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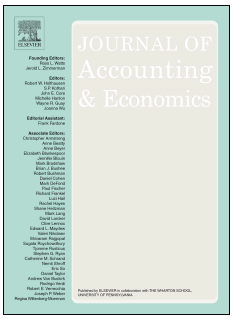

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Accounting Quality and the Transmission of Monetary Policy

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Abstract: We examine how firms' accounting quality affects their reaction to monetary policy. The balance sheet channel of monetary policy predicts that the quality of firms' accounting reports plays a role in transmitting monetary policy by affecting information asymmetries between firms and capital providers. Consistent with this prediction, we find that accounting quality moderates firms' equity market response and future investment sensitivity to unexpected changes in monetary policy. Moreover, the former relation is amplified for firms with more growth opportunities and more financial constraints, further consistent with accounting quality moderating the transmission of monetary policy.

JEL classification: E44; E51; E52; G30; G32; M41
Keywords: monetary policy; federal funds rate; balance sheet channel; accounting quality; financial reporting; information asymmetry; agency conflicts; event study; financial intermediation

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1. Introduction

We study the role of firms' accounting quality in the transmission of monetary policy, which we define as the process through which the central bank's policy actions affect asset prices and general economic conditions (Bernanke and Kuttner, 2005; Mishkin, 2011). Although the goal of monetary policy is to affect macroeconomic outcomes, such as inflation, aggregate output, and unemployment, the various policy instruments available to central bankers have, at best, only an *indirect* effect on these outcomes. Instead, monetary policy is thought to operate through several nonexclusive channels—or transmission mechanisms—that provide a link between the actions of the central bank, financial markets, and the broader economy.

In light of financial market innovations over the last several decades that have changed the ways that firms access capital, an important set of studies develops the *balance sheet channel* as a potentially important mechanism for transmitting monetary policy (e.g., Gertler, 1988; Bernanke and Gertler, 1989, 1995).[1] The balance sheet channel posits that central banks can influence interest rates, thereby altering borrowers' net income and net worth, both of which affect their ability to access external capital. Higher interest rates not only increase borrowers' interest expense, which reduces their net income, but also directly reduce borrowers' net worth as their expected cash flows are discounted at a higher rate.

A crucial feature of the balance sheet channel that distinguishes it from standard "frictionless" models of capital markets is that it explicitly incorporates information asymmetry between borrowers and lenders. Consequently, reductions in borrowers' net income or net worth reduces their pledgeable income or collateral value and, in turn, their share of the payoff from

[1] The term "balance sheet" in the "balance sheet channel" does not refer to the accounting balance sheet *per se*, but rather how economists use the term to refer to potential borrowers' net worth. We adopt this terminology, which is common in the monetary economics literature, throughout this paper.

their investments, exacerbating adverse selection and moral hazard problems.[2] This increased scope for agency conflicts results in a larger external finance premium (i.e., the "wedge" between the cost of internal and external funds).[3] In turn, the larger external finance premium makes it more difficult for firms to access external funding. If firms cannot finance all of their investments with internal funds, then difficulty accessing external funding may force them to forego profitable investment opportunities and lead to a reduction in shareholder wealth (e.g., Bernanke and Gertler, 1989, 1995).[4]

A separate, but conceptually related, literature in corporate finance and accounting argues that firms' information environments—and their accounting quality in particular—can play a role in alleviating information asymmetries between firms and capital providers (see Dechow et al., 2010 and Armstrong et al., 2010 for reviews). This intuition applied in the context of monetary policy suggests that firms' accounting quality might influence the transmission of monetary policy through the balance sheet channel. In particular, firms with higher quality accounting should be less sensitive to monetary policy if their financial transparency reduces their susceptibility to credit market imperfections (e.g., Bharath et al., 2008; Graham et al.,

[2] For example, lower borrower net worth exacerbates adverse selection problems since lenders effectively have less collateral for loans and will charge a higher interest rate as compensation for the increased risk. The higher rate will drive borrowers with more profitable projects—which is unobservable to lenders—to seek alternative sources of financing. In addition, lower net worth can exacerbate moral hazard problems since borrowers' lower equity stakes in their firms can provide them with incentives to take on riskier investments. The common feature of these agency problems is that lenders' expected profit is non-monotonic in the interest rate.

[3] Tirole (2015, p. 472) explains that it should not be surprising that "an increase in the rate of interest has a negative impact on investment" because "when the price of a factor of production (here capital) increases, the use made of this factor of production decreases. […] The interesting insight is that interest rates may have very sharp effects in a corporate finance world, as credit constraints exacerbate their impact." Conceptually, the balance sheet channel is closely related to the "financial accelerator" in that both predict that credit market imperfections caused by information asymmetry between borrowers and lenders can greatly amplify the effect of otherwise small changes in firm value (Bernanke et al., 1996).

[4] Bernanke and Gertler (1989) argue that these predictions hold even if firms are able to substitute to other forms of financing, or are still able to secure additional debt financing by, for example, agreeing to more or more stringent covenants in their debt contracts. These and similar actions are still likely to represent costly deviations from the policy that was optimal prior to the rate change.

2008). Conversely, the effects of the balance sheet channel should be more pronounced for firms with lower quality accounting information, since their access to external financing—and credit in particular—should be more sensitive to changes in their net income and net worth.

Based on these arguments, we examine whether firms' accounting quality moderates their equity market response to unexpected changes in monetary policy. During our sample period, the U.S. Federal Reserve (the Fed) primarily conducted monetary policy by setting a target for the federal funds rate (FFR), which is the overnight interest rate that banks charge each other on reserves.[5] We use FFR futures prices to measure the market's expectation of the target rate. The difference between the market's expectation and the Federal Open Market Committee's (FOMC's) actual announced target rate represents the unexpected (or "surprise") rate change (e.g., Kuttner, 2001; Bernanke and Kuttner, 2005; Gertler and Karadi, 2015; Gallo et al., 2016). Because monetary policy surprises are both unanticipated and have a significant effect on equity values, they provide a powerful source of variation in monetary policy that is arguably otherwise exogenous with respect to individual firms' accounting quality.

Consistent with prior work, we find that unexpected changes in the FFR target lead to changes in aggregate equity market value: on average, an unanticipated 25 basis-point reduction in the target rate leads to a 120 basis-point increase in aggregate equity market value. Next, we examine individual firms to determine whether firms' accounting quality moderates their equity market response to monetary policy surprises. In the context of the balance sheet channel, we define accounting quality as the ability of firms' financial statements to convey information to

[5] Note that targeting the FFR is one of several policy instruments available to central banks. The Federal Reserve used the FFR target as its primary policy instrument until December 16, 2008, when the federal funds rate reached 0%. Because the FOMC cannot move the rate lower than 0% (i.e., the zero lower bound), the Fed relied on quantitative easing and interest on reserves as its primary policy instruments until December 16, 2015 when the FFR target was set to a range of 0.25–0.5%.

capital providers (Dechow et al., 2010). We examine several measures of accounting quality that prior literature argues capture the ability of firms' financial statements to convey information to capital providers, including SEC Accounting and Auditing Enforcement Releases (AAER), accounting restatements, and several common measures of abnormal accruals.

We find that the equity value of firms whose most recently issued (i.e., current) financial statements receive an AAER are almost twice as sensitive to unexpected FFR changes as is the market as a whole. Similarly, firms whose current financial statements are subsequently restated are approximately 20% more sensitive to unexpected FFR changes than is the market as a whole. Finally, firms with one standard deviation greater abnormal accruals, measured as in McNichols (2002) or Dechow and Dichev (2002), are roughly 9% more sensitive to unexpected changes in the FFR than are their counterparts with lower abnormal accruals.

We also examine several firm-level characteristics that we expect to affect the extent to which firms' accounting quality moderates their equity market response to unexpected changes in monetary policy. Bernanke and Gertler (1989, 1995) argue that the balance sheet channel operates through credit market imperfections that prevent firms from financing positive net present value (NPV) projects when money and credit conditions are tight. Consistent with this argument, we find that the moderating role of firms' accounting quality is stronger for younger firms and firms with more growth opportunities, both of which are more likely to have a higher opportunity cost of foregone investment (Adelino et al., 2017). Bernanke and Gertler (1989, 1995) also argue that firms may be forced to forego profitable investments when they lack sufficient internal funds and thus their external finance premium makes it prohibitively costly for them to obtain external financing. Consistent with this argument, we find that the moderating

role of accounting quality is stronger for firms that are more financially constrained and firms at a greater risk of default.

Next, we examine whether firms' accounting quality moderates the sensitivity of their future investment to unexpected changes in monetary policy. The balance sheet channel predicts that firms' equity market response to unexpected changes in monetary policy—as well as any moderating effect of firms' accounting quality—reflects changes in investors' expectations about firms' future investment (e.g., Gertler and Gilchrist, 1994). Therefore, we examine whether investors' expectations are indeed borne out in firms' future investment decisions. Consistent with theoretical predictions, we find that the future investment levels of firms with lower accounting quality are more sensitive to unexpected changes in monetary policy.

We supplement our main analysis with an alternative design aimed at mitigating concerns about omitted variables that are correlated with both firms' accounting quality and their response to monetary policy. Specifically, we examine the staggered implementation of Section 404 of the Sarbanes-Oxley Act (SOX), which increased firms' accounting quality at different times due to pre-existing differences in their fiscal year ends (e.g., Gipper, 2018; Rauter, 2018). Consistent with accounting quality moderating the transmission of monetary policy, we find that the equity market responses of firms subject to Section 404 are relatively less sensitive to unexpected changes in monetary policy. Finally, we find that the effect of firms' accounting quality on their response to monetary policy is concentrated among unexpected rate cuts.

We contribute to the literature on the effects of accounting quality by documenting how firms' accounting quality moderates the effect of monetary policy on their investment and, especially, equity value. Prior work examines how accounting quality affects firms' access to external capital or moderates their investment following changes in real estate values and during

financial crises (e.g., Bharath et al., 2008; Beatty et al., 2008; Costello and Wittenberg-Moerman, 2011; Balakrishnan et al., 2014; Balakrishnan et al., 2016; Balakrishnan, 2018). While changes in investment affect equity values, the magnitude and sign of the effect is theoretically ambiguous (Roychowdhury et al., 2018). Further, Leuz and Wysocki (2016) and Roychowdhury et al. (2018) note that credibly linking "treatments" to high-frequency variables (e.g., short-window changes in equity value from an event study) can provide stronger inferences than linking them to "slow moving" variables (e.g., investment) because the latter are realized over a longer horizon and are more likely to also capture the influence of other forces. Therefore, our paper contributes to this literature by documenting how accounting quality moderates the effect of unexpected FFR changes not only on firms' investment, but also on their equity value.

We also contribute to the literature on monetary policy by documenting evidence consistent with the operation of the balance sheet channel of monetary policy. In doing so, we respond to former Fed Chair Janet Yellen's recent call for more research on the role of firm-level heterogeneity in explaining macroeconomic outcomes.[6] Prior work on monetary policy finds conflicting evidence of how measures of financial frictions that might correspond to firms' accounting quality affect firms' sensitivity to monetary policy (e.g., Gertler and Gilchrist, 1994; Ozdagli, 2017). As we explain in more detail below, we attribute these mixed findings to the use of measures that only weakly capture firms' accounting quality (e.g., firm size and research and development expenditures). Therefore, we contribute to this literature by clarifying how firms' accounting quality affects their reaction to monetary policy.

Although our evidence that firms' accounting quality attenuates their equity market reaction to monetary policy is consistent with the operation of the balance sheet channel, we

[6] https://www.federalreserve.gov/newsevents/speech/yellen20161014a.pdf.

acknowledge that our study does not constitute an exhaustive test of all of the assumptions and implications of the balance sheet channel. We also note that the balance sheet channel is one of several potential, non-exclusive monetary policy transmission channels (Mishkin, 1995, p. 2016). We therefore attempt to control for other prominent monetary transmission channels in order to ensure that our empirical tests isolate the effects of the balance sheet channel. We also develop and test several cross-sectional predictions that are arguably unique to the balance sheet channel. We conclude that our evidence taken as a whole is *consistent* with the balance sheet channel.

We also acknowledge that our evidence is drawn primarily from the cross-section of firms' equity market reaction to monetary policy and therefore only speak indirectly to the aggregate effect of monetary policy. Nevertheless, our finding that firms' accounting quality moderates their equity market reaction to unexpected FFR changes provides important "microfoundational" evidence about the effects of monetary policy (Yellen, 2016).[7] As Boivin et al. (2010, p. 371) explain, "…in order to decide on how to set policy instruments, monetary policymakers must have an accurate assessment of the timing and effect of their policies on the economy. To make this assessment, they need to understand the mechanisms through which monetary policy impacts real economic activity and inflation."

The remainder of our paper proceeds as follows. Section 2 discusses how the U.S. Federal Reserve conducts monetary policy and explains how the quality of firms' accounting information can affect the transmission of monetary policy through the balance sheet channel.

[7] Choi et al. (2019) present evidence that voluntary management earnings guidance resolves uncertainty around FOMC announcements. Nagar and Yu (2014), Konchitchki and Patatoukas (2014a,b), Shivakumar and Urcan (2017), Li et al. (2018), and Lind (2019) present evidence that aggregate firm-level accounting information predicts and explain macroeconomic phenomena. This evidence, when coupled with the theoretical foundations of the balance sheet channel, suggests that the microfoundations we document can also explain macroeconomic phenomena.

Section 3 outlines our research design. Section 4 describes our research setting, sample, and measurement of key variables. Section 5 presents results from our main analyses and robustness tests, and Section 6 provides concluding remarks.

2. Background and theoretical predictions

2.1. Monetary policy

The Fed defines "monetary policy" as "the actions undertaken by a central bank … to influence the availability and cost of money and credit to help promote national economic goals."[8] The Fed relies on three main policy tools to accomplish its policy goals: (i) setting the discount rate that it charges on loans, (ii) setting banks' reserve requirements, and (iii) open market operations. The most common of these tools is open market operations, which are conducted through the purchase and sale of securities—primarily U.S. Treasuries—in the open market by the Fed.[9] Historically, the goal of open market operations has been to reach a target FFR, with the recent exception of December 2008 through December 2015 when the FFR reached the "zero lower bound."[10]

The FOMC sets the Fed's FFR target during eight regularly scheduled meetings per year (roughly every six weeks). The FOMC also holds additional meetings to adjust the FFR target as necessary (e.g., in the immediate aftermath of the terrorist attacks in September 2001). The FOMC consists of the seven members of the Board of Governors of the Federal Reserve, the president of the Federal Reserve Bank of New York, and four of the remaining eleven reserve

[8] https://www.federalreserve.gov/monetarypolicy/fomc.htm.
[9] https://www.newyorkfed.org/aboutthefed/fedpoint/fed32.html.
[10] After the FFR reached 0% following the Global Financial Crisis of 2008, the Fed also began using interest on required reserve balances and overnight repurchases as additional policy tools: https://www.federalreserve.gov/econresdata/notes/feds-notes/2016/the-federal-reserves-new-approach-to-raising-interest-rates-20160212.html.

bank presidents, who serve rotating one-year terms. If the FOMC decides to increase the target rate, the Fed's trading desk will sell U.S. government securities to U.S. banks, reducing the banks' cash reserves. Banks can respond to the decline in their reserves by reducing their overnight lending to other banks, increasing the effective FFR. Conversely, if the FOMC decides to decrease the target rate, the Fed's trading desk will buy U.S. government securities from U.S. banks, increasing the banks' cash reserves. In turn, banks can increase their overnight lending to other banks, lowering the effective FFR.

Numerous monetary economics studies provide evidence that the FOMC's actions have significant effects on financial markets and the real economy (e.g., Friedman and Schwartz, 1963; Romer and Romer, 1989; Bernanke and Gertler, 1995; Bernanke and Kuttner, 2005; Gertler and Karadi, 2015). According to conventional macroeconomic models, these effects occur via the traditional interest rate channel.[11] However, as Kuttner and Mosser (2002, p. 16) and others have observed, "the macroeconomic response to policy-induced interest rate changes is considerably larger than that implied by conventional estimates of the interest elasticities of consumption and investment. This observation suggests that mechanisms other than the narrow interest rate channel may also be at work in the transmission of monetary policy." Responding to this concern, the monetary economics literature has extended its inquiry to determine *why* monetary policy has such significant effects.[12] In particular, it is not obvious why relatively small

[11] Kuttner and Mosser (2002, p. 16) describe the traditional interest rate channel as follows: given some degree of price stickiness, an increase in nominal interest rates, for example, translates into an increase in the real rate of interest and the user cost of capital. These changes, in turn, lead to a postponement in consumption or a reduction in investment spending. This is precisely the mechanism embodied in conventional specifications of the "IS" curve—whether of the "Old Keynesian" variety, or the forward-looking equations at the heart of the "New Keynesian" macro models developed by Rotemberg and Woodford (1997) and Clarida, Galí, and Gertler (1999), among others.

