Management Guidance and Monetary Policy Transmission in the Eurozone*

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Abstract

We study whether management guidance affects how stock prices respond to monetary policy shocks in the Eurozone. Using intraday data to measure European Central Bank's interest rate surprises, we show that issuing earnings guidance prior to the announcement attenuates the stock reaction for young firms by as much as 35 percent. This effect is stronger for firms with high information asymmetry and those that rely on external financing. The nature of the guidance —sentiment, precision, credibility, frequency, and disaggregation— all impact the relation between stock prices and monetary policy changes. Our findings are consistent with the hypothesis that monetary policy is especially important for high-information-asymmetry firms and that managerial guidance reduces the exposure to monetary shocks for such firms.

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Key words: Information asymmetry; management earnings guidance; monetary policy; European Central Bank.

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1. Introduction

Understanding the role of firm heterogeneity in monetary policy transmission is important for policymakers as it helps with monitoring and quantifying the effects of monetary policy on different economic agents within the economy. Consistent with this view, Janet Yellen, the former chair of the U.S. Federal Reserve Bank, called for more research on how different firms react to and anticipate monetary policy news (Yellen 2016). Despite the significance of the research topic and these recent calls from policymakers, much is unknown about how different firms react to or anticipate changes in monetary policy. This study analyzes whether firms can proactively manage the uncertainties associated with unexpected monetary policy changes. More specifically, we examine how management earnings guidance (or "forecasts")[1] issued in the months leading to the monetary policy announcements attenuates firm exposure, measured by stock price reaction, to policy changes by the European Central Bank (ECB).

Extant research shows that monetary policy impacts not only the real economy but also asset prices and stock returns (Chan et al., 1996; Rigobon and Sack, 2003). A seminal study by Bernanke and Kuttner (2005) asserts that "understanding the links between monetary policy and asset prices are thus crucially important for understanding the policy transmission mechanism." They use Federal funds futures data to construct a measure of "surprise" rate changes initiated by the U.S. Federal Reserve Bank ("The Fed") and find that the stock market experiences positive (negative) returns after surprise interest rate cuts (increases). Savor and Wilson (2013) demonstrate that stocks enjoy high returns on days when the Fed is scheduled to announce its monetary policy decisions, suggesting that investors demand a risk premium for exposure to monetary policy risk.[2]

[1] In this paper, we will use two terms "guidance" and "forecast" interchangeably, as noted by Hirst et al. (2008), those terms are synonymous.

[2] Brusa, Savor, and Wilson (2020) find that this announcement premium exists not only in the U.S. but also globally.

Previous studies also explore how cross-firm heterogeneity impacts monetary policy transmission. Perez-Quiros and Timmermann (2000) claim that small firms have higher stock price sensitivity to monetary policy changes due to their lower level of collateral. Firms subject to greater information frictions exhibit weaker market reaction and firms expecting cash flows farther in the future (i.e., those with longer equity durations) exhibit stronger market reaction to monetary policy surprises (Ozdagli, 2018). Armstrong, Glaeser, and Kepler (2019) document a negative relation between accounting quality and firm's responsiveness to monetary policy shocks, consistent with the balance sheet channel (Bernanke and Gertler 1989, 1995). Similarly, firms that borrow through floating rate bonds (Ippolito et al., 2018) and firms that have stickier product prices (Gorodnickenko and Weber, 2016) are more sensitive to monetary policy changes. Together, these findings are consistent with the hypothesis that heterogeneity across firms generated by past managerial choices affects their exposure to monetary policy.

We explore this issue further by analyzing whether firms can strategically respond to potential policy surprises. Our focus is on managerial earnings guidance and how its presence affects the response of equity prices to monetary policy shocks.[3] As in Armstrong et al. (2019), our theoretical motivation relies on the balance sheet channel of monetary policy transmission, which argues that higher interest rates reduce firm profitability and collateral valuation, making it more difficult to access external capital (Bernanke and Gertler, 1995). This effect is most pronounced for firms with high information asymmetry relative to outside investors.

Thus, firms characterized by poor information environments should be especially incentivized to issue management earnings guidance in the months leading to monetary policy

[3] Previous studies show that voluntary disclosure helps reduce stock volatility in general (see, e.g., Billings, Jennings, and Lev, 2015, and Rogers, Skinner, and Van Buskirk, 2009).

announcements, since this may reduce their exposure to unexpected interest rate changes.[4] To test this hypothesis, we concentrate on a set of young firms which are headquartered and incorporated in the Eurozone. We choose young firms because they have shorter reputational history, lower levels of public information, and consequently higher information asymmetry (Armstrong et al., 2019; Diamond, 1989; James and Wier, 1990; Krishnaswami et al., 1999; Lang, 1991; Lu et al., 2010; Pittman and Fortin, 2004; Sanders and Boivie, 2004). Similar to Pittman and Fortin (2004), we define young firms as those which are listed on Compustat Global for less than 10 years.

While most of the research on the role of firm heterogeneity in policy transmission studies how firms in the U.S. react to monetary policy surprises introduced by the Federal Reserve, we analyze the transmission of ECB policy changes for Eurozone firms. We measure monetary policy surprises using intraday changes in the one-month overnight indexed swap (OIS) rate around press releases that follow the ECB Governing Council's meetings, which typically occur once a month (see Altavilla et al., 2019). Using this intraday setting improves identification and better isolates the monetary surprises from potential confounding effects occurring on ECB announcement dates.[5]

To establish whether unexpected monetary policy changes affect asset prices in the euro area, we first estimate the impact of monetary policy surprises on an index of leading Eurozone blue-chip companies, STOXX 50, within the same 35-minute intraday window as the surprises. This stock market index reacts negatively to unexpected interest rate increases; on average, a

[4] A large literature in accounting argues that disclosures of any kind improve a firm's information environment. See, among others, Botosan and Plumlee (2002), Brown and Hillegeist (2007), Coller and Yohn (1997), Dhaliwal et al. (2011), Francis et al. (2008), Hail (2002), Lang and Lundholm (2000), and Leuz and Verrecchia (2000).

[5] To further improve identification, we implement the following steps. We first consider the potential self-selection problems that can arise when the managers choose to issue earnings guidance for reasons other than information dissemination to public. To reduce this bias, we follow the recent literature and estimate a multivariate matching technique called entropy balancing, which aims to achieve virtually identical covariate distributions between treated and control samples (Chapman et al., 2019; Chahine et al., 2020; McMullin and Schonberger, 2020). Using this specification does not alter our main inferences. Second, we use alternative measures of management guidance and show that our main results remain unchanged. Finally, we also perform a placebo test with different specifications. Overall, our results remain qualitatively unchanged.

one basis point increase in monetary surprises leads to a 6.28 basis point decrease in the STOXX 50. This result is consistent with the findings in prior literature for U.S. stocks (Chan et al., 1996; Rigobon and Sack, 2003; Bernanke and Kuttner, 2005), and shows that monetary policy surprises influence equity prices in the Eurozone.

Next, we test whether management earnings guidance attenuates the impact of monetary policy surprises. We follow recent studies (Guan et al. 2020; Li et al., 2019) and use Standard and Poor's Capital IQ to extract management earnings guidance for the firms located in the euro area. Consistent with our hypothesis, we find that young firms issuing management guidance during three months prior to ECB announcements exhibit up to 35% lower stock price sensitivity to interest rate shocks. This result is robust to the inclusion of a battery of firm-specific control variables and firm and announcement date fixed effects, and suggests that young firms can reduce the turbulence associated with monetary policy by proactively disclosing information in the form of managerial earnings guidance. The finding is also consistent with Nagar, Schoenfeld, and Wellman (2019), who argue that some managers tend to respond to greater economic uncertainty by increasing disclosure.

Prior studies (Bernanke and Gertler, 1995; Gertler and Gilchrist, 1994) provide evidence that monetary policy tightening and loosening have different effects on different parts of the economy. To tests for heterogeneous impact of monetary contractions versus expansions, we study whether the impact of management guidance in moderating the response to monetary surprises depends on the direction of the interest rate change. Our analysis finds that the effect of guidance is stronger in the subsample limited to unexpected interest rate increases, consistent with the hypothesis that management guidance helps cushion mainly the negative effects of monetary policy tightening.

We further examine how firm financial conditions influence the impact of managerial guidance. The value of guidance in moderating the effect of monetary policy surprises is greater

for firms with high information asymmetry (such as those with high earnings and cash flow volatility) and for firms that have high dependence on external financing (measured as in Duchin et al., 2010). This evidence provides further support for the balance sheet channel in monetary policy submissions, which predicts that both sets of firms should be more exposed to interest rate changes.

In addition, to better tease out which aspects of managerial guidance are important in mitigating the reaction to monetary policy news, we conduct several subsample analyses related to the nature of guidance. First, we examine the effect of forecast credibility. Using a textual analysis algorithm combined with manual verification, we extract forecast numbers from the guidance text provided by Capital IQ. We then compute forecast errors to classify earnings forecast into two groups, high- and low-credibility forecasts, and find that high-credibility guidance has a stronger effect on monetary transmission than low-credibility guidance. Second, we focus on guidance sentiment to test for asymmetric effects.[6] We classify guidance as good or bad news by applying a textual analysis technique (Loughran and McDonald, 2011), and show that the moderating effect of guidance is statistically significant only for good news. Third, we compare guidance expressed in strong modal words to the guidance expressed in weak modal words. As strong and weak modal words measure the different levels of confidence (Loughran and McDonald, 2011), we expect that strong modal guidance has greater impact on monetary policy transmission, and find support for this hypothesis in the data. We also examine other forecast properties, including precision, disaggregation, and frequency. Among other results, we document that point forecasts are more important than range and qualitative forecasts in moderating the effect of monetary surprises.[7]

[6] Prior studies (e.g., Hirst, Koonce and Venkataraman, 2008; Choi, Myers, Zang and Ziebart, 2010) report that "good news" guidance is more precise than "bad news" guidance.

[7] Hughes and Pae (2004) explain that point forecasts are more precise than range and qualitative forecasts, implying that managers are more certain about their forecasts

Our paper contributes to the literature on monetary policy transmission by showing evidence consistent with the operation of the balance sheet channel in the euro area. Recent studies explore the role of firm characteristics in explaining differences in reactions to monetary policy surprises in the U.S. (see Armstrong et al., 2019, and Ozdagli, 2018). To the best of our knowledge, this paper is the first to examine the heterogeneous effects of monetary policy transmission in the euro area. Our study responds directly to Janet L. Yellen's call for more research in understanding the role of firm heterogeneity in explaining the influence of monetary policy on the economy. The findings are also relevant to the recent discussion in Gallo and Kothari (2019), who encourage exploration of whether and how firms anticipate and respond to monetary policy surprises. Overall, our study provides robust evidence that for young firms, for which information asymmetry is likely a greater issue, voluntary disclosures in the form of management earnings guidance help reduce exposure to monetary policy shocks.

2. Related literature and hypotheses development

2.1. Monetary policy and the balance sheet channel

The ECB uses two types of operations to implement its (conventional) monetary policy decisions: open market operations and standing facilities, with the former being the most important. Open market operations are conducted through the purchase and sale of securities in the open market to reach a target rate (ECB 2011), which is set periodically on pre-scheduled announcement dates.

ECB changed the frequency of its monetary policy meetings over time. At its inception in 1999, the ECB governing council took policy decisions twice a month. After November 2001, the ECB held one policy meeting per month (12 meetings per year) and then moved to a six-week cycle (8 meetings per year) starting in January 2015. On the day of a policy meeting, different from the Federal Open Market Committee (FOMC) press release in the U.S., the ECB policy decision is announced in two separate steps. First, at 13:45 Central European Time

(CET) a brief press release provides the policy decision without any explanations and rationales. This is followed by a press conference at 14:30 CET, where the ECB President explains the decision and announces other non-standard measures (Altavilla et al. 2019). The press release is only related to the decision on policy rates while the press conference is related to other measures, including timing, forward guidance, and/or quantitative easing. Our focus is on the surprises concerning policy rates announced through the press release.

Prior studies report that monetary policy affects financial markets and financial performance of firms through several mechanisms. Bernanke and Gertler (1995) propose the credit channel of monetary policy transmission, which is based on the information asymmetry between borrowers and lenders. There are two components of the credit channel: the bank lending channel and the balance sheet channel. The bank lending channel explains that monetary policy affects the supply of funds available to banks and consequently the amount of loans they can make. A decrease in the quantity of loans can dampen the economic activity of firms that rely on bank financing, making them more financially constrained.

