast error for a firm.	I/B/E/S
Test variables		
Surprise	Fed's policy surprise is measured as daily change in Fed's funds rate futures contracts between the FOMC announcements date and the previous trading day, and this calculated policy surprise is multiplied by -1.	Datastream
Abs_Surprise	Absolute value of the Fed's policy surprise.	
Timing surprise	Difference between the change in the 3-month-ahead futures rate and the current Fed's policy surprise.	Datastream
Reverse direction	A dummy variable equals 1 for observations that target funds rate from the most recent FOMC reverses the direction of the previous ones, 0 otherwise.	Fed
Scheduled	A dummy variable equals 1 for observations when the FOMC meetings are scheduled, 0 otherwise.	Fed
Post_1994	A dummy variable equals 1 for observations beginning with February 1994, 0 otherwise.	Fed
Post_1994_change	A factor variable that measures the changes in FOMC post-meeting disclosure. It ranges from 0 to 4, and higher values indicate better disclosure. It is equal to 0 for observations beginning with February 1994 and before August 1997; equals to 1 for observations beginning with August 1997 and before May 1999; equals to 2 for observations beginning with May 1999 and before February 2000; equals to 3 for observations beginning with February 2000 and before March 2002; equals to 4 for observations beginning with March 2002.	Fed

Variables	Definition	Data source
Control variables		
NFIRM	Number of firms that the analyst follows during the quarter.	I/B/E/S
NIND	Number of Fama-French 48 industries that the analyst follows during the quarter.	Compustat
HORIZON	Number of days between the analyst's earnings forecast date and the firm's announcement date for the quarter.	I/B/E/S
FEXP	Number of quarters that the analyst has issued at least one earnings forecast for the firm prior to the quarter.	I/B/E/S
BSIZE	Number of unique analysts employed by an analyst's brokerage house during the quarter.	I/B/E/S
LAG_TACC	Firm's income before extraordinary items minus total cash flow from operations in the prior quarter, scaled by average total assets in the prior quarter.	Compustat
LAG_PROFIT	Firm's income before extraordinary items in the prior quarter, scaled by average total assets in the prior quarter.	Compustat
LAG_SIZE	Natural logarithm of the market value of equity in the prior quarter.	Compustat
Partition variables		
Abs DAC based on the modified Jones model	Absolute value of a firm's discretional accruals based on the modified Jones model. Discretional accruals is the residual from the regression of a firm's total accruals (i.e. difference between net income and cash flow from operations, scaled by lagged total assets) on reciprocal of lagged total assets, changes in revenues (i.e. difference in sale revenues, scaled by lagged total assets) and PPE (i.e. gross property, plant and equipment, scaled by lagged total assets). The regression is estimated at industry-year level.	Compustat
Abs Sloan CA	Absolute value of a firm's current accruals, calculated as the change in current assets minus the change in current liabilities, minus the change in cash holdings, and plus depreciation and amortization expense, scaled by lagged total assets.	Compustat
Abs Hribar & Collins CA	Absolute value of a firm's current accruals, calculated as earnings before extraordinary items and discontinued operations minus operating cash flows from continuing operations, scaled by lagged total assets.	Compustat

Figure 1: Market reaction to the monetary policy



Dow Rise on Bernanke Testimony

By **Jerry Knight**
April 27, 2006

Stocks edged higher today after Wall Street interpreted comments by Federal Reserve Chairman Ben S. Bernanke to mean that the Fed may soon take a break from its steady series of interest rate increases.

Whether Bernanke was promising a pause -- or merely saying it is possible -- was debatable, but interest rates fell and stocks rose in response to his congressional testimony.

The Dow Jones industrial average gained 28 points to close at 11,382.51; the Nasdaq Stock Market composite index rose 11 points to 2,344.95; and Standard & Poor's 500 stock index advanced 4 points to 1,309.72.

The Fed chairman also said the economy "has been performing well and the near-term prospects look good," but he predicted "a gradual cooling" in the months ahead.

One factor that could slow economic growth is the high cost of energy, which is becoming as much of a worry for Washington lawmakers as it is to Wall Street investors.

Figure 2: EVERCORE ISI's report on the Ford Motor

May 05, 2022

EvrISI Autos Pitstop: Autos & the Fed / FSR Ronin / BWA & UBER rehash / Clean Energy Summit Signups!!!