[12] See Boivin et al. (2010) for a recent review.

changes in the FFR, which is a short-term (i.e., overnight) interest rate, have such far-reaching consequences.[13]

2.2. The credit channel of monetary policy transmission

Bernanke and Gertler (1995) discuss how the perceived shortcomings of the traditional interest rate channel have led "… economists to explore whether imperfect information and other 'frictions' in credit markets might help explain the potency of monetary policy" and have proposed several mechanisms that are collectively referred to as the "credit channel of monetary transmission." The distinguishing feature of the credit channel is that it departs from the standard "frictionless" view of financial markets—e.g., the traditional interest rate channels of monetary policy transmission—and incorporates information asymmetry between borrowers and lenders, which leads to a wedge between the cost of internal and external financing (i.e., an external finance premium). The credit channel of monetary policy transmission considers how the external finance premium can propagate otherwise small changes in firm value—often referred to as the financial accelerator.

Although subsequent work in monetary economics has proposed and explored alternative, non-exclusive transmission channels, the credit channel has received the most attention (e.g., Mishkin, 1995, 2016). There are two main versions of the credit channel: the *bank lending channel*, which is sometimes referred to as the *narrow credit channel*, and the *balance sheet channel*, which is sometimes referred to as the *broad credit channel*.

The *bank lending channel* posits that banks are a unique type of financial intermediary that develop lending relationships as a way to overcome information asymmetries. Monetary

[13] Tirole (2015, p. 476) discusses how, in the presence of adverse selection, "a small improvement in lending conditions may have a substantial impact on economic activity. Along these lines, Mankiw (1986) argues that small government interventions (e.g., subsidized loans to students, farmers, and homeowners) can make a big difference."

policy affects the supply of loanable funds available to banks and, consequently, the amount of loans they can make. A reduction in the quantity of loanable funds can dampen the economic activity of firms that rely on bank financing. A number of authors have argued that this mechanism does not comport with current institutional features since the U.S. financial sector is now largely market based. For example, Woodford (2010) argues that "the most important marginal suppliers of credit are not commercial banks. And deposits that are subject to reserve requirements are not the most important marginal source of funding—even for commercial banks." However, Drechsler et al. (2017) argue that the bank lending channel may operate in ways other than how it is traditionally portrayed.[14] Regardless, we exclude banks and other financial institutions from our analysis because they are likely to be affected by monetary policy through different channels—and through the bank lending channel in particular—than their non-financial counterparts.

Bernanke and Gertler (1995) advance another version of the credit channel known as the *balance sheet channel.* The *balance sheet channel* posits that monetary policy affects potential borrowers' net income and net worth which, in turn, affects their external finance premium. Higher interest rates reduce firms' net income both by increasing their interest expense and by reducing their revenues as the overall economy slows. In addition, higher interest rates reduce firms' net worth since their cash flows are discounted at a higher rate.[15] This reduction in firms' net income and asset collateral values exacerbates adverse selection and moral hazard conflicts that result from information asymmetry with lenders, leading to an increased external finance

[14] Drechsler et al. (2017) relax the standard assumption that banks' reserve requirements are binding and instead assume that banks have power in the market for deposits. Consistent with their theory, Drechsler et al. document evidence that monetary policy propagates via reductions in banks' deposits and the subsequent curtailment of their lending activities.

[15] The balance sheet channel also predicts that *looser* monetary policy increases firms' net worth, which, in turn, reduces adverse selection and moral hazard problems with (potential) capital providers.

premium. As a result of the increase in the external finance premium, the financial accelerator can amplify otherwise small changes in borrowers' balances sheets.

2.3. Accounting quality

A long line of research in corporate finance and accounting argues that firms' information environments—and their accounting quality in particular—can play a role in alleviating information asymmetries between firms and capital providers (see Kothari, 2001; Dechow et al., 2010; and Armstrong et al., 2010 for reviews). For instance, several studies find that firms with lower quality accounting obtain less favorable financing terms from shareholders—such as a higher cost of capital—and creditors—such as more financial covenants and higher interest rates (e.g., Bharath et al., 2008; Graham et al., 2008; Costello and Wittenberg-Moerman, 2011). In total, low accounting quality and the resulting information asymmetry can exacerbate agency conflicts, directly reducing firms' cash flows, and may also increase firms' undiversifiable information risk and affect firm-specific discount rates (Lambert et al., 2007).

This intuition applied in the context of monetary policy suggests that firms' accounting quality could influence the transmission of monetary policy through the balance sheet channel. In particular, firms with higher quality accounting should be less sensitive to monetary policy because their financial transparency reduces their susceptibility to credit market imperfections that are central to the balance sheet channel. Conversely, firms with lower quality accounting should be more sensitive to monetary policy operating through the balance sheet channel because their access to external financing—and credit in particular—should be more sensitive to changes in their net income and net worth.

2.4. Accounting quality and the balance sheet channel of monetary transmission

The central feature of the balance sheet channel is information asymmetry between borrowers and lenders. As Mishkin (2016, pp. 610–11) explains,

> *…the asymmetric information view of financial frictions, which is at the core of credit channel analysis, is a theoretical construct that has proved useful in explaining many other important economic phenomena, such as why many of our financial institutions exist, why our financial system has the structure that it has, and why financial crises are so damaging to the economy…The best support for a theory is its demonstrated usefulness in a wide range of applications. By this standard, the asymmetric information theory, which supports the existence of credit channels as an important transmission mechanism, has much to recommend it.*

Based on our discussion in Section 2.3, we expect firms' accounting quality to play a key role in moderating their response to monetary policy through its effect on information asymmetry with both existing and potential capital providers. We formally motivate this theoretical prediction—as well as the auxiliary cross-sectional predictions in Section 3.2—with a simple model that appears in Appendix A.[16]

Focusing on firm-level accounting information allows us to understand heterogeneity in firms' equity market responses to monetary policy, and, in turn, the importance of the balance sheet channel as a monetary transmission mechanism. Studying the role of firm-level heterogeneity is important because, as Walsh (2010, p. 478) explains, the credit channel "… highlights *heterogeneity* among borrowers, stressing that some borrowers may be more vulnerable to changes in credit conditions than others" (emphasis supplied). Walsh (2010, p. 506) also notes that "evidence [of the credit channel] based on aggregate credit measures can be problematic, however, if borrowers are heterogeneous in their sensitivity to the business cycle and in the types of credit they use." Moreover, "aggregate data are likely to be of limited usefulness in testing" certain predictions of the balance sheet channel "because most data on

[16] We thank an anonymous referee for this suggestion and for helpful guidance developing the model.

credit stocks and flows are not constructed based on characteristics of the borrowers" (Walsh, 2010, p. 508).

Two prior monetary economics studies examine how measures of "financial frictions" that might correspond to firms' accounting quality affect firms' responses to monetary policy. First, Gertler and Gilchrist (1994) find that smaller—and presumably more informationally opaque—manufacturing firms experience larger changes in their production and borrowing than do their larger counterparts following changes in monetary policy. However, firm size is, at best, a coarse proxy for accounting quality that could also or instead capture collateral value, implicit government guarantees, the availability of internal funds, or any number of other constructs (e.g., Watts and Zimmerman, 1986). Second, Ozdagli (2017) finds that proxies for financial frictions that might correspond to accounting quality *attenuate* rather than amplify firms' responses to unexpected changes in monetary policy. This finding is at odds with theoretical predictions from the balance sheet channel and with our empirical evidence.

There are at least three differences between our study and Ozdagli (2017) that may explain the differences in our findings and inferences. First, Ozdagli examines measures of *financing constraints*, rather than measures of *accounting quality*, which are distinct theoretical constructs in the balance sheet channel. Therefore, not all of Ozdagli's empirical measures necessarily correspond to accounting quality (e.g., the Hadlock and Pierce, 2010 index of financing constraint is unlikely to reflect firms' accounting quality). Second, Ozdagli examines a different mechanism than the immediate effect of accounting quality. In particular, he examines how firms' financing constraints affect their leverage *ex ante*, which, in turn, affects the sensitivity of equity value to changes in interest rates. Presumably, this is why Ozdagli's empirical specifications do not control for firms' leverage. In contrast, we are interested in the

immediate effect of firms' accounting quality on their equity market responses to monetary policy, and therefore control for leverage in our empirical specifications.

Third, the measures of financing constraints that Ozdagli examines that might correspond to accounting quality are (i) total accruals calculated as in Sloan (1996), (ii) R&D spending, (iii) an indicator for whether the firm's equity is unrated, and (iv) an indicator for Arthur Andersen clients in the immediate aftermath of the Enron scandal. We believe that (i) and (ii) are more likely to capture firms' recent growth or growth options than accounting quality (Dechow et al., 2010), (iii) more likely reflects capital structure (Ozdagli, 2017), and (iv) corresponds to *higher* rather than lower accounting quality since firms that are expected to hire another auditor in place of Arthur Andersen increase their accounting quality.[17]

3. Research Design

3.1. Aggregate equity market reaction to monetary policy

To examine the role of firms' accounting quality in the transmission of monetary policy, we extend and modify the research designs of Kuttner (2001) and Bernanke and Kuttner (2005). We begin by documenting the sensitivity of the stock market as a whole to monetary policy surprises, replicating the findings of Bernanke and Kuttner (2005) for our sample period. As discussed in Section 2, open market operations are the Fed's most flexible and frequently used tool for implementing monetary policy, and influencing the FFR is the primary goal of open

[17] Prior work on the accounting quality of Arthur Andersen's clients presents mixed evidence. Krishnan (2005), Cahan and Zhang (2006), Fuerman (2006), Krishnan and Visvanathan (2008) and Nelson et al. (2008) present evidence consistent with Arthur Andersen clients experiencing increases in accounting quality after the Enron collapse. However, Krishnamurthy et al. (2006) and Blouin et al. (2007) present evidence consistent with Ozdagli's interpretation.

market operations.[18] Accordingly, we use the Fed's FFR target as our measure of monetary policy (Gallo et al., 2016).

There are three important concerns with examining the effect of monetary policy on financial markets and financial asset prices. First, investors' may trade based on their expectations of the Fed's future policy actions, in which case equity values will reflect the anticipated effect of the actions *before* the actual change in monetary policy. Second, given the Fed's mandate, its actions are endogenous with respect to macroeconomic conditions. For instance, the Fed could respond to deteriorating economic conditions by lowering its FFR target to encourage investment and spending. Consequently, there is likely to be a positive endogenous relation between macroeconomic conditions and the FFR.

To address these two concerns, we follow Kuttner (2001) and Bernanke and Kuttner (2005) and use FFR futures data to estimate the market's expectation of the future FFR. The difference between the market's expectation and the actual FFR represents a "surprise" rate change that was not anticipated by investors. Examining short-window equity market reactions to FFR surprises helps ensure that our findings reflect the effect of monetary policy rather than any changes in macroeconomic conditions to which the Fed is responding.

A third concern with examining the effect of monetary policy on financial market prices is that the Fed may have access to private information. If the Fed's actions (e.g., FFR targets) communicate this private information to investors, then the coefficient on monetary surprises may reflect the market's reaction to the Fed's private information, rather than the Fed's monetary policy actions *per se*. Poole et al. (2002) and Bernanke and Kuttner (2005) acknowledge this concern and present arguments and evidence that suggests that, if anything, this potential source

[18] https://www.newyorkfed.org/aboutthefed/fedpoint/fed32.html.

of endogeneity works *against* finding an effect of monetary policy on stock returns.[19] For example, the FOMC may respond to a disappointing economic report by decreasing the federal funds rate in an attempt to stimulate growth. Investors may infer from the rate cut that the FOMC received bad news, leading to a decline in asset values in response to the perceived news. This scenario would lead to a positive endogenous relation between equity market returns and FFR surprises, which would work against finding the predicted negative relation.[20]

Following Bernanke and Kuttner (2005), we estimate the following model on FOMC announcement dates to assess the sensitivity of the stock market as a whole to monetary policy:

$$MarketReturn_t = \alpha + \beta_1 DailySurprise_t + \beta_2 DailyExpected_t + \varepsilon_{i,t} \quad (1)$$

where *Market Return* is the aggregate daily CRSP value-weighted equity market return, *Daily Surprise* is the unexpected change in the FFR target on each FOMC announcement date *t*, and *Daily Expected* is the expected change in the FFR target. Similar to Bernanke and Kuttner (2005), we expect a negative relation between *Market Return* and *Daily Surprise* (i.e., $\beta_1 < 0$), indicating that surprise increases in the FFR target lead to a decline in aggregate stock prices, and vice versa. We expect no relation between *Market Return* and *Daily Expected* because markets are forward looking and asset prices should already impound the effect of expected monetary actions. When estimating Eq. (1), we base our inferences on robust standard errors.

3.2. Accounting quality and the transmission of monetary policy

To assess whether and how individual firms' accounting quality moderates the relation between monetary policy surprises and changes in their equity market values, we extend

[19] In particular, by examining the response of Treasury yields to monetary policy surprises, Poole et al. (2002) examine the variation in federal funds futures rates on FOMC announcement dates when the actual change in the FFR target matched the market's expectation and find that this measurement error attenuated the bond market's response by 5–10%.

[20] Similar arguments can be made for the Fed reacting to high frequency news on FOMC meeting days (e.g., a disappointing employment report that becomes public).

Bernanke and Kuttner's (2005) research design by disaggregating the aggregate equity market return into individual firms' returns. Our approach is similar to that of Gorodnichenko and Weber (2016) and Ippolito et al. (2017), who examine whether the "stickiness" of firms' product market prices and cross-sectional differences in firms' reliance on floating rate debt, respectively, explain heterogeneity in their equity market reactions to FFR surprises. Specifically, we estimate the following specification on FOMC announcement dates:

$$Return_{i,t} = \alpha + \beta_1 AccountingQuality_{i,t-1} + \beta_2 AccountingQuality_{i,t-1} \times Surprise_t + \Gamma Controls_{i,t-1} + \theta Controls_{i,t-1} \times Surprise_t + \delta_i + \gamma_t + \varepsilon_{i,t} \quad (2)$$

where *Return* is firm *i*'s equity market return on date *t*. *Accounting Quality* is one of several measures of the quality of firm *i*'s financial reports, which we describe in more detail in Section 4. *Surprise* is the unexpected change in the FFR target, using intraday data on FFR futures contracts to compute *Surprise*.[21]

We are primarily interested in the coefficient on *Accounting Quality* × *Surprise*, which captures the differential sensitivity of firms with varying levels of accounting quality to monetary policy surprises. We include firm fixed effects, δ_i, to control for all time-invariant firm characteristics that have been shown to be associated with equity returns (e.g., industry membership, organizational capital, etc.). We also include date fixed effects, γ_t, to control for macroeconomic conditions that are common to all firms in the economy. Date fixed effects also control for the effect of monetary policy surprises on the market as a whole, absorbing the main effect of both *Surprise* as well as any expected change in the FFR.

Controls denotes several time-varying firm characteristics that prior literature has identified as explaining firm-level equity market reactions to monetary policy, which may also

[21] We are unable to estimate our market-level tests using intraday data because the proprietary data on surprises provided by Gilchrist et al. (2015) does not include data on expected or actual intraday changes in the FFR.

be correlated with firms' accounting quality (e.g., Gorodnichenko and Weber, 2016; Ippolito et al., 2017). In particular, our main specification includes controls for *Book-to-Market*, *Sales Growth*, *Stock Volatility*, *Size*, *ROA*, *CAPM Beta*, *Leverage*, *Price-to-Cost Margin*, *Concentration*, *Sales Volatility*, *Investment-to-Sales Ratio*, *Receivable-to-Sales Ratio*, and *Depreciation-to-Sales Ratio*.[22] In addition to these economic controls, our main specification also includes the following statistical controls that are common in the asset pricing literature as parsimonious representations of the return generating process: *High Minus Low Factor Exposure*, *Small Minus Big Factor Exposur*e, and *Momentum Factor Exposure*.[23]

We interact all of the control variables with our measure of monetary surprises to allow the covariance (or "mapping") to differ based on the magnitude of *Surprise*. All variables are defined in Appendix B. We measure the controls and accounting quality as of the most recent fiscal year end (i.e., *t-1*). For example, on October 25, 2006 at 2:15pm the FOMC released a statement targeting a federal funds rate of 5.25%. For a firm with a December fiscal year-end, we use the accounting quality and control variables associated with the December 31, 2005 financial statements when examining the effect of this announcement. When estimating Eq. (2), and in all subsequent event study analyses, we base our inferences on standard errors clustered by two-digit SIC code and date.