The balance sheet channel, on the other hand, is based on the assumption that the external finance premium for a borrower depends on its financial position. Interest rate increases affect a borrower's financial position both directly and indirectly. Directly, higher interest rates weaken borrowers' income statement by increasing their interest expense and decreasing their revenues as the overall economy slows. Indirectly, higher interest rates also weaken borrowers' balance sheet by reducing the firms' net worth since their cash flows are discounted at a higher rate. Consequently, this reduction in firms' net income and asset collateral values exacerbates adverse selection and moral hazard arising from information asymmetry with lenders, and leads to an increase in external finance premium (Bernanke and Gertler 1995). The affected firms face difficulties in raising external capital and forgo profitable investment projects if they do not have enough internal financing (Armstrong et al. 2019). In the next round, borrowers'

financial position is further weakened and external financial premium increases further. That is an endogenous and recursive process, which amplifies the effect of monetary policy. Overall, the balance sheet channel argues that firms with higher levels of information asymmetry are more sensitive to monetary policy than firms with lower levels of information asymmetry. In other words, the level of information asymmetry can explain the heterogeneity in stock market responses to monetary surprises.

2.2. Young firms and information asymmetry

Previous studies suggest that young firms have higher levels of information asymmetry between borrowers and lenders than old firms. Much of this information asymmetry arises due to reputational concerns. For instance, Diamond (1989) argues that young firms initially have short credit histories and are more likely to select risky projects. Over time, young firms can benefit from building a good reputation. Consistent with this, Pittman and Fortin (2004) assert that by choosing one of the six large accounting firms as their auditor, young firms can reduce their cost of debt. This effect, however, decreases as the firm matures, implying that information asymmetry between borrowers and lenders decreases with firm age. Sanders and Boivie (2004) examine the valuation of young firms in emerging markets and demonstrate that young firms have significant information asymmetry and valuation uncertainty. This uncertainty decreases as the firm matures. Furthermore, Lu et al. (2010), Krishnaswami et al., (1999), and James and Wier (1990) directly use firm age as a proxy for information asymmetry. More recently, Armstrong et al. (2019) claim that accounting quality plays a more vital role in moderating monetary shocks in young firms than old firms, suggesting that young firms are more exposed to monetary shocks as a result of higher information asymmetry.

Following these prior papers, we expect that young firms with higher levels of information asymmetry are more sensitive to monetary policy surprises. The influence of management guidance in reducing information asymmetry and moderating monetary surprises should thus

be more pronounced for young firms. Following Pittman and Fortin (2004), we define young firms as those that are less than 10 years old as of the policy announcement date.

2.3. Management earnings guidance and information asymmetry

Prior literature studying the influence of voluntary disclosures indicates that firms disclosing information voluntarily improve their information environment, leading to lower cost of capital (Balakrishnan et al. 2014; Botosan and Plumlee 2002; Brown and Hillegeist 2007; Choi et al. 2019; Dhaliwal et al. 2011; Francis et al. 2008; Hail 2002; Lang and Lundholm 2000; Leuz and Verrecchia 2000; Rogers et al. 2009). Among voluntary disclosures, management guidance is particularly useful in reducing information asymmetries between lenders and borrowers. For instance, Coller and Yohn (1997) directly examine the influence of management forecasts on bid-ask spreads as a proxy for information asymmetry. They document that when managers issue guidance on key financial indicators, there is a reduction in the bid-ask spread. Consistent with this, we predict that management guidance helps reduce information asymmetry and moderate the effect of monetary surprises on young firms' stock prices. We therefore hypothesize as follows:

Hypothesis 1*: Recently issued management earnings guidance moderates young firms' stock price response to ECB monetary policy surprises.*

Bernanke and Gertler (1995) suggest that in case of monetary policy tightening, firms with financial constraints are affected more. Gertler and Gilchrist (1994) show striking differences in the behavior of large and small firms during monetary policy tightening periods. Large firms increase their short-term borrowing and inventories. In contrast, small firms—who in most cases have more limited access to short-term credit markets—reduce inventories and cut working hours and production. On the other hand, when monetary policy is loosened, Bernanke and Gertler (1995) suggest that both firms with and without financial constraints behave in the same way. This implies that financially constrained firms do not necessarily benefit more from

monetary expansion decisions than unconstrained firms. Since firms with high information asymmetry have more negative stock reactions to monetary policy tightening and seemingly indifferent stock reactions to monetary policy loosening, we expect that the effect of management guidance in moderating the effect of monetary surprises is stronger in the case of unexpected interest rate increases (positive surprises) than unexpected interest rate decreases (negative surprises).

For firms with high information asymmetry, there are fewer sources of reliable information in the market. Investors are therefore more likely to rely on management guidance to extract information and make their investment decisions. By contrast, for firms with low information asymmetry, there is more information generation through analysts, media, and other external information sources. In such cases, investors tend to rely less on management guidance. Hence, we predict that the value of management guidance increases with information asymmetry:

Hypothesis 2*: The value of management guidance during monetary policy transmission increases as the firm's information environment deteriorates*.

The extant literature about management guidance shows that the nature of management guidance matters in improving information environment. In terms of forecast sentiment, prior evidence suggests that guidance conveying good news is more precise than guidance conveying bad news. For instance, Choi at al. (2010) find that forecast precision is negatively associated with the magnitude of the forecast surprise and that this negative association is stronger when the forecast conveys bad news than when it conveys good news. Rogers et al. (2009) show that bad news guidance translates into more short-term volatility than good news guidance.

A related concept to guidance conveying good (positive) news versus guidance conveying bad (negative) news is the level of confidence of managers who issue these forecasts. Loughran and McDonald (2011) capture the level of confidence of managers in financial reports through

textual analysis. They report that the stock market responds more positively to 10-K annual reports using strong modal words than reports using weak modal words. This suggests that manager's level of confidence matters for how the market perceives information. We therefore expect that guidance issued using strong modal words is more informative than guidance issued using weak modal words.

King et al. (1990) ague that forecast form shows the precision of managers' beliefs about the future. Since point forecasts are more precise than range forecasts, point forecasts are generally perceived to reflect greater managerial certainty than range forecasts (Hughes and Pae, 2004). Prior studies also report that routine guidance are better than sporadic guidance in reducing information asymmetry. For example, Rogers et al. (2009) posit that since sporadic guidance is unanticipated by the market, it increases stock return volatility and leads to a deterioration in the firm's information environment in the short-term. In terms of forecast disaggregation, Hirst et al., (2007) find that disaggregation can enhance the credibility of forecasts and that disaggregated forecasts are valued more by investors than aggregated forecasts. Based on the differential effect of guidance characteristics on information asymmetry, we form our third hypothesis:

Hypothesis 3*: The nature of management guidance matters during monetary policy transmission events.*

To test hypothesis 3, we examine forecast sentiment, precision, credibility, frequency, and dis-aggregation.

3. Research design and sample selection

3.1. Measuring monetary policy surprises

Following recent studies (e.g. Altavilla et al. 2019; Armstrong et al. 2019; Gilchrist et al. 2015; Gorodnichenko and Weber 2016; Gertler and Karadi 2015), we use intraday data to measure monetary policy surprises. Monetary surprises are computed as the change in the median quote

of one-month overnight indexed swap (OIS) rate from the window 13:25-13:35 before the ECB's press release to the median quote in the window 14:00-14:10 after the ECB's press release on the announcement dates as illustrated in Figure 1 below. Altavilla et al. (2019) show that the target rate factor explains 98% of the variation of one-month OIS rate and that compared to other longer-term OIS rates one-month OIS rate is better at capturing the target-rate surprise.[8] Using this intraday setting also allows for the isolation of monetary policy shocks from other confounding effects occurring on the announcement dates, which improves the identification in our tests. Furthermore, asset prices and firm characteristics are unlikely to affect the magnitude of monetary surprises in such a short period of time. This allows us to study how important are firm-level disclosure practices in alleviating the uncertainty surrounding young firms during these monetary policy announcements.

[Figure 1 around here]

3.2. Aggregate stock market reaction to monetary policy shocks

We begin our analysis by assessing the effect of monetary policy surprises on the aggregate stock market. Following Altavilla et al. (2019), we apply the following model to test for the aggregate market reaction to monetary surprises:

$$Ret\_Stoxx50_t = \alpha + \beta_1 Surprise_t + \varepsilon_t, \quad (1)$$

where $Ret\_Stoxx50_t$ is measured as the basis point change in the STOXX 50 index during the 35-minute window around the ECB announcement time and $Surprise_t$ is measured as a basis point change in the one-month OIS rate during the same 35-minute window. We base our inferences on robust standard errors.

We expect a negative relation between the market return and monetary policy surprises (i.e., $\beta_1 < 0$). By measuring the market return during a short window and simultaneously with

[8] Our main result remains unchanged if we use other longer-term OIS rates (such as the 3-month OIS rate) to measure monetary policy surprises. These results are available upon request.

surprises, we can isolate it from other confounding effects. Since asset prices are unlikely to determine monetary policy surprises over such a short period (Altavilla et al. 2019; Bernanke and Kuttner 2005; Cieslak and Schrimpf 2019), the case for reverse causality is weak.

One potential complication in determining the impact of monetary policy on equity prices is the possibility that the ECB has access to private information about the state of the economy, which is revealed through its policy announcements. For example, the ECB may know about an ongoing weakening of the economy and respond to it by lowering policy rates. Investors may then react to the revelation of this private information by the ECB rather than its monetary policy stance. In this case, the stock reaction to lower policy rates should be negative, implying the positive relationship between stock return and monetary policy surprises. In other words, the coefficient β_1 should be positive, which is the opposite of our predicted sign for β_1 (Poole, Rasche and Thornton, 2002; Bernanke and Kuttner, 2005). Hence, the bias, if applicable, works against our hypothesis or our estimated coefficient β_1 should be seen as the lower bound of the effect of monetary surprise on stock return.

3.3. Management earnings guidance and the transmission of monetary policy

To assess whether and how individual firms' management guidance moderates the effect of monetary surprises on its stock price, we follow the approach of Armstrong et al. (2019), originally based on the research design in Bernanke and Kuttner (2005), Gorodnichenko and Weber (2016), and Ippolito et al. (2018). Specifically, we estimate the following regression specification on announcement dates:

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

where $Return_{i,t}$ is stock return for firm i on the announcement date t, $Guidance_{i,t}$ is an indicator that firm i has issued management guidance before the policy announcement date, and $Suprise_t$ is the monetary policy surprise.

We construct a number of different measures for the presence of management guidance. *Guidance_Dummy_12M* equals one if a firm issues management earnings guidance in the 12 months leading to the policy announcement date and 0 otherwise; *Guidance_Dummy_9M* equals one if a firm issues a management earnings guidance in the 9 months leading to the policy announcement date and 0 otherwise; and *Guidance_Dummy_3M* equals one if a firm issues a management earnings guidance in the 3 months leading to the policy announcement date and 0 otherwise. We choose *Guidance_Dummy_3M* as our main measure because it is less likely to be confounded by other events occurring between the guidance issuance date and the policy announcement date.[9]

All variables are defined in Table A1 in the Appendix. All firm characteristics except for stock return volatility are measured at the most recent fiscal-year end. For example, if the ECB announcement date is November 12, 2019 and a firm's fiscal-year end-date is December 31, its characteristic controls are measured as of December 31, 2018. The remaining variables, including stock return volatility and factor betas, are computed as of the most recent calendar month. We interact all control variables with *Surprise* to allow for the variation of coefficients. We also include firm and date fixed effects (δ_i, γ_t). Firm fixed effects control for time-invariant firm characteristics which can affect stock returns (e.g., industry membership, organizational capital, etc.) while date fixed effects control for macroeconomic conditions which can affect all firms' stock returns on announcement dates. Date fixed effects also absorb the main effect of *Surprise*. We cluster standard errors by firm and date as suggested in Petersen (2009). Our main coefficient of interest is β_2. Since we hypothesize that guidance helps moderate the effect of monetary policy surprises, we predict that β_2 is positive.

[9] In the Table IA.6 in the Internet Appendix, we use other measures of guidance, and all our main results continue to hold.