- **Fed goes 50…but short-term rates are a side-story in Autos** – while rates will always be wrapped in any "consumer recession" debate, the reality is that Autos have typically worked in a slow rising front-end rate environment and rates (both 10yr & Auto lending) are low by historical standards (flat the last 5 years). Many investors would also be surprised that a ~100bp move in rates may only move the average $600+ monthly payment by ~$15. **EvrISI Take** – we are not blind to the impact of the Fed on the broader market sentiment & perception of US recession…our main point (as laid out in "Binary Bullish" Q1 Outlook) is that ***what matters more…is "conflict resolution"*** leading to 2H/'23 production visibility (as well as second-order clarity on raw materials). ***We are willing to fight the Fed…just not world wars for Autos.***

Table 1
Sample Selection

Initial sample: I/B/E/S initial one-quarter-ahead earnings forecasts, 1989-2008	1,739,206
Remaining	
Retain: earnings forecasts issued in USD, identified analysts, and non-missing estimated value and actual value	1,723,553
Retain: the first earnings forecasts issued between current and next FOMC meeting dates	1,486,248
Retain: two earnings forecasts to the same period end by one analyst for one firm between current and next FOMC meeting dates	
Retain: earnings forecasts without overlap of other analysts' event windows	
Retain: earnings forecasts with non-missing CRSP price to deflate the and SIC	1,445,220
Retain: earnings forecasts with available data to compute the control variables	1,292,739
Retain: non-financial institutions and non-utilities	1,123,188
Retain: earnings forecasts issued between prior and current actual earnings announcement dates	1,004,953
Table 4	231,026-1,004,953
Table 5	231,026-1,004,953
Table 6	231,026-1,004,953
Table 7	231,026-1,004,953
Table 9	202,009-1,004,953
Table 10	367,483-481,379

This table presents the sample selection for the analyses in Table 4,5,6,7,9 and 10. The sample period is from 1989 to 2008.

Table 2
Descriptive Statistics

Panel A: Monetary policy shock

Variable	#Obs	Mean	SD	Min	P25	P50	P75	Max
Surprise	176	0.0313	0.1056	-0.1700	-0.0100	0.0000	0.0400	0.7400
Positive_Surprise	77	0.1022	0.1208	0.0100	0.0300	0.0500	0.1500	0.7400
Negative_Surprise	45	-0.0527	0.0437	-0.1700	-0.0600	-0.0400	-0.0200	-0.0100
Timing Surprise	176	0.0097	0.0871	-0.4047	-0.0178	0.0000	0.0237	0.5306

Panel B: Other key variables

	Total Policy Surprise			Positive Policy Surprise (Expansionary)			Negative Policy Surprise (Contractionary)		
Variable	#Obs	Mean	Median	#Obs	Mean	Median	#Obs	Mean	Median
Abs_FE	1,004,953	0.01057	0.00111	395,973	0.01058	0.00107	231,026	0.01053	0.00111
FE	1,004,953	-0.0017	0.0001	395,973	-0.0020	0.0000	231,026	-0.0016	0.0001
NFIRM	1,004,953	11.6290	11.0000	395,973	11.6500	11.0000	231,026	11.6610	11.0000
NIND	1,004,953	5.0961	4.0000	395,973	5.3130	5.0000	231,026	5.1310	4.0000
FEXP	1,004,953	7.6261	5.0000	395,973	7.5492	5.0000	231,026	7.6435	5.0000
HORIZON	1,004,953	61.9690	69.0000	395,973	62.5330	70.0000	231,026	59.9480	63.0000
BSIZE	1,004,953	42.9100	35.0000	395,973	42.8610	35.0000	231,026	42.7680	33.0000
LAG_TACC	1,004,953	-0.0394	-0.0334	395,973	-0.0359	-0.0303	231,026	-0.0391	-0.0335
LAG_PROFIT	1,004,953	0.0090	0.0138	395,973	0.0089	0.0138	231,026	0.0084	0.0133
LAG_SIZE	1,004,953	21.1700	21.0810	395,973	21.0690	20.9840	231,026	21.1280	21.0420

The table reports descriptive statistics. Panel A provides the descriptive statistics for the Fed's monetary policy surprise during the period between 1989 and 2008, except 17th September, 2001. *Surprise* is a daily change in Fed's funds rate futures contracts between the FOMC announcement date and the previous trading day,