We also modify Eq. (2) to determine whether additional firm-level characteristics moderate the relation between firms' accounting quality and their equity market responses to monetary policy. Bernanke and Gertler (1989) argue that the balance sheet channel operates by

[22] Controlling for firm size also ensures that any relations that we document are incremental to Gertler and Gilchrist's (1994) finding that smaller firms are more sensitive to monetary policy surprises.

[23] We do not include these statistical controls in subsequent analyses because they are statistical representations of the return generating process, rather than controls derived from formal economic theory. Importantly, the theory on which we rely suggests that firms' accounting quality, and its interaction with monetary policy, may be part of the return generating process. Consequently, these statistical controls may constitute "bad controls" (Angrist and Pischke, 2008 p. 64).

altering the external finance premium that firms face as a result of information asymmetries with capital providers. Consequently, firms that lack internal funds may be forced to forego profitable investment opportunities when monetary conditions are tight, and, conversely, can undertake more of these investments when monetary conditions are loose. Building on Bernanke and Gertler's arguments, we expect the moderating effect of firms' accounting quality on their equity market response to monetary policy to be more pronounced for firms that have more growth options, as their value is more sensitive to their ability to invest in these potentially valuable projects. This prediction is formalized in Appendix A by comparative static A8. We also expect the moderating effect of firms' accounting quality to be more pronounced for firms that are more reliant on external capital, as these firms are less able to finance their investments with internal funds. This prediction is formalized in Appendix A by comparative static A9.

To test these predictions, we first identify firm characteristics that prior literature argues reflect the presence of growth options and reliance on external financing. We then split our sample based on each of these characteristics, which we discuss in more detail in Section 4, and re-estimate Eq. (2) in each subsample.[24] We compare the coefficient on *Accounting Quality* × *Surprise* between the two subsamples, and we expect the coefficient on *Accounting Quality* × *Surprise* to be more pronounced in the subsample of firms that (i) have more growth options and (ii) are more reliant on external capital.

[24] In our analysis, each subsample is constructed by splitting the primary sample based on the pooled sample characteristic of interest. The resulting empirical specification is analogous to estimating a single model with the particular firm characteristic interacted with all of the other variables, including the fixed effects. We find similar results and draw similar inferences if we construct each subsample based on "within announcement date" characteristics.

4. Variable Measurement and Sample Construction

4.1. Variable measurement

4.1.1. Federal funds rate (FFR) surprises

We measure monetary policy surprises on FOMC announcement days following the methodology described in Kuttner (2001) and Bernanke and Kuttner (2005).[25] In particular, we measure daily FFR surprises (*Daily Surprise*) as the daily change in 30-day federal funds futures rates between the FOMC announcement date and the previous trading day. Because the contract's settlement price is based on the monthly average FFR, we scale the difference between the market's expectation and the actual change in the FFR by a factor that reflects the number of days remaining in the month of the FFR change. We measure daily expected FFR changes (*Daily Expected*) as the difference between the actual daily FFR change and *Daily Surprise*.

We also follow several recent monetary economics studies (e.g., Gorodnichenko and Weber, 2016; Gilchrist et al., 2015; Ippolito et al., 2017) and use a more refined measure of *Surprise* in our primary analyses. This intraday measure, *Surprise*, is calculated during the 60-minute windows surrounding FOMC announcements. Following recent monetary economics studies, we adopt *intraday* FFR surprises around FOMC announcements, as opposed to *daily* FFR surprises. Doing so better isolates variation in monetary policy surprises that is less susceptible to confounding from concurrent events on FOMC announcement dates (e.g., Gürkaynak et al., 2005; Gorodnichenko and Weber, 2016).[26]

4.1.2. Accounting quality

[25] We thank Ken Kuttner for making these data available on his website: http://econ.williams.edu/faculty-pages/research/.

[26] We thank the authors of Gilchrist et al. (2015) for making these data on intraday FFR surprises around FOMC announcements publicly available.

Dechow et al. (2010) argue that there is no single measure of firms' accounting quality, but rather that the appropriateness of any particular measure is context specific. In the context of our research question, we define accounting quality as the informativeness and reliability of financial reports to external capital providers, and creditors in particular. Thus, we consider several alternative proxies for *Accounting Quality* that we expect to influence the degree of information asymmetry between firms and capital providers.

Dechow et al. (2010) argue that AAERs from the SEC and restatements are unambiguous symptoms of accounting deficiencies and information problems. We therefore use AAERs and financial statement restatements as our primary measures of *Accounting Quality*. In particular, we measure accounting quality with indicators for whether the firm's current financial statements subsequently receive an AAER (*AAER*) or whether its financial results are subsequently restated (*Restatement*).[27]

This measurement choice is consistent with Dechow et al.'s (2010, p. 375) observation that "… earnings that were initially reported were less decision useful (of lower quality) in terms of equity valuation than the restated earnings." This measurement choice is also consistent with Karpoff and Lou's (2010) evidence that equity investors anticipate AAERs and restatements and Dechow et al.'s (1996) evidence that external indicators of low accounting quality are elevated during the misreporting period. Therefore, reporting periods that are ultimately receive an AAER or for which the firm restates its financial statements are periods when firms' financial reports would have been less useful for capital providers and would have done little to mitigate

[27] Note that both measures are decreasing in firms' accounting quality.

financing frictions. Moreover, this measurement choice is also consistent with the arguments in Gillette et al. (2017, p. 1):[28]

> *… that firms optimally invest in accounting resources (including hardware, software, and accounting staff human capital) and that the resulting [Earnings Quality] of the firm is the outcome of this (optimal) investment in accounting resources. In the absence of any agency problem, cross-sectional and time-series variation in [Earnings Quality] will still exist due to plausible benefit and cost behavior patterns in the investment in accounting resources (which could be uncorrelated with malfeasance incentives).*

One potential drawback of AAERs and restatements is that they are relatively infrequent events and the negative equity market reaction to the announcement of these events suggests that investors did not fully anticipate the extent or severity of the accounting irregularities (Karpoff et al., 2008).[29] Consequently, these tests may be low power. However, if anything, this should bias our tests against finding a moderating effect of accounting quality on the transmission of monetary policy. Nevertheless, to ensure that the results of our main tests are not merely an artefact of our *Accounting Quality* measurement choices, we also consider two alternative measures of accounting quality in robustness tests that we describe in Section 5.5.2.

4.1.3. Growth options

We measure a firm's growth options using the ratio of the value of its physical assets in place to its market value, or its *Book-to-Market* ratio. Following prior work, we assume that firms with higher *Book-to-Market* ratios have fewer or less valuable growth options (e.g., Myers,

[28] Although firms may restate their financial statements for relatively benign or innocuous reasons (e.g., technical accounting errors), we consider any instance of a restatement when constructing *Restatement*, since we expect any such restatement to be symptomatic of at least some degree of information problems that impede the production of accurate financial statements (Gillette et al., 2017). In untabulated tests, we find that our primary results based on *Restatement* are similar in magnitude and slightly less statistically significant when using Hennes et al.'s (2008) alternative definition of restatements that only includes restatements that are explicitly due to fraud: coefficient estimate (*p*-value) of –1.27 (0.159) and –0.95 (0.129) on *Surprise* × *Restatement* when re-estimating column (2) of Table 3 and column (1) of Table 4.

[29] Alternatively, the equity market reaction to the announcement of an AAER may reflect investors' expectation that the SEC, customers, or other stakeholders will impose penalties rather than the severity of financial misconduct. Indeed, Karpoff et al. argue that equity investors' reaction primarily reflects concerns about reputational damage.

1977). We also use the firm's age, measured as the number of years it has existed in Compustat, or *Firm Age*, as another measure of growth options. Following prior work, we assume that older firms have fewer growth options (e.g., Anthony and Ramesh, 1992).

4.1.4. Financing constraints

To measure a firm's financing constraints, we use the firm's default risk measured following Bharath and Shumway (2008), or *Distance-to-Default*. We assume that firms that are closer to default are more financially constrained. We also use an indicator for whether the firm paid dividends during the prior year, or *Dividend Payer*, as an alternative measure of financing constraints (Fazzari et al., 1988). Similar to prior studies, we assume that firms that pay dividends are less financially constrained than are firms that do not.

Next, we use the volatility of the firm's cash flows, or *Cash Flow Volatility*, and the volatility of the firm's earnings, or *Earnings Volatility*, as additional alternative measures of financing constraints. Prior studies argue that firms with more volatile cash flows are more likely to have periods of cash flow shortfall that force them to forego investment (i.e., they are less able to fund projects with internally-generated cash flows) and face a higher external finance premium (Minton and Schrand, 1999). Prior work also finds that earnings volatility has a negative relation with dividend payout ratios, potentially reflecting capital providers' use of earnings volatility to assess the expected volatility of future cash flows (Minton and Schrand, 1999).[30] Based on these arguments, we assume that firms with higher *Cash Flow Volatility* and higher *Earnings Volatility* are more financially constrained.

Finally, we use a text-based measure of financing constraints developed by Hoberg and Maksimovic (2014), *HM Index*, that is based on textual analysis of the Management's Discussion

[30] Note that Minton and Schrand (1999) find no evidence of a negative relation between earnings volatility and investment incremental to cash flow volatility.

and Analysis (MD&A) Section of the 10-K. While Hoberg and Maksimovic (2014) discuss various strengths of their measure, we note that it may diminish the power of our tests in our particular research setting compared to our other measures of financing constraints. This is because *HM Index* captures both a lack of sufficient internal funds and potential information asymmetry problems, including those caused by low accounting quality, while our other measures should capture primarily a lack of internal funds.

4.2. Sample construction

Our sample period begins in 1997, which is when intra-day FFR futures data begins, and ends in 2013.[31] Following Bernanke and Kuttner (2005), we also exclude the FOMC announcement on September 17, 2001, which followed an unscheduled meeting that was held following the September 11th terror attacks. Given our interest in the transmission of monetary policy to *non-financial* firms through the balance sheet channel, we exclude banks and financial services firms from our sample. We winsorize all continuous variables at the 1st and 99th percentiles. We obtain firm-level financial information from Compustat and stock market returns from CRSP. The resulting sample consists of 491,602 firm-FOMC announcement date observations for 6,204 unique firms with non-missing financial and stock return information, corresponding to 140 FOMC announcement dates. Due to data availability on financial restatements from Audit Analytics, our sample that uses *Restatement* to measure *Accounting Quality* ends in 2012, limiting our firm-event date sample to 446,365 observations for these tests.

Table 1 presents descriptive statistics for the variables used in our tests. Panel A presents statistics for the aggregate and macroeconomic variables. The mean *Daily Surprise* and *Daily Expected* FFR changes are negative during our sample period (–3.13 and –0.99 basis points),

[31] The sample for our tests that use *Daily Surprise* and *Daily Expected* begins in 1989, since we are able to obtain data on daily changes in FFR futures for those FOMC dates.

which reflects the gradual FFR reductions leading up to the financial crisis. Panels B and C of Table 1 present descriptive statistics for the firm-level characteristics used in our tests that measure *Accounting Quality* with *AAER* and *Restatement*. Consistent with prior studies, Panel B shows that AAERs are relatively infrequent: only 1% of our sample observations. Panel C indicates that restatements are more frequent: 13% of our sample observations.

5. Results

5.1. Market reaction to federal funds rate (FFR) surprises

Table 2 presents the results from estimating Eq. (1). We find that the relation between monetary policy surprises and aggregate equity market returns is similar in both sign and magnitude to the results presented in Bernanke and Kuttner (2005). In particular, in column (1) we find that, on average, a hypothetical 25 basis point surprise increase in the FFR target is associated with a negative 1.2 percentage point aggregate market return (*t*-statistic of –3.25). This result is consistent with numerous prior studies that find that monetary policy surprises have a large negative relation with aggregate equity market values. In contrast, the relation between *expected* monetary policy changes and aggregate equity market values is economically small and is not statistically significant at conventional levels (*t*-statistic of 1.57). Our estimates imply that a hypothetical 25 basis point *expected* increase in the FFR target is associated with a 0.2 percentage point increase in aggregate equity market value.

The results in Table 2 corroborate those documented by Bernanke and Kutter (2005) and others, and suggest that monetary policy has a significant effect on aggregate equity values, and, presumably, the broader economy as well.

5.2. The effect of accounting quality on the transmission of monetary policy

5.2.1. Accounting quality and firms' reaction to federal funds rate (FFR) surprises

Table 3 presents the results from estimating Eq. (2), without including firm- or industry-level controls. Columns (1) and (2) report results using *AAER* and *Restatements* as the respective measures of *Accounting Quality*. Both columns include date fixed effects, which absorb the main effect of *Surprise* (as well as the *expected* component of changes in FFR futures rates). Consequently, the interaction between *Accounting Quality* and *Surprise* captures whether firms with low accounting quality differentially respond to monetary policy surprises than does the market as a whole. The results in column (1) imply that the market value of firms whose current financial statements receive an AAER declines by an *additional* 0.8 percentage points following a hypothetical 25 basis point surprise increase in the FFR target (*t*-statistic of –3.77). The results in column (2) imply that the market value of firms whose current financial statements are restated declines by an *additional* 0.25 percentage points following a hypothetical 25 basis point surprise increase in the FFR target (*t*-statistic of –2.64).

5.2.2. Inclusion of firm- and industry-level controls

Table 4 presents the results from estimating Eq. (2) after including firm- and industry-level controls. We include the main effects of the controls, but do not report coefficient estimates and standard errors for parsimony.

Panel A presents results using *AAER* to measure of *Accounting Quality*. In column (1), we include all of the economic controls simultaneously. The results suggest that the market value of firms whose current financial statements receive an AAER declines by an additional 0.5 percentage points following a hypothetical 25 basis point surprise increase in the FFR target (*t*-

statistic of –4.25).[32] This estimate implies an additional reduction of roughly $1.6 million in market value for the median firm in our *AAER* sample. We find similar results when we include the statistical controls and their interactions in column (2), and when we include an interaction for each two-digit SIC code industry with *Surprise* in column (3).

Finally, in column (4) we include *Surprise* × Pseudo-firm fixed effects to control for time-varying heterogeneity across similar types of firms that may jointly affect both their accounting quality and their equity market response to monetary policy (e.g., Gipper et al., 2018). To do so, we group firms into 1,000 portfolios based on firm characteristics—specifically the control variables *Size*, *CAPM Beta*, and *Book-to-Market* in Eq. (2)—and include indicators for each of the 1,000 groups and their interactions with *Surprise* as pseudo-firm fixed effects. The results in column (4) indicate that we obtain similar inferences when using this alternative pseudo-firm fixed effect structure.

We repeat the sequence in Panel B using *Restatement* to measure *Accounting Quality*. In column (1), we include all of the economic controls and find that the market value of firms that subsequently restate their current financial statements declines by an additional 0.1 percentage points following a hypothetical 25 basis point surprise increase in the FFR target (*t*-statistic of –2.12). This estimate implies an additional reduction of roughly $340 thousand in market value for the median firm in our *Restatement* sample We find similar results when we include the statistical controls and their interactions in column (2), when we include an interaction for each two-digit SIC code industry with *Surprise* in column (3), and when we include an interaction for pseudo-firm fixed effects with *Surprise* in column (4). The collective results in Panels A and B

[32] In untabulated analysis, we re-estimate Eq. (2) after individually including each control interacted with *Surprise*. This analysis provides no evidence that the inclusion of any of the individual controls materially alters the coefficient estimate of *Surprise* × *AAER*, suggesting that none of the controls, or their interactions with *Surprise*, are highly correlated with *Surprise* × *AAER*.

of Table 4 indicate that the market values of firms with lower quality accounting are more sensitive to monetary policy surprises.