3.4. Multivariate matching technique - entropy balancing

To further improve identification of our tests, we apply a multivariate matching technique named entropy balancing (Hainmueller 2012) together with our fixed effects model. Several recent studies in accounting and finance (Chapman et al. 2019; Chahine et al. 2020; McMullin and Schonberger 2020) use this technique to address endogeneity concerns. According to Hainmueller (2012), entropy balancing weighs each observation in the control sample such that the post-weighting distribution of each matching variable (covariates or control variables) for the treatment and control samples are virtually identical. This is called rebalancing (or reweighing scheme) of the control sample by applying new weights to each observation in that sample. Rebalancing criteria are based on the moments (mean, variance, skewness, etc.) of the covariates' distributions that are equalized across treatment and weighted control samples. This equalization is referred to as covariate balance.

Shipman et al. (2017) claims that propensity score matching (PSM) technique has some methodological flows. With regards to these flows, entropy balancing has several advantages over PSM technique. First, entropy balancing ensures that higher-order moments of control variables' distributions between treated and control samples are identical, while PSM generally does not. Instead, PSM tries to achieve the covariate balance by balancing the estimated propensity score between two samples. However, this requires a large sample and a true propensity score which is usually unknown. In practice, those requirements hardly hold. Second, unlike PSM, entropy balancing does not allow for a large researcher discretion. For entropy balancing, researchers can only set a tolerance level for the reweighing algorithm designed by Hainmueller (2012). For PSM, researchers can decide to match with or without replacement, choose between propensity score-matching models, perform one-to-one versus one-to-many matching, select a caliper distance, and/or assess match quality. Shipman et al. (2017) shows that these choices significantly influence sample composition and the PSM

output. Furthermore, by using Monte Carlo simulations as well as some empirical applications, prior studies (Hainmueller 2012; McMullin and Schonberger 2020) have shown that entropy balancing is superior to other matching methods in reducing bias and dealing with non-linearity, including Mahalanobis distance-matching, genetic matching, and matching or weighting on a logistic propensity score.

To implement entropy balancing, we include our 17 control variables (covariates) to be matched on two distributional moments: mean and variance. This procedure generates a weight for each observation in control sample while the weight of treated observation remains unchanged. After the matching, we verify that the covariate balance between treated and control samples is achieved in terms of those matching moments. Next, we use the generated weights to re-estimate eq. (2) with reweighed control sample and by applying firm and date fixed effects and by clustering standard errors on firm and date.

3.5. Sample construction

Our sample starts in 2002 and ends in 2019. This period includes 197 ECB meeting dates (12 meetings per year from 2002 to 2014 and 8 meetings per year from 2015 to 2019). The starting year is based on the availability of management earnings guidance. Another reason is that the measurement of monetary policy surprises from 1999 to 2001 is noisy (Altavilla et al. 2019). The sample covers 19 Eurozone countries, with each country's starting year determined by its euro-adoption date.

Following Armstrong et al. (2019), we exclude financial firms from our sample for two reasons. First, as suppliers of credit, banks and financial institutions can be affected by monetary policy through channels (e.g., the bank lending channel) other than the balance sheet channel. Second, seven out of 17 control variables are not available for financial firms.

We winsorize all continuous variables at the 1st and 99th percentile, except for *Surprise*. We obtain stock return and firm-level financial information from Compustat Global and

management guidance and earnings announcements from Capital IQ's Key Development dataset. When we focus on young firms, a firm is contained in the sample if its listing age on Compustat Global is less than 10 years as of a particular announcement date.[10, 11] The final sample contains 72,731 firm-date observations belonging to 2,515 unique firms with non-missing information.[12]

Table 1 provides the descriptive statistics for the variables used in our study. Panel A provides the summary statistics for the macroeconomic variables. The median *Surprise* is zero, indicating that ECB policy decisions on average did not surprise investors in either direction. Panel B presents the summary statistics for our guidance measure, and shows that a relatively small proportion (14.5%) of firms in our sample issue management guidance in the three months leading to the announcement date. Panel C describes firm-level return and control variables.

[Table 1 around here]

4. Results

4.1. Market reaction to monetary policy surprises

Table 2 presents the results from estimating eq. (1). The coefficient on *Surprise* is -6.278 and is statistically significant at the 1% level. The negative sign of the coefficient is consistent with our expectation that the stock market reacts negatively to interest rate increases. If the ECB unexpectedly increases the policy rate by one basis point, the stock market experiences a 6.278 basis point decline. This result is consistent with the findings of Bernanke and Kuttner (2005),

[10] In table IA.4 in the Internet Appendix, we provide a robust test about alternative firm age thresholds ranging from 7 years to 14 years of defining young firms. We find that our main findings still hold when choosing any firm-age thresholds ranging from 7 to 11. Besides, the magnitude of the coefficient of *Surprise* × *Guidance_Dummy_3M* decreases gradually when firm age threshold increases.

[11] In an untabulated robust test, we find that our main results are similar if we compute the firm age based on the firms' founding year instead of listing years on Compustat. Specifically, firm age is computed as the time between the founding year until ECB announcement year. We use python to do Google search automatically and find founding year data for around 60% of our sample.

[12] Table IA.1 in the Internet Appendix provides detailed sample composition and the number of observations for each country in the sample.

Lucca and Moench (2015), Altavilla et al. (2019), Armstrong et al. (2019), Cieslak et al. (2019), and confirms that monetary policy has a significant effect on aggregate equity prices in Europe.

[Table 2 around here]

4.2. Impact of management earnings guidance on the transmission of monetary policy

Table 3 reports the results from estimating eq. (2) with firm and date fixed effects. We employ both a fixed effects model and entropy balancing. Panel A shows the effect of guidance for young and old firm samples separately. For young firms, the coefficient on the interaction term *Surprise* × *Guidance_Dummy_3M* in column (1) is 2.215 and significant at the 5% level. Column (2) documents a similar result. The positive sign is consistent with our expectation in *Hypothesis 1* that the issuance of guidance helps reduce information asymmetry and in consequence moderates the impact of monetary policy shocks on stock prices. Compared to the *Surprise* coefficient in Table 2 (-6.278), if a firm issues guidance over the last previous months, *ceteris paribus*, it on average reduces its stock price exposure to monetary policy by roughly 35%.[13]

For old firms, the coefficient on *Surprise* × *Guidance_Dummy_3M* in both columns (3) and (4) is insignificant and much smaller in magnitude compared to young firms. This finding

[13] We compute 35% as $\frac{2.215}{6.278}$. This number can be seen as a lower bound because the denominator – the estimated aggregate stock market reaction to monetary surprises can be lower. In table 1, we use intraday data of STOXX 50 index to measure the dependent variable, then regress the measure on surprises to estimate the aggregate stock market reaction to monetary surprises. This method helps to isolate the effect of monetary surprises on aggregate stock market and often leads to strong market reaction to surprises (Armstrong et al., 2019). If we estimate the aggregate stock reaction to surprises by regressing daily stock return of STOXX 50 index on surprises or regressing daily stock return of all stocks on surprises, the estimated aggregate reaction to surprises would be lower than 6.278.

implies that the effect of guidance on monetary policy is mainly evident in the sample containing young firms, where there is high information asymmetry.[14,15]

Panel B shows the effect of guidance separately for unexpected interest rate increases ($Surprise_t > 0$) and decreases ($Surprise_t < 0$). Columns (1) and (3) report results from the fixed-effects model, and columns (2) and (4) reports result from entropy balancing. For both models, the interaction-term coefficient is positive and significant in the rate-increase subsample while it is much smaller in magnitude and statistically insignificant in the rate-decrease subsample. This result indicates that the effect of management guidance in reducing young firms' stock price response to ECB monetary surprises is driven by interest rate increases, consistent with models in Bernanke and Gertler (1995) and Gertler and Gilchrist (1994).

[Table 3 around here]

4.3. Impact of management guidance across different firms

4.3.1. Impact of management guidance under high and low information asymmetry

In order to show that management guidance enhances a firm's information environment during monetary policy announcements, we test our second hypothesis under a setting that explicitly distinguishes between high- and low-information asymmetry firms. We first divide our sample into two subsamples based on different measures of financial constraints and information asymmetry. Next, we estimate eq. (2) for each of these subsamples and compare the coefficients on the interaction term of *Surprise* with *Guidance_Dummy_3M*.

[14] Following prior studies (e.g. Guan et al., 2020; Li et al., 2019), we examine the stock market reaction to management guidance issued by young and old firms (see Table IA.7 in the Internet Appendix). The positive and significant coefficient for *Young* variable indicates that stock market reacts more to guidance issued by young firms than guidance issued by old firms, *ceteris paribus*. The result additionally supports the hypothesis that guidance is more important for young firms than old firms due to young firms' higher information asymmetry.

[15] In Table IA.8 in the Internet Appendix, the coefficient on *Surprise* × *Firm_age* is positive and significant at the 5% level, implying that young firms are more sensitive to monetary surprises than old firms. The result is consistent with Bougheas et al., (2006); Cloyne et al., (2018); and Ferrando et al., (2020).

Table 4 reports the results for this specification. In columns (1) and (2), the sample is divided based on the HP index of financial constraints (Hadlock and Pierce 2010). In columns (3) and (4), the sample is split based on the standard deviation of annual earnings before extraordinary items during the previous ten years. In columns (5) and (6), the sample is divided based on the standard deviation of annual cash flows from operations during the previous ten years. For the fixed-effects model in Panel A, the results in all these specifications indicate that as information asymmetry increases, issuing management guidance becomes more important in reducing the exposure of young firms to monetary policy uncertainty.

In Panel B, we repeat our analysis using entropy balancing technique. The results remain qualitatively unchanged and are consistent with our second hypothesis, which states that during the monetary policy transmission periods the value of management guidance increases as the firm's information environment deteriorates.

[Table 4 around here]

4.3.2 Impact of management guidance under high and low external finance dependence

In this section, we examine the effect of management guidance on monetary transmission in industries which have high demand for external finance. Through balance sheet channel, monetary policies can affect funding for corporate investment and as shown above, management guidance can moderate this effect. We expect that the effect of guidance on monetary transmission can be stronger in industries with high demand for external finance. We measure industry-level external finance and equity dependence based on the method described in Duchin et al., (2010) and Rajan and Zingales (1998). First, we compute firm-level external finance and equity dependence as described in the appendix. To smooth temporal fluctuations and reduce the effects of outliers, we take the sum of firm's external finance and investment measures over 2002–2019. Then, for each of the three-digit SIC codes, we measure industry-level external finance and equity dependence as the median external finance and equity

dependence in the industry. Based on the industry-level measures, we divide industries into two groups: high and low external finance dependent. Table 8 shows the effect of management guidance on monetary transmission in each of these groups. For fixed effects and entropy balancing models, the coefficients of Surprise × Guidance_Dummy_3M are only positive and significant in columns 2 and 4. The result is consistent with our expectation that the effect of guidance on monetary transmission is more evident in industries in which firms are more dependent on external finance.

[Table 5 around here]

5. Additional Tests

5.1. Guidance nature and monetary policy transmission

In line with the prior literature on management earnings guidance, we predict that the nature of the management guidance matters for monetary policy transmission. In this section, we test this hypothesis using several different specifications.[16]

5.1.1. Guidance conveying good news versus guidance conveying bad news

We classify guidance as representing good or bad news by using a textual analysis technique.[17] The approach utilizes Loughran and McDonald's (2011) list of 2,702 positive and negative financial words derived from analyzing a large sample of 10-K reports from 1994 to 2008.[18]

Our textual sentiment analysis is based on Natural Language Processing (NLP) techniques. Researchers typically measure tone or sentiment using the percentage of words belonging to a particular sentiment word list. Therefore, for instance, a lower percentage of positive words and a higher percentage of negative words is associated with a less optimistic

[16] Table IA.2 in the Internet Appendix provides descriptive statistics on guidance classifications in this section.
[17] In untabulated robustness tests, we define good and bad news guidance based on the risk-adjusted return on the day the guidance is issued. Positive risk-adjusted returns likely imply that the guidance encompasses good news and vice-versa. Using this procedure gives similar results.
[18] As noted by Loughran and McDonald (2011, 2016), dictionary-based textual analysis depends significantly on the dictionary we choose. Because of the similarity in financial language in 10-K reports and management guidance, we believe that the list of financial words from Loughran and McDonald (2011) is a reasonable choice.

tone. A potential drawback of the technique is that it ignores the contextual words. Our approach goes one step further. It not only considers the number of good and bad words, but also contextual words - valence shifters. Valence shifters include four groups: negations (doesn't, don't, etc.), amplifiers (absolutely, really, etc.), de-amplifiers (barely, partly, etc.), and adversative conjunctions (but, although, etc.). Those words can change the meaning of a sentence. For example, the inclusion of the word "doesn't" can change a sentence tone from positive to negative. Ignoring those contextual words can lead to classification errors. Additionally, instead of analyzing the sentiment of the whole paragraph, our algorithm gives a sentiment score for each sentence. The sentiment score of a sentence is based on the positive and negative words, valence shifters, and their positions in the sentence. The sentiment of a paragraph is the average of all sentences' sentiment.