and this calculated policy surprise is multiplied by -1. *Positive Surprise* includes the observations with values of *Surprise* larger than 0. *Negative Surprise* includes the observations with values of *Surprise* lower than 0. *Timing Surprise* is the difference between the change in the 3-month-ahead futures rate and the current FFR surprise. Panel B provides descriptive statistics for variables used in our tests. *Abs_FE* is the absolute value of analyst forecast error, defined as the absolute value of actual earnings per share minus the analyst earnings forecast, scaled by the price at the beginning of the quarter. *FE* is analyst forecast error, defined as actual earnings per share minus the analyst earnings forecast, scaled by the price at the beginning of the quarter. *NFIRM* is the number of firms covered by an analyst. *NIND* is the number of industries covered by an analyst. *FEXP* is the number of quarters that an analyst has issued at least one earnings forecast for a firm. *HORIZON* is the number of days between an analyst's earnings forecast date and the firm's earnings announcement date. *BSIZE* is the number of unique analysts employed by a brokerage house that hires this analyst. *LAG_TACC* is lagged total accruals, defined as the firm's income before extraordinary items minus total cash flow from operations in the prior quarter, scaled by average total assets in the prior quarter. *LAG_PROFIT* is lagged annual profitability, defined as the firm's income before extraordinary items in the prior quarter, scaled by average total assets in the prior quarter. *LAG_SIZE* is lagged firm size, defined as the natural logarithm of the market value of equity in the prior quarter. All detailed variable definitions are in Appendix B.

Table 3
Earrings sensitivity to the Fed's monetary policy

	n	Mean	Std.Dev.	25%	50%	75%
Consumer Non-Durables	466	11.85%	24.46%	0.25%	1.67%	9.32%
Consumer Durables	229	11.57%	24.38%	0.31%	1.84%	6.45%
Manufacturing	840	10.71%	22.92%	0.36%	1.88%	7.69%
Energy	371	10.69%	22.90%	0.28%	1.55%	7.34%
Chemicals	184	8.78%	20.67%	0.21%	1.26%	5.59%
Business Equipment	2,209	13.00%	24.71%	0.39%	2.32%	11.03%
Telecom	376	14.65%	26.84%	0.38%	3.00%	13.39%
Wholesale, Retail, and Services	965	11.79%	24.43%	0.37%	1.89%	8.35%
Healthcare	1,139	12.67%	25.04%	0.28%	1.83%	10.35%
Others	1,271	13.63%	26.27%	0.33%	1.99%	11.63%

This table presents the firms' earnings sensitivity to Fed's policy surprise based on Fama-French 12 industries. The earnings sensitivity is the adjusted R-squared from the regression of firms' monthly earnings changes on the Fed monetary policy surprise.

Table 4
Analysts' forecasts to monetary policy surprises

	Non-directional forecast errors		Directional forecast errors		
	Absolute FE	Proportional absolute mean FE	Total Policy Surprise	Positive Policy Surprise (Expansionary)	Negative Policy Surprise (Contractionary)
	(1)	(2)	(3)	(4)	(5)
Intercept	0.1726***	-0.3033***	-0.0195***	-0.0267***	-0.0044
	(17.41)	(-16.11)	(-5.84)	(-6.33)	(-0.86)
Abs_Surprise	0.0019**	0.0339**			
	(2.34)	(2.19)			
Surprise			-0.0014***	-0.0037***	-0.0013
			(-2.64)	(-4.33)	(-0.45)
NFIRM	0.0000***	0.0005**	-0.0000	0.0000	-0.0000
	(2.74)	(2.34)	(-1.63)	(0.39)	(-1.32)
NIND	-0.0000	0.0024***	0.0000	-0.0000*	0.0000
	(-0.45)	(5.29)	(0.16)	(-1.90)	(0.35)
BSIZE	-0.0000*	-0.0003***	0.0000***	0.0000***	0.0000***
	(-1.74)	(-9.66)	(4.60)	(3.72)	(3.97)
HORIZON	0.0000***	0.0048***	-0.0000***	-0.0000***	-0.0000***
	(22.09)	(60.05)	(-22.25)	(-17.64)	(-8.91)
FEXP	-0.0000	-0.0011***	0.0000	0.0000	-0.0000
	(-1.25)	(-11.12)	(1.47)	(1.36)	(-1.02)
LAG_TACC	0.0041**	-0.0858***	-0.0023**	-0.0030**	-0.0043**
	(2.31)	(-12.36)	(-2.10)	(-2.02)	(-2.15)
LAG_PROFIT	-0.0698***	0.0670***	0.0162***	0.0144***	0.0179***
	(-10.46)	(4.00)	(4.63)	(2.85)	(2.96)

LAG_SIZE	-0.0083***	0.0009	0.0010***	0.0013***	0.0002
	(-16.65)	(1.00)	(5.74)	(6.30)	(0.74)
Industry FE_48	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Observations	1,004,953	903,785	1,004,953	395,973	231,026
Adj. R-square	66.28%	3.69%	17.26%	21.74%	24.12%