5.3. Growth options and the moderating effects of accounting quality on monetary policy transmission

Table 5 presents results from estimating Eq. (2) after splitting the sample on several measures of firms' growth opportunities. We include all of the economic controls and their interaction with *Surprise* in all specifications, but do not report coefficient estimates or standard errors for parsimony. Panel A presents results using *AAER* to measure *Accounting Quality*. We find that the moderating role of firms' accounting quality on their equity market reaction to monetary surprises is more pronounced for younger firms (i.e., those with *Firm Age* less than the sample median) and firms with relatively low *Book-to-Market* ratios. In particular, the coefficient on the interaction between *AAER* and *Surprise* is approximately twice as large for younger firms and approximately 25% larger for firms with relatively low *Book-to-Market* ratios, although neither difference between the coefficients is statistically significant at conventional levels (*p*-values of 0.48 and 0.68 in columns (1) and (2)). One potential explanation for the large economic magnitude of the differences, but the lack of statistical significance of the differences, is that AAERs are relatively infrequent and sub-dividing the AAER sample results in relatively low power tests.

Panel B of Table 5 presents results using *Restatement* to measure *Accounting Quality*. We find that restatements amplify firms' equity market reactions to unexpected changes in the FFR target only for younger firms (coefficient estimates of –1.129 and 0.287 in columns (1a) and (1b)). Similarly, we find that the moderating effect of *Restatements* is much larger for firms with relatively low *Book-to-Market* ratios (coefficient estimates of –0.879 and –0.106 in columns (2a)

and (2b)). In addition, the differences between the coefficients in columns (1a) and (1b) and between columns (2a) and (2b) are statistically significant either at or near conventional levels (*p*-values of 0.04 and 0.13 in columns (1) and (2)).

Collectively, the results in Table 5 indicate that the moderating role of firms' accounting quality in transmitting monetary policy is amplified for firms with more growth opportunities. This finding corroborates a distinct prediction that stems from the balance sheet channel; that the role of accounting quality in mitigating information asymmetries between firms and capital providers is more important—and therefore amplifies borrowers' equity market reaction to monetary surprises—for firms with more growth options (e.g., Bernanke and Gertler, 1989; comparative static A8 of Appendix A). Therefore, the results in Table 5 provide additional support for our inference that firms' accounting quality moderates the transmission of monetary policy via the balance sheet channel.

5.4. Financing constraints and the moderating effects of accounting quality on monetary policy transmission

Table 6 presents results from estimating Eq. (2) after splitting the sample on several measures of firms' financing constraints (i.e., *Distance-to-Default*, *Dividends*, *Cash Flow Volatility*, *Earnings Volatility*, and *HM Index*). Panels A and B of this table present results using *AAER* and *Restatement* as the respective measures of *Accounting Quality*. We find some evidence that the coefficients on *Surprise* × *AAER* is larger in the subsamples of financially constrained firms in Panel A. In particular, the coefficient on *Surprise* × *AAER* in column (4b) for firms with above median earnings volatility is over twice as large as the coefficient for firms with below median earnings volatility (*F*-statistic of 3.35, *p*-value of 0.07).

In Panel B of Table 6, we find that the magnitudes of the coefficients on *Surprise* × *Restatement* are significantly larger for financially constrained firms. The moderating effect of accounting quality in monetary transmission is larger for firms that are closer to default and firms that do not pay dividends (*F*-statistics of 3.02 and 1.37, *p*-values of 0.09 and 0.24 in columns (1) and (2)). We also find that accounting quality is more important in transmitting monetary policy for firms with higher *Cash Flow Volatility* and *Earnings Volatility* (*F*-statistics of 4.58 and 6.25, *p*-values of 0.03 and 0.01 in columns (3) and (4)). This finding corroborates distinct predictions that stem from the balance sheet channel that the role of accounting quality in mitigating information asymmetries between firms and capital providers is more important for—and therefore amplifies the equity market reaction to monetary surprises of—firms that require access to external financing (e.g., Bernanke and Gertler, 1989; comparative static A9 of Appendix A).

5.5. Robustness and extensions

5.5.1. Falsification test: accounting quality and expected monetary policy changes

In Table 7, we estimate a falsification test to assess the robustness of our inferences to concerns that our results are an artefact of an arbitrary decomposition of changes in monetary policy into their expected and surprise components. We estimate a variant of Eq. (2) in which we interact the *expected* (in addition to the *surprise*) change in the FFR target with the measures of firms' accounting quality:[33]

$$Return_{i,t} = \alpha + \beta_1 AccountingQuality_{i,t-1} + \beta_2 AccountingQuality_{i,t-1} \times Daily\ Surprise_t + \beta_3 AccountingQuality_{i,t-1} \times Daily\ Expected_t + \Gamma\ Controls_{i,t-1}$$

[33] We use *daily* changes in federal funds futures rates in these tests, since data on *expected* federal funds futures rate changes on FOMC dates are only publicly available at a daily frequency and through June 2008. We thank Ken Kuttner for making these data available on his website at https://econ.williams.edu/faculty-pages/research/.

$$+ \theta\, Controls_{i,t-1} \times Surprise_t + \delta_i + \gamma_t + \varepsilon_{i,t} \quad (3)$$

Columns (1) and (2) reports results using *AAER* and *Restatement* as the measure of *Accounting Quality*. In both columns, we continue to find that low accounting quality amplifies firms' equity market reaction to monetary policy surprises (*t*-statistics of –4.08 and –1.83). However, we find no evidence that low accounting quality amplifies firms' equity market reaction to *expected* changes in monetary policy (*t*-statistics of 1.74 and 0.70). If anything, the positive and marginally significant coefficient on *Expected* × *AAER* in column (1) suggests that low accounting quality leads to the opposite—i.e., an attenuated—reaction to *expected* changes in monetary policy. However, the magnitude of this coefficient is relatively modest: the coefficient on *Surprise* × *AAER* is more than two orders of magnitude larger.

5.5.2. Alternative measures of accounting quality

Our previous tests use AAERs and restatements as indicators of lower quality accounting since both are symptomatic of a greater potential for information asymmetry between firms and capital providers. However, as with any empirical proxy, restatements and AAERs are susceptible to measurement error and concerns about their validity. One potential concern with these proxies is that they rely on detection and our tests assume that capital providers are not completely surprised by the accounting deficiencies ultimately revealed by an AAER or restatement. Moreover, since both proxies are binary, they are relatively coarse and might fail to capture variation in firms' accounting quality that is meaningful to capital providers. To address these and other potential concerns, we next consider several alternative accounting quality proxies that prior work argues affect information asymmetry between firms and capital providers. Importantly, these measures are complementary to AAERs and restatements in that

they are continuous and they do not rely on the explicit detection of a particular accounting deficiency.

We continue to focus on measures of accounting quality that we believe capture the quality of firms' financial reports from the perspective of capital providers, and lenders in particular. Prior work suggests that firms with larger abnormal accruals face a higher cost of capital (e.g., Richardson et al., 2006; Bharath et al., 2008; Graham et al., 2008). This higher cost of capital suggests that capital providers price protect their claims in the face of asymmetric information that affords greater scope for adverse selection and moral hazard conflicts. Based on these arguments and prior empirical findings, we use firms' abnormal accruals, measured using the absolute value of abnormal accruals calculated as in McNichols (2002) and Dechow and Dichev (2002), as alternative measures of accounting quality.

Table 8 presents results from estimating Eq. (2), using *Abnormal Accruals (McNichols)* in column (1) and *Abnormal Accruals (Dechow-Dichev)* in column (2) as measures of *Accounting Quality*. The results in column (1) indicate that a one standard deviation increase in a firm's *Abnormal Accruals (McNichols)* would result in that firm's equity value declining by an additional 0.11 percentage points following a hypothetical 25 basis point surprise increase in the FFR target (*t*-statistic of –2.24). The results in column (2) imply that a one standard deviation increase in a firm's *Abnormal Accruals (Dechow-Dichev)* would result in that firm's equity value declining by an additional 0.11 percentage points following a hypothetical 25 basis point surprise increase in the FFR target (*t*-statistic of –2.05).

Collectively, the results in Table 8 provide evidence that corroborates our inferences and demonstrates that our findings are robust to using multiple alternative measures of firms' accounting quality that potentially capture more granular differences in the quality of firms'

financial reports. Moreover, because these alternative measures are available for all firms in the economy, finding that they moderate firms' response to monetary policy suggests that our results reflect the effect of monetary policy on the broad cross-section of firms in the economy.

5.5.3. Alternative measures of monetary surprise

Our previous tests use 30-day FFR futures surprises calculated during 60-minute windows around FOMC announcements to measure monetary policy surprises. However, prior studies suggest that news about monetary policy on FOMC announcement days is often also about the likely *path* of policy in the medium term, not just the FFR target (e.g., Gürkaynak et al., 2005; Gertler and Karadi, 2013; Gilchrist et al., 2015). Further, the Fed began to rely on alternative open market operations—quantitative easing in particular—when the FFR reached the zero lower bound in December 2008. In this section, we examine how accounting quality moderates the response to surprises about the path of monetary policy. We also assess the sensitivity of our results to several alternative measures of monetary policy surprise that reflect the effect of quantitative easing.[34,35]

Table 9, columns (1) through (4) present the results of estimating Eq. (2) using the intra-day change in on-the-run six-month Treasury yields to measure *Surprise*. We find evidence that firms' accounting quality moderates their response to medium-term surprises when using *AAER*, *Abnormal Accruals (McNichols)*, or *Abnormal Accruals (Dechow-Dichev)* to measure *Accounting Quality* (*t*-statistics from –2.11 to –3.26). In contrast, we find no evidence that

[34] We thank Refet Gürkaynak for providing us with intraday data on the alternate monetary policy surprise measures used in this section.

[35] We note that excluding the post zero lower bound period does not alter our primary inferences: coefficient estimate (*t*-statistic) on the interaction between *Accounting Quality* and *Surprise* of –1.99 (–4.51); –0.52 (–2.07); –2.99 (–2.13); –2.90 (–2.22) when using *AAER*, *Restatement*, *Abnormal Accruals (McNichols)*, and *Abnormal Accruals (Dechow-Dichev)*, to measure *Accounting Quality*.

Restatement moderates firms' equity market responses to surprises about the path of monetary policy.

We also examine the robustness of our inferences to an alternative measure of monetary policy surprise based on the intra-day change in 30-day Eurodollar futures contracts on FOMC announcements (e.g., Gürkaynak, 2005 and Gürkaynak et al., 2005). We again find results that corroborate our inferences when using *AAER*, *Abnormal Accruals (McNichols)*, or *Abnormal Accruals (Dechow-Dichev)* to measure *Accounting Quality* (*t*-statistics from 1.74 to –2.77), but not when using *Restatement*. In total, the results suggest that our inferences are robust to alternative measures of monetary policy surprises.

5.5.4. Asymmetric response to monetary policy shocks

The balance sheet channel does not predict an asymmetric effect of monetary policy based on the direction of the interest rate change (or surprise). Although the balance sheet channel theory itself predicts a symmetric reaction, Tirole (2015, Section 13.5) discusses several reasons why firms' investment might exhibit an asymmetric response to interest rate changes. For example, "dynamic substitutability" in firms' investment—whereby an investment glut in the past depresses current product prices and discourages current investment—can amplify contractionary effects when firms are credit rationed. Conversely, if firms' investment exhibits dynamic complementarities—whereby past investment increases current net worth and, in turn, relaxes current borrowing constraints and boosts current investment—then contractionary effects may be attenuated.

Because these and other theories provide conflicting predictions about whether firms' investment and equity market reaction to interest rate changes should be larger for rate cuts (e.g., dynamic substitutability), larger for rate increases (e.g., dynamic complementarity), or

symmetric, we conduct an exploratory empirical exercise to examine potential asymmetries. We expect any dynamic substitutability or complementarities in firms' investment to affect the baseline effect of monetary policy. Because the balance sheet channel amplifies and propagates the baseline effect of monetary policy, any asymmetry in the baseline effect of monetary policy should also be amplified via the balance sheet channel (Bernanke and Gertler, 1995).

We modify Eq. (2) by decomposing *Surprise* into positive and negative components (*Positive Surprise* and *Negative Surprise*) and interact these components with *Accounting Quality*.[36] The results presented in Table 10 show that for all four measures of accounting quality, firms' equity market responses are concentrated among negative surprises. These and similar results from other studies are consistent with monetary policy having an asymmetric effect on firms' investment and equity market value.

Although the balance sheet channel theory does not explicitly predict an asymmetric response, it is neither inconsistent with nor ruled out by the theory. To the extent that an asymmetry exists in firms' unconditional response to changes in monetary policy, any moderating effect due to the balance sheet channel should inherit this asymmetry. To the best of our knowledge, the source of this asymmetry, and whether it occurs in the unconditional effect of monetary policy or only in the moderating effect, is unexplained despite being widely documented, suggesting opportunities for future research (e.g., Bernanke and Kuttner, 2005; Lucca and Moench, 2015; Gallo et al., 2016; Neuhierl and Weber, 2018).

5.5.5. Accounting quality and the effect of monetary policy on investment

[36] We note that surprise rate changes are not necessarily in the same direction as the total rate change. For example, if the announced FFR target is higher than the current FFR, but is less than was expected, the surprise component would be negative while the total rate change would be positive.

Our previous tests are based on the notion that firms' equity market responses to unexpected changes in monetary policy reflect changes in investors' expectations about the effect of monetary policy on firms' future investment. We supplement our event study research design with a test of whether firms' accounting quality also moderates the relation between unexpected change in monetary policy and firms' future investment. We do so by estimating the following specification at the firm-year level:

$$Investment_{i,y} = \alpha + \beta_1 AccountingQuality_{i,y-1} + \beta_2 AccountingQuality_{i,y-1} \times Sum(Surprise_y) + \theta\, Controls_{i,y-1} + \theta\, Controls_{i,y-1} \times Sum(Surprise_t) + \delta_i + \gamma_y + \varepsilon_{i,y} \quad (4)$$

where *Investment* is firm *i*'s research and development and capital expenditures during year *y*, scaled by total end of year assets. *Accounting Quality* is each of our measures of firm *i*'s accounting quality, and *Controls* are defined as in Eq. (2). Following prior monetary economics studies that develop a similar research design, *Sum(Surprise)* is defined as the sum of FFR surprises during year *y* (e.g., Ippolito et al., 2017). We aggregate the FFR surprises during the year to correspond to the interval over which investment is measured in firms' annual financial statement. However, this expanded measurement window likely adds measurement error to these tests—which is a concern that our primary event study research design overcomes—because the temporal link between changes in monetary policy and changes in firms' investment occurs at a lower frequency.

Table 11 presents the results of estimating Eq. (4). Consistent with the predictions of the balance sheet channel, we find that firms' accounting quality moderates their investment response to monetary policy surprises. In particular, the results in column (1) suggest that firms whose current financial statements receive an AAER decrease their investment by 1.7% of the sample standard deviation and 1.9% of the sample mean of *Investment* following a hypothetical

25 basis point cumulative increase in the FFR during the year (*t*-statistic of –2.38). Similarly, the results in columns (3) and (4) suggest that a one standard deviation increase in the firms' *McNichols* (*Dechow-Dichev*) abnormal accruals results in a decrease in investment equivalent to 1.3% (1.2%) of the sample standard deviation and 1.4% (1.3%) of the sample mean of *Investment* following a hypothetical 25 basis point cumulative increase in the FFR during the year (*t*-statistics of –5.20 and –3.73).

In contrast, the results in column (2) provide no evidence that *Restatement* moderates the response of firms' investment to monetary policy surprises. One potential explanation is that *Investment* is calculated at yearly intervals, while *Surprise* is calculated at hourly intervals, resulting in measurement error that reduces the power of these tests. Regardless of the specific reason, the results in Table 11 collectively suggest that firms' accounting quality moderates their investment response to monetary policy surprises. This inference is consistent with the notion that the changes in firm value in response to monetary policy surprises reflect revisions in investors' rational expectations about firms' future investment, which is a key prediction of the balance sheet channel.

