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Equity Market and the Transmission Channels of Monetary Policy: Before and After the Zero Lower Bound

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Equity Market and the Transmission Channels of Monetary Policy: Before and After the Zero Lower Bound[1]

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Abstract

We examine the effectiveness of the interest rate channel and the credit channel of monetary policy before and after the zero lower bound (ZLB), using intraday stock returns. We construct a number of industry-specific and firm-specific indicators to capture the sensitivity of firms' demand to interest rates (interest rate channel) and firms' financial constraints (credit channel). We find that the transmission of monetary policy has shifted across both periods. Conventional monetary policy works through both the neoclassical interest rate channel and the credit channel, while unconventional policy is propagated primarily via the credit channel which became even more effective at the ZLB. Our results indicate that before the ZLB the interest rate channel and the credit channel operate primarily through target rate shocks rather than forward guidance announcements, whereas both forward guidance and Large Scale Asset Purchases were equally important for the credit channel during the ZLB. Our findings are robust with respect to a number of model extensions and alternative specifications.

JEL Classification: G14, E44, E52, E58.

Key Words: transmission channels, unconventional monetary policy, LSAPs, forward guidance.

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1. Introduction

The onset of the 2007-2008 financial crisis and its aftermath precipitated a dramatic change in the conduct of monetary policy across the world. Faced with a deteriorating financial and economic outlook, the Federal Reserve lowered the federal funds rate to the zero lower bound (ZLB) in December 2008 and began to pursue a number of unconventional policy measures to stabilize financial markets and mitigate the effect of the crisis. In particular, the Fed turned to Large Scale Asset Purchases (LSAPs) and forward guidance as the main two policy instruments during this period.

More than a decade after their initial adoption, there is still a considerable amount of uncertainty regarding the effectiveness of these policy tools and in particular whether the standard transmission channels – the *interest rate channel* and the *credit channel* – are still relevant at the ZLB.[1] For example, a number of studies have found that the Fed's ability to carry out its dual mandate is substantially impaired at the ZLB (Williams (2009), Kiley and Roberts (2017)). Others find that its impact on equity markets has become counterproductive (Kontonikas, MacDonald and Saggu (2013)), or that its effect is substantially attenuated (Kiley (2014)). In contrast, other studies show that the impact of unconventional monetary policy on stock returns not only has conventional signs, but its effect is significantly amplified during the ZLB relative to the pre-crisis period (Kurov and Gu (2016)).

There are at least three main reasons why a broad consensus on the effectiveness of unconventional policy remains elusive. First, unconventional policy shocks are simply harder to measure (Wright (2012)). While federal funds futures serve as a good proxy for the stance of monetary policy in normal times (Kuttner 2001), there is no such equivalent measure at the ZLB, despite the fact that unconventional announcements are still delivered at specific times. Second, separating forward guidance surprises from LSAP surprises is not a trivial task given that most FOMC announcements contained important information related to both programs especially in the early stages of the financial crisis.

Third, the vast majority of studies consider the overall (average) reaction of aggregate stock indices to policy shocks. However, monetary policy effects exhibit a substantial degree of cross-industry and cross-firm heterogeneity, which is largely lost in aggregated data. In particular, the neoclassical interest rate channel and the broad credit channel operate primarily through various sources of heterogeneity. For example, the interest rate channel

[1] Because interest rates were stuck at zero during the unconventional period, assessing the role of the interest rate channel may seem, at first brush, to be a futile task. Nonetheless, forward guidance announcements during the ZLB were instrumental in guiding market expectations regarding the future path of interest rates, which means that, at least in theory, the interest rate channel is expected to operate at the ZLB, even if indirectly.

postulates that monetary policy has a differential impact on firms across different industries both because the interest-elasticity of demand varies widely from sector to sector and because industry-specific production processes exhibit different sensitivities to the user cost of capital which depends on interest rate changes. Likewise, the transmission of monetary policy via the credit channel is based on a large heterogeneous impact across firms depending on their financial structure and financial constraints.

This study examines the joint relevance of the interest rate channel and the credit channel of conventional and unconventional monetary policy in order to evaluate their effectiveness across the two regimes. Our event-study approach uses intraday industry stock returns around policy announcements to estimate the response of equity returns to monetary policy surprises. We focus on sectors rather than aggregate returns because the substantial cross-industry heterogeneity provides a richer characterization of the monetary transmission process which is not present in aggregate data.

Because sectoral heterogeneity is generally interpreted as evidence of the traditional interest rate channel while firm-level heterogeneity as evidence of the credit channel, we rely on both industry and firm-specific indicators to evaluate the effectiveness of each channel.[2] For the interest rate channel we use a number of industry variables commonly employed in the literature related to the demand for firms' goods: cyclicality of final demand, product durability, and capital intensity. For the credit channel, we construct a number of firm-specific indicators that capture the degree of firms' financial constraints: size, book-to-market ratio, price-to-earning ratio, cash flow ratio, and financial leverage.

We follow Swanson (2021) and compute monetary policy surprises from high-frequency Treasury yield changes around policy announcements. We estimate the first three principle components of Treasury yield changes that have the greatest explanatory power around policy news. These factors are subsequently rotated and orthogonalized within each subperiod, so that two factors (target rate surprises and forward guidance) characterize the conventional period while forward guidance and LSAP surprises capture unconventional policy shocks.

We document several novel findings. First, our preliminary analysis on industry stock returns shows a large degree of heterogeneity across sectors during both conventional and unconventional periods but with different patterns of sectoral heterogeneity. While capital-intensive and cyclical industries are significantly more affected by monetary policy shocks during the conventional period, the highest reaction to unconventional surprises is found for financials and real estate – two sectors that were severely impaired during the financial

[2] In essence, while credit constraints and information asymmetries affect the firms' ability to access external funds – thus impacting the *supply* of firms' products – the neoclassical user-cost of capital channel is more closely related to the *demand* for firms' products, as captured by its sensitivity to interest rates.

crisis. Second, while unconventional shocks have a larger impact on industry returns relative to conventional surprises, this is not the case for all industries, indicating that there is considerable sectoral variation in the effectiveness of monetary policy pre- and post-ZLB which can be missed with aggregated data. Third, our results indicate that the heterogeneous response to policy news is driven primarily by target rate shocks during the conventional period and by LSAPs during the ZLB, with forward guidance generating a more homogeneous response, especially before the ZLB.

Our key empirical results show that the transmission mechanism of monetary policy has shifted across the two periods. We find that conventional policy works through both the neoclassical interest rate channel and the credit channel, while unconventional policy is propagated primarily via the credit channel which has become even more effective since the crisis. Specifically, our estimates indicate that high-capital intensity firms and those producing durable goods react strongly to policy shocks during the conventional era but this effect disappears entirely during the ZLB, casting doubt on the viability of the interest rate channel during this period. In contrast, financially constrained stocks are more sensitive to policy shocks than less financially constrained firms during both periods but particularly at the ZLB when the spread differential is nearly twice as large compared to the earlier period. We also find that target rate shocks are the primary source of heterogeneity for the interest rate and credit channel effects during the conventional period, whereas forward guidance and LSAP shocks were equally important for the credit channel during the ZLB. These findings are robust with respect to a number of sensitivity analyses and alternative specifications.

To our knowledge, this is the first study to provide a systematic and comprehensive analysis of transmission channels across the two policy regimes while considering the full set of policy instruments. As such, the paper is related to three strands of literature and contributes to them in a number of ways. The first rapidly growing literature focuses on the identification of unconventional policy shocks and their effect on asset prices (D'Amico and King (2013), Gagnon et al. (2011), Glick and Leduc (2018), Joyce et al. (2012), Neely (2015), Krishnamurthy and Vissing-Jorgensen (2011), Rogers, Scotti and Wright (2014), Swanson and Williams (2014), Swanson (2021), and Wright (2012). We further add to these efforts by seeking to examine the role of the interest rate channel and the credit channel across both conventional and unconventional periods.

A second related literature examines whether unconventional measures are as effective as conventional ones. As discussed above, a number of studies show that the impact of monetary policy is less effective at the ZLB (Kiley (2014), Kontonikas, MacDonald and Saggu (2013)), while others have documented the opposite effect, showing a stronger impact

on the macroeconomy (Wu and Xia (2016), Debortoli, Gali and Gambetti (2020), on equity returns (Kurov and Gu (2016), Eksi and Tas (2017)), on exchange rates (Glick and Leduc (2018)) and energy prices (Rosa (2014)). We contribute to this literature by providing additional evidence that unconventional policy has become more effective at the ZLB and this is primarily due to the increased relevance of the credit channel since the crisis rather than to the traditional interest rate channel.

Lastly our study is related to a third strand of literature assessing the relevance of the interest rate and the credit channel. A large body of work has documented significant heterogeneity in monetary policy effects on stock returns which are partly attributed to the interest rate channel (operating through industry-wide characteristics) (see for example, Ehrmann and Fratzscher (2004), Bernanke and Kuttner (2005)) and partly through the credit channel (operating through firm-specific characteristics) (e.g. Bernanke and Blinder (1992), Cloyne et al. (2018), Ehrmann and Fratzscher (2004), Fazzari, Hubbard and Petersen (1988), Jeenas (2019), Kashyap, Stein and Wilcox (1993), Kontonikas and Kostakis (2013), Maio (2014), and Ottonello and Winberry (2020)). While these studies were focused on the conventional period, a number of more recent works have investigated the effectiveness of the credit channel during the ZLB (Haitsma, Unalmis and de Haan (2016), and Wu (2018).

We contribute to this strand of literature in several ways. First, by considering forward guidance in addition to target rates surprises during the conventional period, we improve upon the earlier studies which focus strictly on target rate shocks. This turns out to be an important extension because, as we document in this study, forward guidance surprises have a statistically significant and economically important impact on non-cyclical stocks which has been missed by prior studies relying on single-factor analysis. Second, by extending the work of Dedola and Lippi (2005) and Ehrmann and Fratzscher (2004) to the ZLB era, we are able to compare the effectiveness of the interest rate and the credit channel across the two periods. Third, we build on the recent work of Haitsma, Unalmis and de Haan (2016) and Wu (2018) and expand their work along two dimensions: by evaluating separately the impact of forward guidance and LSAPs on industry returns and by simultaneously examining the effectiveness of both the credit channel and the interest rate channel.

The rest of the paper is organized as follows. Section 2 summarizes the literature on transmission channels. Section 3 describes monetary policy news and events. Section 4 provides the empirical framework, data, and methodology including the identification of monetary policy surprises. Section 5 presents our baseline empirical results. Sensitivity analyses are carried out in Section 6. Concluding remarks are summarized in section 7.

2. Related Literature: Monetary Policy Transmission Channels

2.1 The Interest Rate Channel

The traditional interest rate channel operates through the effect of policy changes on the user cost of capital, which in turn affects business and households' investment spending. Most studies assessing the importance of this channel have focused on the heterogeneous cross-industry impact of monetary policy. This heterogeneity arises for a number of reasons. First, the interest-sensitivity of demand for firms' products differs. Firms with demand that is highly cyclical or interest-sensitive (consumer discretionary, business equipment, and automotive sectors) are more sensitive to monetary policy (Ehrmann and Fratzscher (2004)). Second, demand for durable goods is more sensitive to interest rate changes through the cost-of-capital effect, which means that firms producing durable investment or consumption goods (such as construction or business equipment) are significantly more affected by monetary policy than firms producing nondurables (Dedola and Lippi (2005), Peersman and Smets (2005)). Third, capital intensive industries (such as technology and telecommunication sectors) are more sensitive to changes in the user cost of capital which in turn depends on changes in interest rates (Basistha and Kurov (2010), Bernanke and Kuttner (2005), Ehrmann and Fratzscher (2004), Ganley and Salmon (1997), and Hayo and Uhlenbrock (2000)).

Evidence of the interest rate channel during the ZLB is relatively more sparse. The few studies that have examined the heterogeneous cross-industry effect of policy shocks show a more attenuated role for this channel during this period though the evidence is heuristic rather than based on direct tests. For example, Guerin and Leiva-Leon (2017) find that while cyclical and high-capital intensive industries were impacted the most by conventional policy shocks, sectors with the highest sensitivity to unconventional policy surprises were financials and construction. Similar results are also reported by Haitsma, Unalmis and de Haan (2016) for the European markets. In a study that uses a similar methodology to ours in separating forward guidance from LSAP shocks, Jayawickrema (2020) finds that LSAPs do not have a statistically significant impact on industry stock returns, while forward guidance generally elicits a stronger response compared to the pre-ZLB period.

2.2 The Credit Channel

The credit channel arises because imperfect capital markets and information asymmetries affect the external finance premium – the wedge in costs between externally generated funds and those raised internally (Bernanke and Gertler (1989) and Kiyotaki and Moore (1997)). It operates through the bank lending channel and the balance sheet channel. The credit

channel gives rise to the "financial accelerator" effect which allows for small shocks during worsening market conditions to be amplified into large and persistent business cycle fluctuations (Bernanke, Gertler and Gilchrist (1999)).

A large body of work has provided strong evidence in favor of the credit channel during the conventional period. Studies have found that small firms which tend to be bank-dependent borrowers react significantly more strongly to policy shocks than large firms, providing support for the bank lending channel.[3] Evidence in favor of the balance sheet channel is based on firms' financial constraints and vulnerabilities to external finance (Kaplan and Zingales (1997)). Financially constrained firms are more affected by a contractionary policy shock than unconstrained firms because tighter credit conditions tend to weaken their balance sheets and exacerbate adverse selection and moral hazard issues (Bernanke, Gertler and Gilchrist (1996, 1999), Ehrmann and Fratzscher (2004), Kontonikas and Kostakis (2013), Maio (2014)).

A few studies examine the credit channel during the unconventional period. Wu (2018) estimates that financially constrained firms respond significantly more to unconventional shocks than firms that are less financially constrained. Haitsma, Unalmis and de Haan (2016) find evidence in favor of the credit channel only post-crisis when the ECB employed unconventional measures. Farka (2021) shows that the credit channel is even more relevant at the ZLB and its effectiveness is almost entirely attributed to the high sensitivity of financially constrained firms to unconventional policy surprises.

A number of more recent studies investigate the role of capital formation and financial frictions in the transmission process of monetary policy by focusing on firm economic activity after a monetary policy shock. Cloyne et al. (2018) show that while other proxies of financial constraint play a role (size, leverage, liquidity and Tobin's q), firm's age is the most robust predictor of the observed heterogeneity in capital expenditure adjustment in response to a policy shock. Jeenas (2019) finds that firms with higher leverage and lower liquid assets at the time of a contractionary policy shock tend to experience lower inventories, sales, and fixed capital. Kalemli-Özcan et al. (2018) report that highly leveraged firms reduce investments even more when firms are linked to intermediaries with relatively weaker balance sheets.

[3]See, for example, Gertler and Gilchrist (1994), Oliner and Rudebusch (1996), Thorbecke (1997), Perez-Quiros and Timmerman (2000), Dedola and Lippi (2005), Ehrmann and Fratzscher (2004), Peersman and Smets (2005), Kontonikas and Kostakis (2013), Maio (2014), Eijffinger, Mahieu and Raes (2017).

3. Monetary Policy News and Events

3.1 Conventional Monetary Policy

Conventional monetary policy is carried out primarily through changes in the federal funds rate.[4] Nonetheless, the conduct of monetary policy has evolved considerably over the past two decades with policy announcements disclosing an increasingly broader set of information – in the form of forward guidance – which extends well beyond the current decision on interest rates.[5] Forward guidance statements appeared as early as May 1999 when a "policy bias" language was incorporated in FOMC statements regarding the likelihood of future tightening or easing of monetary policy. This language was replaced by a "balance-of-risk assessment" in February 2020 which tied more directly to the outlook for output growth and inflation. In August 2003, the statements were further revised to include more forward guidance elements, such as: "the committee believes that policy accommodation can be maintained for a considerable period" or "the committee believes the policy accommodation can be removed at a measured pace."

3.2 Unconventional Monetary Policy

The conduct of unconventional policy was also carried out primarily along two dimensions: LSAPs and forward guidance.

LSAPs The first round of LSAPs (LSAP-1) – announced in November 25, 2008 – involved purchases of GSE debt, MBSs, and US Treasury securities to the tune of $1.725 trillion. The second round (LSAP-2) – first suggested on August 27, 2010 – ran from November 2010 - June 2011, accumulating an additional $600 billion in longer US Treasuries. The Maturity Extension Program (MEP) was announced on September 21, 2011 and lasted until December 2012. The third round of asset purchases (LSAP-3) was announced on September 2012 with monthly purchases of $40 billion in agency MBSs and $45 billion in long-term Treasuries. Winding down this massive bond-purchasing program proved challenging as witnessed by the "taper tantrum" episode in mid-2013.[6] The FOMC began to wind down its bond purchases in December 2013, ending the program in October 2014. Appendix A lists the major LSAP announcements along with the program phase, a summary of the decision, and a brief news

[4] Beginning in February 1994, the FOMC began to issue its rate decisions at a pre-set time (2:15 pm ET).

[5] Additional changes include the publication of individual votes of FOMC members (2002), the release of meeting minutes with a three week delay (2004), and the inclusion of press conferences after FOMC meetings (2011).

[6] On May 22nd 2013, Chairman Bernanke remarked that the FOMC could begin tapering its asset purchases soon "if the economy and the labor market continue to improve." This pronouncement elicited an outsized negative reaction from global markets as the potential reduction in asset purchases was widely understood to be imminent.

excerpt commenting on the market reaction to the announcement.

Forward Guidance While forward guidance statements appeared well before the onset of the financial crisis, they assumed a greater importance during the ZLB. For example, as the federal funds rate hit the zero lower bound in December 2008, the statement read: "weak economic conditions are likely to warrant exceptionally low levels of the federal funds rate for some time". In March 19, 2009, "for some time" was replaced by "an extended period". The language transitioned to a calendar-based approach in August 2011, as the Fed announced that the low interest rates were expected to prevail through "at least mid-2013." A threshold guidance was adopted in December 2012, linking future interest rate moves to developments in the labor market. As the economy improved and conditions for a lift-off begin to materialize, the language shifted to a throwback of the pre-crisis era, with the committee noting that it "...will maintain current target rate for a considerable time" and "...it can be patient in beginning to normalize the stance of monetary policy" (December 2014). Appendix B summarizes the main forward guidance announcements together with news commentaries related to the language of the guidance.