This table presents the regression analysis of the forecast error on the Fed's monetary policy surprise. The dependent variable under the column of *Non-Directional FE* is the absolute value of analyst forecast error, defined as the absolute value of actual earnings per share minus the analyst earnings forecast, scaled by the price at the beginning of the quarter. Alternatively, we use proportional absolute mean forecast error, defined as the difference between absolute forecast error for an analyst forecast of a firm and mean absolute forecast error for a firm, scaled by mean absolute forecast error for a firm. The dependent variable under the column of *Directional FE* is analyst forecast error, defined as actual earnings per share minus the analyst earnings forecast, scaled by the price at the beginning of the quarter. The columns of *Non-directional FE* and *Total Policy Surprise* under *Directional FE* includes observations with all values of *Surprise*. The column of *Positive Policy Surprise* under *Directional FE* includes the observations with values of *Surprise* larger than 0. The column of *Negative Policy Surprise* under *Directional FE* includes the observations with values of *Surprise* lower than 0. *Abs_Surprise* is the absolute value of daily change in Fed's funds rate futures contracts between the FOMC announcement date and the previous trading day. *Surprise* is a daily change in Fed's funds rate futures contracts between the FOMC announcement date and the previous trading day, and this calculated policy surprise is multiplied by -1. *NFIRM* is the number of firms covered by an analyst. *NIND* is the number of industries covered by an analyst. *BSIZE* is the number of unique analysts employed by a brokerage house which hires this analyst. *HORIZON* is the number of days between an analyst's earnings forecast date and the firm's earnings announcement date. *FEXP* is the number of quarters that an analyst has issued at least one earnings forecast for a firm. *LAG_TACC* is lagged total accruals, defined as the firm's income before extraordinary items minus total cash flow from operations in the prior quarter, scaled by average total assets in the prior quarter. *LAG_PROFIT* is lagged annual profitability, defined as the firm's income before extraordinary items in the prior quarter, scaled by average total assets in the prior quarter. *LAG_SIZE* is lagged firm size, defined as the natural logarithm of the market value of equity in the prior quarter. All detailed variable definitions are in Appendix B. We include Fama-French 48 industries fixed effects, year fixed effects and firm fixed effects. t-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by firm. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05 and 0.001 levels.

Table 5

Level surprise vs Timing surprise

	Total Policy Surprise	Positive Policy Surprise (Expansionary)	Negative Policy Surprise (Contractionary)
	(1)	(2)	(3)
Intercept	-0.0195***	-0.0267***	-0.0043
	(-5.85)	(-6.32)	(-0.85)
Surprise	-0.0016***	-0.0035***	-0.0021
	(-2.68)	(-3.85)	(-0.73)
Timing surprise	-0.0007	0.0007	-0.0024*
	(-1.33)	(0.98)	(-1.78)
NFIRM	-0.0000	0.0000	-0.0000
	(-1.63)	(0.39)	(-1.34)
NIND	0.0000	-0.0000*	0.0000
	(0.17)	(-1.91)	(0.37)
BSIZE	0.0000***	0.0000***	0.0000***
	(4.60)	(3.71)	(3.97)
HORIZON	-0.0000***	-0.0000***	-0.0000***
	(-22.23)	(-17.63)	(-8.94)
FEXP	0.0000	0.0000	-0.0000
	(1.46)	(1.36)	(-1.03)
LAG_TACC	-0.0023**	-0.0030**	-0.0044**
	(-2.10)	(-2.02)	(-2.18)
LAG_PROFIT	0.0162***	0.0144***	0.0181***
	(4.63)	(2.84)	(2.98)
LAG_SIZE	0.0010***	0.0013***	0.0002
	(5.73)	(6.31)	(0.73)
Industry FE_48	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	1,004,953	395,973	231,026
Adj. R-square	17.26%	21.74%	24.12%