5.5.6. Staggered implementation of the Sarbanes-Oxley Act

Our prior tests rely on the assumption that firms' accounting quality is (conditionally) exogenous with respect to unexpected changes in monetary policy. Thus, to the extent that all of our measures of accounting quality are similarly correlated with factors that are not controlled for in our empirical models, and these factors affect firms' responses to monetary policy, our prior tests may suffer from omitted variable bias. To address this potential concern, we use the implementation of SOX Section 404 as an arguably exogenous source of variation that increased firms' accounting quality (e.g., Cohen, Dey, and Lys, 2008; Koh, Matsumoto, and

Rajgopal, 2008; Iliev, 2010; Singer and You, 2011; Alexander, Bauguess, Bernile, Lee, and Marietta-Westberg, 2013). SOX imposed sweeping securities regulations and was implemented in response to a series of unexpected accounting scandals (e.g., Enron and Worldcom).

We use differences in firms' fiscal year ends as a source of variation in compliance with SOX in a generalized differences-in-differences specification (Gipper, 2017, Ferri, Zheng, and Zou, 2018; Rauter, 2018).[37] The final SOX Section 404 rules required all but the smallest public firms with fiscal year ends on or after November 15, 2004 to comply with the SOX reporting requirements in their 2004 financial statements. All other non-small firms had to comply with the SOX reporting requirements in their 2005 financial statements.[38] We use these differences in the timing of SOX implementation based on firms' fiscal year ends in the following differences-in-differences specification:

$$Return_{i,t} = \alpha + \beta_1 SOX\ Compliant_{i,t-1} + \beta_2 Sox\ Compliant_{i,t-1} \times Surprise_t + \Gamma Controls_{i,t-1} + \theta Controls_{i,t-1} \times Surprise_t + \delta_i + \gamma_t + \varepsilon_{i,t} \quad (5)$$

where *i* indexes firms and *t* indexes dates. We estimate Eq. (5) for the period centered on the dates that non-small firms first complied with SOX (2001 through 2008). We exclude firms with fiscal year ends between January and July to ensure comparability between treated and control firms. *SOX Compliant* is an indicator for SOX compliance that takes the value one for (i) December and November fiscal year-end firms starting with the 2004 10-K reporting period,

[37] An alternative approach is to use a fuzzy regression discontinuity design (RDD) with firms' public float as the running variable (Iliev, 2010). We choose not to do so for two reasons. First, the generalizability of the effect of SOX on small firms near the public float reporting threshold to the broader population of publicly-traded firms is unclear (Gao, Wu, and Zimmerman, 2009, Iliev, 2010; Glaeser and Guay, 2017). Second, only a small number of firms are near the threshold. This small sample would likely result in relatively low-power tests.

[38] Duguay, Minnis, and Sutherland (2018) present evidence that SOX increased the audit costs of private firms by increasing public firms' demand for auditors, particularly those with December fiscal year ends. In contrast, we use differences in compliance requirements as a source of variation in accounting quality among public firms with *different* fiscal year ends.

and (ii) August, September, and October fiscal year-end firms starting with the 2005 10-K reporting period (the *t-1* subscript continues to refer to the most recent fiscal year end).

We remove firm-years in which the most recent year-end market value was within $75 million of the $75 million public float requirement for accelerated filer status because these firms may delist, deregister, or otherwise alter their behavior in response to SOX (Engel et al., 2007; Leuz et al., 2008; Gao et al., 2009; Glaeser et al., 2019; Glaeser and Omartian, 2019). These requirements result in a sample of 129,873 firm-year observations during 2001 through 2008. We include date fixed effects, *z*, and firm fixed effects, δ. Consequently, the coefficient β_2 captures the differential change in the response to monetary policy surprises between firms that exogenously increase their accounting quality because of SOX compliance and firms that do not *at the same point in time*.[39]

We report the results of estimating Eq. (5) in Table 12. Column (1) reports results after including date fixed effects alone, column (2) reports results after including firm and date fixed effects, column (3) reports results after including date fixed effects, controls, and their interaction with *Surprise*, and column (4) reports results after including controls, their interaction with *Surprise*, and firm and date fixed effects. The results indicate that the market value of firms with SOX compliant financial statements declines between 1.55 to 1.97 percentage points less than their non-SOX compliant counterparts following a hypothetical 25 basis point surprise increase in the FFR (*t*-statistics of 1.79 to 2.18). To the extent that SOX increased firms' accounting quality, as argued by Cohen et al. (2008), Koh et al. (2008), Iliev (2010), Singer and You (2011), and Alexander et al. (2013), these results provide additional

[39] For example, the specification compares the response to the federal funds rate announcement on June 30, 2005 of November fiscal year end firms, which prepared SOX compliant financial statements, to the response of October fiscal year end firms, which did not.

evidence that corroborates our earlier inferences and is consistent with theoretical predictions of the balance sheet channel.

6. Conclusion

Using federal funds futures contracts to measure unexpected (or surprise) changes in monetary policy, we show that firms' accounting quality moderates their equity market responses to unexpected policy changes. We find that firms' accounting quality, as measured by AAERs, restatements, abnormal accruals, and plausibly exogenous differences in the timing of firms' compliance with SOX Section 404, moderates their equity market reaction to unexpected changes in monetary policy. This moderating role of accounting quality is consistent with its role in mitigating information asymmetry with capital providers—and lenders in particular—affecting their response to monetary policy as predicted by the balance sheet channel.

We also test for heterogeneity in the extent to which firms' accounting quality moderates their response to monetary policy in ways that are predicted by the balance sheet channel. In particular, we find that the moderating role of accounting quality is amplified for firms with more growth opportunities and firms that are more financially constrained. We also find that the future investment levels of firms with lower quality accounting are more sensitive to unexpected changes in monetary policy, further consistent with key predictions of the balance sheet channel. Finally, we find that the equity market response to monetary policy is concentrated among unexpected rate cuts.

Our theoretical predictions are derived from synthesizing the previously distinct literatures on the balance sheet channel of monetary policy transmission and the role of accounting quality in mitigating information asymmetries between firms and capital providers.

Our results provide insight into how firms' response to monetary policy depends on the properties of their financial reports which affects their ability to access external financing for their investments and, in turn, firm value. Thus, our results are consistent with several key predictions of the balance sheet channel and highlight the importance of considering firm-level heterogeneity for understanding the transmission of monetary policy.

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Appendix A. Model of Firm Value and Investment in the Presence of Financing Frictions

A.1. Benchmark model of firm value and investment with no financing frictions

We begin by developing a simple model based on the neoclassical *q*-theory that establishes the relationship between investment and firm value in the absence of financing frictions. This model is similar in spirit to those found in Hayashi (1982), Kaplan and Zingales (1997), Tirole (2015), and others in the corporate finance literature. For a complete, "real business cycle" model of the balance sheet channel see, e.g., Bernanke and Gertler (1989). The value of firm *i* is given by

$$V_i^* = \max_{I_i} \left\{ q_i I_i - \left(\frac{\phi_i}{2}\right) I_i^2 - I_i \right\} \tag{A1}$$

where V_i is firm *i*'s (equity) market value, q_i is the firm's Tobin's *q*, which captures the relationship between investment, I_i, and the firm's market value. The term $(\phi_i/2)\, I_i^2$ captures the (convex) adjustment cost of new investment. Differentiating (A1) with respect to I_i yields the value-maximizing first-best level of investment, $I_i^* = (q_i - 1)/\phi_i \equiv I_i^{FB}$.

A.2. Firm value and investment with financing frictions

In order to introduce the notion of financing frictions, we now assume that firm *i* faces capital constraints. In particular, the firm's internal funds (or "pledgeable net income" in the language of Tirole, 2015), w_i, are insufficient to finance the first-best level of investment, or $w_i < I_i^{FB}$. To invest an amount greater than w_i, the firm has to raise $e_i = I_i - w_i$ of *arm's-length* external capital. We capture the notion of financing frictions by assuming a (convex) cost of $(\theta_i/2)e_i^2$ associated with raising arm's-length external capital due to informational problems between the firm and external capital providers.[40] θ_i captures the severity of informational problems and is the key parameter for the comparative statics that provide our empirical predictions. In particular, firms' accounting quality influences the severity of their informational problems with external capital providers: firms with lower quality accounting have higher values of θ_i and, conversely, firms with higher quality accounting have lower values of θ_i.

In the presence of capital constraints and informational problems that make it costly to raise external financing, assuming $I_i > w_i$, firm value is now given by:

$$V_i^* = \max_{I_i} \left\{ q_i I_i - \left(\frac{\phi_i}{2}\right) I_i^2 - I_i - \frac{\theta_i}{2}(I_i - w_i)^2 \right\} \tag{A2}$$

A.2.1. Firm investment with financing frictions

Differentiating (A2) with respect to I_i yields the optimal second-best level of investment, which is less than the first-best level of investment because of the costly financing frictions:

[40] These information problems can take the form of moral hazard and/or adverse selection.

$$I_i^* = \frac{\phi_i}{\phi_i+\theta_i}\frac{q_i-1}{\phi_i} + \frac{\theta_i}{\phi_i+\theta_i}w_i = I_i^{FB} - \frac{\theta_i}{\phi_i+\theta_i}(I_i^{FB} - w_i) < I_i^{FB} \quad \text{(A3)}$$

The balance sheet channel of monetary policy (e.g., Gertler, 1988; Bernanke and Gertler, 1995) argues that by changing the short-term interest rate (e.g., the federal funds rate), the central bank can alter firms' net income and net worth, which affects their ability to access external capital. For example, higher interest rates can increase firms' interest expense, which reduces their pledgeable net income. In addition, higher interest rates can also directly reduce the value of firms' internal funds (or net worth) as their expected cash flows are discounted at a higher rate. Consequently, a reduction in borrowers' net income and net worth reduces their pledgeable income and collateral value and, in turn, their share of the payoff from their investments, which exacerbates informational (i.e., adverse selection and moral hazard) problems. This increased scope for agency conflicts between borrowers and lenders results in a larger external finance premium—i.e., the "wedge" between the cost of internal and external funds—making it more difficult for the firm to access external funding. Based on this discussion, the firm's pledgeable net income is *decreasing* in the interest rate, *r*, or $\partial w_i/\partial r = -\gamma_i < 0$. Thus we have:

$$\frac{\partial I_i^*}{\partial r} = \frac{\partial I_i^*}{\partial w_i}\frac{\partial w_i}{\partial r} = -\frac{\theta_i}{\phi_i+\theta_i}\gamma_i < 0 \quad \text{(A4)}$$

and

$$\frac{\partial I_i^*}{\partial r \partial \theta_i} = \frac{\partial^2 I_i^*}{\partial w_i \partial \theta_i}\frac{\partial w_i}{\partial r} = -\frac{\theta_i}{\phi_i+{\theta_i}^2}\gamma_i < 0. \quad \text{(A5)}$$

Eq. (A4) shows that the optimal level of investment is *decreasing* in the interest rate because of its effect on the firm's internal funds (or pledgeable net income). Eq. (A-5) is the cross-partial derivative of investment with respect to the interest rate, *r*, and the severity of the firm's information problems, θ_i, and shows that the relation between investment and the interest rate is more pronounced at firms that have more severe information problems. We argue that firms with higher quality accounting should be less sensitive to the balance sheet channel if their financial transparency reduces their susceptibility to credit market imperfections and reduces their external finance premium (e.g., Bharath et al., 2008; Graham et al., 2008). We test this prediction in Section 5.5.5 and present evidence that the future investment of firms with lower quality accounting (i.e., larger θ_i) is more sensitive to unexpected changes in monetary policy than that of their counterparts with higher quality accounting, which are less susceptible to financing frictions.

It is important to note that the balance sheet channel is distinct from the neoclassical cost of capital (or interest rate) channels, whereby monetary policy has a *direct* effect on firms' Tobin's *q* such that $\partial q_i/\partial r < 0$. In order to focus on the balance sheet channel, we assume that $\partial q_i/\partial r$ is small so that the neoclassical cost of capital channel has a negligible effect on firms'

investment and equity market value.[41] This assumption also highlights how the balance sheet channel is distinct from direct cost of capital effects, but operates through the interaction of monetary policy actions and the external finance premium. In other words, the key feature of the balance sheet channel is not that interest rates (or financial frictions for that matter) can directly affect investment. The key feature of the balance sheet channel is that information problems can greatly amplify the effect of changes in interest rates (this "financial accelerator" effect is highlighted by A5).

A.2.2. Firm value with financing frictions

As we discuss in Section 3.2, our primary research design is a short-window event study that examines how firms' equity market values respond to unexpected changes in monetary policy (i.e., $\partial V_i/\partial r$). Differentiating Eq. (A2) with respect to the interest rate, r, yields:

$$\frac{\partial V_i^*}{\partial r} = \frac{\partial V_i^*}{\partial w_i}\frac{\partial w_i}{\partial r} = -\theta_i(I_i^* - w_i)\,\gamma_i = -\frac{\theta_i\phi_i}{\phi_i+\theta_i}(I_i^{FB} - w_i)\,\gamma_i < 0. \quad \text{(A6)}$$

In the presence of capital constraints and information problems that make it costly to raise external financing, firm value is decreasing in the interest rate. Table 2 presents results that are consistent with this prediction and indicate that aggregate equity market value is decreasing in unexpected changes in the federal funds rate. These results corroborate Bernanke and Kuttner's (2005) findings.

A.2.3. Moderating effect of accounting quality on firm value with financing frictions

Taking the cross-partial derivative of Eq. (A2) with respect to the interest rate and the severity of informational problems yields the following expression:

$$\frac{\partial^2 V_i^*}{\partial r\partial\theta_i} = -\frac{\phi_i^2}{(\phi_i+\theta_i)^2}(I_i^{FB} - w_i)\,\gamma_i < 0 \quad \text{(A7)}$$

This comparative static provides the basis for our main prediction that firms' accounting quality moderates their equity market reaction to unexpected changes in monetary policy. Since firms with lower quality accounting have more severe information problems (i.e., higher θ_i), Eq. (A7) predicts that these firms' equity market values are more sensitive to unexpected changes in monetary policy.

A.2.3. Moderating interactions with accounting quality

Our model also generates several predictions about factors that interact with firms' accounting quality to further moderate the effect of monetary policy on firm value. In other

[41] If there is a non-negligible neoclassical cost of capital channel, this would imply:

$$\frac{\partial I_i}{\partial r}^* = \frac{1}{\phi_i+\theta_i}\frac{\partial q_i}{\partial r} + \frac{\theta_i}{\phi_i+\theta_i}\frac{\partial w}{\partial r}.$$

words, there are additional factors that moderate the effect of firms' accounting quality when there are policy-induced changes in interest rates (i.e., ∂r and $\partial\theta_i$). We now consider how firms' growth opportunities, q_i, capital constraints, w_i, interact with the external finance premium, θ_i, to determine their response to unexpected changes in monetary policy.

A.2.3.1. Interaction between accounting quality and growth opportunities

Differentiating firm value with respect to the interest rate, accounting quality, and growth opportunities yields the following comparative static:

$$\frac{\partial^3 V_i^*}{\partial r \partial \theta_i \partial q_i} = -\frac{\phi_i}{(\phi_i+\theta_i)^2}\gamma_i < 0 \tag{A8}$$

This expression shows that the moderating effect of firms' accounting quality on their market reaction to monetary policy should be more pronounced for firms with more valuable growth options (i.e., higher q_i). It is important to note that this prediction relates to *marginal* rather than *average q*.

A.2.3.2. Interaction between accounting quality and financing constraints

Firms with less internal financing (i.e., those with lower values of w_i) are more dependent on external financing for their investments. The corporate finance literature characterizes these firms as being capital constrained (e.g., Fazzari et al., 1988). The third derivative of firm value with respect to the interest rate, information problems, and internal financing yields the following comparative static:

$$\frac{\partial^3 V_i^*}{\partial r \partial \theta_i \partial w_i} = \frac{\phi_i^2}{(\phi_i+\theta_i)^2}\gamma_i > 0 \tag{A9}$$

This expression shows that the moderating effect of firms' accounting quality on their equity market reaction to unexpected changes in monetary policy should be larger for firms with lower values of w_i, which corresponds to more financially constrained firms.

Appendix B. Variable Definitions

This table present variable definitions for our empirical tests.