Around 75% of our guidance text data is mixed with earning announcement text since firms frequently report their and issue guidance on the same date. This raises a concern that our sentiment score from textual analysis is driven by earnings announcement text rather than guidance text. To respond to the concern, we also examine only guidance that is not bundled with an earnings announcement.

After classifying guidance as good and bad news, we establish two subsamples. First, we divide all observations into 4 groups: (1) Treated_good: observations are only affected by good news; (2) Treated_bad: observations are only affected by bad news; (3) Treated_both_or_neutral: observations are affected by both groups or only affected by neutral guidance; (4) control: observations are not affected by any guidance. Next, we establish two subsamples: (1) good news subsample = Treated_good + control; (2) bad news subsample = Treated_bad + control.

Panel A in Table 6 reports the results for the good and bad news subsamples. Columns (1), (2), (4), and (5) show results for the fixed-effects model, and Columns (3) and (6) show

the results for entropy balancing. The *Surprise* × *Guidance_Dummy_3M* interaction-term coefficient is positive and statistically significant only in the good-news subsample. Moreover, the coefficient is almost twice as large in the good-news subsample compared to the coefficient in the bad-news subsample. These results indicate that good news guidance is more relevant in reducing future information asymmetries. This is consistent with prior studies (e.g., Choi et al. 2010; Hirst et al. 2008; Rogers et al. 2009), which demonstrate that good news guidance is more precise and accurate than bad news guidance. Choi at al. (2010) further explain that since bad news guidance often has a stronger effect on the stock price than good news guidance, managers are reluctant to issue accurate and precise guidance related to bad news to avoid litigation risk.

Taken together, our findings here suggest that young firms issuing (more accurate) good news guidance benefit more from lower exposure to monetary policy shocks than young firms issuing (less accurate) bad news guidance, which is consistent with our third hypothesis.

[Table 6 around here]

5.1.2 Guidance using strong modal words versus guidance using weak modal words

Like good news and bad news classification, we apply the same textual sentiment analysis techniques with the list of 46 strong and weak modal financial words from Loughran and McDonald (2011). Examples of strong modal words are words such as *always, highest, must,* and *will*. Examples of weak modal words are *could, depending, might,* and *possibly*. There are 19 strong modal words in our list and 27 weak modal words. Loughran and McDonald (2011) explain that strong and weak modal words measure the levels of confidence. Since the level of managerial confidence is essential in determining the effect of management guidance (Hayward and Fitza 2017), we examine how the use of strong and weak modal words influences the moderating effect of guidance on monetary policy transmission.

We estimate the regression model in eq. (2) for each subsample. The results are reported in Panel B of Table 6. The coefficient on *Surprise* × *Guidance_Dummy_3M* is positive and statistically significant in the case of guidance containing strong modal words and statistically insignificant in the case of guidance containing weak modal words. This finding is consistent with the notion that managerial confidence in future earnings is received favorably by the market. This managerial confidence is also likely to result in reducing information asymmetries over time and moderate the effect of monetary policy transmission.

5.1.3 Point, range, and qualitative guidance

To classify guidance into quantitative and qualitative forecasts, we apply a text searching technique. First, we clean the guidance text so that it is no longer mixed with earnings announcement text by using a text searching algorithm, then manually check these for accuracy. We also remove numbers related to the fiscal year or date to ensure that they are not mixed with forecast numbers. After cleaning the guidance text, we search for forecast numbers in each guidance to classify it as quantitative and qualitative guidance.[19] Following Brockman and Cicon (2013), we define quantitative guidance as guidance giving at least one forecast number.[20] Qualitative guidance is guidance giving no forecast numbers.[21] Among quantitative guidance, we further classify them as point and range forecasts. Range guidance is guidance giving at least a range forecast.[22] To classify a guidance as range, we look for keywords such as *between* and *in the range of*. We group all remaining quantitative guidance as point guidance. To ensure the accuracy of the classification, we manually check all guidance.

[19] For a small percentage of guidance, the text is missing on Key Development. In such cases, we are unable to classify them as either quantitative or qualitative and therefore exclude them from the sample.
[20] For example, the earnings for the third quarter of the fiscal year 2011 is anticipated to be €40 million.
[21] For example, the earnings for the second quarter of the fiscal year 2015 is anticipated to be higher than the earnings for the second quarter of the fiscal year 2014.
[22] For example, the earnings for the fourth quarter of the fiscal year 2013 is anticipated to be between €40 million and €45 million.

Next, we establish subsamples for point, range and qualitative forecasts based on the similar method to the establishment of good and bad news subsamples. Then, we rerun our main model in eq. (2) for each subsample separately. The results for these specifications are provided in the panel A of Table 7. The coefficient on the main interaction term is positive and statistically significant only in the case of point forecasts. The magnitude of the coefficient is also significantly higher for the point forecast than for the range and qualitative forecasts. This supports our third hypothesis that point guidance is more beneficial than range and qualitative guidance in reducing future uncertainties during monetary policy transmission. Since point forecasts are more precise than range and qualitative forecasts, point forecasts are generally perceived to reflect managers' certainty about their estimates and is deemed as more convincing by lenders and investors (Hughes and Pae, 2004).

[Table 7 around here]

5.1.4 High versus low guidance credibility

To classify guidance by high and low credibility, we apply the following procedure. First, we extract sales forecast numbers from guidance text. We choose sales because of two reasons. First, Barton et al., (2010) claim that sales is one of the most valuable performance measures for investors. Second, sales forecasts are the most popular forecast measures, appearing in around 85% of the forecasts. The second most popular forecast measure – EBITDA appears in only around 30% of the forecasts. To extract sales forecasts, we first use a text searching algorithm, then manually check and correct all extracted numbers to ensure the accuracy. For range forecasts, the forecast is measured as the average of lower and upper forecasts. Second, we compute *forecast error*$_{i,t}$ for each guidance as the absolute value of the difference between sales forecast and actual sales scaled by share price on the realization date.[23] Third, we calculate *average forecast error*$_{i,t}$ on each guidance announcement date as the average of current *forecast*

[23] These conclusions are unchanged if we scale forecast error by actual number. Results available upon request.

error and all previous *forecast error*. Intuitively, *average forecast error*$_{i,t}$ measures the level of forecast accuracy for a firm *i* based on all its current and past forecast errors, so it relates to the reputation of forecast accuracy of that firm. Lastly, based on the *average forecast error*$_{i,t}$, we divide guidance into two groups: high (low) credibility guidance if its *average forecast error*$_{i,t}$ is lower (higher) than median of *average forecast error*$_{i,t}$. Basically, high credibility forecasts are forecasts made by a firm with a reputation of high forecast accuracy while low credible forecasts are forecasts made by a firm with a reputation of low forecast accuracy. The classification approach is consistent with prior papers (e.g. Williams 1996; Hutton and Stocken 2007).

Based on this classification, we establish two subsamples to compare the effect of guidance between low credible and high credible guidance based on a similar method to the establishment of good and bad news subsamples. Then, we rerun our main model in eq. (2) for each subsample separately. The results for this specification are provided in the panel B of Table 7. We find that the coefficient on the main interaction term is positive and statistically significant only in the case of high credible forecasts. The magnitude of the coefficient is also significantly higher for the high credible forecasts than low credible forecasts. This supports our third hypothesis that high credible forecasts are better than low credible forecasts in improving information environment and moderating the effect of monetary policy because of its higher reputation of accuracy.

5.1.5 Routine versus sporadic guidance

To classify guidance into routine and sporadic forecasts, we follow the method of Rogers et al. (2009). Routine guidance is defined as the guidance issued by firms that, prior to the quarter of the current guidance, issued guidance in at least three of the last four calendar quarters. All

remaining guidance is defined as sporadic forecasts.[24] Based on the classification, we establish two subsamples based on the similar method to the establishment of good and bad news subsamples. We then estimate eq. (2) for both subsamples separately. The results are provided in the panel A of Table 8. The coefficient on the main interaction term is positive and statistically significant at the 5% level only in the subsample of routine forecasts. The magnitude of the coefficient is also larger for routine forecasts. The result indicates that routine forecasts are better than sporadic forecasts in moderating the negative impact of monetary policy surprises, consistent with Rogers et al. (2009). This supports our claim that forecast frequency matters in reducing future uncertainties related to unexpected monetary policy changes.

[Table 8 around here]

5.1.6 Dis-aggregated and aggregated guidance

To classify guidance by dis-aggregation and aggregation, we follow the following steps. *First*, we count the number of unique forecast measures for each guidance. Following Barton et al., (2010), we focus on the following 10 important and possibly existing forecast measures: (1) sales, (2) EBITDA, (3) operating income, (4) income before taxes, (5) net income, (6) capital expenditure, (7) operating cash flow, (8) expenses, (9) EPS and (10) other balance sheet item. To count those forecast measures, we first use a text searching algorithm on cleaned guidance text which is not mixed with earnings announcement text. Then, we manually check all guidance to ensure its accuracy. Following prior papers (e.g. Guan et al., 2020; Li et al., 2019), we define dis-aggregated guidance as guidance giving at least two unique forecast measures and aggregated guidance as guidance giving only one unique forecast measure.

[24] For example, a firm issues a guidance on July 3, 2019, so its current quarter is July 2019 – September 2019. If there are at least three guidance events in the last four quarters from June 2018 – June 2019, the guidance is defined as a routine guidance.

Based on the classification, we establish 2 subsamples based on the similar method to the establishment of good and bad news subsamples, then estimate eq. (2) for both subsamples separately. The results are provided in the panel B of table 8. The coefficient on the main interaction term is positive and statistically significant at the 5% level only in the subsample of dis-aggregated forecasts. The magnitude of the coefficients is also larger for dis-aggregated forecasts. The result implies that dis-aggregated forecasts are better than aggregated forecasts in improving information environment and moderating the negative impact of monetary policy surprises. The finding is consistent with Hirst et al., (2007) who demonstrate that dis-aggregated forecasts are perceived by investors to be more credible than aggregated forecasts.

5.2. Placebo tests

To mitigate the concern that our results are spurious, we perform a placebo test in which we generate four new samples based on the original sample. In the first sample, we randomly assign treatment (firms issuing guidance) provided that the number of treated observations in the new sample is the same as the corresponding number in the original sample. In the second sample, we randomly assign observations into the treatment sample while making sure that the number of treated observations in each country is the same as the corresponding number in the original sample. In the third sample, we randomly assign treatment provided that the number of treated observations in each industry is the same as the corresponding number in the original sample. Finally, in the fourth sample, following Ippolito et al. (2018), we replace the dependent variable by the last two-day return before announcement dates. Because the blackout period covers two days prior to the announcement date, in which governing council members avoid making comments about monetary policy decisions, there should be no effect of monetary policy on the market. We estimate both fixed effects model and entropy balancing for each sample. As shown in Table 9, in all samples, the coefficients on *Surprise* × *Guidance_Dummy_3M* are

statistically insignificant and close to zero. This further mitigates the concern that our results are driven by endogenous matching.

[Table 9 around here]

5.3. Different monetary policy tools

5.3.1. Management earnings guidance and non-standard ECB measures

Thus far, we have computed monetary surprises as the change in the median quote of one-month overnight indexed swap (OIS) rate from the window 13:25-13:35 before the ECB's press release to the median quote in the window 14:00-14:10 after the ECB's press release. However, this only captures surprises resulting from target rate ECB measure. ECB also applies non-standard monetary measures, including timing, forward guidance, quantitative easing. In this section, we examine the effect of management guidance on monetary surprises resulting from such non-standard measures. The non-standard monetary measure surprises are measured as the basis point change in the median quote of two-year OIS rate from the window 14:15-14:25 before the press conference to the median quote in the window 15:40-15:50 after the conference on monetary policy announcement dates (Altavilla et al. 2019). Altavilla et al. (2019) show that non-standard monetary factors can explain 99% of the variation of the two-year OIS rate. Table 10 reports our estimate of eq. (2) with firm and date fixed effects and the same firm controls. The coefficient of *Non-standard_Surprise* × *Guidance_Dummy_3M* is positive and significant at 5% for fixed effects model. We find consistent results using entropy balancing. These findings indicate that management guidance can also moderate the effects of non-standard monetary measures.