This table presents a regression analysis of the forecast error on the Fed's monetary policy surprise, conditional on level or timing surprise. The column of *Total Policy Surprise* includes observations with all values of *Surprise*. The column of *Positive Policy Surprise* includes the observations with values of *Surprise* larger than 0. The column of *Negative Policy Surprise* includes the observations with values of *Surprise* lower than 0. The dependent variable is analyst forecast error, defined as actual earnings per share minus the analyst earnings forecast, scaled by the price at the beginning of the quarter. *Surprise* is a daily change in Fed's funds rate futures contracts between the FOMC announcement date and the previous trading day, and this calculated policy surprise is multiplied by -1. *Timing surprise* is the difference between the change in the 3-month-ahead

futures rate and the current FFR surprise. *NFIRM* is the number of firms covered by an analyst. *NIND* is the number of industries covered by an analyst. *BSIZE* is the number of unique analysts employed by a brokerage house which hires this analyst. *HORIZON* is the number of days between an analyst's earnings forecast date and the firm's earnings announcement date. *FEXP* is the number of quarters that an analyst has issued at least one earnings forecast for a firm. *LAG_TACC* is lagged total accruals, defined as the firm's income before extraordinary items minus total cash flow from operations in the prior quarter, scaled by average total assets in the prior quarter. *LAG_PROFIT* is lagged annual profitability, defined as the firm's income before extraordinary items in the prior quarter, scaled by average total assets in the prior quarter. *LAG_SIZE* is lagged firm size, defined as the natural logarithm of the market value of equity in the prior quarter. All detailed variable definitions are in Appendix B. We include Fama-French 48 industries fixed effects, year fixed effects and firm fixed effects. t-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by firm. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05 and 0.001 levels.

Table 6

FOMC meetings with reversing direction in monetary policy

	Total Policy Surprise	Positive Policy Surprise (Expansionary)	Negative Policy Surprise (Contractionary)
	(1)	(2)	(3)
Intercept	-0.0198***	-0.0275***	-0.0044
	(-5.95)	(-6.57)	(-0.86)
Surprise	-0.0004	-0.0023***	-0.0009
	(-0.80)	(-2.90)	(-0.33)
Surprise*Reverse direction	-0.0073***	-0.0109***	0.0076
	(-4.05)	(-4.23)	(0.63)
Reverse direction	0.0000	0.0005*	0.0009
	(0.13)	(1.79)	(0.75)
NFIRM	-0.0000*	0.0000	-0.0000
	(-1.66)	(0.29)	(-1.32)
NIND	0.0000	-0.0000*	0.0000
	(0.20)	(-1.85)	(0.35)
BSIZE	0.0000***	0.0000***	0.0000***
	(4.61)	(3.72)	(3.98)
HORIZON	-0.0000***	-0.0000***	-0.0000***
	(-22.35)	(-18.14)	(-8.87)
FEXP	0.0000	0.0000	-0.0000
	(1.48)	(1.43)	(-1.02)
LAG_TACC	-0.0022**	-0.0031**	-0.0043**
	(-2.07)	(-2.09)	(-2.13)
LAG_PROFIT	0.0163***	0.0148***	0.0179***
	(4.66)	(2.92)	(2.96)
LAG_SIZE	0.0010***	0.0014***	0.0002
	(5.82)	(6.51)	(0.74)
Industry FE_48	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	1,004,953	395,973	231,026
Adj. R-square	0.1727	0.2178	0.2412

This table presents a regression analysis of the forecast error on the Fed's monetary policy surprise, conditional on whether the FOMC meetings incur reversing direction in monetary policy. The column of *Total Policy Surprise* includes observations with all values of *Surprise*. The column of *Positive Policy Surprise* includes the observations with values of *Surprise* larger than 0. The column of *Negative Policy Surprise* includes the observations with values of *Surprise* lower than 0. The dependent variable is analyst forecast error, defined as

actual earnings per share minus the analyst earnings forecast, scaled by the price at the beginning of the quarter. *Surprise* is a daily change in Fed's funds rate futures contracts between the FOMC announcement date and the previous trading day, and this calculated policy surprise is multiplied by -1. *Reverse direction* is a dummy variable that equals 1 if the FOMC target funds rate reverses the direction of previous ones, 0 otherwise. *NFIRM* is the number of firms covered by an analyst. *NIND* is the number of industries covered by an analyst. *BSIZE* is the number of unique analysts employed by a brokerage house which hires this analyst. *HORIZON* is the number of days between an analyst's earnings forecast date and the firm's earnings announcement date. *FEXP* is the number of quarters that an analyst has issued at least one earnings forecast for a firm. *LAG_TACC* is lagged total accruals, defined as the firm's income before extraordinary items minus total cash flow from operations in the prior quarter, scaled by average total assets in the prior quarter. *LAG_PROFIT* is lagged annual profitability, defined as the firm's income before extraordinary items in the prior quarter, scaled by average total assets in the prior quarter. *LAG_SIZE* is lagged firm size, defined as the natural logarithm of the market value of equity in the prior quarter. All detailed variable definitions are in Appendix B. We include Fama-French 48 industries fixed effects, year fixed effects and firm fixed effects. t-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by firm. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05 and 0.001 levels.