Accounting Quality Measures	
AAER	Indicator equal to one if the firm's current year financial statements subsequently receive an Accounting and Auditing Enforcement Release (AAER) from the U.S. Securities and Exchange Commission, and zero otherwise.
Restatement	Indicator equal to one if the firm subsequently restates its current year financial results (quarterly, annual, or otherwise), and zero otherwise.
Abnormal Accruals (Dechow-Dichev)	The absolute value of abnormal accruals, calculated from the Dechow and Dichev (2002) model of accruals.
Abnormal Accruals (McNichols)	The absolute value of abnormal accruals, calculated from the McNichols (2002) model of accruals.
SOX Compliant	An indicator for SOX compliance that takes the value 1 for December and November fiscal year-end firms starting with the 2004 10-K reporting period, and 1 for August, September, and October fiscal year-end firms starting with the 2005 10-K reporting period, and 0 otherwise.
Macroeconomic Variables	
Δ Treasury	Intra-day change in 6-month on-the-run Treasury yields during the 60 minute window around FOMC announcements, following Gürkaynak (2005).
Δ Eurodollar	Intra-day change in 30-day Eurodollar futures during the 60 minute window around FOMC announcements, following Gürkaynak (2005).
Daily Expected	The expected component of monetary policy actions, measured following Kuttner (2001) and Bernanke and Kuttner (2005) as the actual change in target federal funds rate minus *Surprise.*
Daily Surprise	The surprise component of monetary policy actions, measured following Kuttner (2001) and Bernanke and Kuttner (2005) as the change in 30 Day federal funds futures prices relative to the day prior to the policy action, scaled by a factor related to the number of days remaining in the month affected by the change.
Negative Surprise	Takes on all negative values of *Surprise*, and zero otherwise
Positive Surprise	Takes on all non-negative values of *Surprise*, and zero otherwise.
Surprise	The surprise component of monetary policy actions, measured following Gilchrist, Lopez-Salido, and Zakrajsek (2015) using intra-day changes in 30 day federal funds futures prices during the 60-minute window around the FOMC announcement.
Sum(Surprise)	Sum of all surprise changes in federal funds rates (i.e., *Surprise*) that occur during the fiscal year.
Equity Return and Investment Measures	
Investment	Sum of research and development expense plus capital expenditures during the fiscal year, scaled by total assets as of the end of the fiscal year.
Market Return	Daily CRSP value-weighted equity market return on the FOMC announcement date.
Return	Daily stock return on the FOMC announcement date.

Appendix B. Variable Definitions (continued)

Control Variables	
Book-to-Market	Book value of equity scaled by market value of equity, measured as of the firm's fiscal year end.
CAPM Beta	Factor loading on the market return from a Fama-French and Carhart four-factor model of daily returns over the 252 trading days prior to the FOMC announcement date.
Depreciation-to-Sales Ratio	Depreciation expense scaled by sales during the current fiscal year.
Concentration	The share of sales by the four largest firms in the industry during the current year, based on 2-digit SIC code.
High Minus Low	Factor loading on HML from a Fama-French and Carhart four-factor model of daily returns over the 252 trading days prior to the FOMC announcement date.
Investment-to-Sales Ratio	The ratio of capital expenditures to sales during the current fiscal year.
Leverage	Total liabilities scaled by total assets, as of the end of the fiscal year.
Log(Size)	Natural logarithm of total assets at the end of the fiscal year.
Momentum	Factor loading on UMD from a Fama-French and Carhart four-factor model of daily returns over the 252 trading days prior to the FOMC announcement date.
Price-to-Cost Margin	Sales minus cost of goods sold, scaled by sales during the current fiscal year.
Receivable-to-Sales Ratio	Accounts receivable minus accounts payable, scaled by total assets, measured as of the end of the fiscal year.
ROA	Income before extraordinary items scaled by beginning of the year total assets.
Sales Growth	Percentage growth in current fiscal year sales over the prior year.
Sales Volatility	Standard deviation of sales scaled by total assets over the previous ten years.
Small Minus Big	Factor loading on SMB from a Fama-French and Carhart four-factor model of daily returns over the 252 trading days prior to the FOMC announcement date.
Stock Volatility	Standard deviation of monthly stock returns during the twelve month period prior to fiscal year-end.
Moderating Variables	
Distance-to-Default	Measured following Bharath and Shumway (2008) as $[\ln[(E+F) / F] + r - 0.5\sigma 2]/\sigma$, where E equals CRSP items $\lvert prc \rvert \times shrout$ /1,000, F equals Compustat items $dlc + 0.5dltt$, r is the firm's annual stock return computed by cumulating monthly returns (CRSP item *ret*) over the previous 12 months, and σ^2 captures the volatility of the firm's total value (debt and equity). σ is approximated as $(E/(E+F)) \times \sigma E + (F/(E+F)) \times (0.05 + 0.25\sigma E)$, where σE is the annualized percent standard deviation of returns, estimated from monthly stock returns (CRSP item *ret*) over the previous 12 months. A firm's probability of default is then defined as $N(-DD)$, where N is the cumulative standard normal distribution function. When F is 0, DD is not defined and the probability of default is set to zero.

Appendix B. Variable Definitions (continued)

Dividend Payer	Indicator that equals 1 if the firm pays common or preferred dividends during the current fiscal year, and zero otherwise.
Firm Age	Count of the number of years the firm appears in Compustat as of the most recent fiscal year.
Cash Flow Volatility	Standard deviation of annual cash flow from operations during the previous ten years.
Earnings Volatility	Standard deviation of annual earnings before extraordinary items during the previous ten years.
HM Index	Delayed investments constraints index from Hoberg and Maksimivic (2015) based on textual analysis of the Management's Discussion and Analysis section of the firm's most recent 10-K filing.

Table 1. Descriptive Statistics

This table presents descriptive statistics for variables used in our tests. Panel A reports descriptive statistics for the macroeconomic variables used in our tests. Panel B reports descriptive statistics for the firm- and time-varying variables used in our tests that use *AAER* as a measure of *Accounting Quality*. Panel C reports descriptive statistics for the firm- and time-varying variables used in our tests that use *Restatement* as a measure of *Accounting Quality*. Panel D presents results for all variables used in our firm-year investment analysis in Table 10.

Panel A. Macroeconomic Variables

Variable	N	Mean	SD	P10	P25	P50	P75	P90
Market Return	140	0.41	1.39	–1.11	–0.39	0.32	1.12	1.83
Surprise	140	–0.02	0.08	–0.06	–0.01	0.00	0.01	0.04
Δ Treasury	140	–0.01	0.05	–0.05	–0.02	0.00	0.01	0.02
Δ Eurodollar	140	–0.01	0.06	–0.06	–0.02	0.00	0.01	0.04
Daily Surprise	176	–0.03	0.11	–0.17	–0.04	0.00	0.01	0.05
Daily Expected	176	–0.01	0.19	–0.25	–0.07	0.00	0.04	0.25

Table 1. Descriptive Statistics (continued)

Panel B. AAER Sample

Variable	N	Mean	SD	P10	P25	P50	P75	P90
Accounting Quality Measures								
AAER	446,365	0.01	.	.	.	.	.	.
Abnormal Accruals (McNichols)	416,463	0.10	0.14	0.01	0.02	0.06	0.13	0.23
Abnormal Accruals (Dechow-Dichev)	419,796	0.12	0.16	0.01	0.03	0.07	0.15	0.27
Firm Outcomes and Controls								
Return	446,365	0.44	4.35	–4.12	–1.64	0.29	2.27	5.21
Book-to-Market	446,365	0.61	0.63	0.12	0.26	0.47	0.78	1.27
Sales Growth	446,365	–0.98	0.07	–1.00	–1.00	–1.00	–0.98	–0.95
Stock Volatility	446,365	0.16	0.10	0.06	0.09	0.13	0.20	0.29
Log(Size)	446,365	5.83	2.11	3.14	4.27	5.70	7.26	8.73
ROA	446,365	–0.05	0.80	–0.30	–0.05	0.03	0.09	0.15
Leverage	446,365	0.49	0.25	0.17	0.29	0.48	0.65	0.80
Price-to-Cost Margin	446,365	0.20	1.22	0.10	0.22	0.35	0.53	0.70
Receivable-to-Sales Ratio	446,365	0.05	0.43	–0.05	0.01	0.07	0.14	0.21
Investment-to-Sales Ratio	446,365	0.13	0.32	0.01	0.02	0.04	0.10	0.25
Depreciation-to-Sales Ratio	446,365	0.09	0.16	0.014	0.026	0.045	0.086	0.191
Sales Volatility	446,365	0.28	0.27	0.06	0.11	0.20	0.35	0.59
Concentration	446,365	0.02	0.09	0.00	0.00	0.00	0.01	0.03
CAPM Beta	446,365	0.88	0.61	0.13	0.49	0.88	1.24	1.62
Small Minus Big Factor Exposure	446,365	0.68	0.79	–0.21	0.13	0.59	1.13	1.70
High Minus Low Factor Exposure	446,365	0.21	0.95	–0.89	–0.29	0.22	0.74	1.31
Momentum Factor Exposure	446,365	–0.08	0.69	–0.86	–0.42	–0.07	0.26	0.68
Moderating Variables								
Ln(Firm Age)	446,365	2.67	0.72	1.79	2.08	2.56	3.22	3.76
Cash Flow Volatility	445,521	0.14	1.05	0.02	0.04	0.07	0.12	0.24
Earnings Volatility	446,365	0.19	1.08	0.02	0.03	0.06	0.16	0.35
Distance-to-Default	350,773	0.11	0.26	0.00	0.00	0.00	0.02	0.53
Dividend Payer	446,365	0.31	.	.	.	.	.	.
HM Index	314,725	–0.01	0.09	–0.12	–0.08	–0.02	0.05	0.12

Table 1. Descriptive Statistics (continued)

Panel C. Restatement Sample

Variable	N	Mean	SD	P10	P25	P50	P75	P90
Accounting Quality Measures								
Restatement	491,602	0.13	.	.	.	.	.	.
Abnormal Accruals (McNichols)	459,417	0.11	0.16	0.01	0.02	0.06	0.13	0.24
Abnormal Accruals (Dechow-Dichev)	462,996	0.12	0.17	0.01	0.03	0.07	0.15	0.28
Firm Outcomes and Controls								
Return	491,602	0.40	4.24	–4.00	–1.61	0.26	2.17	5.00
Book-to-Market	491,602	0.62	0.63	0.12	0.26	0.47	0.79	1.28
Sales Growth	491,602	–0.98	0.06	–1.00	–1.00	–1.00	–0.98	–0.95
Stock Volatility	491,602	0.16	0.10	0.06	0.09	0.13	0.19	0.28
Log(Size)	491,602	5.91	2.12	3.19	4.34	5.78	7.36	8.82
ROA	491,602	–0.05	0.77	–0.29	–0.05	0.03	0.09	0.15
Leverage	491,602	0.49	0.25	0.17	0.29	0.48	0.65	0.80
Price-to-Cost Margin	491,602	0.20	1.22	0.11	0.22	0.35	0.53	0.70
Receivable-to-Sales Ratio	491,602	0.05	0.43	–0.05	0.01	0.07	0.13	0.21
Investment-to-Sales Ratio	491,602	0.13	0.32	0.01	0.02	0.04	0.10	0.25
Depreciation-to-Sales Ratio	491,602	0.09	0.16	0.01	0.03	0.04	0.09	0.19
Sales Volatility	491,602	0.28	0.26	0.06	0.11	0.20	0.35	0.57
Concentration	491,602	0.02	0.09	0.00	0.00	0.00	0.01	0.04
CAPM Beta	491,602	0.88	0.59	0.14	0.51	0.89	1.24	1.60
Small Minus Big Factor Exposure	491,602	0.67	0.78	–0.22	0.12	0.58	1.13	1.69
High Minus Low Factor Exposure	491,602	0.19	0.93	–0.88	–0.30	0.19	0.70	1.27
Momentum Factor Exposure	491,602	–0.08	0.68	–0.85	–0.42	–0.07	0.26	0.66
Moderating Variables								
Ln(Firm Age)	491,602	2.70	0.71	1.79	2.08	2.64	3.22	3.78
Cash Flow Volatility	490,701	0.14	1.02	0.02	0.04	0.06	0.12	0.23
Earnings Volatility	491,602	0.19	1.05	0.02	0.03	0.06	0.15	0.34
Distance-to-Default	386,374	0.11	0.26	0.00	0.00	0.00	0.01	0.51
Dividend Payer	491,602	0.32	.	.	.	.	.	.
HM Index	345,462	–0.01	0.09	–0.12	–0.08	–0.02	0.05	0.11

Table 1. Descriptive Statistics (continued)

Panel D. Investment Analysis Sample

Variable	N	Mean	SD	P10	P25	P50	P75	P90
Investment Measure								
Investment	54,131	0.12	0.13	0.02	0.04	0.08	0.15	0.26
Accounting Quality Measures								
AAER	54,131	0.01	.	.	.	.	.	.
Restatement	54,131	0.14	.	.	.	.	.	.
Abnormal Accruals (McNichols)	54,131	0.11	0.12	0.01	0.03	0.06	0.13	0.25
Abnormal Accruals (Dechow-Dichev)	54,131	0.12	0.14	0.01	0.03	0.07	0.16	0.28
Monetary Policy Surprise Measure								
Sum(Surprise)	54,131	–0.17	0.27	–0.75	–0.20	–0.08	–0.01	0.04
Controls								
Book-to-Market	54,131	0.62	0.66	0.11	0.25	0.47	0.80	1.32
Sales Growth	54,131	–0.97	0.08	–1.00	–1.00	–1.00	–0.98	–0.94
Stock Volatility	54,131	0.17	0.10	0.07	0.10	0.14	0.21	0.30
Log(Size)	54,131	5.67	2.10	3.01	4.11	5.54	7.07	8.49
ROA	54,131	–0.04	0.29	–0.32	–0.07	0.03	0.09	0.15
Leverage	54,131	0.48	0.26	0.16	0.28	0.47	0.64	0.80
Price-to-Cost Margin	54,131	0.19	1.27	0.11	0.23	0.36	0.54	0.71
Receivable-to-Sales Ratio	54,131	0.05	0.44	–0.05	0.01	0.07	0.14	0.21
Investment-to-Sales Ratio	54,131	0.12	0.32	0.01	0.02	0.04	0.09	0.23
Depreciation-to-Sales Ratio	54,131	0.09	0.17	0.01	0.03	0.04	0.08	0.19
Sales Volatility	54,131	0.29	0.27	0.07	0.12	0.21	0.37	0.60
Concentration	54,131	0.02	0.06	0.00	0.00	0.00	0.01	0.03
CAPM Beta	54,131	1.31	1.49	–0.23	0.42	1.12	2.00	3.16

Table 2. Market Reaction to Federal Funds Rate Surprises

This table presents results from estimating Eq. (a) on Federal Open Market Committee announcement dates:

$$Market\ Return_t = \alpha + \beta_1 Surprise_t + \beta_2 Expected_t + \varepsilon_t \qquad (a)$$

where *Market Return* is the CRSP value-weighted return as defined in Appendix B. *Daily Surprise* is computed following Bernanke & Kuttner (2005) using 30 Day federal Funds Futures data as defined in Appendix B. *Daily Expected* is computed as the actual FFR change minus *daily Surprise*. *t*-statistics are reported below coefficient estimates and are calculated based on robust standard errors. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels.

Dependent variable:	*Market Return*$_t$
	(1)
Intercept	0.146*
	(1.80)
daily Surprise$_t$	**–4.780*** **
	(–3.25)
daily Expected$_t$	0.730
	(1.57)
Observations	171
R^2	0.147

Table 3. The Effect of Accounting Quality on the Transmission of Monetary Policy

This table presents results from estimating Eq. (a) around Federal Open Market Committee announcement dates:

$$Return_{it} = \alpha + \beta_1 Accounting\ Quality_{it-1} + \beta_2 Accounting\ Quality_{it-1} \times Surprise_t + \delta_i + \gamma_t + \varepsilon_{it} \qquad (a)$$

where *Return* is the firm's stock return as defined in Appendix B. *Accounting Quality* is either *AAER* or *Restatement* as defined in Appendix B. *Surprise* is computed following Bernanke & Kuttner (2005) and Gilchrist, Lopez-Salido, and Zakrajsek (2015) using intra-day 30 Day federal funds futures data during 60-minute windows around FOMC announcements, as defined in Appendix B. We include firm and date fixed effects when estimating Eq. (a) (δ_i and γ_t). For parsimony we do not tabulate coefficients for the fixed effects. *t*-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by industry and date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels.