3.3 Monetary Policy Announcements

Our conventional monetary policy period extends from May 1999 – when the Fed first issued its forward guidance statement – until October 2008. The unconventional period begins in November 2008 (when the Fed first signaled its intention to carry out large-scale asset purchases) until October 2015 (which marks the end of the ZLB era). Overall, our sample includes a total of 144 policy dates, of which 81 belong to the conventional period and 63 to the unconventional period. There are 77 scheduled meetings and 4 intermeetings in the conventional sample.[7] The unconventional period includes 56 regularly scheduled meetings, the initial announcement of the LSAP program on November 25, 2008, as well as a number of selected speeches and testimonies by Chairman Bernanke which signalled possible extensions or alterations of the LSAP program.[8]

[7] Our baseline sample includes the intermeeting announcements of January 3, 2001, April 18, 2001, January 22, 2008 and October 8, 2008 and excludes the following unscheduled meetings: September 17, 2001, August 10, 2007, August 17, 2007, and March 11, 2008. The September 2001 announcement is commonly excluded from the set of event studies due to the idiosyncratic nature of the meeting following the terrorist attacks of September 11 (see for example, Bernanke and Kuttner (2005), and D'Amico and Farka (2011)). The unscheduled meetings of August 10, 2007, August 17, 2007 and March 11, 2008 are excluded because they did not contain important policy changes but rather focused on details about liquidity provisions through the Term Auction Facility, Term Securities Lending Facility, or discount window lending.

[8] Our sample includes five speeches from Chairman Bernanke and one Congressional testimony on the following days: December 1, 2008, August 27, 2010, October 15, 2010, August 26, 2011, August 31, 2012, and May 22, 2013.

4. Data and Methodology

4.1 Identification of Monetary Policy Surprises

We borrow from the literature and identify monetary policy shocks via intraday changes in interest rate futures in a tight window bracketing policy announcements.[9] Our approach follows closely the methodology of Swanson (2021) which we briefly summarize here. We use intraday data 15 minutes before and 1 hour and 45 minutes after a policy announcements in the first and third federal funds futures contracts (ΔFFR_1, ΔFFR_3), the second, third and fourth Eurodollar futures (ΔEUR_2, ΔEUR_3, ΔEUR_4), and the 2-, 5-,10-, and 30-year Treasury yields.[10] The federal funds futures are a good measure of the immediate policy shocks (target shocks or TS), Eurodollar futures capture near-term policy shocks (more closely associated with forward guidance, or FG) and long-dated Treasuries reflect longer-term monetary policy surprises (driven primarily by LSAP surprises).

Following Swanson (2021), the intraday data are collected in a matrix X which contains 144 observations (corresponding to policy announcements) and 9 columns (corresponding to interest rate data). We use factor analysis and estimate the following factor model:

$$X = Z\lambda + \varepsilon \tag{1}$$

where Z is a $T\ x\ r$ matrix of latent factors such that $(r < p)$, λ is a matrix of factor loadings with dimensions $r \times n$, and ε is a $T \times n$ matrix of error terms. We find that the majority of the variation in X (over 95%) is explained by three factors over the entire sample, which are estimated by extracting the first three principal component of the data. Following Swanson (2021), we perform a rotation to obtain another set of orthogonal factors that have a clear structural interpretation and can be clearly mapped into our three policy surprises.[11]

We identify two orthogonal factors for the conventional period a) TS, which corresponds to information that systematically captures the immediate setting of policy as reflected by changes in the federal funds futures (Kuttner (2001)): $TS = \frac{m}{m-d}(FFR_t^{fut} - FFR_{t-1}^{fut})$), and

[9] Gilchrist, Yue and Zakrajsek (2014) and Gertler and Karadi (2015) measure unconventional monetary policy by intraday changes in the two-year Treasury yields. Wright (2012), Rogers, Scotti and Wright (2014) and Wu (2018) derive policy surprises at the ZLB from the principle component of the change in yields from two-, five-, ten and thirty-year Treasury futures. Glick and Leduc (2018) use changes in federal funds futures to identify target rate shocks, changes in the one-year-ahead Eurodollar futures to identify forward guidance surprises, and the principle component from changes in the two-, five-, ten- and thirty-year Treasury futures as long-term path surprises.

[10] The data are obtained from the Federal Reserve Board. As in Swanson (2021), we avoid overlapping future contracts since they tend to be highly correlated for institutional rather than policy reasons.

[11] Similar to Swanson (2021), we employ the following identifying restrictions: a) changes in forward guidance have no impact on the target surprises, b) changes in LSAPs have no impact on target surprises, and c) the LSAP factor is as small as possible over the conventional policy period (May 1999 - November 2008). Details of the methodology are provided in Swanson (2021).

b) FG, which reflects changes in the near-term path of monetary policy. The unconventional period is also characterized by two factors, with the FG factor capturing moves in near–term-horizon through changes in intermediate-maturity interest rates and $LSAP$ corresponding to policy releases that systematically move medium- and longer-term interest rates. Each factor is normalized to have a unit standard deviation, so results are interpreted in terms of basis points per standard deviation of monetary policy shock.[12] A positive surprise indicates a policy tightening for that policy instrument. Summary statistics are presented in Table 1.

4.2 Event Study Approach

The relation between monetary policy and stock returns can be represented by the following structural system of equations:

$$r_t = \alpha \Delta MP_t + z_t + u_t \tag{2}$$

$$\Delta MP_t = \beta r_t + \gamma z_t + \varepsilon_t \tag{3}$$

where r_t is the asset return, ΔMP_t stands for the monetary policy decision, z_t represents a set of macroeconomic shocks affecting both policy decisions and stock returns, and u_t and ε_t represent shocks to stock returns and policy decisions, respectively. As it is now well understood, this type of analysis is normally plagued by endogeneity and omitted variable bias. The endogeneity problem arises because causality between policy decisions and asset prices runs both ways if the data-frequency interval is wide enough. Omitted variable biases arise because other news may impact both policy decisions and asset prices. As argued by Rigobon and Sack (2004), in the presence of endogeneity and omitted variables, α is biased with this bias given by:

$$\widehat{\alpha} - \alpha = (1 - \alpha\beta)\frac{\beta\sigma_u + (\beta + \gamma)\sigma_z}{\sigma_\varepsilon + \beta^2\sigma_u + (\beta + \gamma)\sigma_z} \tag{4}$$

where σ_x is the variance of shock x. α is affected by endogeneity bias if $\beta \neq 0$ and $\sigma_u > 0$, and by the omitted variable bias if $\gamma \neq 0$ and $\sigma_z > 0$.

The event study approach addresses these issues by focusing on the period immediately around policy releases (D'Amico and Farka (2011), Gürkaynak and Wright (2013)). Most studies use daily data to estimate equation (2) via OLS (e.g., Bernanke and Kuttner (2005)). However, the use of daily data may not appropriately mitigate omitted variable issues since

[12] The target rate shock is normalized over the period from May 1999 - December 2008, the LSAP factor over the period of November 2008 - October 2015, while the forward guidance factor is normalized to have a unit standard deviation over the entire sample (May 1999 - October 2015).

on a number of occasions macroeconomic news were released on FOMC days.[13] In addition, as argued by Kurov and Gu (2016), the bias with daily data may be particularly large during times of market stress as financial shocks (σ_u), macro shocks (σ_z), and the response of policy decisions to stock returns (β), tend to increase significantly during these times.

This paper uses intraday stock futures data (15 minutes before and 1 hour and 45 minutes after a policy announcements) to address these biases. The tighter time-frame mitigates the possibility that other news are released at the same time (σ_u and σ_z are negligible relative to the variance of policy shocks σ_ε). Nonetheless, there is no clear consensus as to what constitutes an optimal time-frame around FOMC announcements. A tight window may miss its full impact while too wide of an interval increases the possibility that policy news is contaminated by other information. We allow for a wider time-interval post-announcements than what is common in the literature motivated by the observation that the information delivered during the ZLB was significantly more complex, requiring more time to process. As such, our time-frame aims to strike a balance between identifying "pure" exogenous policy surprises and the time it takes market participants to absorb and react to it.[14]

Our benchmark event-study estimates the following nested model:

$$r_t^i = \alpha_0 + \alpha_1 TS_t + \beta_1 FG_t + I_t^u(\alpha_2 + \beta_2 FG_t + \gamma_1 LSAP_t) + \varepsilon_t \tag{5}$$

where r_t^i represents the excess return on announcement day t on industry stock return, and I_t^u is an indicator variable equal to unity during the unconventional period and zero otherwise. With this set-up, β_2 captures shifts in the impact of forward guidance between the two policy regimes, $\beta_1 + \beta_2$ reflects the impact of forward guidance during the ZLB, and γ_1 captures the effect of LSAPs. Overall, the total impact of conventional policy is captured by $\alpha_1 + \beta_1$ and that of unconventional policy by $\beta_1 + \beta_2 + \gamma_1$.

4.3 Data

4.3.1 S&P500 Sector Futures We use intraday data in E-mini S&P500 Sector Select Futures which are traded around the clock via the electronic platform CME Globex. The data, first introduced in 1999, is based on the Global Industry Classification Standard (GICS) taxonomy consisting of 11 sector indices which we use in our analysis. Sector returns are computed by taking the log difference of average future prices 15 minutes before an FOMC

[13] Most major macroeconomic news are released at 9:30 am or 10 am ET. As pointed out by Hu et al. (2021), a number of these releases occurred during FOMC announcement days, suggesting that daily data may be unable to mitigate omitted variable issues.

[14] We conduct sensitivity analysis exploring a number of other time-frames and found that our results are robust with respect to the various interval specifications. Results are available upon request.

announcement and 1 hour and 45 minutes after the announcement. The data are obtained from the Chicago Mercantile Exchange (CME). We then compute excess returns by subtracting the 1-month Treasury rate from the intradaily returns.

Summary statistics during policy announcement days are provided in Table 2. As expected, there is considerable cross-sector heterogeneity in mean returns over the entire sample as well as pre- and post- ZLB. The sample means are positive for almost all sectors, suggesting that policy releases tend to lift stocks during announcement days, particularly during the ZLB.

4. 3. 2. Industry- and Firm-Specific Data We use a number of industry- and firm-specific characteristics to evaluate the interest rate and the credit channel of monetary policy transmission. The data are compiled from several sources. Firm-level data on debt to total capital and investments over total capital is obtained from Datastream. Other firm characteristics (such as size, book to market, PE, cash flow to net income) are obtained from Compustat. The database is constructed by aggregating individual firm financial and accounting data at the industry level based on the industry taxonomy provided by the Global Industry Classification Standards. Sector returns are then sorted into three groups (*high*, *medium* and *low*) according to their position in the cross-sectional distribution of each respective indicator at the start of each year.

Industry data A number of industry-specific variables are used to proxy for the conventional interest rate/cost of capital channel. Following Dedola and Lippi (2005) and Peersman and Smets (2005), we use **capital intensity** measured as the ratio of investments over total capital as one indicator for this channel. While capital intensive industries are more sensitive to interest rate changes, it is unclear whether this continues to remain the case when interest rates hit the zero-lower bound. Another measure – **durability** – is a bit harder to assess in our data because it is based on broad sectors (such as consumer discretionary) which include firms producing both durable and non-durable goods. To sidestep this issue, we regress sector returns on industrial production and rank industries based on their industrial production growth beta.[15]

In a similar fashion, we compute a third factor – **cyclicality** – ranking our industries

[15]We follow Boudoukh, Richardson and Whitelaw (1994) and Eijffinger, Mahieu and Raes (2017) and estimate the following regression: $r_t = \alpha + \beta IPG_t + \varepsilon_t$, where r_t is the intraday stock return and IPG_t is the industrial production growth rate. As a sensitivity check, we also estimate β by regressing growth rates of sectoral output (GDP-by-industry data obtained from the Bureau of Economic Analysis accounts) on industrial production growth. Our industry rankings remain unchanged regardless of the method used to obtain the durabilty betas. Results are available upon request.

based on their sensitivity to the Chicago Fed National Activity Index ($CFNAI$). Cyclical industries are expected to show a higher sensitivity to policy shocks because they are more vulnerable to the business cycle than industries which tend to be less cyclical.[16]

Firm-Specific data To analyze the role of the credit channel, we follow the literature and use several measures of financial constraints (Lamont, Polk and Saa-Requejo (2001); Kaplan and Zingales (1997)). First, we look at firm **size** measured by market capitalization. Small firms are expected to be more sensitive to policy announcements because they are generally younger, have less access to credit, face higher information asymmetries and are subject to tighter credit terms. Next, we rank firms based on **financial leverage**, measured as the ratio of debt to total capital and **cash flow**, measured as the ratio of cash flow to income. In both cases, the impact of policy announcements is not clear. High leverage may indicate a high indebtedness capacity of the firm i.e., its ability to attract funds at lower cost, but it may also be a sign of financial distress signalling a high probability of bankruptcy. Likewise, while high cash flows may signal the ability to rely on internal funds to carry out operations or expand investments, they also may suggest financial stress precisely because external funding is harder to come by.

Lastly, we consider two indicators for value/growth stocks: **book-to-market** and **earnings-to-price ratio**. Value firms, which are characterized by high-book-to-market and high earnings-to-price ratio, should be more vulnerable to adverse policy shocks since they are characterized by high cash flows relative to their market price and are generally more financially constrained as reflected by their low equity valuations (Kontonikas and Kostakis (2013)).

Table 3a provides summary statistics among the various firm-specific variables (aggregated at the industry level), pointing to a wide cross-section dispersion. Table 3b presents the correlation of the various measures of financial constraints and capital intensity. It bears noting that the correlation values are not high, indicating that firms which appear relatively financially constrained according to one measure, may not be so according to another measure.

To estimate interest rate and credit channel effects, we modify our benchmark model and carry out a panel estimation as follows:

$$r_{i,t} = \sum_{k=high,med,low} (\alpha_0^k + \alpha_1^k TS_t^k + \beta_1^k FG_t^k) + I_t^u \sum_{k=high,med,low} (\alpha_2^k + \beta_2^k FG_t^k + \gamma_1^k LSAP_t^k) + \varepsilon_{i.t} \quad (6)$$

[16] As in the case of durability, we estimate two sets of models: one where sector returns are regressed on $CFNAI$ and another based on regression of sectoral output growth on $CFNAI$. Both produce similar results. Results are available upon request.

Equation (6) is estimated with industry fixed effects to account for any permanent features at the industry level.[17] We use panel corrected standard errors (PCSE), which corrects for heteroskedasticity and assumes that errors are contemporaneously correlated across panels.[18]

5. Empirical Results

5.1 Sector Returns and Monetary Policy

We begin by documenting the cross-section impact of monetary policy decisions on various industry returns (equation 5). Results are summarized in Table 4. A pooled OLS estimation of all industry portfolio returns is also carried out to establish a baseline for the *average* response to policy shocks. As expected, our results indicate a wide amount of heterogeneity across industries both for the conventional and unconventional period.

Focusing first on the conventional period, a few results stand out. First, as documented by existing literature, we find that capital-intensive and cyclical industries are significantly more affected by policy decisions than other sectors.[19] The reaction of the top three most sensitive sectors – technology, telecommunications and consumer discretionary – is around one and a half times larger than the average stock response, whereas consumer staples, energy and utilities show the least sensitivity with an estimated response of roughly half of the average stock response. These results corroborate a large number of studies (e.g., Ehrmann and Fratzscher (2004), Bernanke and Gertler (2005)) and are consistent with the interest rate (cost of capital) channel.

Second, our methodology allows us to provide a more complete assessment of the impact of conventional policy shocks by considering both target rate and forward guidance surprises. This turns out to be an important extension: We find that while the least sensitive sectors – consumer staples, energy, and utilities – do not respond significantly to target rate surprises, their reaction to forward rate shocks is statistically significant and economically meaningful. This contradicts prior findings based solely on target rate surprises, indicating that single-factor analysis may have missed important interactions between policy announcements and industry returns.

Third, we find that for the vast majority of sectors, target rate shocks are more important

[17] We also include time fixed effects to control for any aggregate time-variant factors that may change over time.

[18] We also compute standard errors by allowing for clustering at the industry group level, and bootstrapped and clustered along both time and industry group level. Our results (available upon request) show that standard errors vary little across these various estimators.

[19] Unless otherwise indicated, the discussion here and elsewhere considers the total effect for each period, as captured by $\alpha_1 + \beta_1$ and $\beta_1 + \beta_2 + \gamma_1$ for the conventional and unconventional periods, respectively.

than forward guidance surprises. For the average response industries, the target rate impact is roughly twice as large as that of the forward guidance, while for industries with larger than average response it is around five to seven times larger. These findings indicate that during the conventional period, the immediate policy setting appears to have played a larger role on stock returns than the future path of policy rates, especially for capital-intensive and cyclical industries.

Our findings for the unconventional period paint a very different picture. The top most sensitive sectors are real estate, financial and consumer discretionary, whereas capital-intensive industries (technology and telecommunication) display an average response. Similar findings are also reported by Guerin and Leiva-Leon (2016) and Haitsma et al. (2016). These results lend some preliminary support for the credit channel (which we explore further below) as banks and real estate firms faced severe financial constraints following the housing market collapse at the onset of the financial crisis.

Importantly, we find that both forward guidance and LSAP shocks have a statistical and economic significant impact on all industry returns. For most industries, forward guidance surprises are by far the most important, generating a response roughly twice as large as LSAPs. This should not come as a surprise: As interest rates were stuck at zero, forward guidance assumed greater importance at the ZLB as an effective communication tool, subsuming the importance of target rate shocks. The relevance of forward guidance during the ZLB is also documented by Campbell et al. (2012) and Bundick and Smith (2020) who find that they have important implications for near-term economic outlook, which tends to be the primary driver of equity returns.

LSAP surprises are the most important drivers of financial and real estate sectors during the ZLB, which is expected given that these measures were adopted in large part to address deteriorating conditions in these sectors at the height of the financial crisis. As argued by Chodrow-Reich (2014), unconventional policy measures implemented in the winter of 2008-09 had a large beneficial effect on banks. Rodnyanski and Darmouni (2017) find that bank lending increased as a result of LSAP purchases, primarily during the first and the third round. The real estate sector also benefited greatly from asset purchases: Chakraborty et al. (2020) show that MBS purchases led to an increase in the share of mortgage origination of banks active in the MBS market, while Hancock and Passmore (2015) estimate that the reduction in MBS yields and mortgage rates due to LSAPs was larger than what can be accounted solely by changes in market expectations about future rates.

Our findings shed further light on the current debate about the effectiveness of unconventional monetary policy. While we find that most industries respond more strongly to

policy shocks during the ZLB relative to the conventional period lending support to the view that monetary policy has become more effective, this is not the case for all industries. Specifically, unconventional policy has a larger impact on seven industries, a similar effect in two industries (health care and industrials) and smaller effect in two industries (technology and telecommunications). These findings portray a nuanced picture on the effectiveness of monetary policy before and after ZLB and underscore the importance of accounting for the substantial heterogeneity observed in industry returns rather than relying on aggregate measures.