[Table 10 around here]

5.3.2. Decomposing monetary policy surprises

Prior papers (e.g., Altavilla et al. 2019; Jarociński and Karadi 2020) show that monetary policy surprise can be decomposed into two components: Monetary policy shock (MPshock) and

central bank information shock (CBIshock). MPshock is the shock related to unexpected change in monetary policies such as unexpected interest rate increase. Under monetary theories, there should be a negative relationship between MPshock and stock prices. CBIshock is the information shock about the economic outlook that the market interprets from the monetary policies. For example, the market can see significantly unexpected interest rate decreases as a signal that the economy is facing with a crisis and the central bank promptly responds to the threat by decreasing interest rate significantly. Unlike MPshock, there should be a positive relationship between CBIshock and stock price. These two components aggregately affect the co-movement between monetary surprise and stock price. If MPshock prevails, there will be a negative co-movement between surprise and stock price. By contrast, if CBIshock prevails, the co-movement is positive. There were some major events in the past that CBIshock prevails. For example, on August 4 2011, in response to the European public debt crisis, the ECB decided to keep its policy rates unchanged after increasing them twice in April and July in the same year and ruled out further tightening in the near future. The STOXX 50 index dropped significantly, which was in line with the message of the accompanying statement from ECB which emphasized "particularly high" uncertainty on financial markets.

Following the approach of Jarociński and Karadi (2020), we decompose monetary surprises into MPshock and CBIshock, then examine the effect of guidance on the transmission of those shocks[25]. Under the balance sheet channel, we expect that management guidance moderates the effect of MPshock. For CBIshock, we are not aware of any studies which examine management guidance and shocks from economic outlook. However, we predict the insignificant effect of guidance on CBIshock because it is unlikely that management guidance can moderate the effect of shocks related to economic outlook like European public debt crisis on firms. We find results consistent with our expectation in table 11. The interaction

[25] We are grateful to Jarociński and Karadi (2020) for sharing the data about MPshock and CBIshock.

coefficients of Guidance_Dummy_3M*MPshock are significantly positive, regardless of estimated methods. The interaction coefficients of Guidance_Dummy_3M*CBIshock are not significant. Overall, we find that management guidance mainly moderates the effect of MPshock.

[Table 11 around here]

6. Conclusion

We examine the value of management earnings guidance in moderating the effect of unexpected monetary policy changes on young firms headquartered in the euro area. We use intraday data to measure monetary surprises over a 35-minute window around the ECB announcement time. Consistent with the prior literature on voluntary disclosures, we predict that management earnings guidance is likely to reduce future information asymmetries between the lenders and borrowers. In line with the balance sheet channel, we argue that firms issuing management guidance in the months leading to the monetary policy announcements are likely to alleviate the negative impact of unexpected interest rate changes.

We test these predictions by using different specifications including firm and date fixed effects and entropy balancing technique. Our findings indicate that young firms issuing guidance within 3 months leading to the monetary policy announcement can reduce around 35% of the impact of monetary policy surprises on their stock prices. The moderating effect of management guidance increases when the information environment of the firm deteriorates. Management guidance helps mostly by alleviating the negative effect of monetary policy tightening and has no significant effect during monetary policy loosening periods. Finally, the nature of management guidance, including guidance sentiment, forecast precision, credibility, disaggregation and frequency, is vital in determining the market reaction to monetary policy surprises. Our findings remain unchanged when different measures of management guidance

are used. Several different placebo tests and entropy balancing help identify managerial guidance is a reliable hedging strategy to unexpected monetary policy changes by ECB.

Our study contributes to the recent literature assessing the role of inter-firm heterogeneity during monetary policy transmission periods. The findings correspond to the call from both policy makers (e.g. former FED chair and current Treasury Secretary Janet Yellen) and academics (e.g. Gallo and Kothari 2019) for more research on how individual firms anticipate and respond to macroeconomic shocks. We are the first paper who shows the effect of management earnings guidance on the monetary policy transmission in the euro area. Overall, our results are informative and relevant to the recent discussions in the financial accounting literature about the linkages between firm's accounting policies and the external macroeconomic factors.

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Figure 1

Timeline for computing monetary surprises on ECB announcement dates.

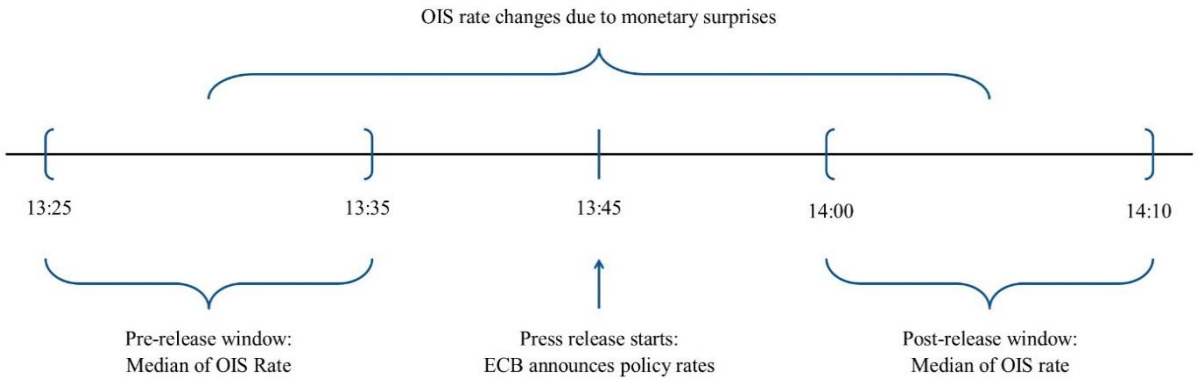

Table 1

Summary statistics: Young firm samples.

	Observations	Mean	S.D.	P25	Median	P75
Panel A: Macroeconomic variables						
Ret_Stoxx50	197	-0.111	0.694	-0.376	-0.082	0.226
Surprise	197	0.060	2.932	-0.500	0.000	0.500
Panel B: Guidance variables						
Guidance_Dummy_3M	72,731	0.145	0.000	0.000	0.000	0.000
Panel C: Firm characteristics						
Return	72,731	-0.039	2.934	-1.108	0.000	0.893
Depreciation	72,731	0.078	0.110	0.023	0.044	0.083
Investment	72,731	0.084	0.170	0.013	0.032	0.077
Leverage	72,731	0.576	0.233	0.416	0.580	0.721
Assets	72,731	4.740	1.657	3.550	4.534	5.745
Gross_margin	72,731	0.539	0.364	0.253	0.473	1.000
Receiveables	72,731	0.081	0.135	-0.001	0.067	0.155
Roa	72,731	-0.008	0.140	-0.039	0.018	0.058
Sales Growth	72,731	0.096	0.431	-0.069	0.050	0.186
Sales Sd	72,731	0.248	0.233	0.097	0.174	0.310
Concentration	72,731	0.128	0.352	0.008	0.025	0.080
BM Ratio	72,731	0.913	1.119	0.344	0.612	1.103
Firm Age	72,731	6.414	1.655	5.326	6.584	9.764
Stock Sd	72,731	0.110	0.059	0.068	0.097	0.138
MKT_Beta	72,731	0.681	0.652	0.257	0.641	1.057
SMB_Beta	72,731	0.726	1.387	-0.123	0.603	1.455
HML_Beta	72,731	-0.165	1.722	-1.094	-0.121	0.713
WML_Beta	72,731	-0.219	0.732	-0.606	-0.179	0.186

This table presents descriptive statistics for variables used in our tests. Panel A presents macroeconomic variables used table 2. Panel B presents guidance variable as our main independent variable. Panel C presents firm variables, including return and control variables.

Table 2

Aggregate market reaction to monetary policy surprises.

	Dependent variable*: Ret_Stoxx50*
	(1)
Surprise	**-6.278*****
	(2.24)
Intercept	-10.711**
	(4.78)
Adjusted R^2	0.07
Number of observations	197

This table contains results of estimating equation (1). *Ret_Stoxx50* is the basis point change in the median quote of STOXX50, Europe's 50 most valuable blue-chip companies in the euro area, from the window 13:25-13:35 before the press release to the median quote in the window 14:00-14:10 after the release on monetary policy announcement dates (Altavilla et al. 2019). *Surprise* is the basis point change in the median quote of one-month OIS rate from the window 13:25-13:35 before the press release to the median quote in the window 14:00-14:10 after the release on monetary policy announcement dates (Altavilla et al. 2019). The robust standard errors are in parentheses. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Table 3

Management earnings guidance and transmission of monetary policy.

Panel A: Aggregate effect of Guidance_Dummy_3M: young and old firm subsamples

	Dependent variable: *Return*			
	Young firm subsample ($< 10\ years$)		Old firm subsample ($\geq 10\ years$)	
	Fixed effects	Entropy balancing	Fixed effects	Entropy balancing
	(1)	(2)	(3)	(4)
Guidance_Dummy_3M	**0.001**	**-0.004**	**0.029**	**0.019**
	(0.044)	**(0.045)**	**(0.053)**	**(0.052)**
Surprise × Guidance_Dummy_3M	**2.215****	**2.269*****	**0.827**	**0.744**
	(1.148)	**(0.788)**	**(0.935)**	**(0.817)**
Surprise × Earning_announce	-4.300*	-2.420	-3.863***	-4.220***
	(2.497)	(2.911)	(1.418)	(1.266)
Surprise × Depreciation	-0.207	5.542	-0.553	7.881
	(8.770)	(15.286)	(0.499)	(8.192)
Surprise × Investment	1.215	-13.427**	-0.032	-10.977**
	(3.565)	(5.546)	(0.047)	(5.433)
Surprise × Leverage	1.770	1.310	2.878	-7.272
	(2.616)	(3.167)	(3.252)	(6.691)
Surprise × Assets	-0.687	0.174	-0.058	0.124
	(0.630)	(0.869)	(0.971)	(1.288)
Surprise × Gross-margin	4.696***	5.425***	-0.082**	-0.017
	(1.670)	(1.877)	(0.035)	(0.170)
Surprise × Receivables	-8.105**	-9.064*	6.045	-1.226
	(3.236)	(5.292)	(4.079)	(5.938)
Surprise × Roa	3.444	-4.141	9.407	-5.825
	(5.686)	(9.091)	(8.213)	(20.893)
Surprise × Sales Growth	-0.068	3.121	0.963	1.649
	(1.335)	(1.927)	(0.655)	(1.937)
Surprise × Sales Sd	3.645	2.144	-8.426	-2.715
	(2.299)	(2.791)	(7.181)	(1.906)
Surprise × Concentration	0.734	-0.712	0.078	0.121
	(1.654)	(1.455)	(0.216)	(0.271)
Surprise × BM Ratio	-0.582	-0.102	-0.002	-0.560
	(0.484)	(0.683)	(0.009)	(0.563)
Surprise × Stock Sd	15.837	9.599	-5.058	11.656
	(24.605)	(43.150)	(32.560)	(33.470)
Surprise × Mkt_Beta	-1.402	0.128	-1.612	-0.819
	(2.565)	(3.334)	(2.896)	(3.361)
Surprise × HML_Beta	-0.020	0.329	0.566	0.461
	(0.406)	(0.503)	(0.822)	(0.752)
Surprise × SMB_Beta	0.761	1.076**	2.019**	1.700*
	(0.475)	(0.505)	(0.926)	(1.024)
Surprise × WML_Beta	0.274	0.179	-1.019	-1.603
	(0.723)	(0.612)	(1.394)	(1.098)
Main effects on controls	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes
Clustering on firm and date	Yes	Yes	Yes	Yes
Adjusted R^2	0.087	0.150	0.024	0.027
Number of observations	72,731	72,731	162,205	162,205

Table 3 (continued)

Panel B: The separate effect of Guidance_Dummy_3M under Unexpected interest rate increase and unexpected interest rate decrease for young firm subsample

	Dependent variable: *Return*			
	Unexpected interest rate increase (Surprise > 0); *N = 89 Meetings*		Unexpected interest rate decrease (Surprise < 0); *N = 63 Meetings*	
	Fixed effects	Entropy balancing	Fixed effects	Entropy balancing
	(1)	(2)	(3)	(4)
Guidance_Dummy_3M	**-0.081**	**-0.057**	**0.031**	**0.024**
	(0.081)	**(0.113)**	**(0.074)**	**(0.08)**
Surprise × Guidance_Dummy_3M	**5.567****	**4.070***	**-0.154**	**1.252**
	(2.528)	**(2.378)**	**(1.257)**	**(1.224)**
Surprise × Controls	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes
Clustering on firm and date	Yes	Yes	Yes	Yes
Adjusted R^2	0.135	0.221	0.154	0.218
Number of observations	29,261	29,261	27,426	27,426

This table contains results of estimating equation (2). Panel A reports the effect of guidance for young and old firm samples. Panel B reports the separating effect of guidance for young firm sample under 2 cases: unexpected interest rate increase ($Surprise_t > 0$) and unexpected interest rate decrease ($Surprise_t < 0$). *Return* is the daily stock return on the day of the announcement. *Surprise* is the basis point change in the median quote of one-month OIS rate from the window 13:25-13:35 before the press release to the median quote in the window 14:00-14:10 after the release on monetary policy announcement dates (Altavilla et al. 2019). *Guidance_Dummy_3M* equals one if the firm issues a management earnings guidance in the three months leading to the policy announcement date. The main effects on the control variables are included but the results are omitted. All regressions include firm and announcement date fixed effects. The two-way (firm and announcement date) clustered robust standard errors are in parentheses. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Table 4

Management earnings guidance and transmission of monetary policy: High versus low information asymmetry.