Table 7
Scheduled vs Unscheduled FOMC meetings

	Total observations	Positive Policy Surprise (Expansionary)	Negative Policy Surprise (Contractionary)
	(1)	(2)	(3)
Intercept	-0.0193***	-0.0270***	-0.0046
	(-5.80)	(-6.40)	(-0.91)
Surprise	-0.0037***	-0.0042***	-0.0106
	(-3.73)	(-2.89)	(-0.35)
Surprise *Scheduled	0.0045***	0.0035**	0.0085
	(3.95)	(2.05)	(0.29)
Scheduled	-0.0003	0.0000	-0.0000
	(-1.55)	(0.06)	(-0.00)
NFIRM	-0.0000*	0.0000	-0.0000
	(-1.67)	(0.35)	(-1.32)
NIND	0.0000	-0.0000*	0.0000
	(0.19)	(-1.89)	(0.35)
BSIZE	0.0000***	0.0000***	0.0000***
	(4.65)	(3.79)	(3.94)
HORIZON	-0.0000***	-0.0000***	-0.0000***
	(-22.25)	(-17.65)	(-8.95)
FEXP	0.0000	0.0000	-0.0000
	(1.49)	(1.35)	(-1.03)
LAG_TACC	-0.0023**	-0.0030**	-0.0044**
	(-2.10)	(-2.02)	(-2.18)
LAG_PROFIT	0.0163***	0.0144***	0.0179***
	(4.65)	(2.86)	(2.96)
LAG_SIZE	0.0010***	0.0013***	0.0002
	(5.74)	(6.33)	(0.73)
Industry FE_48	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	1,004,953	395,973	231,026
Adj. R-square	17.27%	21.75%	24.12%

This table presents the regression analysis of the forecast error on the Fed's monetary policy surprise, conditional on the scheduled or non-scheduled FOMC meetings. The column of *Total Policy Surprise* includes observations with all values of *Surprise*. The column of *Positive Policy Surprise* includes the observations with values of *Surprise* larger than 0. The column of *Negative Policy Surprise* includes the observations with values of *Surprise* lower than 0. The dependent variable is analyst forecast error, defined as actual earnings per share minus the analyst earnings forecast, scaled by the price at the beginning of the quarter. *Surprise* is a daily change in Fed's funds rate futures contracts between the FOMC announcement date and the previous

trading day, and this calculated policy surprise is multiplied by -1. *Scheduled* is a dummy variable that equals 1 for observations when the FOMC meetings are scheduled, 0 otherwise. *NFIRM* is the number of firms covered by an analyst. *NIND* is the number of industries covered by an analyst. *BSIZE* is the number of unique analysts employed by a brokerage house which hires this analyst. *HORIZON* is the number of days between an analyst's earnings forecast date and the firm's earnings announcement date. *FEXP* is the number of quarters that an analyst has issued at least one earnings forecast for a firm. *LAG_TACC* is lagged total accruals, defined as the firm's income before extraordinary items minus total cash flow from operations in the prior quarter, scaled by average total assets in the prior quarter. *LAG_PROFIT* is lagged annual profitability, defined as the firm's income before extraordinary items in the prior quarter, scaled by average total assets in the prior quarter. *LAG_SIZE* is lagged firm size, defined as the natural logarithm of the market value of equity in the prior quarter. All detailed variable definitions are in Appendix B. We include Fama-French 48 industries fixed effects, year fixed effects and firm fixed effects. t-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by firm. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05 and 0.001 levels.

Table 8

Date	Changes in FOMC post-meeting disclosure
February 1994	FOMC starts to release the post-meeting announcement that discloses the target Federal funds rate.
August 1997	Fed's monetary policy formulation and implementation are explicitly based on the target Federal funds rate.
May 1999	FOMC starts to use the post-meeting announcement to communicate and discuss the future direction of the monetary policy.
February 2000	FOMC improves choices of language in the post-meeting statement to describe the economic outlook and express the view of the committee in terms of the balance of risks.
March 2002	FOMC provides information on the votes of individual FOMC member

This table presents the changes in FOMC post-meeting disclosure between 1989 and 2008.