Lastly, our set up allows us to examine with some level of detail the source of heterogeneity induced by the various policy surprises. Our estimates indicate that this heterogeneity is driven primarily by target rate shocks in the conventional period and by LSAPs during the ZLB, with forward guidance surprises generating a more homogeneous response. To gain a deeper understanding of these effects, we next turn to the transmission channels of monetary policy.

5.2 The Interest Rate Channel

Empirical findings for the various measures related to the interest rate channel are summarized in Table 5, panel A. Our results indicate broad similarities in stock market responses when industries are ranked along the **capital intensity** and **durability** factors. Pre-ZLB, in line with other studies, we find that high capital intensive industries and those producing durable goods react more strongly to monetary shocks than other firms, consistent with the view of the conventional interest rate channel. Our estimates also reveal that the source of heterogeneity arising from the interest rate channel is driven entirely by target rate shocks.

However, the interest rate channel ceases to exist during the ZLB era. We find no discernible differences between high/low-ranked industries categorized on the basis of capital intensity or durability, casting doubt on the effectiveness of the interest rate channel during the unconventional period. This is largely driven by the heightened sensitivity to unconventional policy shocks of financials and real estate sectors, which are neither high-capital intensity nor durable-goods-producing. This point is further underscored by comparing pre- and post ZLB estimates (line 8; Table 5, panel A): While the response of high-capital intensive/high durability industries has remained roughly the same across both periods, the reaction of low-ranked industries is much higher during the unconventional era, wiping out the differential responses across the high/low categories.

In contrast to these findings, our results based on the **cyclicality** indicator provide support in favor of the interest rate channel during the ZLB. We find that highly cyclical

industries respond more strongly than non-cyclical industries to both conventional and unconventional shocks, and these differences are statistically significant. The spread between high/low industries is also roughly similar across both periods. In addition, our estimates indicate that both target rate and LSAP shocks generate large heterogeneous responses: the effect of target rate surprises on cyclical firms is around five times as large as non-cyclical firms while the impact of LSAPs is twice as large. This indicates that the interest rate channel – as captured by the cyclicality factor – operates through target rate shocks pre-ZLB and through LSAP surprises during the ZLB.

5.3 The Credit Channel

Our results for the credit channel are more consistent across periods and rankings. We find that the credit channel operates both during the conventional and unconventional era, becoming more effective during the ZLB. It is propagated primarily through target rate shocks before the ZLB and through both forward guidance and LSAP surprises in the unconventional period, though there are distinct differences across the credit channel indicators. Results are reported in Table 5, panel B.

Focusing first on **book-to-market** and **earnings-to-price** indicators, we find that monetary policy has a large heterogeneous impact on value and growth stocks (as measured by either ratio) across both conventional and unconventional periods. Value stocks are significantly more sensitive to policy announcements that growth stocks, especially during the unconventional period when the spread differential is nearly twice as large. Similar findings are also reported by Farka (2021) for the US equity market.[20] These findings suggest that the primary beneficiaries from the easing of financial conditions by unconventional monetary policy were financially constrained firms (such as value stocks). These results are broadly in line with Gilchrist and Zakrajsek (2013) who show that LSAPs substantially reduced default premiums and lowered borrowing costs, especially for financially constrained firms and Hattori et al. (2016) who find that unconventional policy played an important role in reducing tail risks and dampening investor risk aversion, benefiting primarily financially constrained firms.

Moving next to the **size** indicator, our estimates show that small firms react significantly more to policy shocks than large firms, but the mechanism that drives these results is different

[20] Maio (2014) and Kontonikas and Kostakis (2013) also document that value stocks (as captured by high book-to-market and high earnings-to-price ratio) are significantly more affected by policy shocks than growth portfolios during the conventional period. Our study extends these works in two dimensions: by expanding the sample to the ZLB era and by broadening the measure of conventional policy surprises to include forward guidance in addition to target rate shocks.

across the two periods. Before the ZLB, similar to Maio (2014) and Kontonikas and Kostakis (2013), we find that the impact of target rate shocks is the highest on medium-sized firms followed by small firms. Small and medium-sized firms are also more sensitive to forward guidance surprises than large firms. In contrast, during the unconventional period, our estimates reveal an asymmetric pattern, with LSAPs impacting large firms the most, while forward guidance surprises having their largest effect on small firms. Overall, small firms are significantly more sensitive to unconventional shocks than large firms but the spread differential is smaller (nearly half) compared to the earlier period.

These results conform with the literature on financial frictions and unconventional monetary policy. For example, while LSAPs are found to significantly reduce corporate bond spreads (e.g. Swanson (2021)) which are normally issued by larger and older firms, they did not have a meaningful impact on bank lending which is the main source of financing for smaller and younger firms (DiMaggio et al. (2016)).[21] In addition, Foley-Fisher et al. (2016) find that firms relying on longer-term debt (which tend to be larger and older) benefited the most from the Maturity Extension Program. In contrast, forward guidance has proven more successful than LSAPs at stimulating bank lending: As argued by Delis et al. (2022), bank loans spreads were substantially reduced as a result of forward guidance announcements, especially for riskier (smaller) firms.

Similar to a number of studies in the literature, we find that firms with low **cash flows** react more strongly to policy announcements than other firms. This finding is markedly more robust during the unconventional period when the spread differential between high/low cash flow firms is nearly twice as large as before the ZLB. These results partially corroborate those of Haitsma et al. (2016) for the European markets: they find no difference in responses of high/low cash flow firms pre-ZLB but a strong credit channel effect since the ZLB. We further expand these results by uncovering the source of the heterogeneity: as seen in Table 5, panel b, it is driven by target rate shocks before the ZLB and by forward guidance surprises during the ZLB. In contrast, LSAP shocks have a more homogeneous impact on firms sorted on the basis of cash flows.

Lastly, our estimates reveal a structural change in the role of **financial leverage** as a proxy for financial friction before and after the crisis. Prior to the ZLB, and similar to the

[21] Other studies offer additional evidence on the inability of LSAPs to stimulate bank lending. Chakraborty, Goldstein, and MacKinlay (2020) find that purchases of Treasuries had an insignificant effect on bank lending, while MBS purchases led to a decrease in commercial bank lending and an increase in mortgage originations. Chang and Song (2014) find that while LSAPs increased corporate financing, they did not stimulate bank lending. Ippolito, Ozdagli, and Perez (2018) show that the absence of a floating rate channel during the unconventional period significantly reduced the role of bank debt usage in the transmission of monetary policy during the ZLB, a phenomenon that affected primarily financially constrained firms which rely more extensively on bank loans.

findings of Ehrmann and Fratzscher (2005), our results show a non-linear pattern: firms with both high and low leverage are significantly more sensitive to policy announcements than those with intermediate debt levels. The largest effect is found for firms with low leverage, consistent with the view that low debt levels may signal financial distress as manifested by the inability to attract external funds. Similar findings are also reported by a number of studies focusing on financial frictions and corporate finance (e.g. Cloyne et al. (2018) and Ottonello and Winberry (2020)).

The opposite is true during the ZLB: We find that high-leverage firms are significantly more impacted by policy shocks during this period, indicating a shift in the transmission of monetary policy pre- and post-ZLB. Lakdawala and Moreland (2019) come to a similar conclusion. As seen in Table 3, our findings are not driven by the changing behavior of the leverage indicator across the two periods: average leverage increased only marginally since the crisis and the cross-sectional distribution is similar in the two samples. One possible explanation for this shift, as argued by Lakdawala and Moreland (2019) may have to do with the fact that high-leverage firms began relying disproportionately more on long-term debt since the crisis. At the same time, long-term debt issuance has become highly sensitive to policy news during the ZLB (Lakdawala and Moreland (2019)), which explains why highly leveraged firms have tended to react more strongly to unconventional shocks.

Our results are in line with a growing literature on the impact of unconventional policy on firms' financial structure. Jeenas (2019) shows that firms with higher leverage and lower liquid assets experience lower capital expenditure, inventories and sales growth after a monetary policy tightening. Likewise, Bianco and Herrera (2019) find that unconventional policy had a significantly larger impact on credit flows of financially constrained firms –small, young highly leveraged firms – than other firms. Anderson and Cesa-Bianchi (2020) show that a surprise policy tightening leads to a persistent increase in credit spreads for all firms but especially for highly leveraged firms.

Owing to the advantage of our methodological approach, we are able to identify the contribution of each policy instrument to the observed heterogeneity in responses. For the conventional period, we find that while forward guidance has a more homogeneous effect, target rate shocks impact low-leverage firms the most, followed by high-leverage firms. During the ZLB, both forward guidance and LSAPs drive the heterogeneous response. LSAPs tend to have somewhat larger distributional effects, likely reflecting the role of asset purchases in reducing long-term corporate bond yields, which in turn reduced the cost of long-term debt for highly leveraged firms.

Summing it all up, we find robust support for the presence of the credit channel during the

ZLB, which has become even more effective during this period compared to the conventional era. In contrast, we find weak evidence for the interest rate channel during the ZLB. Target rate shocks played a large role in the transmission of monetary policy through both the interest rate channel and credit channel prior to the ZLB, while forward guidance surprises had a more uniform and less heterogeneous impact. After the crisis, forward guidance and LSAP shocks were equally important in the propagation of monetary policy via the credit channel.

6. Sensitivity Analysis

We carry out a series of robustness checks. First we consider the role of important announcements which may potentially bias our results, such as: assessing the role of important unconventional announcements, separating the first round of asset purchases (LSAP-I) from the rest of unconventional announcements, and removing non-FOMC events. Second, we control for specific dates in the transition between the conventional and unconventional period. Third, we consider alternative measures of policy shocks by relying on identification through heteroskedasticity. Our results hold up quite well under these alternative specifications and the central message of this study – that the transmission of monetary policy during the ZLB is carried out primarily by the credit channel – remains essentially unchanged.

6.1 Important unconventional policy announcements

Some unconventional policy announcements, particularly those announcing a new program, an extension of an existing program, or a new direction of policy, have had an outsized impact on financial markets. One such example is the LSAP announcement of March 18, 2009 when the Fed unveiled its plan to buy massive amounts of Treasuries and mortgage backed securities.[22] A number of Chairman Bernanke's speeches were also quite influential as they tended to either hint at future asset purchases (August 31, 2012), acknowledged the ability and readiness of the Fed to "do more" to aid the recovery (August 26, 2011), or signalled the end of the quantitative easing program ("taper tantrum") (May 22, 2013). Some forward guidance announcements also appear to have had a larger impact on the market than others. For example, on August 9, 2011, the FOMC gave explicit forward guidance about the path of interest rates over the next few quarters; on December 17, 2014, March 18, 2015 and September 15, 2015, the FOMC surprised the market by signalling caution and "patience" in raising the funds rate; on October 28, 2015 the FOMC did not change the

[22] On that day, the Financial Times reported: "The Federal Reserve on Wednesday stunned investors by announcing plans to buy $300bn of US government debt, triggering a plunge in bond yields and the dollar".

federal funds rate but gave an unusually explicit guidance that a rate hike was imminent in the upcoming meeting.

We assess the robustness of our benchmark results by estimating our baseline models over a smaller subsample during the unconventional period based on key announcements listed in Appendix A and B. Overall, we find that our results are robust to this alternative specification as the credit channel continues to remain stronger during the ZLB compared to the previous period, while the interest rate channel is non-existent (except when stocks are ranked by cyclicality measure) (Table 6). As expected, the response of all stocks, regardless of ranking, is now higher with respect to both LSAP and forward guidance shocks compared to the baseline case. Importantly, the spread differential between firms that are financially constrained and those that are not remains virtually unchanged across the different measures of financial vulnerability. Standard errors are higher across the board suggesting that key unconventional announcements were generally released during times of high uncertainty and market turmoil.

6.2 Separating LSAP-1 announcements

The outsized effect of the credit channel during the ZLB may be driven in part by the severity of the financial crisis especially in the early stages as financial accelerator effects are generally more pronounced in times of market stress (Peersman and Smets (2005)). It is possible that the transmission mechanism of policy announcements at the start of the crisis may differ substantially from the way other unconventional releases propagated through the economy. Gagnon et al. (2011) find that the first five unconventional announcements, which make up the first round of LSAP program, accounted for 98% of the movement in Treasury yields. Glick and Leduc (2018) estimate that the effects of the LSAP-1 on the dollar were larger and significantly more persistent than other unconventional announcements.

We follow Glick and Leduc (2018) and examine the extend to which our results are driven by LSAP-1 announcements by separating the LSAP-1 period from other unconventional days with the use of dummy variables, as follows:

$$r_{i,t} = \sum_{k=high,med,low} (\alpha_0^k + \alpha_1^k TS_t^k + \beta_1^k FG_t^k) + \sum_{k=high,med,low} \sum_{j=1}^{2} I_{t,j}(\alpha_{2,j}^k + \beta_{2,j}^k FG_t^k + \gamma_{1,j}^k LSAP_t^k) + \varepsilon_{i.t} \tag{7}$$

where $\beta_{2,j}^k$ and $\gamma_{1,j}^k$ reflect the (additional) impact of forward guidance and of LSAP shocks during the LASP-1 phase ($j = 1$) and other announcements ($j = 2$).[23] Our results

[23] Results should be interpreted with care since only a handful of observations (a total of five announcements) make up the LSAP-1 subsample (Appendix A).

show that the first round of asset purchases does indeed have a larger impact on all portfolios irrespective of their ranking, indicating that LSAP-1 was instrumental in restoring financial stability (Table 7). Standard errors are also higher, as these policy announcements were released at the height of the financial crisis. But our estimates also show that other unconventional announcements, though more attenuated, had a significant impact on stock returns suggesting that additional rounds of LSAPs also played an important role in maintaining the normal functioning of the financial markets.

Importantly, our main finding – that the transmission of unconventional monetary policy is carried out primarily via the credit channel – is robust to this analysis. As in the baseline case, the interest rate channel is not operational during LSAP-1 or outside this period. In fact, even the earlier evidence in favor of the interest rate channel captured through the cyclicality measure appears to be entirely due to LSAP-1: the difference between highly cyclical industries and noncyclical ones is not statistically significant outside of this interval. In contrast, the response of financially constrained stocks to unconventional policy measures is significantly higher than unconstrained stocks during both LSAP-1 and other unconventional announcements for all measures of financial constraints, suggesting that the credit channel was in effect throughout the unconventional period and not only at its onset.

6.3 Excluding non-FOMC events

Our benchmark sample includes four intermeeting announcements during the conventional era and seven non-FOMC events during the unconventional period. These events may bias our results as they are normally released during periods of heightened uncertainty, tend to be larger in magnitude, and are likely to include a significant "signalling" component with regards to future economic activity or upcoming policy moves. For example, Fleming and Piazzesi (2005) and Farka and DaSilva (2011) find that the response of Treasury rates to target rate surprises during unscheduled intermeetings is more attenuated than in normal times, while Glick and Leduc (2018) report similar results for the dollar.

As another robustness exercise, we remove the unscheduled meetings and non-FOMC events from our sample. Results are summarized in Table 8. For the conventional period, we find that the removal of intermeetings implies a larger sensitivity to target rate shocks but a smaller reaction to forward guidance surprises. This is in line with the "signalling" explanation: Because intermeeting announcements contain important information about future economic developments or anticipated path of policy rates, their removal from the sample dampens the effect of forward guidance on stock returns.[24] For the unconventional

[24]Intermeeting moves have tended to reveal a weaker-than-expected future economic landscape. For exam-

period, removing the non-FOMC events results in smaller estimates for LSAP shocks in line with the argument that the market oftentimes became aware of important policy decisions by the Fed, particularly related to the LSAP program, not from scheduled FOMC releases but from a number of speeches and Congressional testimony by chairman Bernanke.[25]. Overall, the exclusion of non-FOMC events do not alter our baseline findings that the credit channel operates both during conventional and unconventional period while the interest rate channel is relevant only in the pre-ZLB era.

6.4 The transition period from conventional to unconventional era

As discussed in section 3.3, our ZLB period begins in November 2008 when the Fed first signalled its intention to commence asset purchases. However, the federal funds rate reached the effective lower bound only on December 16, 2008, which means that three announcements in our unconventional sample (November 15, 2008, December 1, 2008 and December 16, 2008) contained information about both conventional (target rate) and unconventional policy measures. It is possible that the outsized credit channel effect we estimate at the ZLB may reflect in part, the importance of conventional policy tools during those three dates. As a robustness check, we follow Glick and Leduc (2018) and continue to consider November 2008 as the start of the unconventional period, but use dummy variables to control for these three announcements.[26]

Results for this analysis are summarized in Table 9. We find that all three dates have a large and economically significant impact on most stock returns and in particular on financially constrained stocks, with November 25th and December 16th announcements lifting portfolio returns, and the December 1st announcement having a negative impact. This is in line with expectations: the market cheered the Fed's initial statement of LSAPs (November 25, 2008) and its commitment "to do whatever it takes" to battle deflation and get the

ple, the financial press characterized the intermeeting rate cut of January 3 2001 as follows: "...the statement led many economists to believe the Fed continues to be extremely worried about the risk of a recession and that the rate cuts were meant as an insurance policy against such a downturn" (CNNMoney). Likewise, the 50 basis point rate cut of April 18, 2001 was also in response to a weakening outlook: "Officials said they took the extraordinary step of cutting rates between regularly scheduled meetings yet again to combat weakness in corporate and consumer spending and investment" (WSJ).

[25] For example, in his Jackson Hole address on August 26, 2011, Bernanke promised "...the Fed will do all that it can to help restore high rates of growth and employment," prompting news articles to declare "stocks saw a Ben Bernanke-fueled rally Friday. It looks like they're open to doing QE3" (*CNNMoney*). Similarly, Bernanke's Congressional testimony on May 22, 2003 led to the first outburst of the taper-tantrum, when the chairman stated that "the FOMC will likely slow asset purchases later in 2013 if economy continues to improve". Bloomberg's headline on the news was: "U.S. 10-Year Yield Tops 2% as Bernanke Says Fed May Taper Buys."

[26] We also examine the robustness of our results by starting the unconventional period in January 2009 and find that our results are essentially unchanged.

economy "off the mat" (CNNMoney, December 16, 2008). Chairman's Bernanke's speech on December 1st had the opposite effect because on that day, the NBER declared that the US economy had entered a recession as far back as December 2007, which reinforced the chairman's downbeat assessment of the economy.