Panel A: Fixed effects

	Dependent variable: *Return*					
	HP index		Earnings volatility		Cash flow volatility	
	Below median	Above median	Below median	Above median	Below median	Above median
	(1)	(2)	(3)	(4)	(5)	(6)
Guidance_Dummy_3M	**0.071**	**-0.054**	**0.010**	**-0.011**	**0.008**	**-0.024**
	(0.07)	**(0.06)**	**(0.06)**	**(0.06)**	**(0.07)**	**(0.06)**
Surprise* × *Guidance_Dummy_3M	**1.470**	**2.693****	**0.282**	**3.841****	**1.006**	**3.801****
	(2.46)	**(1.36)**	**(1.58)**	**(1.82)**	**(1.67)**	**(1.65)**
Surprise × *Controls*	Yes	Yes	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clustering on firm and date	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.080	0.127	0.086	0.110	0.080	0.114
Number of observations	36,372	36,372	34,283	34,281	34,278	34,286

Panel B: Entropy balancing

	Dependent variable: *Return*					
	HP Index		Earnings volatility		Cash flow volatility	
	Below median	Above median	Below median	Above median	Below median	Above median
	(1)	(2)	(3)	(4)	(5)	(6)
Guidance_Dummy_3M	**0.071**	**-0.035**	**0.014**	**-0.042**	**0.017**	**-0.035**
	(0.07)	**(0.056)**	**(0.07)**	**(0.07)**	**(0.07)**	**(0.06)**
Surprise* × *Guidance_Dummy_3M	**2.101**	**2.950****	**0.005**	**4.480****	**1.641**	**3.556****
	(2.73)	**(1.41)**	**(1.61)**	**(1.72)**	**(1.35)**	**(1.58)**
Surprise × *Controls*	Yes	Yes	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clustering on firm and date	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.125	0.192	0.125	0.196	0.131	0.188
Number of observations	36,372	36,372	34,283	34,281	34,278	34,286

This table contains results of estimating equation (2). *Return* is the daily stock return on the day of the announcement. *Surprise* is the basis point change in the median quote of one-month OIS rate from the window 13:25-13:35 before the press release to the median quote in the window 14:00-14:10 after the release on monetary policy announcement dates (Altavilla et al. 2019). *Guidance_Dummy_3M* equals one if the firm issues a management earnings guidance in the three months leading to the policy announcement date. In columns (1) and (2), the sample is divided based on the HP index of financial constraint (Hadlock and Pierce 2010). In columns (3) and (4), the sample is divided based on the standard deviation of annual earnings before extraordinary items during the previous ten years. In columns (5) and (6), the sample is divided based on the standard deviation of annual cash flows from operations during the previous ten years. The main effects on the control variables and their interactions with *Surprise* are included but the results are omitted. All regressions include firm and announcement date fixed effects. The two-way (firm and announcement date) clustered robust standard errors are in parentheses. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Table 5

Management earnings guidance and transmission of monetary policy: high versus low external finance dependence.

Panel A: Fixed effects

	Dependent variable: *Return*			
	External finance dependence		External equity dependence	
	Below median	Above median	Below median	Above median
	(1)	(2)	(3)	(4)
Guidance_Dummy_3M	**-0.028**	**0.026**	**0.037**	**-0.007**
	(0.050)	**(0.070)**	**(0.080)**	**(0.050)**
Surprise* × *Guidance_Dummy_3M	**0.444**	**4.922*****	**0.719**	**2.819****
	(1.469)	**(1.777)**	**(1.255)**	**(1.390)**
Surprise × *Controls*	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes
Clustering on firm and date	Yes	Yes	Yes	Yes
Adjusted R^2	0.088	0.094	0.097	0.088
Number of observations	42,643	29,908	21,220	51,377

Panel B: Entropy balancing

	Dependent variable: *Return*			
	External finance dependence		External equity dependence	
	Below median	Above median	Below median	Above median
	(1)	(2)	(3)	(4)
Guidance_Dummy_3M	**-0.028**	**0.026**	**0.037**	**-0.007**
	(0.050)	**(0.070)**	**(0.080)**	**(0.050)**
Surprise* × *Guidance_Dummy_3M	**0.444**	**4.922*****	**0.719**	**2.819****
	(1.469)	**(1.777)**	**(1.255)**	**(1.390)**
Surprise × *Controls*	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes
Clustering on firm and date	Yes	Yes	Yes	Yes
Adjusted R^2	0.088	0.094	0.097	0.088
Number of observations	42,643	29,908	21,220	51,377

This table contains results of estimating equation (2). *Return* is the daily stock return on the day of the announcement. *Surprise* is the basis point change in the median quote of one-month OIS rate from the window 13:25-13:35 before the press release to the median quote in the window 14:00-14:10 after the release on monetary policy announcement dates (Altavilla et al. 2019). *Guidance_Dummy_3M* equals one if the firm issues a management earnings guidance in the three months leading to the policy announcement date. In columns (1) and (2), the sample is divided based on external finance dependence which is the industry-median proportion of investment not financed by cash flow from operations. In columns (3) and (4), the sample is divided based external equity dependence (Duchin et al, 2010) which is the industry-median ratio of equity to investment. The main effects on the control variables and their interactions with *Surprise* are included but the results are omitted. All regressions include firm and announcement date fixed effects. The two-way (firm and announcement date) clustered robust standard errors are in parentheses. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Table 6

Management earnings guidance and transmission of monetary policy: The effect of guidance sentiment.

Panel A: Guidance conveying good news versus guidance conveying bad news

	Dependent variable: *Return*					
	Good news			Bad news		
	Fixed effects		Entropy balancing	Fixed effects		Entropy balancing
	(1)	(2)	(3)	(4)	(5)	(6)
Guidance_Dummy_3M	**-0.023**	**0.022**	**-0.089**	**0.021**	**0.054**	**0.042**
	(0.06)	**(0.10)**	**(0.07)**	**(0.06)**	**(0.11)**	**(0.06)**
Surprise* × *Guidance_Dummy_3M	**4.528*****	**9.127*****	**4.941****	**2.492**	**4.987**	**1.881**
	(1.19)	**(2.55)**	**(1.99)**	**(1.64)**	**(3.22)**	**(1.34)**
Surprise × *Controls*	Yes	Yes	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clustering on firm and date	Yes	Yes	Yes	Yes	Yes	Yes
Adjustment for earnings text	No	Yes	No	No	Yes	No
Adjusted R^2	0.086	0.086	0.208	0.085	0.086	0.167
Number of observations	64,768	62,974	64,768	67,486	63,307	67,486

Panel B: Guidance containing strong modal words versus guidance containing weak modal words

	Dependent variable: *Return*					
	Strong modal			Weak modal		
	Fixed effects		Entropy balancing	Fixed effects		Entropy balancing
	(1)	(2)	(3)	(4)	(5)	(6)
Guidance_Dummy_3M	**-0.007**	**0.034**	**-0.005**	**0.006**	**-0.032**	**-0.046**
	(-0.06)	**(0.09)**	**(0.08)**	**(-0.12)**	**(0.24)**	**(0.17)**
Surprise* × *Guidance_Dummy_3M	**3.799****	**8.363****	**4.003***	**3.739**	**3.838**	**1.811**
	(1.76)	**(3.65)**	**(2.16)**	**(4.64)**	**(5.40)**	**(4.07)**
Surprise × *Controls*	Yes	Yes	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clustering on firm and date	Yes	Yes	Yes	Yes	Yes	Yes
Adjustment for earnings text	No	Yes	No	No	Yes	No
Adjusted R^2	0.085	0.086	0.189	0.086	0.086	0.341
Number of observations	65,106	63,242	65,106	62,801	62,418	62,801

This table contains results of estimating equation (2). *Return* is the daily stock return on the day of the announcement. *Surprise* is the basis point change in the median quote of one-month OIS rate from the window 13:25-13:35 before the press release to the median quote in the window 14:00-14:10 after the release on monetary policy announcement dates (Altavilla et al. 2019). *Guidance_Dummy_3M* equals one if the firm issues a management earnings guidance in the three months leading to the policy announcement date. In panel A, good and bad news is defined by a textual analysis technique based on Loughran and McDonald (2011) financial dictionary. In panel B, strong modal and weak modal are defined in the same technique with panel A, please refer to table IA.2 in internet appendix for more details. The main effects on the control variables and their interactions with *Surprise* are included but the results are omitted. All regressions include firm and announcement date fixed effects. The two-way (firm and announcement date) clustered robust standard errors are in parentheses. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Table 7

Management earnings guidance and transmission of monetary policy: The effect of forecast precision and credibility.

Panel A: forecast precision

	Dependent variable: *Return*					
	Point forecasts		Range forecasts		Qualitative forecasts	
	Fixed effects	Entropy balancing	Fixed effects	Entropy balancing	Fixed effects	Entropy balancing
	(1)	(2)	(3)	(4)	(5)	(6)
Guidance_Dummy_3M	**0.032**	**0.021**	**-0.027**	**-0.008**	**0.027**	**-0.064**
	(0.049)	**(0.054)**	**(0.072)**	**(0.086)**	**(0.044)**	**(0.120)**
Surprise* × *Guidance_Dummy_3M	**4.985*** **	**4.197*** **	**0.803**	**1.964**	**2.533**	**1.269**
	(1.027)	**(1.374)**	**(2.566)**	**(2.229)**	**(1.587)**	**(1.687)**
Surprise × *Controls*	Yes	Yes	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Clustering on firm and date	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.086	0.176	0.087	0.218	0.087	0.189
Number of observations	67313	67313	65391	65391	70569	64092

Panel B: forecast credibility

	Dependent variable: *Return*			
	High credibility		Low credibility	
	Fixed effects	Entropy Balance	Fixed effects	Entropy Balance
	(1)	(2)	(3)	(4)
Guidance_Dummy_3M	**0.067**	**-0.024**	**0.049**	**0.076**
	(0.075)	**(0.106)**	**(0.092)**	**(0.115)**
Surprise* × *Guidance_Dummy_3M	**5.895****	**6.874****	**1.230**	**-2.405**
	(2.336)	**(3.015)**	**(2.777)**	**(2.152)**
Surprise × *Controls*	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes
Clustering by firm and date	Yes	Yes	Yes	Yes
Observations	64,413	64,413	64,352	64,352
Adjusted R^2	0.085	0.177	0.086	0.224

This table contains results of estimating equation (2). *Return* is the daily stock return on the day of the announcement. *Surprise* is the basis point change in the median quote of one-month OIS rate from the window 13:25-13:35 before the press release to the median quote in the window 14:00-14:10 after the release on monetary policy announcement dates (Altavilla et al. 2019). *Guidance_Dummy_3M* equals one if the firm issues a management earnings guidance in the three months leading to the policy announcement date. Panel A classifies guidance based on its forecast precision. Panel B classifies guidance based on its forecast credibility, which is based on forecast accuracy, please refer to table IA.2 in internet appendix for more details. All other variables are as defined in Table 1. The main effects on the control variables and their interactions with *Surprise* are included but the results are omitted. All regressions include firm and announcement date fixed effects. The two-way (firm and announcement date) clustered robust standard errors are in parentheses. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Table 8

Management earnings guidance and transmission of monetary policy: The effect of guidance frequency and dis-aggregation.