Table 9
Changes in FOMC post-meeting disclosure

	Total observations		Positive Policy Surprise (Expansionary)		Negative Policy Surprise (Contractionary)	
	Whole sample	Sample since 1994	Whole sample	Sample since 1994	Whole sample	Sample since 1994
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.0196***	-0.0201***	-0.0269***	-0.0296***	-0.0043	-0.0039
	(-5.86)	(-4.93)	(-6.37)	(-5.47)	(-0.84)	(-0.65)
Surprise	0.00002	-0.0016**	-0.0014	-0.0036**	0.0013	0.0017
	(0.03)	(-2.22)	(-1.34)	(-2.34)	(0.17)	(0.33)
Surprise * post_1994	-0.0018*		-0.0030**		-0.0029	
	(-1.75)		(-1.98)		(-0.37)	
Surprise*post_1994_change		-0.0001		-0.0003		-0.0011
		(-0.41)		(-0.65)		(-0.66)
post_1994_change		-0.0004*		-0.0013***		-0.0009
		(-1.79)		(-3.39)		(-1.31)
NFIRM	-0.0000	-0.0000*	0.0000	-0.0000	-0.0000	-0.0000
	(-1.64)	(-1.92)	(0.38)	(-0.35)	(-1.32)	(-1.03)
NIND	0.0000	0.0000	-0.0000*	-0.0000	0.0000	0.0000
	(0.16)	(0.96)	(-1.94)	(-0.52)	(0.34)	(0.16)
BSIZE	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
	(4.61)	(4.29)	(3.80)	(3.65)	(3.97)	(3.50)
HORIZON	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***
	(-22.26)	(-20.11)	(-17.71)	(-15.86)	(-8.88)	(-7.35)
FEXP	0.0000	0.0000	0.0000	0.0000	-0.0000	-0.0000

	(1.46)	(1.30)	(1.32)	(1.30)	(-1.02)	(-0.99)
LAG_TACC	-0.0023**	-0.0011	-0.0030**	-0.0014	-0.0043**	-0.0026
	(-2.11)	(-0.91)	(-2.04)	(-0.83)	(-2.16)	(-1.14)
LAG_PROFIT	0.0162***	0.0125***	0.0146***	0.0094*	0.0179***	0.0141**
	(4.63)	(3.41)	(2.88)	(1.75)	(2.96)	(2.19)
LAG_SIZE	0.0010***	0.0011***	0.0013***	0.0016***	0.0002	0.0003
	(5.74)	(5.26)	(6.28)	(5.79)	(0.73)	(0.85)
Industry FE_48	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,004,953	858,060	395,575	318,876	231,026	202,009
Adj. R-square	17.26%	16.12%	21.76%	20.56%	24.12%	23.96%

This table presents the regression analysis of the forecast error on the Fed's monetary policy surprise, conditional on the changes in the FOMC post-meeting disclosure. The column of *Total Policy Surprise* includes observations with all values of *Surprise*. The column of *Positive Policy Surprise* includes the observations with values of *Surprise* larger than 0. The column of *Negative Policy Surprise* includes the observations with values of *Surprise* lower than 0. The sub-columns of *whole sample* include observations obtained between 1989 and 2008. The sub-columns of *sample since 1994* include observations obtained between 1994 and 2008. The dependent variable is analyst forecast error, defined as actual earnings per share minus the analyst earnings forecast, scaled by the price at the beginning of the quarter. *Surprise* is a daily change in Fed's funds rate futures contracts between the FOMC announcement date and the previous trading day, and this calculated policy surprise is multiplied by -1. *Post_1994* is a dummy variable that equals 1 for observations beginning with February 1994, 0 otherwise. The variable of *Post_1994* itself has been omitted from the regression due to it is absorbed by year fixed-effects. *Post_1994_change* is a factor variable that measures the change in FOMC post-meeting disclosure. It ranges from 0 to 4, and higher values indicate better FOMC post-meeting disclosure. *NIND* is the number of industries covered by an analyst. *BSIZE* is the number of unique analysts employed by a brokerage house which hires this analyst. *HORIZON* is the number of days between an analyst's earnings forecast date and the firm's earnings announcement date. *FEXP* is the number of quarters that an analyst has issued at least one earnings forecast for a firm. *LAG_TACC* is lagged total accruals, defined as the firm's income before extraordinary items minus total cash flow from operations in the prior quarter, scaled by average total assets in the prior quarter. *LAG_PROFIT* is lagged annual profitability, defined as the firm's income before extraordinary items in the prior quarter, scaled by average total assets in the prior quarter. *LAG_SIZE* is lagged firm size, defined as the natural logarithm of the market value of equity in the prior quarter. All detailed variable definitions are in Appendix B. We include Fama-French 48 industries fixed effects, year fixed effects and firm fixed effects. t-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by firm. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05 and 0.001 levels.