Despite the large impact of these three announcements, our baseline estimates are very similar to the benchmark results. The biggest change is observed for forward guidance shocks which have a more attenuated effect now compared to the baseline, largely because of the December 16 announcement. On that day, the Fed slashed interest rates to the lowest level on record and assured the markets that they would remain low "...for some time." Given the important forward-guidance implication of this announcement, it is no surprise that the impact of forwards guidance shocks is smaller once we control for this date. Nonetheless, our main finding – that the transmission of unconventional monetary policy was carried out via the credit channel — goes through even when controlling for these three announcements.

6.5 Identification through heteroskedasticity

The event-study approach used in this work is based on the idea that the lumpy manner in which policy announcements are released provides a source of identification for policy shocks (Gürkaynak and Wright (2013)). As discussed in section 4.2, this analysis assumes that, on announcement days, policy surprises are the only relevant news and other shocks are negligible, especially when high-frequency data are used. However, our intraday announcement window is arguably longer than what is commonly used in this type of event-studies to allow market participants time to fully digest the more complex FOMC statements released during the ZLB. With longer time frames, other shocks matter as well, which means our analysis may be contaminated by other news.

As an additional robustness test, we adopt a heteroskedasticity-based identification which is based on weaker assumptions than the event-study approach, requiring simply that the variance of policy shocks during announcement windows is higher compared to non-news time-frames (Rigobon and Sack (2004)). The one drawback from this approach is that we end up with a composite measure of policy shocks and cannot separately identify the specific effects of each policy tool (target surprises, forward guidance, or LSAPs).

We follow Wright (2012) and estimate a daily VAR specified in reduced form as:

$$(AL)Y_t = \mu + \eta_t \tag{8}$$

where Y_t is a $px1$ vector consisting of the federal funds rate (which measures monetary policy pre-ZLB), ten-year nominal Treasury zero-coupon yields (which measures monetary

policy during the ZLB as in Wright (2012)), and three portfolio returns (*high*, *medium*, *low*) constructed by averaging stock returns during FOMC and non-FOMC days ranked using our industry and firm-specific variables. η_t are reduced form shocks related to structural shocks as follows:

$$\eta_t = \sum_{i=1}^{p} \mathbf{R}_i \varepsilon_{i,t} \tag{9}$$

where $\varepsilon_{i,t}$ is the ith structural shock and $\mathbf{R}_i$ is a $px1$ vector. If monetary policy shock is ranked first (purely for notational convenience), then R_1 captures the contemporaneous effect of monetary policy shock on asset prices. As in Wright (2012), we assume that the sample can be partitioned in monetary days (M) and non-monetary days (NM), with the variance of the policy shock being σ^2_M during announcement days and σ^2_{NM} during all other days. All other shocks are identically distributed across all days. The main identifying assumption is $\sigma^2_M \neq \sigma^2_{NM}$. Let Σ_M and Σ_{NM} denote the variance-covariance matrix of reduced form errors and , then:

$$\Sigma_M - \Sigma_{NM} = R_1 R_1' \sigma^2_M - R_1 R_1' \sigma^2_{NM} = R_1 R_1' (\sigma^2_M - \sigma^2_{NM}) \tag{10}$$

From here, R_1 can be identified. The sample variance-covariance matrices of reduced form errors $\widehat{\Sigma}_M$ and $\widehat{\Sigma}_{NM}$ is computed by estimating a daily VAR over announcement dates and over non-announcements, separately for the conventional and unconventional period.[27] The identified monetary policy shock (ε_1) is normalized to have a unit standard deviation to facilitate comparisons with our earlier results.

Estimates are summarized in Table 10. We find that our baseline results go through with this alternative specification. Since this methodology is unable to separately identify the specific effect of each policy tool, we are left with a composite impact of policy shocks on stock returns. Overall, we find that the total effects are generally more attenuated now compared to the baseline results for both periods, suggesting that the use of single-factor models (federal funds rate pre-ZLB and 10-year Treasury yields during the ZLB) may not fully capture the interactions between equity markets and policy decisions. The biggest differences are found for cash flow and size indicators. We do not find a statistically significant difference between high/low ranked firms before the crisis when firms are ranked by the cash flow indicator. Similarly, the spread differential is not statistically significant

[27] We follow Wright (2012) and assume that $\sigma^2_M - \sigma^2_{NM} = 1$. As discussed in Wright (2012), R_1 is estimated by solving the minimum distance problem: $\widehat{R}_1 = \arg\min \left[vech(\widehat{\Sigma}_M - \widehat{\Sigma}_{NM}) - vech(R_1 R_1')' [\widehat{V}_{NM} + \widehat{V}_M]^{-1} [vech(\widehat{\Sigma}_M - \widehat{\Sigma}_{NM}) - vech(R_1 R_1') \right]$, where $\widehat{V}_{NM}$ and $\widehat{V}_M$ are the variance-covariance matrices of $vech(\widehat{\Sigma}_{NM})$ and $vech(\widehat{\Sigma}_M)$, respectively. A daily VAR(2) is estimated based on the Bayes Information Criterion for both conventional and unconventional periods. Standard errors are computed using the bias-adjusted bootstrap of Kilian (1998).

during the ZLB for firms ranked by size. Despite these differences, our results hold for all other indicators.

7. Conclusions

This study investigates the effectiveness of the interest rate channel and the credit channel before and after the ZLB. We use an event-study approach and rely on intraday changes in industry returns around policy announcements to estimate the response of the stock market to monetary policy surprises. We borrow from the literature and construct a number of industry-specific indicators (durability, capital intensity, cyclicality) and firm-specific indicators (size, book-to-market, earnings-to-price, cash flows and financial leverage) to capture the sensitivity of firms' demand to interest rates (interest rate channel) and firms' financial constraints (credit channel). Monetary policy surprises are identified by extracting the first three principle components from high-frequency Treasury yield changes around policy announcements as in Swanson (2021).

Our preliminary results on industry returns document a substantial degree of heterogeneity in the responses to monetary surprises before and during the ZLB but we also find a shift in the pattern of this heterogeneity. Before the financial crisis, the most sensitive sectors are technology, telecommunications and consumer discretionary, while after the crisis financials and real estate turn out to register the largest reaction to policy shocks. Also, while unconventional policy shocks generate larger responses than conventional surprises suggesting that monetary policy has become more effective during the ZLB, this is not true for all industries. We find that unconventional policy has a larger impact on seven industries, a similar effect in two industries, and smaller effect in two industries. Thus, determining the degree of effectiveness of monetary policy across the two periods requires a more granular approach based on disaggregated data which are better suited to capture the distributional effects of monetary policy.

We provide new evidence indicating that the transmission mechanism of monetary policy has shifted across the two periods. During the conventional era, monetary policy works through both the interest rate channel and the credit channel, with the interest rate channel having a slightly larger quantitative effect. In contrast, we find that the economic significance of some of the interest rate channel variables (durability, capital intensity) has disappeared during the ZLB. Another industry feature related to this channel – cyclicality – appears to be in effect during the ZLB with cyclical firms responding much stronger to policy shocks than non-cyclical firms, but this reaction dissipates outside of the first round of the LSAP program.

We find robust evidence for the presence of the credit channel during the ZLB, which has become even more effective during this period compared to the conventional era. Looking at various measures of financial constraints, we show that firms that are financially constrained (small market cap, high book-to-market, high earnings-to-price, low cash flow) respond significantly more to policy announcements especially during the ZLB than less constrained firms. A somewhat surprising result is that the role of financial leverage as an indicator of financial stress appears to have shifted across the two periods: We find that policy shocks have the largest effect on firms with low leverage during the conventional period and on high leverage firms during the ZLB. As in Lakdawala and Moreland (2021), we attribute this change to the increased reliance of high-leverage firms on long-term debt since the crisis and the increased sensitivity of long-term funding to unconventional policy shocks.

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Table 1
Monetary Policy Surprises Summary Statistics

		Full Sample	*Conventional*	*Unconventional*	*LSAP1*	*LSAP2*	*MEP*	*LSAP3*	*Taper Tantrum*	*Taper Hold*	*Exit*
Target Surprise	*Mean*	n/a	-0.233	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	St. Dev.		1.000								
	Max		1.381								
	Min		-4.758								
Forward Guidance	*Mean*	0.004	0.067	-0.087	-0.953	0.154	0.715	-0.084	0.453	-1.037	0.306
	St. Dev.	1.000	1.094	0.863	1.234	0.528	0.257	0.744	0.513		0.905
	Max	3.849	3.849	1.689	0.090	1.089	0.897	0.568	0.816		1.299
	Min	-2.514	-2.219	-2.514	-2.514	-0.110	0.534	-0.909	0.090		-0.471
LSAPs	*Mean*	n/a	n/a	-0.005	-1.474	0.551	-1.306	-0.300	1.292	-1.705	0.079
	St. Dev.			1.000	2.764	1.020	0.296	0.784	0.082		0.806
	Max			1.471	0.108	1.471	-0.365	0.659	1.351		1.009
	Min			-5.605	-5.605	-0.956	-1.515	-0.124	1.232		-0.425
No. Obs.		144	144	81	63	5	5	2	3	2	1	3

Notes: This table reports summary statistics for the various monetary policy surprises separated over various subsamples and policy dates. Positive values indicate monetary policy tightening. Monetary policy surprises are measured using intraday interest rates data 15 minutes before and 1 hour and 45 minutes after a policy announcement. Full sample period is from May 1999 – December 2015; the conventional period from May 1999 – October 2008 and unconventional period from November 2008 – December 2015. Target surprises are normalized to have a unit standard deviation over the conventional period; LSAP surprises over the unconventional period, while forward guidance shocks are normalized over the entire period. Statistics for the various phases of unconventional policy as well as taper-related and exit dates are computed for key announcement days as summarized in Appendix A.

Table 2
Sector Returns Summary Statistics

		Consumer Discretionary	*Consumer Staples*	*Energy*	*Financials*	*Health*	*Industrial*	*Materials*	*Real Estate*	*Technology*	*Telecom*	*Utilities*
Full Sample	*Mean*	0.098	0.027	0.064	0.093	0.097	0.144	0.135	0.176	0.115	0.125	0.055
	St. Dev	0.791	0.466	0.715	1.015	0.630	0.706	0.830	1.258	1.058	1.110	0.663
	Max	4.181	1.559	2.712	5.014	3.934	3.674	3.430	6.849	9.098	8.334	2.752
	Min	-1.732	-1.844	-3.322	-3.265	-2.354	-1.601	-2.352	-4.705	-2.778	-3.039	-3.386
Conventional	*Mean*	0.040	-0.024	0.030	0.024	0.064	0.095	0.093	-0.094	0.086	0.105	-0.015
	St. Dev	0.866	0.419	0.690	1.072	0.699	0.753	0.898	1.061	1.323	1.397	0.595
	Max	4.181	1.029	1.703	5.014	3.934	3.674	3.430	2.295	9.098	8.334	1.280
	Min	-1.732	-1.844	-3.322	-3.265	-2.354	-1.601	-2.352	-4.705	-2.778	-3.039	-3.386
Unconventional	*Mean*	0.173	0.093	0.107	0.183	0.140	0.206	0.190	0.388	0.151	0.160	0.145
	St. Dev	0.684	0.517	0.749	0.937	0.532	0.641	0.737	1.375	0.565	0.684	0.737
	Max	2.768	1.559	2.712	3.778	1.479	3.029	2.679	6.849	1.879	2.823	2.752
	Min	-1.648	-1.337	-2.202	-2.340	-1.161	-0.997	-1.397	-2.406	-1.394	-1.446	-1.236

Notes: This table shows summary statistics for industry excess returns. Intraday returns are computed around policy announcements by taking the log difference in average prices 15 minutes before and 1 hour and 45 minutes after announcements. Mean values are given in percent and standard errors in parenthesis. Full sample period is from May 1999 – December 2015; the conventional period from May 1999 – October 2008 and the unconventional period from November 2008 – December 2015.

Table 3a
Summary Statistics for Firm-Specific Variables

		Capital Intensity	*Market Capitalization*	*Financial Leverage*	*Cash Flow*	*Book-to-Market*	*Earnings to Price*
Full Sample	*Mean*	7.25	348,069.05	41.80	58.40	4.00	44.45
	St. Dev	1.66	95,387.64	4.57	32.51	1.64	13.42
	Max	10.85	573,225.91	46.30	117.51	7.27	75.78
	Min	4.54	207,092.68	26.36	-11.30	1.80	18.15
Conventional	*Mean*	7.86	368,821.19	38.87	59.28	4.65	45.70
	St. Dev	1.58	111,440.87	6.52	35.48	1.42	8.77
	Max	10.85	573,225.91	45.72	117.51	7.27	59.92
	Min	6.03	274,350.12	26.36	-11.30	2.71	33.22
Unconventional	*Mean*	6.38	318,423.1	43.56	57.15	3.08	42.66
	St. Dev	1.43	62,384.0	1.44	30.43	1.55	18.93
	Max	8.27	418,971.3	46.30	85.79	6.46	75.78
	Min	4.54	207,092.7	41.40	9.50	1.80	18.15

Table 3b
Cross-Correlations of Firm-Specific Variables

	Capital Intensity	*Market Capitalization*	*Financial Leverage*	*Cash Flow*	*Book/ Market*	*Earnings to Price*
Cap Intensity	1.000					
Market Cap	-0.025	1.000				
Fin Leverage	-0.045	-0.105	1.000			
Cash Flow	-0.019	-0.010	-0.142	1.000		
Book/Market	0.107	0.494	-0.127	-0.242	1.000	
Earnings/Price	-0.288	0.262	0.126	-0.046	0.611	1.000

Notes: This table shows summary statistics and cross-correlations for the various indicators for firm specific variables. Summary statistics are provided for the full period and separately for the conventional and unconventional period. Cross-correlations are measured over the entire sample. Full sample period is from May 1999 – December 2015; the conventional period from May 1999 – October 2008 and the unconventional period from November 2008 – December 2015.

Table 4
Monetary Policy Surprises and Industry Returns

	Cons Disc	*Cons Staples*	*Energy*	*Financials*	*Health*	*Industrials*	*Materials*	*Real Estate*	*Technology*	*Telecom*	*Utilities*	*All*
(1) TS (α_1)	**-0.52*****	**-0.07**	**-0.05**	**-0.38*****	**-0.27*****	**-0.45*****	**-0.39*****	**-0.33****	**-0.81*****	**-0.69*****	**0.03**	**-0.36*****
	(0.070)	(0.044)	(0.073)	(0.096)	(0.062)	(0.064)	(0.082)	(0.158)	(0.095)	(0.108)	(0.061)	(0.026)
(2) FG (β_1)	**-0.18*****	**-0.22*****	**-0.25*****	**-0.21****	**-0.15*****	**-0.18*****	**-0.18****	**-0.25****	**-0.11**	**-0.14**	**-0.29*****	**-0.20*****
	(0.064)	(0.041)	(0.067)	(0.088)	(0.057)	(0.059)	(0.075)	(0.134)	(0.087)	(0.107)	(0.056)	(0.024)
(3) I^U * FG (β_2)	**-0.37*****	**-0.18****	**-0.13**	**-0.28****	**-0.19****	**-0.28*****	**-0.36*****	**-0.32***	**-0.37*****	**-0.39*****	**-0.15**	**-0.28*****
	(0.093)	(0.072)	(0.099)	(0.135)	(0.081)	(0.083)	(0.112)	(0.190)	(0.133)	(0.148)	(0.099)	(0.041)
(4) I^U LSAP (γ_1)	**-0.38*****	**-0.23*****	**-0.27*****	**-0.69*****	**-0.16****	**-0.30*****	**-0.28*****	**-0.72*****	**-0.21***	**-0.21***	**-0.16****	**-0.33*****
	(0.080)	(0.051)	(0.084)	(0.110)	(0.071)	(0.073)	(0.093)	(0.139)	(0.108)	(0.122)	(0.070)	(0.029)
(5) $\beta_1 + \beta_2$	**-0.55*****	**-0.41*****	**-0.38*****	**-0.50*****	**-0.34*****	**-0.46*****	**-0.55*****	**-0.58*****	**-0.48*****	**-0.53*****	**-0.44*****	**-0.47*****
	(0.076)	(0.059)	(0.081)	(0.111)	(0.066)	(0.068)	(0.091)	(0.173)	(0.109)	(0.133)	(0.082)	(0.034)
(6) $\alpha_1 + \beta_1$	**-0.70*****	**-0.29*****	**-0.31*****	**-0.60*****	**-0.43*****	**-0.63*****	**-0.57*****	**-0.58*****	**-0.92*****	**-0.83*****	**-0.26*****	**-0.56*****
	(0.097)	(0.061)	(0.101)	(0.132)	(0.086)	(0.091)	(0.113)	(0.224)	(0.131)	(0.157)	(0.085)	(0.036)
(7) $\beta_1 + \beta_2 + \gamma_1$	**-0.94*****	**-0.64*****	**-0.65*****	**-1.19*****	**-0.50*****	**-0.76*****	**-0.83*****	**-1.30*****	**-0.69*****	**-0.75*****	**-0.60*****	**-0.80*****
	(0.109)	(0.078)	(0.114)	(0.154)	(0.095)	(0.098)	(0.129)	(0.221)	(0.152)	(0.166)	(0.108)	(0.044)
(8) Post/Pre ZLB	**-0.24*** (0. 122)	**-0.35***** (0.084)	**-0.34***** (0.128)	**-0.59***** (0.171)	**-0.08** (0.107)	**-0.13** (0.112)	**-0.26*** (0.144)	**-0.72**** (0.285)	**0.23** (0.169)	**0.08** (0.188)	**-0.34***** (0.116)	**-0.25***** (0.049)
Line 7/Line 6	1.3	2.2	2.1	2.0	1.2	1.2	1.5	2.2	0.7	0.9	2.3	1.4

Note: This table presents the response of industry excess returns to various policy surprises during the conventional and unconventional periods. Coefficients are in percentage points per standard deviation change in the monetary policy surprise. Sector returns are computed by taking the log difference of average future prices 15 min before and 1 hr and 45 min after a policy announcement. Policy surprises are identified by extracting the first three principle components from high-frequency Treasury yield changes 15 min before and 1 hr 45 min after a policy announcement. I_t^u is an indicator variable equal to 1 during the unconventional period, and 0 otherwise. TS corresponds to target surprises, FG reflects the forward guidance factor, and LSAP captures large-scale asset purchases. ZLB is the zero lower bound. Robust standard errors are in parentheses. Sample period is May 1999–December 2015.
*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

Table 5
Monetary Policy Surprises, Industry Characteristics and Firm Financial Constraints