Dependent variable:	$Return_{i,t}$	
	(1)	(2)
$AAER_{i,t-1}$	–0.097	
	(–1.15)	
$Surprise_t \times AAER_{i,t-1}$	**–3.343*** **	
	(–3.77)	
$Restatement_{i,t-1}$		–0.036**
		(–2.05)
$Surprise_t \times Restatement_{i,t-1}$		**–0.981** **
		(–2.64)
Firm Fixed Effects	Yes	Yes
Date Fixed Effects	Yes	Yes
Observations	477,499	525,206
R^2	0.118	0.120

Table 4. The Effect of Accounting Quality on the Transmission of Monetary Policy*: Firm-* and *Industry-Level Controls*

This table presents results from estimating Eq. (a) around Federal Open Market Committee announcement dates:

$$Return_{it} = \alpha + \beta_1 Accounting\ Quality_{it-1} + \beta_2 Accounting\ Quality_{it-1} \times Surprise_t + \Phi Controls_{it-1} \times Surprise_t + \Gamma Controls_{it-1} + \delta_i + \gamma_t + \varepsilon_{it} \quad (a)$$

where *Return* is the firm's stock return as defined in Appendix B. *Accounting Quality* is either *AAER* or *Restatement* as defined in Appendix B. *Surprise* is computed following Bernanke & Kuttner (2005) and Gilchrist, Lopez-Salido, and Zakrajsek (2015) using intra-day 30 Day federal funds futures data during 60-minute windows around FOMC announcements, as defined in Appendix B. *Controls* is a vector of time-varying firm and industry characteristics as identified and defined in Appendix B. Panel A (Panel B) displays results using *AAER (Restatement)* to measure *Accounting Quality*. Column (1) estimates Eq. (a) with all of our main controls simultaneously. Column (2) estimates Eq. (a) with all of our main controls plus our additional statistical controls simultaneously. We interact *Surprise* with industry fixed effects in column (3). Column (4) presents results after including date and *Surprise* interacted with pseudo-firm fixed effects following Gipper et al. (2018). For parsimony we do not tabulate coefficients for the fixed effects or main effects from our control variables. We include firm and date fixed effects in each estimation (δ_i and γ_t). *t*-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by industry and date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels.

Table 4. The Effect of Accounting Quality on the Transmission of Monetary Policy: *Firm-* and *Industry-Level Controls* (continued)

Panel A. Firm- and Industry-Level Controls: AAER Models (continued)

Dependent variable:	$Return_{i,t}$			
	(1)	(2)	(3)	(4)
$AAER_{i,t-1}$	–0.046	–0.038	–0.025	–0.048
	(–0.45)	(–0.41)	(–0.27)	(–0.69)
$Surprise_t \times AAER_{i,t-1}$	**–2.102*** **	**–1.456*** **	**–1.159*** **	**–1.395*** **
	(–4.25)	**(–3.39)**	**(–3.49)**	**(–3.69)**
$Surprise_t \times Book\text{–}to\text{–}Market_{i,t-1}$	0.167	0.257	0.368	–0.319
	(0.25)	(0.44)	(0.68)	(–0.57)
$Surprise_t \times Sales\ Growth_{i,t-1}$	–0.259*	–0.282	–0.353**	1.429
	(–1.68)	(–1.29)	(–2.04)	(1.10)
$Surprise_t \times Stock\ Volatility_{i,t-1}$	–12.467***	–9.484**	–8.343**	–7.036
	(–2.93)	(–2.07)	(–2.13)	(–1.44)
$Surprise_t \times Log(Size)_{i,t-1}$	–0.285	–0.171	–0.235	0.020
	(–0.99)	(–0.71)	(–1.10)	(0.10)
$Surprise_t \times ROA_{i,t-1}$	–0.068	–0.176*	–0.230***	–0.158
	(–0.55)	(–2.00)	(–3.24)	(–1.32)
$Surprise_t \times Leverage_{i,t-1}$	2.868	2.708*	2.486*	2.546
	(1.51)	(1.68)	(1.82)	(1.53)
$Surprise_t \times Price\text{-}to\text{-}Cost\ Margin_{i,t-1}$	–0.325**	–0.258**	–0.133	–0.201*
	(–2.30)	(–2.10)	(–1.09)	(–1.77)
$Surprise_t \times Receivable\text{-}to\text{-}Sales\ Ratio_{i,t-1}$	0.184	0.238	0.182	0.403
	(0.79)	(1.05)	(0.72)	(1.53)
$Surprise_t \times Investment\text{-}to\text{-}Sales\ Ratio_{i,t-1}$	0.942**	0.736***	0.563*	0.774**
	(2.02)	(3.37)	(1.81)	(2.12)
$Surprise_t \times Depreciation\text{-}to\text{-}Sales\ Ratio_{i,t-1}$	–2.595	–1.350	–1.460	–0.791
	(–1.38)	(–0.88)	(–0.98)	(–0.48)
$Surprise_t \times Sales\ Volatility_{i,t-1}$	–0.894	–0.616	–0.181	–0.724*
	(–1.50)	(–1.37)	(–0.56)	(–1.98)
$Surprise_t \times Concentration_{i,t-1}$	–2.318	–2.435	–6.889	0.003
	(–0.48)	(–0.74)	(–0.78)	(0.00)
$Surprise_t \times CAPM\ Beta_{i,t-1}$	–4.908***	–5.695**	–4.777**	–5.622**
	(–2.92)	(–2.55)	(–2.26)	(–2.24)
Statistical Controls				
$Surprise_t \times Small\ Minus\ Big_{i,t-1}$		0.921	1.149	1.033
		(1.07)	(1.33)	(1.18)
$Surprise_t \times High\ Minus\ Low_{i,t-1}$		1.166	0.748	1.296
		(0.60)	(0.42)	(0.66)
$Surprise_t \times Momentum_{i,t-1}$		5.486***	5.723***	5.266***
		(3.76)	(3.67)	(3.39)
Main effect on control(s)	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	No
Date Fixed Effects	Yes	Yes	Yes	Yes
$Surprise_t \times$ Industry Fixed Effects	No	No	Yes	No
$Surprise_t \times$ Pseudo-firm Fixed Effects	No	No	No	Yes
Observations	446,368	446,368	446,368	446,368
R^2	0.128	0.134	0.156	0.143

Table 4. The Effect of Accounting Quality on the Transmission of Monetary Policy: *Firm-* and *Industry-Level Controls* (continued)

Panel B. Firm- and Industry-Level Controls: Restatement Models (continued)

Dependent variable:	*Return*$_{i,t}$			
	(1)	(2)	(3)	(4)
Restatement$_{i,t-1}$	–0.024	–0.021	–0.019	–0.029
	(–1.17)	(–0.95)	(–0.84)	(–1.53)
***Surprise*$_t$ × *Restatement*$_{i,t-1}$**	**–0.487****	**–0.362***	**–0.375***	**–0.402****
	(–2.12)	**(–1.92)**	**(–1.91)**	**(–2.16)**
Surprise$_t$ × *Book–to–Market*$_{i,t-1}$	0.164	0.253	0.366	–0.349
	(0.24)	(0.44)	(0.68)	(–0.62)
Surprise$_t$ × *Sales Growth*$_{i,t-1}$	–0.254	–0.274	–0.346*	1.477
	(–1.67)	(–1.28)	(–1.97)	(1.15)
Surprise$_t$ × *Stock Volatility*$_{i,t-1}$	–12.372***	–9.371**	–8.217**	–6.842
	(–2.92)	(–2.06)	(–2.11)	(–1.41)
Surprise$_t$ × *Log(Size)*$_{i,t-1}$	–0.293	–0.179	–0.243	0.010
	(–1.01)	(–0.75)	(–1.13)	(0.05)
Surprise$_t$ × *ROA*$_{i,t-1}$	–0.064	–0.171*	–0.226***	–0.155
	(–0.46)	(–1.84)	(–3.25)	(–1.26)
Surprise$_t$ × *Leverage*$_{i,t-1}$	2.907	2.735*	2.514*	2.605
	(1.53)	(1.70)	(1.85)	(1.57)
Surprise$_t$ × *Price-to-Cost Margin*$_{i,t-1}$	–0.326**	–0.258**	–0.133	–0.200*
	(–2.33)	(–2.19)	(–1.11)	(–1.75)
Surprise$_t$ × *Receivable-to-Sales Ratio*$_{i,t-1}$	0.170	0.224	0.170	0.394
	(0.78)	(1.07)	(0.69)	(1.62)
Surprise$_t$ × *Investment-to-Sales Ratio*$_{i,t-1}$	0.985**	0.782***	0.589*	0.848**
	(2.11)	(3.73)	(1.91)	(2.45)
Surprise$_t$ × *Depreciation-to-Sales Ratio*$_{i,t-1}$	–2.630	–1.380	–1.495	–0.805
	(–1.39)	(–0.90)	(–1.00)	(–0.49)
Surprise$_t$ × *Sales Volatility*$_{i,t-1}$	–0.921	–0.635	–0.199	–0.738*
	(–1.54)	(–1.39)	(–0.60)	(–2.00)
Surprise$_t$ × *Concentration*$_{i,t-1}$	–2.253	–2.390	–6.878	0.051
	(–0.46)	(–0.72)	(–0.77)	(0.05)
Surprise$_t$ × *CAPM Beta*$_{i,t-1}$	–4.911***	–5.670**	–4.753**	–5.552**
	(–2.93)	(–2.54)	(–2.26)	(–2.21)
Statistical Controls				
Surprise$_t$ × *Small Minus Big*$_{i,t-1}$		0.878	1.109	0.971
		(1.02)	(1.29)	(1.12)
Surprise$_t$ × *High Minus Low*$_{i,t-1}$		1.168	0.749	1.297
		(0.61)	(0.42)	(0.66)
Surprise$_t$ × *Momentum*$_{i,t-1}$		5.473***	5.713***	5.246***
		(3.76)	(3.67)	(3.38)
Main effect on control(s)	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	No
Date Fixed Effects	Yes	Yes	Yes	Yes
Surprise$_t$ × Industry Fixed Effects	No	No	Yes	No
Surprise$_t$ × Pseudo-firm Fixed Effects	No	No	No	Yes
Observations	491,606	491,606	491,606	491,606
R^2	0.130	0.135	0.157	0.146

Table 5. Moderating Effects of Accounting Quality and Monetary Policy: Growth Options

This table presents OLS estimates of Eq. (a) on Federal Open Market Committee announcement dates, after splitting the sample on the measures of growth options defined in Appendix B:

$$Return_{it} = \alpha + \beta_1 Accounting\ Quality_{it-1} + \beta_2 Accounting\ Quality_{it-1} \times Surprise_t + \Gamma Controls_{it-1} + \Phi Controls_{it-1} \times Surprise_t + \delta_i + \gamma_t + \varepsilon_{it} \quad (a)$$

where *Return* is the firm's stock return as defined in Appendix B. *Accounting Quality* is either *AAER* or *Restatement* as defined in Appendix B. *Surprise* is computed following Bernanke & Kuttner (2005) and Gilchrist, Lopez-Salido, and Zakrajsek (2015) using intra-day 30 Day federal funds futures data during 60-minute windows around FOMC announcements, as defined in Appendix B. *Controls* is a vector of time-varying firm characteristics as identified and defined in Appendix B. Panel A displays results using *AAER* to measure of *Accounting Quality*, and Panel B presents results using *Restatement* to measure *Accounting Quality*. We include firm and date fixed effects in each estimation (δ_i and γ_t). For parsimony we do not tabulate coefficients for our estimated fixed effects, controls, or the interactions of controls and *Surprise*. *t*-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by industry and date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels.

Panel A. AAERs and Growth Options

Dependent variable:	$Return_{i,t}$			
	(1a)	(1b)	(2a)	(2b)
Moderating variable:	$Firm\ Age_{i,t-1}$		$Book\text{-}to\text{-}Market_{i,t-1}$	
Sample restriction:	Below Median	Above Median	Below Median	Above Median
$AAER_{i,t-1}$	0.066	–0.161	–0.060	0.047
	(0.44)	(–1.34)	(–0.50)	(0.37)
$Surprise_t \times AAER_{i,t-1}$	**–2.472*** **	**–1.215**	**–2.443*** **	**–1.944*** **
	(–3.28)	**(–1.03)**	**(–2.70)**	**(–3.66)**
F-statistic of the Difference	**0.50**		**0.17**	
F-stat [p-value]	**[0.48]**		**[0.68]**	
Controls	Yes	Yes	Yes	Yes
$Surprise_t \times Controls$	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes
Date Fixed Effects	Yes	Yes	Yes	Yes
Observations	206,743	239,622	223,182	223,183
R^2	0.131	0.143	0.162	0.128

Table 5. Moderating Effects of Accounting Quality and Monetary Policy: Growth Options (continued)

Panel B. Restatements and Growth Options

Dependent variable:	*Return*$_{i,t}$			
	(1a)	(1b)	(2a)	(2b)
Moderating variable:	*Firm Age*$_{i,t-1}$		*Book-to-Market*$_{i,t-1}$	
Sample restriction:	Below Median	Above Median	Below Median	Above Median
Restatement$_{i,t-1}$	–0.062	0.001	0.017	–0.047
	(–1.61)	(0.04)	(0.57)	(–1.35)
Surprise$_t$ **×** ***Restatement***$_{i,t-1}$	**–1.129****	**0.287**	**–0.879****	**–0.106**
	(–2.25)	**(0.98)**	**(–2.47)**	**(–0.24)**
F-statistic of the Difference	**4.12****		**2.31**	
F-stat [p-value]	**[0.04]**		**[0.13]**	
Controls	Yes	Yes	Yes	Yes
Surprise$_t$ × *Controls*	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes
Date Fixed Effects	Yes	Yes	Yes	Yes
Observations	237,732	253,870	245,798	245,804
R^2	0.131	0.149	0.164	0.129

Table 6. Moderating Effects of Accounting Quality and Monetary Policy: Financing Constraints

This table presents results from estimating Eqs. (a) on Federal Open Market Committee announcement dates, after splitting the sample on the measures of financing constraints defined in Appendix B:

$$Return_{it} = \alpha + \beta_1 Accounting\ Quality_{it-1} + \beta_2 Accounting\ Quality_{it-1} \times Surprise_t + \Gamma Controls_{it-1} + \Phi Controls_{it-1} \times Surprise_t + \delta_i + \gamma_t + \varepsilon_{it} \quad (a)$$

where *Return* is measured as the firm's stock return as defined in Appendix B. *Accounting Quality* is measured as either *AAER* or *Restatement* as defined in Appendix B. *Surprise* is computed following Bernanke & Kuttner (2005) and Gilchrist, Lopez-Salido, and Zakrajsek (2015) using intra-day 30 Day federal funds futures data during 60-minute windows around FOMC announcements, as defined in Appendix B. *Controls* is a vector of time-varying firm characteristics as identified and defined in Appendix B. Panel A displays results using *AAER* to measure of *Accounting Quality*, and Panel B presents results using *Restatement* to measure *Accounting Quality*. We include firm and date fixed effects in each estimation (δ_i and γ_t). For parsimony we do not tabulate coefficients for our estimated fixed effects, controls, or the interactions of controls and *Surprise*. *t*-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by industry and date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels.