Table 10

Moderating effects of following firms' disclosure qualities

	Abs DAC based on the modified Jones model	Abs DAC based on the modified Jones model	Abs Sloan CA	Abs Sloan CA	Abs Hribar & Collins CA	Abs Hribar & Collins CA
	Large	Low	Large	Low	Large	Low
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.0167***	-0.0178***	-0.0191***	-0.0161***	-0.0149***	-0.0247***
	(-3.59)	(-3.32)	(-3.72)	(-3.62)	(-3.04)	(-6.11)
Surprise	-0.0024**	-0.0009	-0.0019**	-0.0003	-0.0019**	-0.0005
	(-2.21)	(-1.53)	(-2.38)	(-0.45)	(-2.10)	(-0.88)
NFIRM	-0.0000	0.0000	0.0000	-0.0000	-0.0000	-0.0000
	(-1.28)	(1.41)	(0.17)	(-0.11)	(-1.41)	(-1.23)
NIND	0.0000	-0.0000**	-0.0000	-0.0000	-0.0000	0.0000
	(0.41)	(-2.30)	(-0.49)	(-1.23)	(-0.04)	(0.22)
BSIZE	0.0000***	0.0000***	0.0000**	0.0000***	0.0000***	0.0000***
	(3.44)	(3.16)	(2.54)	(4.31)	(4.42)	(2.99)
HORIZON	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***	-0.0000***
	(-13.09)	(-17.04)	(-15.92)	(-15.66)	(-16.60)	(-16.26)
FEXP	0.0000*	-0.0000	0.0000	0.0000	0.0000	0.0000
	(1.68)	(-0.11)	(0.03)	(0.40)	(1.56)	(0.96)
LAG_TACC	-0.0023*	-0.0030	-0.0046***	-0.0006	-0.0022	0.0012
	(-1.68)	(-1.61)	(-3.21)	(-0.39)	(-1.48)	(0.63)
LAG_PROFIT	0.0066*	0.0351***	0.0129***	0.0144***	0.0129***	0.0345***
	(1.68)	(4.30)	(2.86)	(2.65)	(3.26)	(4.78)

LAG_SIZE	0.0008***	0.0008***	0.0009***	0.0008***	0.0008***	0.0012***
	(3.51)	(3.01)	(3.62)	(3.37)	(3.06)	(5.86)
Industry FE_48	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	367,486	367,483	453,527	453,511	481,379	481,379
Adj. R-square	22.66%	24.49%	19.96%	23.80%	20.20%	22.69%
p-values of difference in *Surprise* across Large vs Low	0.00		0.00		0.00	

This table presents the moderating effects of the following firms' disclosure qualities. The sample includes observations with all values of *Surprise*. The sub-columns of *Large (Low) Abs DAC based on the modified Jones model* include observations with the absolute value of discretional accruals based on the modified Jones model (Dechow et al. [1995]) above (below) the sample median. The sub-columns of *Large (Low) Abs Sloan CA* include observations with the absolute value of current accruals based on Sloan [1996] above (below) the sample median. The sub-columns of *Large (Low) Abs Hribar & Collins CA* include observations with the absolute value of current accruals based on Hribar and Collins [2002] above (below) the sample median. The dependent variable is analyst forecast error, defined as actual earnings per share minus the analyst earnings forecast, scaled by the price at the beginning of the quarter. *Surprise* is a daily change in Fed's funds rate futures contracts between the FOMC announcement date and the previous trading day, and this calculated policy surprise is multiplied by -1. *NFIRM* is the number of firms covered by an analyst. *NIND* is the number of industries covered by an analyst. *BSIZE* is the number of unique analysts employed by a brokerage house which hires this analyst. *HORIZON* is the number of days between an analyst's earnings forecast date and the firm's earnings announcement date. *FEXP* is the number of quarters that an analyst has issued at least one earnings forecast for a firm. *LAG_TACC* is lagged total accruals, defined as the firm's income before extraordinary items minus total cash flow from operations in the prior quarter, scaled by average total assets in the prior quarter. *LAG_PROFIT* is lagged annual profitability, defined as the firm's income before extraordinary items in the prior quarter, scaled by average total assets in the prior quarter. *LAG_SIZE* is lagged firm size, defined as the natural logarithm of the market value of equity in the prior quarter. All detailed variable definitions are in Appendix B. We include Fama-French 48 industries fixed effects, year fixed effects and firm fixed effects. t-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by firm. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05 and 0.001 levels. The p-values of Fisher's permutation test for difference in the variables of *Surprise* across regressions with large or low values of absolute discretional accruals and absolute current accruals are reported at the bottom of the table.