Panel A: Interest Rate Channel

	Durability				***Capital Intensity***				***Cyclicality***			
	High	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*
(1) TS (α_1)	**-0.54*****	**-0.26*****	**-0.25*****	**-0.30*****	**-0.51*****	**-0.39*****	**-0.19*****	**-0.32*****	**-0.55*****	**-0.40*****	**-0.11****	**-0.44*****
	(0.042)	(0.045)	(0.048)	(0.064)	(0.042)	(0.045)	(0.048)	(0.064)	(0.044)	(0.041)	(0.048)	(0.065)
(2) FG (β_1)	**-0.16*****	**-0.23*****	**-0.20*****	**0.03**	**-0.20*****	**-0.21*****	**-0.22*****	**0.02**	**-0.19*****	**-0.19*****	**-0.22*****	**0.03**
	(0.038)	(0.041)	(0.044)	(0.058)	(0.040)	(0.039)	(0.044)	(0.060)	(0.039)	(0.039)	(0.044)	(0.059)
(3) I^U * FG (β_2)	**-0.35*****	**-0.25*****	**-0.22*****	**-0.13**	**-0.34*****	**-0.22*****	**-0.22*****	**-0.12**	**-0.34*****	**-0.29*****	**-0.17****	**-0.16**
	(0.067)	(0.069)	(0.078)	(0.103)	(0.069)	(0.068)	(0.078)	(0.104)	(0.067)	(0.067)	(0.077)	(0.102)
(4) I^U LSAP (γ_1)	**-0.23*****	**-0.34*****	**-0.39*****	**0.16****	**-0.29*****	**-0.29*****	**-0.38*****	**0.09**	**-0.48*****	**-0.27*****	**-0.20*****	**-0.28*****
	(0.048)	(0.048)	(0.055)	(0.073)	(0.048)	(0.048)	(0.055)	(0.073)	(0.047)	(0.047)	(0.054)	(0.072)
(5) $\beta_1 + \beta_2$	**-0.51*****	**-0.48*****	**-0.42*****	**-0.10**	**-0.55*****	**-0.43*****	**-0.45*****	**-0.10**	**-0.53*****	**-0.48*****	**-0.40*****	**-0.13**
	(0.056)	(0.056)	(0.064)	(0.085)	(0.056)	(0.056)	(0.064)	(0.085)	(0.055)	(0.055)	(0.063)	(0.084)
(6) $\alpha_1 + \beta_1$	**-0.71*****	**-0.49*****	**-0.45*****	**-0.26*****	**-0.72*****	**-0.61*****	**-0.42*****	**-0.30*****	**-0.74*****	**-0.58*****	**-0.33*****	**-0.41*****
	(0.058)	(0.062)	(0.067)	(0.088)	(0.060)	(0.060)	(0.067)	(0.090)	(0.061)	(0.058)	(0.066)	(0.090)
(7) $\beta_1 + \beta_2 + \gamma_1$	**-0.74*****	**-0.82*****	**-0.81*****	**0.06**	**-0.83*****	**-0.72*****	**-0.83*****	**-0.01**	**-1.01*****	**-0.75*****	**-0.60*****	**-0.41*****
	(0.073)	(0.073)	(0.085)	(0.112)	(0.073)	(0.073)	(0.085)	(0.112)	(0.072)	(0.072)	(0.084)	(0.111)
(8)Post/Pre ZLB	**-0.04**	**-0.33*****	**-0.36*****	**0.33****	**-0.12**	**-0.12**	**-0.41*****	**0.29****	**-0.26*****	**-0.16***	**-0.27****	**0.00**
	(0.093)	(0.096)	(0.108)	(0.142)	(0.095)	(0.095)	(0.108)	(0.144)	(0.095)	(0.093)	(0.106)	(0.142)

Panel B: Credit Channel

	Book-to-Market				***Earnings-to-Price***				***Size***			
	High	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*Low-High*
(1) TS (α_1)	**-0.52*****	**-0.39*****	**-0.30*****	**-0.22*****	**-0.51*****	**-0.35*****	**-0.27*****	**-0.24*****	**-0.24*****	**-0.52*****	**-0.46*****	**-0.22*****
	(0.042)	(0.041)	(0.052)	(0.067)	(0.045)	(0.042)	(0.049)	(0.066)	(0.042)	(0.041)	(0.052)	(0.067)
(2) FG (β_1)	**-0.19*****	**-0.22*****	**-0.15*****	**-0.04**	**-0.17*****	**-0.19*****	**-0.21*****	**0.04**	**-0.11*****	**-0.28*****	**-0.26*****	**-0.14****
	(0.039)	(0.038)	(0.046)	(0.060)	(0.041)	(0.039)	(0.044)	(0.060)	(0.039)	(0.038)	(0.046)	(0.060)
(3) I^U * FG (β_2)	**-0.35*****	**-0.15****	**-0.14***	**-0.21****	**-0.37*****	**-0.28*****	**-0.20****	**-0.16**	**-0.19*****	**-0.28*****	**-0.30*****	**-0.11**
	(0.067)	(0.067)	(0.078)	(0.103)	(0.069)	(0.068)	(0.078)	(0.105)	(0.067)	(0.067)	(0.078)	(0.103)
(4) I^U LSAP (γ_1)	**-0.46*****	**-0.34*****	**-0.24*****	**-0.23*****	**-0.44*****	**-0.35*****	**-0.19*****	**-0.24*****	**-0.42*****	**-0.27*****	**-0.37*****	**0.06**
	(0.047)	(0.047)	(0.055)	(0.072)	(0.048)	(0.048)	(0.055)	(0.073)	(0.047)	(0.047)	(0.055)	(0.072)
(5) $\beta_1 + \beta_2$	**-0.54*****	**-0.36*****	**-0.29*****	**-0.26*****	**-0.54*****	**-0.47*****	**-0.42*****	**-0.12**	**-0.30*****	**-0.57*****`	**-0.56*****	**-0.26*****
	(0.055)	(0.055)	(0.064)	(0.084)	(0.056)	(0.056)	(0.065)	(0.085)	(0.055)	(0.055)	(0.064)	(0.084)
(6) $\alpha_1 + \beta_1$	**-0.72*****	**-0.61*****	**-0.45*****	**-0.26*****	**-0.68*****	**-0.53*****	**-0.49*****	**-0.19****	**-0.36*****	**-0.81*****	**-0.72*****	**-0.36*****
	(0.058)	(0.057)	(0.072)	(0.092)	(0.063)	(0.058)	(0.067)	(0.092)	(0.058)	(0.057)	(0.072)	(0.092)
(7) $\beta_1 + \beta_2 + \gamma_1$	**-1.01*****	**-0.71*****	**-0.52*****	**-0.48*****	**-0.98*****	**-0.83*****	**-0.61*****	**-0.37*****	**-0.73*****	**-0.84*****	**-0.93*****	**-0.20***
	(0.073)	(0.073)	(0.084)	(0.111)	(0.074)	(0.074)	(0.085)	(0.113)	(0.073)	(0.073)	(0.084)	(0.111)
(8)Post/Pre ZLB	**-0.29*****	**-0.10**	**-0.07**	**-0.22**	**-0.30*****	**-0.29*****	**-0.12**	**-0.17**	**-0.37*****	**-0.03**	**-0.21***	**0.16**
	(0.093)	(0.093)	(0.110)	(0.144)	(0.097)	(0.094)	(0.108)	(0.136)	(0.093)	(0.093)	(0.110)	(0.144)

Panel B (cont'd): Credit Channel

	Cash Flows				***Financial Leverage***			
	High	*Medium*	*Low*	*Low-High*	*High*	*Medium*	*Low*	*High-Low**
(1) TS (α_1)	**-0.28*****	**-0.38*****	**-0.43*****	**-0.16****	**-0.35*****	**-0.15*****	**-0.61*****	**-0.25*****
	(0.042)	(0.045)	(0.049)	(0.065)	(0.041)	(0.044)	(0.048)	(0.063)
(2) FG (β_1)	**-0.17*****	**-0.20*****	**-0.19*****	**-0.02**	**-0.22*****	**-0.18*****	**-0.18*****	**0.04**
	(0.039)	(0.039)	(0.047)	(0.061)	(0.038)	(0.039)	(0.045)	(0.059)
(3) I^U * FG (β_2)	**-0.15****	**-0.20*****	**-0.38****	**-0.23****	**-0.32*****	**-0.22*****	**-0.19****	**-0.13**
	(0.068)	(0.068)	(0.080)	(0.105)	(0.067)	(0.068)	(0.078)	(0.103)
(4) I^ULSAP (γ_1)	**-0.25*****	**-0.30*****	**-0.36*****	**-0.11**	**-0.41*****	**-0.28*****	**-0.20*****	**-0.21*****
	(0.048)	(0.048)	(0.056)	(0.074)	(0.047)	(0.047)	(0.054)	(0.072)
(5) $\beta_1 + \beta_2$	**-0.33*****	**-0.40*****	**-0.58*****	**-0.25*****	**-0.54*****	**-0.40*****	**-0.38*****	**-0.09**
	(0.056)	(0.056)	(0.065)	(0.086)	(0.055)	(0.055)	(0.064)	(0.084)
(6) $\alpha_1 + \beta_1$	**-0.45*****	**-0.58*****	**-0.63*****	**-0.18****	**-0.57*****	**-0.33*****	**-0.79*****	**-0.21****
	(0.058)	(0.061)	(0.070)	(0.090)	(0.057)	(0.061)	(0.067)	(0.088)
(7) $\beta_1 + \beta_2 + \gamma_1$	**-0.58*****	**-0.70*****	**-0.94*****	**-0.36*****	**-0.95*****	**-0.67*****	**-0.57*****	**-0.38*****
	(0.074)	(0.074)	(0.085)	(0.113)	(0.072)	(0.072)	(0.084)	(0.111)
(8)Post/Pre ZLB	**-0.13**	**-0.12**	**-0.31*****	**-0.18**	**-0.38*****	**-0.35*****	**0.22****	**-0.60*****
	(0.094)	(0.096)	(0.110)	(0.125)	(0.092)	(0.095)	(0.107)	(0.142)

Note: This table presents the response of industry excess returns to policy surprises over the conventional and unconventional period. Excess returns are ranked by industry-specific and firm-specific indicators. The categorization is made according to the following specification: a ranking of "low" if it is in the bottom 33% of the indicator's distribution, "high" if it is in the top 33%, and "medium" otherwise. Panel A represents ranking according to the industry-specific variables (interest rate channel); Panel B represents ranking according to the firm-specific variables (credit channel). For the *financial leverage* variable, the spread is computed as *Low-High* for the conventional sample, and *High-Low* for the unconventional sample. Coefficients are in percentage points per standard deviation change in the monetary policy surprise. Sector returns are computed by taking the log difference of average future prices 15 min before and 1 hr and 45 min after a policy announcement. Policy surprises are identified by extracting the first three principle components from high-frequency Treasury yield changes 15 min before and 1 hr 45 min after a policy announcement. I_t^u is an indicator variable equal to 1 during the unconventional period, and 0 otherwise. TS corresponds to target surprises, FG reflects the forward guidance factor, and LSAP captures large-scale asset purchases. ZLB is the zero lower bound. Robust standard errors are in parentheses. Sample period is May 1999–December 2015.

*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

Table 6
Robustness: Important Unconventional Announcements

Panel A: Interest Rate Channel

	Durability				***Capital Intensity***				***Cyclicality***			
	High	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*
(1) TS (α_1)	**-0.54*****	**-0.26*****	**-0.25*****	**-0.30*****	**-0.51*****	**-0.39*****	**-0.19*****	**-0.32*****	**-0.55*****	**-0.40*****	**-0.11****	**-0.44*****
	(0.046)	(0.050)	(0.053)	(0.071)	(0.042)	(0.045)	(0.048)	(0.064)	(0.044)	(0.041)	(0.048)	(0.065)
(2) FG (β_1)	**-0.16*****	**-0.23*****	**-0.20*****	**0.03**	**-0.20*****	**-0.21*****	**-0.22*****	**0.02**	**-0.19*****	**-0.19*****	**-0.22*****	**0.03**
	(0.042)	(0.045)	(0.049)	(0.065)	(0.040)	(0.039)	(0.044)	(0.060)	(0.039)	(0.039)	(0.044)	(0.059)
(3) I^U * FG (β_2)	**-0.38*****	**-0.33*****	**-0.27*****	**-0.11**	**-0.37*****	**-0.24*****	**-0.27*****	**-0.11**	**-0.37*****	**-0.32*****	**-0.23****	**-0.13**
	(0.081)	(0.083)	(0.094)	(0.124)	(0.083)	(0.082)	(0.094)	(0.125)	(0.081)	(0.081)	(0.093)	(0.123)
(4) I^U LSAP (γ_1)	**-0.33*****	**-0.40*****	**-0.39*****	**0.06**	**-0.32*****	**-0.33*****	**-0.42*****	**0.10**	**-0.54*****	**-0.29*****	**-0.26*****	**-0.28*****
	(0.056)	(0.056)	(0.065)	(0.085)	(0.056)	(0.056)	(0.065)	(0.086)	(0.055)	(0.055)	(0.064)	(0.084)
(5) $\beta_1 + \beta_2$	**-0.54*****	**-0.56*****	**-0.47*****	**-0.07**	**-0.58*****	**-0.45*****	**-0.49*****	**-0.09**	**-0.56*****	**-0.51*****	**-0.46*****	**-0.10**
	(0.069)	(0.069)	(0.080)	(0.106)	(0.070)	(0.070)	(0.080)	(0.106)	(0.068)	(0.068)	(0.079)	(0.105)
(6) $\alpha_1 + \beta_1$	**-0.71*****	**-0.49*****	**-0.45*****	**-0.26*****	**-0.72*****	**-0.61*****	**-0.42*****	**-0.30*****	**-0.74*****	**-0.58*****	**-0.33*****	**-0.41*****
	(0.064)	(0.069)	(0.074)	(0.098)	(0.060)	(0.060)	(0.067)	(0.090)	(0.061)	(0.058)	(0.066)	(0.090)
(7) $\beta_1 + \beta_2 + \gamma_1$	**-0.88*****	**-0.96*****	**-0.86*****	**-0.01**	**-0.90*****	**-0.79*****	**-0.91*****	**0.01**	**-1.10*****	**-0.79*****	**-0.71*****	**-0.39****
	(0.088)	(0.088)	(0.101)	(0.134)	(0.088)	(0.088)	(0.101)	(0.134)	(0.087)	(0.087)	(0.100)	(0.132)
(8)Post/Pre ZLB	**-0.17**	**-0.47*****	**-0.42*****	**0.25**	**-0.18***	**-0.18***	**-0.49*****	**0.31***	**-0.35*****	**-0.21***	**-0.38*****	**0.02**
	(0.108)	(0.112)	(0.125)	(0.166)	(0.110)	(0.110)	(0.126)	(0.167)	(0.110)	(0.108)	(0.124)	(0.165)

Panel B: Credit Channel

	Book-to-Market				***Earnings-to-Price***				***Size***			
	High	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*Low-High*
(1) TS (α_1)	**-0.52*****	**-0.39*****	**-0.30*****	**-0.22*****	**-0.51*****	**-0.35*****	**-0.27*****	**-0.24*****	**-0.24*****	**-0.52*****	**-0.46*****	**-0.22*****
	(0.042)	(0.041)	(0.052)	(0.067)	(0.045)	(0.042)	(0.049)	(0.066)	(0.042)	(0.041)	(0.052)	(0.067)
(2) FG (β_1)	**-0.19*****	**-0.22*****	**-0.15*****	**-0.04**	**-0.17*****	**-0.19*****	**-0.21*****	**0.04**	**-0.11*****	**-0.28*****	**-0.26*****	**-0.14****
	(0.039)	(0.038)	(0.046)	(0.060)	(0.041)	(0.039)	(0.044)	(0.060)	(0.039)	(0.038)	(0.046)	(0.060)
(3) I^U * FG (β_2)	**-0.39*****	**-0.18****	**-0.20****	**-0.19**	**-0.39*****	**-0.24*****	**-0.26*****	**-0.13**	**-0.22*****	**-0.25*****	**-0.34*****	**-0.12**
	(0.081)	(0.081)	(0.094)	(0.124)	(0.083)	(0.082)	(0.095)	(0.126)	(0.081)	(0.081)	(0.094)	(0.124)
(4) I^U LSAP (γ_1)	**-0.56*****	**-0.36*****	**-0.25*****	**-0.30*****	**-0.51*****	**-0.40*****	**-0.23*****	**-0.28*****	**-0.44*****	**-0.30*****	**-0.40*****	**0.04**
	(0.055)	(0.055)	(0.064)	(0.085)	(0.056)	(0.056)	(0.065)	(0.086)	(0.055)	(0.055)	(0.064)	(0.085)
(5) $\beta_1 + \beta_2$	**-0.59*****	**-0.40*****	**-0.35*****	**-0.23****	**-0.56*****	**-0.43*****	**-0.48*****	**-0.09**	**-0.33*****	**-0.54*****	**-0.60*****	**-0.27****
	(0.069)	(0.069)	(0.079)	(0.105)	(0.070)	(0.070)	(0.081)	(0.107)	(0.069)	(0.069)	(0.079)	(0.105)
(6) $\alpha_1 + \beta_1$	**-0.72*****	**-0.61*****	**-0.45*****	**-0.26*****	**-0.68*****	**-0.53*****	**-0.49*****	**-0.19****	**-0.36*****	**-0.81*****	**-0.72*****	**-0.36*****
	(0.058)	(0.057)	(0.072)	(0.092)	(0.063)	(0.058)	(0.067)	(0.092)	(0.058)	(0.057)	(0.072)	(0.092)
(7) $\beta_1 + \beta_2 + \gamma_1$	**-1.14*****	**-0.76*****	**-0.60*****	**-0.54*****	**-1.07*****	**-0.83*****	**-0.71*****	**-0.37*****	**-0.77*****	**-0.84*****	**-1.00*****	**-0.23***
	(0.087)	(0.087)	(0.100)	(0.133)	(0.088)	(0.088)	(0.102)	(0.135)	(0.087)	(0.087)	(0.100)	(0.133)
(8)Post/Pre ZLB	**-0.43*****	**-0.16**	**-0.15**	**-0.28***	**-0.39*****	**-0.30*****	**-0.22***	**-0.17**	**-0.42*****	**-0.03**	**-0.28****	**0.14**
	(0.108)	(0.108)	(0.128)	(0.167)	(0.113)	(0.109)	(0.126)	(0.169)	(0.108)	(0.108)	(0.128)	(0.167)