Panel A: Guidance frequency

	Dependent variable: *Return*			
	Routine		Sporadic	
	Fixed effects	Entropy balancing	Fixed effects	Entropy Balance
	(1)	(2)	(3)	(4)
Guidance_Dummy_3M	**0.018**	**0.093**	**-0.000**	**0.003**
	(0.078)	**(0.111)**	**(0.051)**	**(0.047)**
Surprise* × *Guidance_Dummy_3M	**4.848****	**4.392****	**0.042**	**0.010**
	(1.904)	**(1.851)**	**(1.207)**	**(1.558)**
Surprise × *Controls*	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes
Clustering on firm and date	Yes	Yes	Yes	Yes
Adjusted R^2	0.087	0.212	0.085	0.149
Number of observations	66,729	66,729	68,122	68,122

Panel B: Guidance dis-aggregation

	Dependent variable: *Return*			
	Dis-aggregated		Aggregated	
	Fixed effects	Entropy balancing	Fixed effects	Entropy Balance
	(1)	(2)	(3)	(4)
Guidance_Dummy_3M	**0.033**	**-0.010**	**-0.032**	**0.025**
	(0.050)	**(0.055)**	**(0.063)**	**(0.066)**
Surprise* × *Guidance_Dummy_3M	**3.548****	**3.597****	**1.611**	**2.015**
	(1.609)	**(1.716)**	**(2.559)**	**(2.600)**
Surprise × *Controls*	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes
Clustering on firm and date	Yes	Yes	Yes	Yes
Adjusted R^2	0.087	0.169	0.086	0.183
Number of observations	68,706	68,706	65,690	65,690

This table contains results of estimating equation (2). *Return* is the daily stock return on the day of the announcement. *Surprise* is the basis point change in the median quote of one-month OIS rate from the window 13:25-13:35 before the press release to the median quote in the window 14:00-14:10 after the release on monetary policy announcement dates (Altavilla et al. 2019). *Guidance_Dummy_3M* equals one if the firm issues a management earnings guidance in the three months leading to the policy announcement date. In panel A, routine guidance is defined as the guidance issued by firms that, prior to the quarter of the current guidance, issued guidance in at least three of the last four calendar quarters. All other guidance is defined as sporadic forecasts. In panel B, dis-aggregated guidance is defined as guidance with the number of unique forecast measures higher than or equal to 2, whereas, aggregated guidance is defined as guidance with the number of unique forecast measures lower than 2, please refer to table IA.2 in internet appendix for more details. The main effects on the control variables and their interactions with *Surprise* are included but the results are omitted. All regressions include firm and announcement date fixed effects. The two-way (firm and announcement date) clustered robust standard errors are in parentheses. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Table 9

Management earnings guidance and transmission of monetary policy: Placebo Test.

	Dependent variable: *Return*							
	Sample 1		Sample 2		Sample 3		Sample 4	
	Fixed effects	Entropy balancing	Fixed effects	Entropy balancing	Fixed effects	Entropy balancing	Fixed effects	Entropy balancing
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Guidance_Dummy_3M	**-0.002**	**-0.002**	**0.003**	**0.002**	**0.007**	**0.008**	**-0.029**	**-0.033**
	(0.03)	**(0.03)**	**(0.04)**	**(0.04)**	**(0.04)**	**(0.03)**	**(0.06)**	**(0.07)**
Surprise × Guidance_Dummy_3M	**-0.639**	**-0.447**	**-0.780**	**-0.697**	**-0.028**	**-0.224**	**-0.099**	**2.674**
	(1.78)	**(1.87)**	**(1.74)**	**(1.78)**	**(1.28)**	**(1.39)**	**(3.11)**	**(5.76)**
Surprise × *Controls*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering on firm and date	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.087	0.123	0.087	0.115	0.087	0.118	0.100	0.098
Number of observations	72,731	72,731	72,731	72,731	72,731	72,731	72,731	72,731

This table contains results of estimating equation (2). *Return* is the daily stock return on the day of the announcement. *Surprise* is the basis point change in the median quote of one-month OIS rate from the window 13:25-13:35 before the press release to the median quote in the window 14:00-14:10 after the release on monetary policy announcement dates (Altavilla et al. 2019). *Guidance_Dummy_3M* equals one if the firm issues a management earnings guidance in the three months leading to the policy announcement date. In sample 1, we randomly assign treatment provided the number of treated observations in the whole sample is the same as the corresponding number in the original sample. In sample 2, we randomly assign treatment provided the number of treated observations in each country is the same as the corresponding number in the original sample. In sample 3, we randomly assign treatment provided the number of treated observations in each industry is the same as the corresponding number in the original sample. In sample 4, we replace the dependent variable by the last two-day return before announcement dates. The main effects on the control variables and their interactions with *Surprise* are included but the results are omitted. All regressions include firm and announcement date fixed effects. The two-way (firm and announcement date) clustered robust standard errors are in parentheses. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Table 10

Management earnings guidance and non-standard ECB measure surprises

	Dependent variable: *Return*	
	Fixed effects	Entropy balancing
	(1)	(2)
Guidance_Dummy_3M	**-0.005**	**-0.023**
	(0.042)	**(0.041)**
Non-standard_Surprise* × *Guidance_Dummy_3M	**1.563****	**1.187***
	(0.736)	**(0.704)**
Non-standard_Surprise × *Controls*	Yes	Yes
Main effects on controls	Yes	Yes
Firm and Date fixed effects	Yes	Yes
Clustering on firm and date	Yes	Yes
Number of observations	68,781	68,781
Adjusted R^2	0.084	0.147

This table contains results of estimating equation (2). *Non-standard_Surprise* is the basis point change in the median quote of two-year OIS rate from the window 14:15-14:25 before the press conference to the median quote in the window 15:40-15:50 after the conference on monetary policy announcement dates (Altavilla et al. 2019). *Guidance_Dummy_3M* equals one if the firm issues a management earnings guidance in the three months leading to the policy announcement date. The main effects on the control variables are included but the results are omitted. All regressions include firm and announcement date fixed effects. The two-way (firm and announcement date) clustered robust standard errors are in parentheses. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Table 11

Decomposing monetary policy surprise into Monetary policy shock and Central bank information shock

	Dependent variable: *Return*			
	Monetary policy shock		Central bank information shock	
	Fixed effects	Entropy balancing	Fixed effects	Entropy balancing
	(1)	(2)	(3)	(4)
Guidance_Dummy_3M	**-0.013**	**-0.037**	**-0.000**	**-0.023**
	(0.050)	**(0.045)**	**(0.050)**	**(0.050)**
Guidance_Dummy_3M* × *MPshock	**3.478****	**2.954****		
	(1.413)	**(1.385)**		
Guidance_Dummy_3M* × *CBIshock			**2.742**	**2.287**
			(2.501)	**(3.023)**
Surprise × *Controls*	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes
Clustering on firm and date	Yes	Yes	Yes	Yes
Num. obs.	55,714	55,714	55,714	55,714
R^2	0.088	0.157	0.088	0.156

This table contains results of estimating equation (2) with the replacement of surprise by monetary policy shock (MPshock) or central bank information shock (CBIshock). MPshock and CBIshock are two components of monetary policy surprise. We decompose surprise based on the method of Jarociński and Karadi (2020). *Return* is the daily stock return on the day of the announcement. *Guidance_Dummy_3M* equals one if the firm issues a management earnings guidance in the three months leading to the policy announcement date. The main effects on the control variables are included but the results are omitted. All regressions include firm and announcement date fixed effects. The two-way (firm and announcement date) clustered robust standard errors are in parentheses. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Appendix

Table A1.

Variable definitions

Panel A: Macroeconomic variables	
Ret_Stoxx50	STOXX 50 index change in percentage point in the median quote from the window 13:25-13:35 before the press release to the median quote in the window 14:00-14:10 after the release on meeting dates (Altavilla et al., 2019).
Surprise	1-month OIS rate change in basis point in the median quote from the window 13:25-13:35 before the press release to the median quote in the window 14:00-14:10 after the release on meeting dates (Altavilla et al., 2019).
Panel B: Guidance variable	
Guidance_Dummy_3M	Equal 1 if a firm have issued a guidance for the past 3 months and 0 otherwise.
Panel C: Firm variables	
Return	Daily stock return on the ECB announcement date.
Earning_announce	A dummy variable, equal 1 if an ECB announcement date happens during the window of [-4; +4] days around earning announcement, the window is based on Yohn (1998).
BM Ratio	Book value of equity scaled by market value of equity, measured as of the firm's fiscal year end.
Depreciation	Depreciation expense scaled by sales during the current fiscal year.
Concentration	The percentage share of sales of firms in the industry during the current year, based on 2-digit SIC code.
Investment	The ratio of capital expenditures to sales during the current fiscal year.
Leverage	Total liabilities scaled by total assets, as of the end of the fiscal year.
Assets	Natural logarithm of total assets at the end of the fiscal year.
Gross Margin	Sales minus cost of goods sold, scaled by sales during the current fiscal year.
Receivable	Accounts receivable minus accounts payable, scaled by total assets, measured as of the end of the fiscal year.
Roa	Income before extraordinary items scaled by beginning of the year total assets.
Sales Growth	Percentage growth in current fiscal year sales over the prior year.
Sales Sd	Standard deviation of sales scaled by total assets over the previous ten years with at least 2 observations.
Stock Sd	Standard deviation of monthly stock returns during the twelve-month period prior to fiscal year-end.
MKT_Beta	Factor loading on the market factor from the Carhart four-factor model using monthly return over the past 5 years from the month prior to announcement dates with at least 30 observations, based on Dimson (1979) approach.
SMB_Beta	Factor loading on the SMB factor from the Carhart four-factor model using monthly return over the past 5 years from the month prior to announcement dates with at least 30 observations, based on Dimson (1979) approach.
HML_Beta	Factor loading on the HML factor from the Carhart four-factor model using monthly return over the past 5 years from the month prior to announcement dates with at least 30 observations, based on Dimson (1979) approach.
WML_Beta	Factor loading on the WML factor from the Carhart four-factor model using monthly return over the past 5 years from the month prior to announcement dates with at least 30 observations, based on Dimson (1979) approach.
Firm Age	The number of years a firm exists in Compustat until the announcement dates.
Panel D: Information asymmetry and external finance dependence measures	
HP index	$-0.737Size + 0.043Size^2 - 0.040Age$, where Size equals the log of inflation adjusted Compustat item AT (in 2004 Euros), and Age is the firm age as defined above. Size is capped at $4.5 billion and Age is capped at 37 years. See Hadlock and Pierce (2010).
Earnings volatility	Standard deviation of annual earnings before extraordinary items during the previous ten years.
Cash flow volatility	Standard deviation of annual cash flow from operations during the previous ten years.
External finance dependence	(Capital expenditures (capx)- funds from operations (fopt))/capital expenditures (capx). Where fopt = Income before extraordinary items (ibc)+ depreciation and amortization (dpc)+ deferred taxes (txdc)+ sale of property, plant, and equipment and investments gain/loss (sppiv)+ funds from operations other (fopo).
External equity dependence	(sale of common and preferred stock (sstk) - purchase of common and pref. stock (prstkc)) / to capital expenditures (capx).

Internet Appendix

to

Management Guidance and Monetary Policy Transmission in the Eurozone

by

Mansoor Afzali, Gonul Colak, Sinh Thoi Mai, Pavel Savor

1. Supplementary descriptive statistics

Table IA.1

Sample composition.

No	Country	Number Of observations	Beginning year in sample
1	Austria	1,632	2002
2	Belgium	2,459	2002
3	Cyprus	1,248	2008
4	Germany	18,760	2002
5	Spain	2,278	2002
6	Estonia	92	2011
7	Finland	3,324	2002
8	France	18,704	2002
9	Greece	9,289	2002
10	Ireland	918	2002
11	Italy	8,469	2002
12	Lithuania	81	2015
13	Luxembourg	918	2002
14	Latvia	12	2015
15	Malta	203	2010
16	Netherlands	2,649	2002
17	Portugal	1,256	2002
18	Slovakia	64	2009
19	Slovenia	389	2009

The table shows the number of firm-date observations per country for each of the 19 countries in our sample. The total number of observations is 72,731. The starting year of a country in the sample is determined by the starting year of that country adopting the euro.