Panel A. AAERs and Financing Constraints

	$Return_{i,t}$									
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)	(5a)	(5b)
	Distance-to-Default		*Dividend Payer*		*Cash Flow Volatility*		*Earnings Volatility*		*HM Index*	
	Low Default Pr.	High Default Pr.	Yes	No	< Median	>= Median	< Median	>= Median	< Median	>= Median
$AAER_{i,t-1}$	–0.133	–0.028	–0.158	–0.024	–0.133	0.100	–0.084	0.008	–0.101	0.076
	(–1.22)	(–0.20)	(–0.93)	(–0.22)	(–1.19)	(0.69)	(–0.79)	(0.05)	(–0.88)	(0.41)
$Surprise_t$ * $AAER_{i,t-1}$	**–3.202**	**–1.882****	**–3.466*****	**–1.617****	**–2.038**	**–2.436*****	**–1.271**	**–3.300*****	**–0.926**	**–3.724*****
	(–1.57)	**(–2.47)**	**(–2.73)**	**(–2.36)**	**(–1.38)**	**(–3.81)**	**(–1.53)**	**(–6.08)**	**(–0.88)**	**(–2.87)**
F-statistic of the Difference	**0.26**		**1.37**		**0.04**		**3.35***		**1.66**	
F-stat (p-value)	**[0.61]**		**[0.24]**		**[0.84]**		**[0.07]**		**[0.20]**	
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Surprise × *Controls*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	175,386	175,387	138,183	308,184	222,759	222,764	223,178	223,189	157,352	157,362
R-squared	0.191	0.139	0.199	0.123	0.169	0.119	0.164	0.125	0.141	0.157

Table 6. Moderating Effects of Accounting Quality and Monetary Policy: Financing Constraints (continued)

Panel B. Restatements and Financing Constraints

	Return$_{i,t}$									
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)	(5a)	(5b)
	Distance-to-Default		*Dividend Payer*		*Cash Flow Volatility*		*Earnings Volatility*		*HM Index*	
	Low Default Pr.	High Default Pr.	Yes	No	< Median	>= Median	< Median	>= Median	< Median	>= Median
Restatement$_{i,t-1}$	–0.025	–0.025	0.009	–0.029	0.001	–0.046	–0.024	0.009	0.013	–0.019
	(–0.70)	(–0.60)	(0.25)	(–1.18)	(0.04)	(–1.53)	(–0.92)	(0.29)	(0.38)	(–0.48)
***Surprise*$_t$ * *Restatement*$_{i,t-1}$**	**0.051**	**–0.813****	**0.172**	**–0.654***	**0.205**	**–1.055****	**0.283**	**–1.188*****	**–0.672**	**–0.688***
	(0.14)	**(–2.23)**	**(0.44)**	**(–1.70)**	**(1.05)**	**(–2.20)**	**(1.18)**	**(–2.89)**	**(–1.26)**	**(–1.90)**
F-statistic of the Difference F-stat (p-value)	**3.28* [0.07]**		**1.37 [0.24]**		**4.58** [0.03]**		**6.25** [0.01]**		**0.00 [0.98]**	
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Surprise × *Controls*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	193,187	193,187	156,378	335,224	245,350	245,351	245,797	245,805	157,352	157,362
R-squared	0.199	0.138	0.205	0.124	0.174	0.120	0.169	0.125	0.164	0.125

Table 7. Falsification Test: Accounting Quality and Expected Monetary Policy Changes

This table presents results from estimating Eq. (a) around Federal Open Market Committee announcement dates:

$$Return_{it} = \alpha + \beta_1 Accounting\ Quality_{it-1} + \beta_2 Accounting\ Quality_{it-1} \times Daily\ Surprise_t + \beta_3 Accounting\ Quality_{it-1} \times Daily\ Expected_t + \Gamma Controls_{it-1} + \Phi Controls_{it-1} \times daily\ Surprise_t + \delta_i + \gamma_t + \varepsilon_{it} \quad (a)$$

Where *Return* is measured as the firm's stock return as defined in Appendix B. *Accounting Quality* is measured as either *AAER* or *Restatement* as defined in Appendix B. *Daily Surprise* is computed following Bernanke & Kuttner (2005) using 30 Day federal Funds Futures data as defined in Appendix B. *Daily Expected* is computed as the actual FFR change minus *Daily Surprise*. *Controls* is a vector of time-varying firm characteristics as identified and defined in Appendix B. We include firm and date fixed effects in each estimation (δ_i and γ_t). For parsimony we do not tabulate coefficients for our estimated fixed effects, controls, or the interactions of controls and *Daily Surprise* or *Daily Expected*. *t*-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by industry and date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels.

Dependent variable:	$Return_{i,t}$	
	(1)	(2)
$AAER_{i,t-1}$	–0.017	
	(–0.15)	
Daily Surprise$_t$ × AAER$_{i,t-1}$	**–2.220*** **	
	(–4.08)	
Daily Expected$_t$ × AAER$_{i,t-1}$	**0.006***	
	(1.74)	
$Restatement_{i,t-1}$		–0.055
		(–1.65)
Daily Surprise$_t$ × Restatement$_{i,t-1}$		**–0.484***
		(–1.83)
Daily Expected$_t$ × Restatement$_{i,t-1}$		**0.001**
		(0.70)
Controls	Yes	Yes
Daily Surprise$_t$ × Controls	Yes	Yes
Daily Expected$_t$ × Controls	Yes	Yes
Firm Fixed Effects	Yes	Yes
Date Fixed Effects	Yes	Yes
Observations	361,092	361,092
R^2	0.113	0.113

Table 8. Alternative Measures of Accounting Quality

This table presents results from estimating Eq. (a) around Federal Open Market Committee announcement dates:

$$Return_{it} = \alpha + \beta_1 Accounting\ Quality_{it-1} + \beta_2 Accounting\ Quality_{it-1} \times Surprise_t + \Gamma Controls_{it-1} + \Phi Controls_{it-1} \times Surprise_t + \delta_i + \gamma_t + \varepsilon_{it} \quad (a)$$

Where *Return* is measured as the firm's stock return as defined in Appendix B. *Accounting Quality* is measured using two alternative measures of *Abnormal Accruals* as defined in Appendix B. *Surprise* is computed following Bernanke & Kuttner (2005) and Gilchrist, Lopez-Salido, and Zakrajsek (2015) using intra-day 30 Day federal funds futures data during 60-minute windows around FOMC announcements, as defined in Appendix B. *Controls* is a vector of time-varying firm characteristics as identified and defined in Appendix B. We include firm and date fixed effects in each estimation (δ_i and γ_t). For parsimony we do not tabulate coefficients for our estimated fixed effects, controls, or the interactions of controls and *Surprise*. *t*-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by industry and date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels.

Dependent variable:	$Return_{i,t}$	
	(1)	(2)
Abnormal Accruals (McNichols)$_{i,t-1}$	0.129**	
	(2.58)	
***Surprise*$_t$ × *Abnormal Accruals (McNichols)*$_{i,t-1}$**	**–2.797****	
	(–2.24)	
Abnormal Accruals (Dechow-Dichev)$_{i,t-1}$		0.124**
		(2.12)
***Surprise*$_t$ × *Abnormal Accruals (Dechow-Dichev)*$_{i,t-1}$**		**–2.548****
		(–2.05)
Controls	Yes	Yes
Surprise$_t$ × *Controls*	Yes	Yes
Firm Fixed Effects	Yes	Yes
Date Fixed Effects	Yes	Yes
Observations	458,601	462,179
R^2	0.134	0.134

Table 9. Alternative Measures of Monetary Surprise

This table presents results from estimating Eq. (a) around Federal Open Market Committee announcement dates:

$$Return_{it} = \alpha + \beta_1 Accounting\ Quality_{it-1} + \beta_2 Accounting\ Quality_{it-1} \times Surprise_t + \Gamma Controls_{it-1} + \Phi Controls_{it-1} \times Surprise_t + \delta_i + \gamma_t + \varepsilon_{it} \quad (a)$$

Where *Return* is measured as the firm's stock return as defined in Appendix B. *Accounting Quality* is measured using either *AAER*, *Restatement*, or one of our two measures of *Abnormal Accruals* as defined in Appendix B. *Surprise* is computed using either intra-day change in on-the-run 6-month month treasury yields or intra-day change in 30-day Eurodollar futures contracts around FOMC announcements, following Gürkaynak (2005). *Controls* is a vector of time-varying firm characteristics as identified and defined in Appendix B. We include firm and date fixed effects in each estimation (δ_i and γ_t). For parsimony we do not tabulate coefficients for our estimated fixed effects, controls, or the interactions of controls and *Surprise*. *t*-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by industry and date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels.

Dependent variable:	$Return_{i,t}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Measure of *Accounting Quality*:	*AAER*	*Restatement*	*Abnormal Accruals (McNichols)*	*Abnormal Accruals (Dechow-Dichev)*	*AAER*	*Restatement*	*Abnormal Accruals (McNichols)*	*Abnormal Accruals (Dechow-Dichev)*
Accounting Quality$_{,t-1}$	–0.087	–0.018	0.033	0.053	–0.091	–0.020	0.045	0.077
	(–1.12)	(–0.77)	(0.49)	(0.91)	(–1.42)	(–0.85)	(0.80)	(1.32)
Δ Treasury$_t$ × Accounting Quality$_{,t-1}$	**–2.490*** **	**–0.057**	**–3.107** **	**–3.600** **				
	(–3.26)	**(–0.10)**	**(–2.20)**	**(–2.11)**				
Δ Eurodollar$_t$ × Accounting Quality$_{,t-1}$					**–1.764*** **	**–0.313**	**–1.918** **	**–2.083***
					(–2.77)	**(–0.84)**	**(–2.30)**	**(–1.74)**
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Δ Treasury$_t$ × Controls	Yes	Yes	Yes	Yes	No	No	No	No
Δ Eurodollar$_t$ × Controls	No	No	No	No	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Date Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	597,208	546,625	601,596	606,382	656,731	546,625	646,799	651,537
R^2	0.104	0.117	0.108	0.108	0.098	0.117	0.103	0.103

Table 10. Asymmetric Response

This table presents results from estimating Eq. (a) around Federal Open Market Committee announcement dates:

$$Return_{it} = \alpha + \beta_1 Accounting\ Quality_{it-1} + \beta_2 Accounting\ Quality_{it-1} \times Positive\ Surprise_t + \beta_2 Accounting\ Quality_{it-1} \times Negative\ Surprise_t + \Gamma Controls_{it-1} + \Phi Controls_{it-1} \times Surprise_t + \delta_i + \gamma_t + \varepsilon_{it} \quad (a)$$

Where *Return* is measured as the firm's stock return as defined in Appendix B. *Accounting Quality* is measured using four alternative measures: *AAER*, *Restatement*, and two measures of *Abnormal Accruals* as defined in Appendix B. *Surprise* is computed following Bernanke & Kuttner (2005) and Gilchrist, Lopez-Salido, and Zakrajsek (2015) using intra-day 30 Day federal funds futures data during 60-minute windows around FOMC announcements, as defined in Appendix B, and decomposed into its positive and negative components, *Positive Surprise* and *Negative Surprise*. *Controls* is a vector of time-varying firm characteristics as identified and defined in Appendix B, with descriptive statistics presented in Panel A (for our *Restatements* sample). Panel B presents results. We include firm and date fixed effects in each estimation (δ_i and γ_t). For parsimony we do not tabulate coefficients for our estimated fixed effects, controls, or the interactions of controls and *Surprise*. *t*-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by industry and date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels.

Panel A. Descriptive Statistics

Variable	N	Mean	SD	P10	P25	P50	P75	P90
Positive Surprise	491,603	0.01	0.02	0.00	0.00	0.00	0.01	0.04
Negative Surprise	491,603	–0.03	0.08	–0.07	–0.02	0.00	0.00	0.00

Panel B. Accounting Quality and Asymmetric Responses to Monetary Policy Surprises

	Return$_{i,t}$			
	(1)	(2)	(3)	(4)
Measure of *Accounting Quality*:	*AAER*	*Restatement*	*Abnormal Accruals (McNichols)*	*Abnormal Accruals (Dechow-Dichev)*
Accounting Quality$_t$	–0.055	–0.030	0.088	0.069
	(–0.50)	(–1.05)	(1.39)	(0.92)
***Positive Surprise*$_t$ × *Accounting Quality*$_{,t-1}$**	**–2.063**	**0.007**	**–0.662**	**0.451**
	(–1.22)	**(0.01)**	**(–0.20)**	**(0.13)**
***Negative Surprise*$_t$ × *Accounting Quality*$_{,t-1}$**	**–2.235*****	**–0.594**	**–3.055****	**–2.998****
	(–2.83)	**(–1.43)**	**(–2.09)**	**(–2.03)**
Controls	Yes	Yes	Yes	Yes
Positive Surpriset × *Controls*	Yes	Yes	Yes	Yes
Negative Surprise × *Controls*	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes
Date Fixed Effects	Yes	Yes	Yes	Yes
Observations	446,367	491,603	459,413	462,992
R-squared	0.129	0.131	0.134	0.134

Table 11. Accounting Quality and the Effect of Monetary Policy on Investment

This table presents results from estimating annual firm-year regressions of Eq. (a):

$$Investment_{it} = \alpha + \beta_1 Accounting\ Quality_{it-1} + \beta_2 Accounting\ Quality_{it-1} \times sum(Surprise)_t + \Gamma Controls_{it-1} + \Phi\ Controls_{it-1} \times sum(Surprise)_t + \delta_i + \gamma_t + \varepsilon_{it} \quad (a)$$

Where *Investment* is the firm's research and development and capital expenditures, divided by assets. *Accounting Quality* is either *AAER*, *Restatement*, *Abnormal Accruals (McNichols)*, or one of our two measures of *Abnormal Accruals* as defined in Appendix B. *Sum(Surprise)* is the sum of all federal funds rate surprises (measured during the 60-minute window around FOMC announcements, as defined in Appendix B) that occur during the year. Controls is a vector of time-varying firm characteristics as identified and defined in Appendix B. We include firm and date fixed effects in each estimation (δ_i and γ_t). For parsimony we do not tabulate coefficients for our estimated fixed effects, controls, or the interactions of controls and *Surprise*. *t*-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by industry and fiscal year-end date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels.

Dependent variable:	*Investment*$_{i,t}$			
	(1)	(2)	(3)	(4)
Measure of *Accounting Quality*:	*AAER*	*Restatement*	*Abnormal Accruals (McNichols)*	*Abnormal Accruals (Dechow-Dichev)*
Accounting Quality$_{i,t-1}$	0.040***	0.028**	0.046**	0.047***
	(3.78)	(2.30)	(2.08)	(2.82)
***Sum(Surprise)*$_t$ × *Accounting Quality*$_{i,t-1}$**	**–0.009****	**0.001**	**–0.057*****	**–0.046*****
	(–2.38)	**(0.40)**	**(–5.20)**	**(–3.73)**
Controls	Yes	Yes	Yes	Yes
Sum(Surprise)$_t$ × *Controls*	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	54,782	64,192	57,332	57,746
R^2	0.770	0.763	0.767	0.767

Table 12. Staggered Implementation of the Sarbanes-Oxley Act

This table presents results from estimating Eq. (a) around Federal Open Market Committee announcement dates:

$$Return_{it} = \alpha + \beta_1 SOX\ Compliant_{it-1} + \beta_2 SOX\ Compliant_{it-1} \times Surprise_t + \Gamma Controls_{it-1} + \Phi Controls_{it-1} \times Surprise_t + \delta_i + \gamma_t + \varepsilon_{it} \quad (a)$$

Where *Return* is measured as the firm's stock return as defined in Appendix B. *SOX Complaint* is measured as an indicator for SOX compliance, and takes the value 1 for December and November fiscal year-end firms starting with the 2004 10-K reporting period, and 1 for August, September, and October fiscal year-end firms starting with the 2005 10-K reporting period as defined in Appendix B with descriptive statistics presented in Panel A. Panel B presents results. *Surprise* is computed following Bernanke & Kuttner (2005) and Gilchrist, Lopez-Salido, and Zakrajsek (2015) using intra-day 30 Day federal funds futures data during 60-minute windows around FOMC announcements, as defined in Appendix B. *Controls* is a vector of time-varying firm characteristics as identified and defined in Appendix B. We include firm and date fixed effects in each estimation (δ_i and γ_t). For parsimony we do not tabulate coefficients for our estimated fixed effects, controls, or the interactions of controls and *Surprise*. *t*-statistics are reported below coefficient estimates and are calculated based on robust standard errors clustered by industry and date. *, **, *** indicate statistical significance (two-sided) at the 0.1, 0.05, and 0.01 levels.

Panel A. Descriptive Statistics

Variable	N	Mean
SOX Compliant	129,873	0.65

Panel B. SOX and the Transmission of Monetary Policy

	Return$_{i,t}$			
	(1)	(2)	(3)	(4)
SOX Compliant$_{i,t-1}$	–0.017	0.060	0.022	0.075
	(–0.31)	(1.04)	(0.31)	(1.10)
***Surprise*$_t$ × *SOX Compliant*$_{i,t-1}$**	**6.190****	**6.596***	**7.480****	**6.857***
	(2.18)	**(1.94)**	**(2.05)**	**(1.79)**
Controls	No	No	Yes	Yes
Surprise × *Controls*	No	No	Yes	Yes
Firm Fixed Effects	No	Yes	No	Yes
Date Fixed Effects	Yes	Yes	Yes	Yes
Observations	129,873	129,873	122,529	122,529
R-squared	0.173	0.211	0.187	0.222