Panel B (cont'd): Credit Channel

	Cash Flows				***Financial Leverage***			
	High	*Medium*	*Low*	*Low-High*	*High*	*Medium*	*Low*	*High-Low**
(1) TS (α_1)	**-0.28*****	**-0.38*****	**-0.43*****	**-0.16****	**-0.35*****	**-0.15*****	**-0.61*****	**-0.25*****
	(0.042)	(0.04)5	(0.049)	(0.065)	(0.041)	(0.044)	(0.048)	(0.063)
(2) FG (β_1)	**-0.17*****	**-0.20*****	**-0.19*****	**-0.02**	**-0.22*****	**-0.18*****	**-0.18*****	**0.04**
	(0.039)	(0.039)	(0.047)	(0.061)	(0.038)	(0.039)	(0.045)	(0.059)
(3) I^U * FG (β_2)	**-0.19****	**-0.24*****	**-0.35*****	**-0.16**	**-0.33*****	**-0.25*****	**-0.22****	**-0.11**
	(0.082)	(0.082)	(0.096)	(0.127)	(0.080)	(0.081)	(0.094)	(0.123)
(4) I^ULSAP (γ_1)	**-0.26*****	**-0.30*****	**-0.40*****	**-0.14**	**-0.44*****	**-0.30*****	**-0.24*****	**-0.20****
	(0.056)	(0.056)	(0.065)	(0.086)	(0.055)	(0.055)	(0.064)	(0.085)
(5) $\beta_1 + \beta_2$	**-0.38*****	**-0.44*****	**-0.55*****	**-0.18***	**-0.56*****	**-0.43*****	**-0.41*****	**-0.07**
	(0.070)	(0.070)	0.081)	(0.107)	(0.069)	(0.069)	(0.079)	(0.105)
(6) $\alpha_1 + \beta_1$	**-0.45*****	**-0.58*****	**-0.63*****	**-0.18****	**-0.57*****	**-0.33*****	**-0.79*****	**-0.21****
	(0.058)	(0.061)	(0.070)	(0.090)	(0.057)	(0.061)	(0.067)	(0.088)
(7) $\beta_1 + \beta_2 + \gamma_1$	**-0.64*****	**-0.74*****	**-0.96*****	**-0.31****	**-1.00*****	**-0.73*****	**-0.65*****	**-0.35*****
	(0.089)	(0.089)	(0.102)	(0.135)	(0.087)	(0.087)	(0.100)	(0.132)
(8)Post/Pre ZLB	**-0.18***	**-0.16**	**-0.32****	**-0.14**	**-0.42*****	**-0.41*****	**0.14**	**-0.57****
	(0.110)	(0.112)	(0.128)	(0.169)	(0.107)	(0.110)	(0.125)	(0.165)

Note: This table presents the response of industry excess returns to policy shocks when the set of unconventional policy days is confined over important announcements summarized in Appendices A and B. Excess returns are ranked by industry-specific and firm-specific indicators according to the following specification: a ranking of "low" if it is in the bottom 33% of the indicator's distribution, "high" if it is in the top 33%, and "medium" otherwise. Panel A represents ranking according to the industry-specific variables (interest rate channel); Panel B represents ranking according to the firm-specific variables (credit channel). For the *financial leverage* variable, the spread is computed as *Low-High* for the conventional sample, and *High-Low* for the unconventional sample. Coefficients are in percentage points per standard deviation change in the monetary policy surprise. Sector returns are computed by taking the log difference of average future prices 15 min before and 1 hr and 45 min after a policy announcement. Policy surprises are identified by extracting the first three principle components from high-frequency Treasury yield changes 15 min before and 1 hr 45 min after a policy announcement. I_t^u is an indicator variable equal to 1 during the unconventional period, and 0 otherwise. TS corresponds to target surprises, FG reflects the forward guidance factor, and LSAP captures large-scale asset purchases. ZLB is the zero lower bound. Robust standard errors are in parentheses. Sample period is May 1999–December 2015.
*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

Table 7
Robustness: Separating LSAP-1 Announcements

Panel A: Interest Rate Channel

	Durability				*Capital Intensity*				*Cyclicality*			
	High	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*
(1) TS (α_1)	**-0.54*****	**-0.26*****	**-0.25*****	**-0.30*****	**-0.51*****	**-0.39*****	**-0.19****	**-0.32*****	**-0.55*****	**-0.40*****	**-0.11*****	**-0.44*****
	(0.041)	(0.045)	(0.048)	(0.063)	(0.042)	(0.044)	(0.048)	(0.064)	(0.044)	(0.041)	(0.047)	(0.064)
(2) FG (β_1)	**-0.16*****	**-0.23*****	**-0.20*****	**0.03**	**-0.20*****	**-0.21*****	**-0.22*****	**0.02**	**-0.19*****	**-0.19*****	**-0.22*****	**0.03**
	(0.038)	(0.040)	(0.044)	(0.058)	(0.040)	(0.038)	(0.044)	(0.059)	(0.039)	(0.038)	(0.043)	(0.058)
(3) I^{LSAP1} * FG (β_{21})	**-0.47*****	**-0.32****	**-0.31****	**-0.16**	**-0.45*****	**-0.31****	**-0.29***	**-0.16**	**-0.51*****	**-0.38*****	**-0.25***	**-0.26**
	(0.126)	(0.127)	(0.152)	(0.214)	(0.127)	(0.126)	(0.152)	(0.215)	(0.124)	(0.124)	(0.149)	(0.210)
(4) I^{LSAP1} * LSAP (γ_{11})	**-0.30*****	**-0.38*****	**-0.48*****	**0.18**	**-0.32*****	**-0.33*****	**-0.44*****	**0.12**	**-0.52*****	**-0.33*****	**-0.24*****	**-0.28****
	(0.079)	(0.079)	(0.091)	(0.120)	(0.079)	(0.079)	(0.091)	(0.120)	(0.078)	(0.078)	(0.090)	(0.119)
(5) I^{Other} * FG (β_{22})	**-0.25*****	**-0.23*****	**-0.17****	**-0.07**	**-0.26*****	**-0.18****	**-0.17****	**-0.09**	**-0.24*****	**-0.26*****	**-0.14***	**-0.10**
	(0.073)	(0.074)	(0.084)	(0.112)	(0.074)	(0.073)	(0.085)	(0.112)	(0.073)	(0.072)	(0.083)	(0.110)
(6) I^{Other} * LSAP (γ_{12})	**-0.21*****	**-0.28*****	**-0.30*****	**0.10**	**-0.22*****	**-0.24*****	**-0.37*****	**0.14**	**-0.22*****	**-0.14****	**-0.17****	**-0.05**
	(0.071)	(0.071)	(0.082)	(0.108)	(0.071)	(0.071)	(0.082)	(0.108)	(0.070)	(0.070)	(0.081)	(0.107)
(7) $\alpha_1 + \beta_1$	**-0.71*****	**-0.49*****	**-0.45*****	**-0.26*****	**-0.72*****	**-0.61*****	**-0.42*****	**-0.30*****	**-0.74*****	**-0.58*****	**-0.33*****	**-0.41*****
	(0.057)	(0.062)	(0.066)	(0.088)	(0.059)	(0.060)	(0.066)	(0.089)	(0.060)	(0.057)	(0.065)	(0.089)
(8) $\beta_1 + \beta_{21} + \gamma_{11}$	**-0.94*****	**-0.93*****	**-0.98*****	**0.05**	**-0.98*****	**-0.86*****	**-0.96*****	**-0.02**	**-1.22*****	**-0.89*****	**-0.71*****	**-0.51*****
	(0.124)	(0.124)	(0.148)	(0.207)	(0.124)	(0.124)	(0.148)	(0.207)	(0.122)	(0.122)	(0.145)	(0.203)
(9) $\beta_1 + \beta_{22} + \gamma_{12}$	**-0.61*****	**-0.74*****	**-0.67*****	**0.06**	**-0.69*****	**-0.64*****	**-0.76*****	**0.07**	**-0.65*****	**-0.59*****	**-0.53*****	**-0.12**
	(0.105)	(0.105)	(0.121)	(0.160)	(0.105)	(0.105)	(0.121)	(0.160)	(0.103)	(0.103)	(0.119)	(0.157)

Panel B: Credit Channel

	Book-to-Market				*Earnings-to-Price*				*Size*			
	High	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*
(1) TS (α_1)	**-0.52*****	**-0.39*****	**-0.30*****	**-0.22*****	**-0.51*****	**-0.35*****	**-0.27*****	**-0.24*****	**-0.24*****	**-0.52*****	**-0.46*****	**-0.22*****
	(0.041)	(0.041)	(0.052)	(0.066)	(0.045)	(0.042)	(0.048)	(0.066)	(0.041)	(0.041)	(0.052)	(0.066)
(2) FG (β_1)	**-0.19*****	**-0.22*****	**-0.15*****	**-0.04**	**-0.17*****	**-0.19*****	**-0.21*****	**0.04**	**-0.11*****	**-0.28*****	**-0.26*****	**-0.14****
	(0.038)	(0.038)	(0.045)	(0.059)	(0.041)	(0.038)	(0.044)	(0.060)	(0.038)	(0.038)	(0.045)	(0.059)
(3) I^{LSAP1} * FG (β_{21})	**-0.53*****	**-0.31****	**-0.33****	**-0.20**	**-0.55*****	**-0.38*****	**-0.35****	**-0.19**	**-0.30****	**-0.47*****	**-0.50*****	**-0.20**
	(0.125)	(0.125)	(0.150)	(0.212)	(0.128)	(0.127)	(0.153)	(0.216)	(0.125)	(0.125)	(0.150)	(0.212)
(4) I^{LSAP1} * LSAP (γ_{11})	**-0.53*****	**-0.37*****	**-0.28*****	**-0.25****	**-0.58*****	**-0.33*****	**-0.24*****	**-0.34*****	**-0.45*****	**-0.33*****	**-0.47*****	**-0.02**
	(0.078)	(0.078)	(0.090)	(0.119)	(0.079)	(0.079)	(0.091)	(0.121)	(0.078)	(0.078)	(0.090)	(0.119)
(5) I^{Other} * FG (β_{22})	**-0.27*****	**-0.11**	**-0.10**	**-0.17**	**-0.29*****	**-0.18****	**-0.16***	**-0.13**	**-0.10**	**-0.16****	**-0.28*****	**-0.18**
	(0.073)	(0.072)	(0.085)	(0.112)	(0.075)	(0.074)	(0.085)	(0.113)	(0.073)	(0.072)	(0.085)	(0.112)
(6) I^{Other} * LSAP (γ_{12})	**-0.32*****	**-0.21*****	**-0.22*****	**-0.10**	**-0.28*****	**-0.17****	**-0.15***	**-0.13**	**-0.30*****	**-0.19*****	**-0.25*****	**0.06**
	(0.070)	(0.070)	(0.081)	(0.107)	(0.071)	(0.071)	(0.082)	(0.109)	(0.070)	(0.070)	(0.081)	(0.107)

(7) $\alpha_1 + \beta_1$	**-0.72*****	**-0.61*****	**-0.45*****	**-0.26*****	**-0.68*****	**-0.53*****	**-0.49*****	**-0.19****	**-0.36*****	**-0.81*****	**-0.72*****	**-0.36*****
	(0.057)	(0.057)	(0.071)	(0.092)	(0.062)	(0.058)	(0.067)	(0.091)	(0.057)	(0.057)	(0.071)	(0.092)
(8) $\beta_1 + \beta_{21} + \gamma_{11}$	**-1.26*****	**-0.90*****	**-0.77*****	**-0.49****	**-1.30*****	**-0.90*****	**-0.81*****	**-0.49****	**-0.87*****	**-1.08*****	**-1.23*****	**-0.36****
	(0.122)	(0.122)	(0.146)	(0.204)	(0.125)	(0.125)	(0.149)	(0.208)	(0.122)	(0.122)	(0.146)	(0.181)
(9) $\beta_1 + \beta_{22} + \gamma_{12}$	**-0.79*****	**-0.54*****	**-0.47*****	**-0.31****	**-0.75*****	**-0.54*****	**-0.53*****	**-0.22**	**-0.52*****	**-0.64*****	**-0.78*****	**-0.27***
	(0.104)	(0.104)	(0.120)	(0.158)	(0.105)	(0.105)	(0.122)	(0.161)	(0.104)	(0.104)	(0.120)	(0.158)

Panel B (Cont'd): Credit Channel

	Cash Flow				***Financial Leverage***			
	High	*Medium*	*Low*	*Low-High*	*High*	*Medium*	*Low*	*High-Low**
(1) TS (α_1)	**-0.28*****	**-0.38*****	**-0.43*****	**-0.16****	**-0.35*****	**-0.15*****	**-0.61*****	**-0.25*****
	(0.042)	(0.045)	(0.049)	(0.064)	(0.041)	(0.044)	(0.048)	(0.063)
(2) FG (β_1)	**-0.17*****	**-0.20*****	**-0.19*****	**-0.02**	**-0.22*****	**-0.18*****	**-0.18*****	**0.04**
	(0.038)	(0.039)	(0.047)	(0.061)	(0.038)	(0.039)	(0.045)	(0.058)
(3) I^{LSAP1} * FG (β_{21})	**-0.25****	**-0.29*****	**-0.49*****	**-0.23**	**-0.41*****	**-0.33*****	**-0.27***	**-0.14**
	(0.128)	(0.128)	(0.154)	(0.216)	(0.124)	(0.125)	(0.150)	(0.251)
(4) I^{LSAP1} * LSAP (γ_{11})	**-0.26*****	**-0.32*****	**-0.44*****	**0.18**	**-0.58*****	**-0.44*****	**-0.28*****	**-0.30****
	(0.079)	(0.079)	(0.092)	(0.121)	(0.078)	(0.078)	(0.090)	(0.119)
(5) I^{Other} * FG (β_{22})	**-0.11**	**-0.18****	**-0.28*****	**-0.17**	**-0.32*****	**-0.15****	**-0.18****	**-0.14**
	(0.074)	(0.074)	(0.086)	(0.114)	(0.072)	(0.073)	(0.084)	(0.111)
(6) I^{Other} * LSAP (γ_{12})	**-0.17****	**-0.19*****	**-0.29*****	**-0.12**	**-0.29*****	**-0.14****	**-0.16***	**-0.13**
	(0.071)	(0.071)	(0.082)	(0.109)	(0.070)	(0.070)	(0.081)	(0.107)
(7) $\alpha_1 + \beta_1$	**-0.45*****	**-0.58*****	**-0.63*****	**-0.18****	**-0.57*****	**-0.33*****	**-0.79*****	**-0.21****
	(0.058)	(0.061)	(0.069)	(0.090)	(0.057)	(0.060)	(0.067)	(0.088)
(8) $\beta_1 + \beta_{21} + \gamma_{11}$	**-0.69*****	**-0.81*****	**-1.12*****	**-0.44****	**-1.22*****	**-0.95*****	**-0.73*****	**-0.48****
	(0.125)	(0.125)	(0.150)	(0.209)	(0.122)	(0.122)	(0.146)	(0.239)
(9) $\beta_1 + \beta_{22} + \gamma_{12}$	**-0.46*****	**-0.57*****	**-0.77*****	**-0.31****	**-0.83*****	**-0.47*****	**-0.52*****	**-0.31****
	(0.105)	(0.105)	(0.122)	(0.153)	(0.103)	(0.103)	(0.119)	(0.152)

Note: This table presents the response of industry excess returns to policy shocks. The set of policy days during the unconventional period is segregated between the first round of large-scale asset purchases (LSAP1; captured by I^{LSAP1} dummy) and other phases of LSAPs (I^{Other}). Excess returns are ranked by industry-specific and firm-specific indicators according to the following specification: a ranking of "low" if it is in the bottom 33% of the indicator's distribution, "high" if it is in the top 33%, and "medium" otherwise. Panel A represents ranking according to the industry-specific variables (interest rate channel); Panel B represents ranking according to the firm-specific variables (credit channel). For the *financial leverage* variable, the spread is computed as *Low-High* for the conventional sample, and *High-Low* for the unconventional sample. Coefficients are in percentage points per standard deviation change in the monetary policy surprise. Sector returns are computed by taking the log difference of average future prices 15 min before and 1 hr and 45 min after a policy announcement. Policy surprises are identified by extracting the first three principle components from high-frequency Treasury yield changes 15 min before and 1 hr 45 min after a policy announcement. I_t^u is an indicator variable equal to 1 during the unconventional period, and 0 otherwise. TS corresponds to target surprises, FG reflects the forward guidance factor, and LSAP captures large-scale asset purchases. ZLB is the zero lower bound. Robust standard errors are in parentheses. Sample period is May 1999–December 2015. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

Table 8
Robustness: Excluding non-FOMC Events

Panel A: Interest Rate Channel

	Durability				***Capital Intensity***				***Cyclicality***			
	High	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*
(1) TS (α_1)	**-0.56*****	**-0.39*****	**-0.29*****	**-0.27*****	**-0.54*****	**-0.47*****	**-0.23*****	**-0.31*****	**-0.61*****	**-0.45*****	**-0.19*****	**-0.42*****
	(0.059)	(0.062)	(0.068)	(0.090)	(0.060)	(0.060)	(0.068)	(0.091)	(0.061)	(0.059)	(0.068)	(0.091)
(2) FG (β_1)	**-0.12*****	**-0.13*****	**-0.14*****	**0.01**	**-0.11*****	**-0.12*****	**-0.16*****	**0.05**	**-0.13*****	**-0.10*****	**-0.12*****	**-0.01**
	(0.030)	(0.032)	(0.035)	(0.047)	(0.032)	(0.031)	(0.035)	(0.048)	(0.031)	(0.031)	(0.035)	(0.047)
(3) I^U * FG (β_2)	**-0.37*****	**-0.28*****	**-0.27*****	**-0.10**	**-0.45*****	**-0.26*****	**-0.27*****	**-0.18****	**-0.36*****	**-0.26*****	**-0.21*****	**-0.15***
	(0.053)	(0.054)	(0.061)	(0.080)	(0.054)	(0.053)	(0.061)	(0.081)	(0.053)	(0.053)	(0.060)	(0.080)
(4) I^U LSAP (γ_1)	**-0.25*****	**-0.30*****	**-0.29*****	**0.04**	**-0.23*****	**-0.28*****	**-0.34*****	**0.11****	**-0.42*****	**-0.28*****	**-0.17*****	**-0.25*****
	(0.038)	(0.038)	(0.043)	(0.058)	(0.038)	(0.038)	(0.043)	(0.057)	(0.037)	(0.037)	(0.043)	(0.057)
(5) $\beta_1 + \beta_2$	**-0.49*****	**-0.41*****	**-0.41*****	**-0.09**	**-0.56*****	**-0.39*****	**-0.43*****	**-0.13****	**-0.50*****	**-0.36*****	**-0.33*****	**-0.16****
	(0.043)	(0.043)	(0.049)	(0.065)	(0.043)	(0.043)	(0.049)	(0.065)	(0.043)	(0.043)	(0.049)	(0.065)
(6) $\alpha_1 + \beta_1$	**-0.69*****	**-0.52*****	**-0.43*****	**-0.26*****	**-0.65*****	**-0.60*****	**-0.39*****	**-0.26****	**-0.75*****	**-0.55*****	**-0.31*****	**-0.43*****
	(0.062)	(0.065)	(0.071)	(0.094)	(0.063)	(0.063)	(0.071)	(0.095)	(0.064)	(0.062)	(0.071)	(0.095)
(7) $\beta_1 + \beta_2 + \gamma_1$	**-0.74*****	**-0.71*****	**-0.70****	**-0.04**	**-0.79*****	**-0.67*****	**-0.77*****	**-0.02**	**-0.92*****	**-0.65*****	**-0.50*****	**-0.42*****
	(0.058)	(0.058)	(0.067)	(0.089)	(0.058)	(0.058)	(0.067)	(0.089)	(0.058)	(0.058)	(0.067)	(0.088)
(8)Post/Pre ZLB	**-0.05**	**-0.19****	**-0.27*****	**0.21**	**-0.14**	**-0.07**	**-0.38*****	**0.24***	**-0.17****	**-0.10**	**-0.19***	**0.02**
	(0.085)	(0.087)	(0.098)	(0.129)	(0.086)	(0.086)	(0.098)	(0.130)	(0.086)	(0.085)	(0.097)	(0.130)

Panel B: Credit Channel

	Book-to-Market				***Earnings-to-Price***				***Size***			
	High	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*Low-High*
(1) TS (α_1)	**-0.58*****	**-0.47*****	**-0.33*****	**-0.25*****	**-0.53*****	**-0.42*****	**-0.32*****	**-0.21****	**-0.26*****	**-0.57*****	**-0.49*****	**-0.24*****
	(0.060)	(0.059)	(0.070)	(0.092)	(0.059)	(0.059)	(0.071)	(0.092)	(0.042)	(0.041)	(0.052)	(0.067)
(2) FG (β_1)	**-0.10*****	**-0.17*****	**-0.11*****	**0.00**	**-0.12*****	**-0.13*****	**-0.15*****	**0.02**	**-0.15*****	**-0.19*****	**-0.19*****	**-0.04**
	(0.032)	(0.030)	(0.035)	(0.048)	(0.031)	(0.030)	(0.036)	(0.048)	(0.039)	(0.038)	(0.046)	(0.060)
(3) I^U * FG (β_2)	**-0.37*****	**-0.18*****	**-0.21*****	**-0.16****	**-0.39*****	**-0.31*****	**-0.24*****	**-0.15***	**-0.21*****	**-0.34*****	**-0.38*****	**-0.17***
	(0.053)	(0.052)	(0.061)	(0.081)	(0.053)	(0.052)	(0.061)	(0.081)	(0.067)	(0.067)	(0.078)	(0.103)
(4) I^U LSAP (γ_1)	**-0.41*****	**-0.36*****	**-0.20*****	**-0.21*****	**-0.37*****	**-0.36*****	**-0.15*****	**-0.22*****	**-0.35*****	**-0.28*****	**-0.37*****	**-0.01**
	(0.037)	(0.037)	(0.043)	(0.057)	(0.037)	(0.037)	(0.043)	(0.057)	(0.047)	(0.047)	(0.055)	(0.072)
(5) $\beta_1 + \beta_2$	**-0.47*****	**-0.35*****	**-0.32*****	**-0.16****	**-0.51*****	**-0.44*****	**-0.39*****	**-0.13****	**-0.36*****	**-0.53*****	**-0.58*****	**-0.21****
	(0.043)	(0.043)	(0.049)	(0.065)	(0.043)	(0.043)	(0.049)	(0.065)	(0.055)	(0.055)	(0.064)	(0.084)
(6) $\alpha_1 + \beta_1$	**-0.68*****	**-0.64*****	**-0.44*****	**-0.25****	**-0.65*****	**-0.55*****	**-0.47*****	**-0.19***	**-0.41*****	**-0.76*****	**-0.69*****	**-0.28*****
	(0.063)	(0.061)	(0.074)	(0.097)	(0.062)	(0.062)	(0.075)	(0.097)	(0.058)	(0.057)	(0.072)	(0.092)
(7) $\beta_1 + \beta_2 + \gamma_1$	**-0.89*****	**-0.71*****	**-0.52*****	**-0.37*****	**-0.89*****	**-0.80*****	**-0.54*****	**-0.35*****	**-0.71*****	**-0.82*****	**-0.94*****	**-0.23****
	(0.058)	(0.058)	(0.067)	(0.088)	(0.058)	(0.058)	(0.067)	(0.088)	(0.073)	(0.073)	(0.084)	(0.111)
(8)Post/Pre ZLB	**-0.20***	**-0.07**	**-0.08**	**-0.12**	**-0.23*****	**-0.25**	**-0.07**	**-0.16**	**-0.31*****	**-0.05**	**-0.26****	**0.05**
	(0.086)	(0.084)	(0.100)	(0.131)	(0.085)	(0.084)	(0.100)	(0.131)	(0.093)	(0.093)	(0.110)	(0.144)

Panel B (cont'd): Credit Channel

	Cash Flows				***Financial Leverage***			
	High	*Medium*	*Low*	*Low-High*	*High*	*Medium*	*Low*	*High-Low**
(1) TS (α_1)	**-0.35*****	**-0.39*****	**-0.48*****	**-0.14**	**-0.34*****	**-0.20*****	**-0.58*****	**-0.24*****
	(0.060)	(0.061)	(0.071)	(0.093)	(0.059)	(0.061)	(0.069)	(0.090)
(2) FG (β_1)	**-0.10*****	**-0.15*****	**-0.16*****	**-0.06**	**-0.14*****	**-0.12*****	**-0.13*****	**0.01**
	(0.031)	(0.031)	(0.038	(0.049)	(0.030)	(0.031)	(0.036)	(0.047)
(3) I^U * FG (β_2)	**-0.21*****	**-0.22*****	**-0.39*****	**-0.18****	**-0.38*****	**-0.29*****	**-0.23*****	**-0.15***
	(0.053)	(0.053)	(0.062)	(0.082)	(0.052)	(0.053)	(0.061)	(0.080)
(4) I^ULSAP (γ_1)	**-0.22*****	**-0.29*****	**-0.33*****	**-0.11***	**-0.36*****	**-0.24*****	**-0.21*****	**-0.15*****
	(0.038)	(0.038)	(0.043)	(0.057)	(0.037)	(0.037)	(0.043)	(0.057)
(5) $\beta_1 + \beta_2$	**-0.31*****	**-0.38*****	**-0.56*****	**-0.24*****	**-0.52*****	**-0.41*****	**-0.36*****	**-0.14****
	(0.043)	(0.043)	(0.049)	(0.065)	(0.043)	(0.043)	(0.049)	(0.065)
(6) $\alpha_1 + \beta_1$	**-0.45*****	**-0.55*****	**-0.65*****	**-0.20****	**-0.48*****	**-0.33*****	**-0.71*****	**0.23****
	(0.062)	(0.064)	(0.075)	(0.097)	(0.061)	(0.064)	(0.072)	(0.094)
(7) $\beta_1 + \beta_2 + \gamma_1$	**-0.54*****	**-0.67*****	**-0.89*****	**-0.35*****	**-0.88*****	**-0.65*****	**-0.57*****	**-0.31*****
	(0.057)	(0.057)	(0.066)	(0.087)	(0.058)	(0.058)	(0.067)	(0.088)
(8)Post/Pre ZLB	**-0.09**	**-0.12**	**-0.24****	**-0.15**	**-0.40*****	**-0.33*****	**0.14**	**-0.54*****
	(0.085)	(0.086)	(0.099)	(0.131)	(0.084)	(0.086)	(0.098)	(0.129)

Note: This table presents the response of industry excess returns to policy shocks when unscheduled FOMC policy announcements (intermeetings, speeches, and congressional testimony) are removed from the full set of policy dates. Excess returns are ranked by industry-specific and firm-specific indicators according to the following specification: a ranking of "low" if it is in the bottom 33% of the indicator's distribution, "high" if it is in the top 33%, and "medium" otherwise. Panel A represents ranking according to the industry-specific variables (interest rate channel); Panel B represents ranking according to the firm-specific variables (credit channel). For the *financial leverage* variable, the spread is computed as *Low-High* for the conventional sample, and *High-Low* for the unconventional sample. Coefficients are in percentage points per standard deviation change in the monetary policy surprise. Sector returns are computed by taking the log difference of average future prices 15 min before and 1 hr and 45 min after a policy announcement. Policy surprises are identified by extracting the first three principle components from high-frequency Treasury yield changes 15 min before and 1 hr 45 min after a policy announcement. I_t^u is an indicator variable equal to 1 during the unconventional period, and 0 otherwise. TS corresponds to target surprises, FG reflects the forward guidance factor, and LSAP captures large-scale asset purchases. ZLB is the zero lower bound. Robust standard errors are in parentheses. Sample period is May 1999–December 2015. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

Table 9
Robustness: Controlling for Key Dates in the Transition Between Conventional and Unconventional Period

Panel A: Interest Rate Channel

	Durability				***Capital Intensity***				***Cyclicality***			
	High	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*
(1) TS (α_1)	**-0.54*****	**-0.26*****	**-0.25*****	**-0.30*****	**-0.51*****	**-0.39*****	**-0.19*****	**-0.32*****	**-0.55*****	**-0.40*****	**-0.11****	**-0.44*****
	(0.041)	(0.044)	(0.047)	(0.062)	(0.041)	(0.044)	(0.047)	(0.063)	(0.043)	(0.040)	(0.046)	(0.063)
(2) FG (β_1)	**-0.16*****	**-0.23*****	**-0.20*****	**0.03**	**-0.20*****	**-0.21*****	**-0.22*****	**0.02**	**-0.19*****	**-0.19*****	**-0.22*****	**0.03**
	(0.037)	(0.040)	(0.043)	(0.057)	(0.039)	(0.038)	(0.043)	(0.059)	(0.038)	(0.038)	(0.043)	(0.057)
(3) I^U * FG (β_2)	**-0.31*****	**-0.22*****	**-0.17*****	**-0.14**	**-0.26*****	**-0.20*****	**-0.18****	**-0.09**	**-0.30*****	**-0.27*****	**-0.14***	**-0.16**
	(0.069)	(0.071)	(0.080)	(0.106)	(0.071)	(0.070)	(0.080)	(0.107)	(0.069)	(0.069)	(0.079)	(0.105)
(4) I^U LSAP (γ_1)	**-0.22*****	**-0.31*****	**-0.38*****	**0.16****	**-0.25*****	**-0.32*****	**-0.38*****	**0.13***	**-0.47*****	**-0.27*****	**-0.18*****	**-0.29*****
	(0.047)	(0.047)	(0.054)	(0.071)	(0.047)	(0.047)	(0.054)	(0.072)	(0.046)	(0.046)	(0.053)	(0.070)
(5) $I^{11/25/2008}$	**0.54**	**1.91*****	**1.30*****	**-**	**1.88*****	**0.62***	**1.22*****	**-**	**2.41*****	**0.15**	**1.16*****	**-**
	(0.371)	(0.371)	(0.429)		(0.372)	(0.372)	(0.430)		(0.365)	(0.365)	(0.422)	
(6) $I^{12/1/2008}$	**-0.73***	**-1.26*****	**-1.38*****	**-**	**-1.02*****	**-0.91****	**-1.45*****	**-**	**-1.32*****	**-1.00*****	**-0.93****	**-**
	(0.371)	(0.371)	(0.429)		(0.372)	(0.372)	(0.430)		(0.365)	(0.365)	(0.422)	
(7) $I^{12/16/2008}$	**0.78****	**0.48**	**1.02****	**-**	**0.52**	**0.84****	**0.88****	**-**	**1.12*****	**0.85****	**0.08**	**-**
	(0.398)	(0.398)	(0.459)		(0.399)	(0.399)	(0.461)		(0.391)	(0.391)	(0.452)	
(8) $\beta_1 + \beta_2$	**-0.47*****	**-0.45*****	**-0.37*****	**-0.10**	**-0.47*****	**-0.41*****	**-0.40*****	**-0.07**	**-0.49*****	**-0.45*****	**-0.36*****	**-0.13**
	(0.059)	(0.059)	(0.068)	(0.089)	(0.059)	(0.059)	(0.068)	(0.090)	(0.058)	(0.058)	(0.066)	(0.088)
(9) $\alpha_1 + \beta_1$	**-0.71*****	**-0.49*****	**-0.45*****	**-0.26*****	**-0.72*****	**-0.61*****	**-0.42*****	**-0.30*****	**-0.74*****	**-0.58*****	**-0.33*****	**-0.41*****
	(0.056)	(0.061)	(0.065)	(0.086)	(0.059)	(0.059)	(0.065)	(0.088)	(0.059)	(0.056)	(0.064)	(0.087)
(10) $\beta_1 + \beta_2 + \gamma_1$	**-0.69*****	**-0.76*****	**-0.75*****	**0.06**	**-0.71*****	**-0.73*****	**-0.78*****	**0.07**	**-0.96*****	**-0.72*****	**-0.55*****	**-0.42*****
	(0.075)	(0.075)	(0.087)	(0.114)	(0.075)	(0.075)	(0.087)	(0.115)	(0.074)	(0.074)	(0.085)	(0.113)
Post/Pre ZLB	**0.01**	**-0.27*****	**-0.31*****	**0.32****	**0.00**	**-0.13**	**-0.36*****	**0.37****	**-0.22****	**-0.14**	**-0.21****	**-0.01**
	(0.094)	(0.097)	(0.108)	(0.143)	(0.095)	(0.096)	(0.109)	(0.145)	(0.095)	(0.093)	(0.107)	(0.142)

Table 9 Cont'd

Panel B: Credit Channel

	Book-to-Market				***Earnings-to-Price***				***Size***			
	High	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*Low-High*
(1) TS (α_1)	**-0.52*****	**-0.39*****	**-0.30*****	**-0.22*****	**-0.51*****	**-0.35*****	**-0.27*****	**-0.24*****	**-0.24*****	**-0.52*****	**-0.46*****	**-0.22*****
	(0.041)	(0.041)	(0.051)	(0.066)	(0.044)	(0.041)	(0.048)	(0.065)	(0.041)	(0.041)	(0.051)	(0.065)
(2) FG (β_1)	**-0.19*****	**-0.22*****	**-0.15*****	**-0.04**	**-0.17*****	**-0.19*****	**-0.21*****	**0.04**	**-0.11*****	**-0.28*****	**-0.26*****	**-0.14****
	(0.039)	(0.037)	(0.044)	(0.059)	(0.040)	(0.038)	(0.044)	(0.059)	(0.038)	(0.037)	(0.045)	(0.059)
(3) I^U * FG (β_2)	**-0.29*****	**-0.26*****	**-0.09**	**-0.20***	**-0.30*****	**-0.26*****	**-0.17****	**-0.13**	**-0.10**	**-0.15****	**-0.24*****	**-0.14**
	(0.070)	(0.069)	(0.080)	(0.107)	(0.071)	(0.070)	(0.081)	(0.108)	(0.069)	(0.069)	(0.080)	(0.106)
(4) I^U LSAP (γ_1)	**-0.43*****	**-0.33*****	**-0.22*****	**-0.21*****	**-0.43*****	**-0.32*****	**-0.22*****	**-0.20*****	**-0.39*****	**-0.28*****	**-0.35*****	**0.04**
	(0.047)	(0.047)	(0.054)	(0.071)	(0.047)	(0.047)	(0.055)	(0.072)	(0.046)	(0.046)	(0.053)	(0.071)
(5) $I^{11/25/2008}$	**3.47*****	**0.10**	**0.73****	-	**1.48*****	**1.38*****	**0.94****	-	**0.50**	**1.11*****	**2.42*****	-
	(0.427)	(0.370)	(0.365)		(0.433)	(0.375)	(0.375)		(0.367)	(0.367)	(0.424)	
(6) $I^{12/1/2008}$	**-1.47*****	**-1.02*****	**-0.90****	-	**-1.54*****	**-0.89****	**-0.98*****	-	**-0.70***	**-1.24*****	**-1.25*****	-
	(0.431)	(0.370)	(0.376)		(0.433)	(0.375)	(0.375)		(0.367)	(0.367)	(0.424)	
(7) $I^{12/16/2008}$	**1.23*****	**0.66***	**0.45**	-	**0.69**	**1.02****	**0.49**	-	**0.72***	**0.37**	**1.11****	-
	(0.458)	(0.396)	(0.396)		(0.464)	(0.402)	(0.402)		(0.394)	(0.394)	(0.455)	
(8) $\beta_1 + \beta_2$	**-0.49*****	**-0.48*****	**-0.24*****	**-0.25*****	**-0.47*****	**-0.44*****	**-0.39*****	**-0.09**	**-0.21*****	**-0.44*****	**-0.49*****	**-0.28*****
	(0.058)	(0.058)	(0.067)	(0.089)	(0.059)	(0.059)	(0.068)	(0.090)	(0.058)	(0.058)	(0.067)	(0.088)
(9) $\alpha_1 + \beta_1$	**-0.72*****	**-0.61*****	**-0.45*****	**-0.26*****	**-0.68*****	**-0.53*****	**-0.49*****	**-0.19****	**-0.36*****	**-0.81*****	**-0.72*****	**-0.36*****
	(0.058)	(0.056)	(0.069)	(0.091)	(0.062)	(0.057)	(0.066)	(0.090)	(0.057)	(0.056)	(0.070)	(0.090)
(10) $\beta_1 + \beta_2 + \gamma_1$	**-0.92*****	**-0.82*****	**-0.46*****	**-0.46*****	**-0.90*****	**-0.76*****	**-0.61*****	**-0.29****	**-0.60******	**-0.72*****	**-0.84*****	**-0.24****
	(0.075)	(0.075)	(0.086)	(0.114)	(0.076)	(0.076)	(0.087)	(0.116)	(0.074)	(0.074)	(0.086)	(0.113)
Post/Pre ZLB	**-0.20****	**-0.21****	**-0.01**	**-0.20**	**-0.22****	**-0.23****	**-0.12**	**-0.10**	**-0.25*****	**0.09**	**-0.12**	**0.13**
	(0.095)	(0.093)	(0.111)	(0.146)	(0.098)	(0.095)	(0.109)	(0.147)	(0.093)	(0.093)	(0.111)	(0.145)

Table 9 (Cont'd)

Panel B (cont'd): Credit Channel

	Cash Flows				*Financial Leverage*			
	High	*Medium*	*Low*	*Low-High*	*High*	*Medium*	*Low*	*High-Low**
(1) TS (α_1)	**-0.28*****	**-0.38*****	**-0.43*****	**-0.16****	**-0.35*****	**-0.15*****	**-0.61*****	**-0.25*****
	(0.041)	(0.044)	(0.048)	(0.063)	(0.040)	(0.043)	(0.047)	(0.062)
(2) FG (β_1)	**-0.17*****	**-0.20*****	**-0.19*****	**-0.02**	**-0.22*****	**-0.18*****	**-0.18*****	**0.04**
	(0.038)	(0.038)	(0.046)	(0.060)	(0.037)	(0.038)	(0.044)	(0.057)
(3) I^U * FG (β_2)	**-0.12***	**-0.18*****	**-0.28*****	**-0.16**	**-0.28*****	**-0.19*****	**-0.13***	**-0.14**
	(0.070)	(0.072)	(0.082)	(0.108)	(0.069)	(0.069)	(0.080)	(0.105)
(4) I^ULSAP(γ_1)	**-0.22*****	**-0.30*****	**-0.35*****	**-0.13***	**-0.40*****	**-0.30*****	**-0.18*****	**-0.22*****
	(0.047)	(0.047)	(0.054)	(0.072)	(0.046)	(0.046)	(0.053)	(0.071)
(5) $I^{11/25/2008}$	**0.00**	**1.90*****	**1.60*****	**-**	**2.28*****	**0.51**	**0.85****	
	(0.374)	(0.374)	(0.432)		(0.367)	(0.367)	(0.424)	
(6) $I^{12/1/2008}$	**-0.76****	**-0.93****	**-1.51*****	**-**	**-1.31*****	**-1.00*****	**-0.94****	
	(0.374)	(0.374)	(0.432)		(0.367)	(0.367)	(0.424)	
(7) $I^{12/16/2008}$	**0.57**	**0.69***	**0.91****	**-**	**0.89****	**0.52**	**0.82***	
	(0.401)	(0.401)	(0.463)		(0.393)	(0.393)	(0.454)	
(8) $\beta_1 + \beta_2$	**-0.30*****	**-0.38*****	**-0.47*****	**-0.18***	**-0.50*****	**-0.37*****	**-0.32*****	**-0.18****
	(0.059)	(0.059)	(0.068)	(0.090)	(0.058)	(0.058)	(0.067)	(0.088)
(9) $\alpha_1 + \beta_1$	**-0.45*****	**-0.58*****	**-0.63*****	**-0.18****	**-0.57*****	**-0.33*****	**-0.79*****	**-0.21****
	(0.057)	(0.060)	(0.069)	(0.089)	(0.056)	(0.059)	(0.066)	(0.086)
(10) $\beta_1 + \beta_2 + \gamma_1$	**-0.52*****	**-0.68*****	**-0.82*****	**-0.30*****	**-0.90*****	**-0.67*****	**-0.50*****	**-0.40*****
	(0.076)	(0.076)	(0.087)	(0.115)	(0.074)	(0.074)	(0.085)	(0.113)
Post/Pre ZLB	**-0.07**	**-0.10**	**-0.20***	**-0.13**	**-0.32*****	**-0.34*****	**0.29*****	**-0.62*****
	(0.095)	(0.096)	(0.111)	(0.146)	(0.093)	(0.095)	(0.108)	(0.142)

Note: This table presents the response of industry excess returns to policy shocks controlling for specific announcements during the transition from conventional to unconventional period. Dummy variables are used for the following dates: November 25, 2008, December 1, 2008 and December 16, 2008. Excess returns are ranked by industry-specific and firm-specific indicators according to the following specification: a ranking of "low" if it is in the bottom 33% of the indicator's distribution, "high" if it is in the top 33%, and "medium" otherwise. Panel A represents ranking according to the industry-specific variables (interest rate channel); Panel B represents ranking according to the firm-specific variables (credit channel). For the *financial leverage* variable, the spread is computed as *Low-High* for the conventional sample, and *High-Low* for the unconventional sample. Coefficients are in percentage points per standard deviation change in the monetary policy surprise. Sector returns are computed by taking the log difference of average future prices 15 min before and 1 hr and 45 min after a policy announcement. Policy surprises are identified by extracting the first three principle components from high-frequency Treasury yield changes 15 min before and 1 hr 45 min after a policy announcement. I_t^u is an indicator variable equal to 1 during the unconventional period, and 0 otherwise. TS corresponds to target surprises, FG reflects the forward guidance factor, and LSAP captures large-scale asset purchases. ZLB is the zero lower bound. Robust standard errors are in parentheses. Sample period is May 1999–December 2015. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

Table 10
Robustness: Identification Through Heteroskedasticity

Panel A: Interest Rate Channel

	Durability				***Capital Intensity***				***Cyclicality***			
	High	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*
(1) Conventional	**-0.65*****	**-0.45*****	**-0.38*****	**-0.28****	**-0.67*****	**-0.55*****	**-0.38*****	**-0.28****	**-0.68*****	**-0.51*****	**-0.28****	**-0.39****
	(0.116)	(0.122)	(0.128)	(0.140)	(0.115)	(0.120)	(0.127)	(0.142)	(0.129)	(0.137)	(0.143)	(0.175)
(2) Unconventional	**-0.67*****	**-0.74*****	**-0.72*****	**0.04**	**-0.76*****	**-0.67*****	**-0.78*****	**0.02**	**-0.96*****	**-0.72*****	**-0.54*****	**-0.42****
	(0.132)	(0.136)	(0.153)	(0.184)	(0.135)	(0.133)	(0.157)	(0.186)	(0.128)	(0.134)	(0.153)	(0.183)

Panel B: Credit Channel

	Book-to-Market				***Earnings-to-Price***				***Size***			
	High	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*High-Low*	*High*	*Medium*	*Low*	*Low-High*
(1) Conventional	**-0.61*****	**-0.53*****	**-0.33****	**-0.28***	**-0.73*****	**-0.44*****	**-0.45*****	**-0.28***	**-0.38*****	**-0.71*****	**-0.67*****	**-0.29***
	(0.122)	(0.126)	(0.144)	(0.164)	(0.121)	(0.124)	(0.145)	(0.166)	(0.121)	(0.116)	(0.144)	(0.162)
(2) Unconventional	**-0.92*****	**-0.74*****	**-0.47*****	**-0.45****	**-0.88*****	**-0.68*****	**-0.53*****	**-0.35***	**-0.60*****	**-0.75*****	**-0.88*****	**-0.28**
	(0.143)	(0.133)	(0.163)	(0.184)	(0.142)	(0.146)	(0.159)	(0.192)	(0.131)	(0.142)	(0.156)	(0.189)

Panel B (cont'd): Credit Channel

	Cash Flows				***Financial Leverage***			
	High	*Medium*	*Low*	*Low-High*	*High*	*Medium*	*Low*	*High-Low**
(1) Conventional	**-0.48*****	**-0.50*****	**-0.56*****	**-0.08**	**-0.50*****	**-0.20*****	**-0.77*****	**-0.26***
	(0.130)	(0.130)	(0.143)	(0.172)	(0.115)	(0.134)	(0.149)	(0.156)
(2) Unconventional	**-0.52*****	**-0.71*****	**-0.90*****	**-0.38****	**-0.82*****	**-0.53*****	**-0.51*****	**-0.31***
	(0.133)	(0.138)	(0.148)	(0.182)	(0.155)	(0.151)	(0.151)	(0.179)

Note: This table presents the instantaneous (initial) impulse response of industry excess returns to a one standard deviation policy surprise using identification through heteroskedasiticty as described in Section 6.5. Daily vector autoregressions (VARs) are estimated over announcement dates and over nonannouncements, separately for the conventional (May 1999–October 2008) and unconventional (November 2008–October 2015) periods. Excess returns are ranked by industry-specific and firm-specific indicators according to the following specification: a ranking of "low" if it is in the bottom 33% of the indicator's distribution, "high" if it is in the top 33%, and "medium" otherwise. Panel A represents ranking according to the industry-specific variables (interest rate channel); Panel B represents ranking according to the firm-specific variables (credit channel). For the *financial leverage* variable, the spread is computed as *Low-High* for the conventional sample, and *High-Low* for the unconventional sample. Bias-adjusted bootstrap standard errors are in parentheses.
*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

Appendix A

Major LSAP Announcements

Date	Time EST	Program	Announcement	Description	News Excerpts
11/25/2008	8:15am	LSAP-1	Initial Announcement of LSAP	Purchase up to $500 billion in MBS and $100 billion of agency debt	Stocks gained after the government said it was preparing to buy billions in bad mortgage debt.
12/1/2008	1:45pm	LSAP-1	Bernanke speech in Austin, Texas	Fed could purchase longer-term Treasury or agency securities in substantial quantities.	U.S. Treasury prices rose sharply, pushing yields to their lowest in five decades, as expectations built the Fed would become a large buyer.
12/16/2008	2:21 pm	LSAP-1	FOMC Statement	Evaluating the potential benefits of purchasing longer-term Treasury securities.	Stocks were rallying after the announcement on both the surprise element and the realization that the Fed is willing to do whatever it takes to battle deflation and get the economy "off the mat."
1/28/2009	2:15pm	LSAP-1	FOMC Statement	Ready to expand agency debt and MBS purchases and purchase longer-term Treasury securities	There was disappointment among some bond traders that the Fed did not announce specific plans Wednesday to buy Treasuries.
3/18/2009	2:17pm	LSAP-1	FOMC Statement	Purchase $750 billion of MBSs, increase purchases of agency debt by $100 billion; purchase up to $300 billion in long-term Treasuries.	Stocks rallied after the Federal Reserve said it would buy up to $300 billion in long-term government bonds.
8/10/2010	2:19pm	LSAP-2	FOMC Statement	Reinvest principal payments from MBS in longer-term Treasury securities.	The key take away is that Fed is keenly aware of the current economic situation and is both ready and willing to act aggressively
8/27/2010	10am	LSAP-2	Bernanke speech at Jackson Hole	Prepared to provide additional "unconventional measures"	The fact that Bernanke outlined some options about what the Fed could still do and is willing to do has helped an uptrend.
9/21/2010	2:18pm	LSAP-2	FOMC Statement	Maintain existing policy of reinvesting principal payments and is prepared to provide additional accommodation if needed	Investors looking for references to quantitative easing, cheered after Federal Reserve said it was "prepared to provide additional accommodation if needed to support the economic recovery."
10/15/2010	8:15am	LSAP-2	Bernanke Speech at Boston Fed	"there would appear...to be a case for further action."	Investors reacted positively to Fed chair Ben Bernanke's comments about the central bank's plans to pump more money into the economy.
11/3/2010	2:16pm	LSAP-2	FOMC Statement	Purchase $600 billion more in longer-term Treasury securities by Q2 2011	The real surprise was in the bond market, where yields on the longer term 10-year and 30-year rose, after traders realized the Fed's plan called for 91% of its purchases at shorter maturities than expected.

8/26/2011	10:00am		Bernanke speech at Jackson Hole	"The Fed will do all that it can to help restore high rates of growth and employment	Stocks saw a Ben Bernanke-fueled rally Friday. It looks like they're open to doing QE3, but they're going to wait for more data before taking action.
9/21/2011	2:24pm	MEP	FOMC Statement	Purchase $400 billion of long-term and sell an equal amount of short-term Treasury Securities	Stocks plunged after the Federal Reserve made Operation Twist a go. "Operation Twist was priced into the market, and investors needed a twist on the twist, something more.
6/20/2012	12:32pm	MEP	FOMC Statement	MEP extended until end 2012	The 10-year yield slid to 1.63% as traders signaled disappointment in Bernanke's comments.
8/31/2012	10:00am	LSAP3	Bernanke speech at Jackson Hole	"Provide additional policy accommodation as needed	The stock market initially ceded most of its gains but then bounced back on speculation that Bernanke may be building the case for more easing further down the road.
9/13/2012	12:31pm	LSAP3	FOMC Statement	Purchase additional agency MBS at a pace of $40 billion per month.	A rally on Wall Street gained momentum Thursday afternoon, sending stocks to fresh multi-year highs, as investors welcomed the Federal Reserve's new bond-buying plan.
12/12/2012	12:30pm	LSAP3	FOMC Statement	Purchase longer-term Treasury securities at a pace of $45 billion per month.	Stock prices jumped after the Fed released its policy statement
5/22/2013	12:30pm	Taper Tantrum	Bernanke Testimony	FOMC likely to slow asset purchases later in 2013 if economy continues to improve.	U.S. stocks slid Wednesday, reversing gains after comments from the Fed chief suggested the central bank may begin tapering its bond-buying program in coming months.
6/19/2013	12:30pm	Taper Tantrum	FOMC Statement	Bernanke (news conference): The Fed will start cutting back later this year and may stop entirely by the middle of 2014	Markets freaked out on the news. The Dow Jones industrial average closed down by more than 200 points, or 1.3%. The S&P 500 dropped 1.4% and the Nasdaq sank 1.1%.
9/18/2013	2:15pm	Taper Hold	FOMC Statement	Await more evidence that progress will be sustained before adjusting the pace of purchases.	Investors largely assumed that taper would begin this month, and have sent bond yields and mortgage rates soaring. But Wednesday's announcement caused stocks to rally as bond yields fell.
12/18/2013	2:00pm	Exit	FOMC Statement	Reduce monthly purchases of Treasuries and MBS to $35 billion and $40 billion.	The Dow Jones industrial average jumped more than 290 points after the Federal Reserve surprised some experts Wednesday by announcing a modest reduction, or tapering, in its bond buying program.
1/29/2014	2:0pm	Exit	FOMC Statement	Reduce monthly purchases of Treasuries and MBS to $30 billion and $35 billion.	Stocks sank more than 1% on Wednesday after the Federal Reserve announced plans to further reduce its monthly bond buying program.
3/19/2014	2:0pm	Exit	FOMC Statement	Reduce monthly purchases of Treasuries and MBS to $25 billion and $30 billion.	The Dow fell as many as 180 points before recovering after Yellen said the Fed's stimulus program would most likely be finished by the fall and that a rate hike could come as soon as early 2015.

Appendix B

Major Forward Guidance Announcements

12/16/2008	2:21 PM	FOMC Statement	exceptionally low rates… for some time	In its latest effort to try and stimulate the U.S. economy, the Federal Reserve said it expects to keep rates near that unprecedented low level for some time to come.
3/18/2009	2:17pm	FOMC Statement	exceptionally low rates… for an extended period	
8/9/2011	2:19pm	FOMC Statement	exceptionally low rates... at least through mid-2013.	The new two-year time horizon was an unusual move because the Fed doesn't typically signal its policies that far in advance
1/25/2012	12:28pm	FOMC Statement	exceptionally low rates... at least through late-2014	U.S. stocks shaved early losses and ended higher Wednesday afternoon after the Federal Reserve said it plans to keep interest rates near historic lows through late 2014.
9/13/2012	12:28pm	FOMC Statement	exceptionally low rates... at least through mid-2015	The Dow Jones Industrial Average, tacked on 206.51 points, or 1.5%, to 13539.86, its highest level since December 2007. With the Fed saying it planned to continue bond purchases and pledging to keep rates low until mid-2015, these trends could potentially play out for years to come.
12/12/2012	12:30pm	FOMC Statement	exceptionally low rates...at least as long as the unemployment rate remains above 6.5 percent	This was the first time the Fed has issued an exact target for the unemployment rate, and it marked the end of the Fed's calendar guidance, One economist called it an "historic move,"
12/18/2013	2:00pm	FOMC Statement	maintain current target range … well past the time that the unemployment rate declines below 6.5 percent	
3/19/2014	2:00pm	FOMC Statement	…dropped reference to unemployment rate	The Fed also said in its statement that was dropping its 6.5% unemployment threshold for hiking interest rates, instead saying that it will strive for maximum employment and 2% inflation before any rate change.
9/17/2014	2:00pm	FOMC Statement	maintain current target range ... for a considerable time after the asset purchase program ends,	Investors and economists had been debating whether the Fed would keep the "considerable time" language in its statement. If the Fed had dropped those two words, it could have been a signal from the central bank that it might look to hike interest rates in the spring of next year ... earlier than expected. Investors were pleased. They sent the Dow to a record level in the afternoon -- crossing 17,200 for the first time ever
10/29/2014	2:00pm	FOMC Statement	maintain current target rate for a considerable time following the end of asset purchase program. However, if incoming	Many economists found the statement more “hawkish,” easing off concerns about progress in the labor market. While the Fed did maintain its promise to keep rates low for a considerable

			information indicates faster progress ... then increases in the target range are likely to occur sooner than currently anticipated	time after this meeting, the rest of the statement sounds positive about the economy and thus reads more hawkishly from a market perspective.
12/17/2014	2:00pm	FOMC Statement	maintain current target rate...for a considerable time. Patient in beginning to normalize the stance of monetary policy.	The Federal Reserve is going to take its sweet time raising interest rates. And the market couldn't be happier.
1/28/2015	2:00pm	FOMC Statement	Patient in beginning to normalize the stance of monetary policy.	The Fed dropped the term "considerable time" it has been using to describe when it will start to hike rates. Stocks were up slightly ahead of the Fed announcement but lost those gains after the statement was released.
3/18/2015	2:00pm	FOMC Statement	an increase in the target range...unlikely at the April FOMC meeting.	The central bank reassured the market that a rate increase was "unlikely" at its next meeting in April. Stocks surged after the Fed's latest statement was released Wednesday afternoon.
6/17/2015	2:00pm	FOMC Statement/Press Conference	"No decision has been made about the right timing of an increase, but certainly an increase this year is possible," Janet Yellen , press conference	America's first interest rate hike in almost a decade could come on September 17 when the Fed holds its next meeting. It's being dubbed a "liftoff" moment, since interest rates are currently close to 0%.
9/17/2015	2:00pm	FOMC Statement/Press Conference	“we want to take a little bit more time to evaluate the likely rate hikes,” Janet Yellen press conference	The decision to leave rates unchanged, after months of discussion about raising them, reflected in part Ms. Yellen’s cautious nature as an individual and leader. Traders seemed unsure how to react to the news. Stocks zigzagged between big gains and modest losses on Thursday .
10/28/2015	2:00pm	FOMC Statement/Press Conference	consider raising interest rates… in the next meeting	The Fed opened the door more explicitly than they have before to raising rates at their final 2015 meeting.