Table IA.2

Guidance classification.

Panel A: Sentiment, confidence, forecast form

Sentiment		Confidence		Forecast form	
(1)		(2)		(3)	
Good news	1,338	Strong modal	1,361	Quantitative	4,377
Bad news	2,672	Weak modal	271	Point	2,644
Neutral	1,368	Neutral	3,746	Range	1,733
Total	5,378	Total	5,378	Qualitative	949
				Unidentified	52
				Total	5,378

Panel B: Frequency, dis-aggregation, credibility

Frequency		Dis-aggregation		Credibility	
(4)		(5)		(6)	
Routine	2,283	Dis-aggregated	3,457	Highly reliable	2,335
Sporadic	3,095	Aggregated	1,869	Lowly reliable	2,335
Unidentified	0	Unidentified	52	Unidentified	708
Total	5,378	Total	5,378	Total	5,378

Column (1) shows the classification of guidance by good news and bad news. Column (2) provides the classification of guidance by the use strong modal and weak modal words. Column (3) presents the classification of guidance by quantitative and qualitative guidance as well as point and range forecasts. Column (4) shows the classification of guidance by routine and sporadic forecasts. Column (5) presents the classification of guidance by dis-aggregated and aggregated forecasts. Column (6) presents the classification of guidance by high and low reliability.

Table IA.3

Summary statistics: Young and old firm comparison.

	Observations	Mean	S.D.	P25	Median	P75
Panel A: Young firm sample						
Return	72,731	-0.039	2.934	-1.108	0.000	0.893
Depreciation	72,731	0.078	0.110	0.023	0.044	0.083
Investment	72,731	0.084	0.170	0.013	0.032	0.077
Leverage	72,731	0.576	0.233	0.416	0.580	0.721
Assets	72,731	4.740	1.657	3.550	4.534	5.745
Gross_margin	72,731	0.539	0.364	0.253	0.473	1.000
Receiveables	72,731	0.081	0.135	-0.001	0.067	0.155
Roa	72,731	-0.008	0.140	-0.039	0.018	0.058
Sales Growth	72,731	0.096	0.431	-0.069	0.050	0.186
Sales Sd	72,731	0.248	0.233	0.097	0.174	0.310
Concentration	72,731	0.128	0.352	0.008	0.025	0.080
BM Ratio	72,731	0.913	1.119	0.344	0.612	1.103
Stock Sd	72,731	0.110	0.059	0.068	0.097	0.138
MKT_Beta	72,731	0.681	0.652	0.257	0.641	1.057
SMB_Beta	72,731	0.726	1.387	-0.123	0.603	1.455
HML_Beta	72,731	-0.165	1.722	-1.094	-0.121	0.713
WML_Beta	72,731	-0.219	0.732	-0.606	-0.179	0.186
Panel B: Old firm sample						
Return	162,205	0.031	2.445	-0.825	0	0.85
Depreciation	162,205	0.056	0.061	0.022	0.039	0.065
Investment	162,205	0.061	0.097	0.016	0.033	0.064
Leverage	162,205	0.6	0.215	0.468	0.599	0.723
Assets	162,205	6.026	2.178	4.417	5.799	7.432
Gross_margin	162,205	0.424	0.26	0.236	0.383	0.564
Receiveables	162,205	0.062	0.115	-0.005	0.046	0.119
Roa	162,205	0.021	0.09	-0.002	0.029	0.062
Sales Growth	162,205	0.039	0.225	-0.048	0.03	0.111
Sales Sd	162,205	0.194	0.17	0.087	0.142	0.238
Concentration	162,205	0.733	2.124	0.016	0.073	0.332
BM Ratio	162,205	1.026	1.394	0.395	0.696	1.206
Stock Sd	162,205	0.091	0.048	0.058	0.08	0.112
MKT_Beta	162,205	0.615	0.524	0.278	0.585	0.925
SMB_Beta	162,205	0.428	1.064	-0.233	0.385	1.055
HML_Beta	162,205	0.25	1.182	-0.464	0.157	0.851
WML_Beta	162,205	-0.08	0.601	-0.405	-0.072	0.244

3. Supplementary tests

Table IA4: Robust test

Alternative firm age thresholds for defining young firm sample

Dependent variable:	*Return*							
Young firm sample	< 7 years	< 8 years	< 9 years	< 10 years	< 11 years	< 12 years	< 13 years	< 14 years
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Guidance_Dummy_3M	**0.023**	**-0.020**	**0.002**	**0.001**	**-0.010**	**-0.009**	**-0.003**	**0.010**
	(0.061)	**(0.062)**	**(0.044)**	**(0.044)**	**(0.037)**	**(0.030)**	**(0.026)**	**(0.024)**
Surprise* × *Guidance_Dummy_3M	**4.694***	**2.987***	**2.245****	**2.215****	**1.612***	**0.593**	**0.265**	**0.284**
	(2.488)	**(1.703)**	**(1.111)**	**(1.148)**	**(0.850)**	**(0.705)**	**(0.593)**	**(0.645)**
Surprise × *Controls*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering on firm and date	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. obs.	44,443	59,056	67,045	72,731	99,586	111,499	124,500	139,365
R^2	0.099	0.092	0.086	0.084	0.082	0.081	0.080	0.080

This table contains results of estimating equation (2) for different young firm samples defined by different firm age thresholds ranging from 7 years to 14 years. Firm age is computed as the number of years a firm is listed in Compustat database on each announcement date. *Return* is the daily stock return on the day of the announcement. *Surprise* is the basis point change in the median quote of one-month OIS rate from the window 13:25-13:35 before the press release to the median quote in the window 14:00-14:10 after the release on monetary policy announcement dates (Altavilla et al. 2019). *Guidance_Dummy_3M* equals one if the firm issues a management earnings guidance in the three months leading to the policy announcement date. We control for 17 variables, including firm characteristics, earning announcement, stock betas. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Table IA.5
Controlling for zero-lower bound effect

	Dependent variable: *Return*	
	Fixed effects	Entropy balancing
	(1)	(2)
Guidance_Dummy_3M	**0.034**	**0.013**
	(0.052)	**(0.053)**
Surprise × Guidance_Dummy_3M	**2.473****	**2.496*****
	(1.298)	**(0.934)**
Surprise × Controls	Yes	Yes
Main effects on controls	Yes	Yes
Firm and Date fixed effects	Yes	Yes
Clustering on firm and date	Yes	Yes
Num. obs.	60,298	60,298
R^2	0.093	0.164

The table reports the effect of management guidance on the monetary policy transmission after controlling for zero-lower bound effect. We estimated eq. (2) for the sample period from 2002 to the middle of 2012. We restrict the sample period until the middle of 2012 since ECB policy rate reaches zero-lower bound after that period. $^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$. SE in parenthesis.

Table IA.6: Robust test

Alternative measures of guidance.

	Dependent variable: *Return*							
	Fixed effects	Entropy Balance	Fixed effects	Entropy Balance	Fixed effects	Entropy Balance	Fixed effects	Entropy Balance
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Guidance_Dummy_9M	0.067	0.042						
	(0.043)	(0.040)						
Surprise × Guidance_Dummy_9M	**1.805*****	**2.148****						
	(0.669)	**(0.974)**						
Guidance_Dummy_12M			0.082	0.042				
			(0.052)	(0.042)				
Surprise × Guidance_Dummy_12M			**2.009****	**2.490*****				
			(0.904)	**(0.926)**				
Guidance_Dummy_24M					0.076	0.048		
					(0.047)	(0.044)		
Surprise × Guidance_Dummy_24M					**3.102****	**3.708*****		
					(1.322)	**(1.257)**		
Guidance_Dummy_Horizon							0.055	-0.002
							(0.043)	(0.042)
Surprise × Guidance_Dummy_Horizon							**1.621*****	**1.648****
							(0.524)	**(0.924)**
Surprise × Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Main effects on controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Date fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustering by firm and date	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. obs.	72,731	72,731	72,731	72,731	72,731	72,731	72,731	72,731
Adjusted R^2	0.087	0.128	0.087	0.128	0.087	0.121	0.087	0.128

This table contains results of estimating equation (2). *Return* is the daily stock return on the day of the announcement. *Surprise* is the basis point change in the median quote of one-month OIS rate from the window 13:25-13:35 before the press release to the median quote in the window 14:00-14:10 after the release on monetary policy announcement dates (Altavilla et al. 2019). *Guidance_Dummy_9M* equals one if the firm issues a management earnings guidance in the 9 months leading to the policy announcement date. *Guidance_Dummy_12M* equals one if the firm issues a management earnings guidance in the 12 months leading to the policy announcement date. *Guidance_Dummy_24M* equals one if the firm issues a management earnings guidance in the 24 months leading to the policy announcement date. *Guidance_Dummy_Horizon* equals one if the firm issues a management earnings guidance in the past and its forecast horizon covers the announcement date. The main effects on the control variables are included but the results are omitted. All regressions include firm and announcement date fixed effects. The two-way (firm and announcement date) cluster robust standard errors are in parentheses. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.

Table IA.7: Robust test

Stock market reaction to management earnings guidance issued by young and old firms.

	Dependent variable: CAR [-1; +1]			
	Fixed effects		Entropy balancing	
	(1)	(2)	(3)	(4)
Young	**0.376*****	**0.330*****	**0.476****	**0.368*****
	(0.118)	**(0.089)**	**(0.222)**	**(0.117)**
Guidance_issued_with_earnings	-0.158**	-0.184***	-0.300**	-0.289**
	(0.072)	(0.066)	(0.143)	(0.138)
Number_analysts	0.012	0.020***	0.016	0.030***
	(0.008)	(0.005)	(0.019)	(0.010)
Depreciation	-0.014	0.017	3.857**	1.601*
	(0.054)	(0.046)	(1.867)	(0.944)
Investment	0.527**	0.167	0.899***	0.159
	(0.225)	(0.179)	(0.264)	(0.244)
Leverage	0.156	0.182	0.701	0.843**
	(0.351)	(0.206)	(0.606)	(0.339)
Assets	0.079	-0.093***	0.397*	-0.145*
	(0.103)	(0.033)	(0.216)	(0.076)
Gross-margin	0.024***	0.008	0.840**	0.334*
	(0.005)	(0.005)	(0.379)	(0.190)
Receivables	0.011	0.186	-0.652	0.283
	(0.600)	(0.364)	(1.707)	(0.519)
Roa	0.187	-0.582	0.860	-0.754
	(0.538)	(0.364)	(0.850)	(0.510)
Sales Growth	0.006	-0.034**	0.340*	-0.007
	(0.050)	(0.015)	(0.201)	(0.089)
Sales Sd	0.590*	0.123	1.168**	0.085
	(0.317)	(0.093)	(0.468)	(0.095)
Concentration	-7.002**	-4.470***	-39.300*	-16.549**
	(3.055)	(1.165)	(22.358)	(7.151)
BM Ratio	-0.026	-0.010**	-0.011	-0.007***
	(0.017)	(0.005)	(0.013)	(0.002)
Stock Sd	0.144***	0.192***	0.077***	0.155***
	(0.011)	(0.010)	(0.022)	(0.016)
Firm and year fixed effects	Yes	No	Yes	No
Industry and year fixed effects	No	Yes	No	Yes
Clustering on firm and industry*year	Yes	Yes	Yes	Yes
Num. obs.	23,084	23,084	23,084	23,084
R^2	0.175	0.102	0.235	0.120

This table presents regression results of market reaction to management earnings guidance. Following prior studies (e.g. Guan et al., 2020; Li et al., 2019), we measure the dependent variable CAR as absolute value of three-day cumulative stock returns adjusted for market, SMB, HML and momentum risks centered on the management forecast issuance date. Young is a dummy variable, equals one if on the date of issuing guidance, its firm age is less than 10 years and zero otherwise. *Guidance_issued_with_earnings* is a dummy variable, equals 1 if the guidance is issued with earnings announcement on the same day. *Number_analysts* is the number of analysts following a firm at the beginning of a year, data is taken from IBES database. The definitions of other variables are reported in table A1 Appendix. Standard errors are clustered at both the firm and industry*year levels, and t-statistics are reported in brackets. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, respectively. Bold text indicates variables of interest.

Table IA.8: Robust test

The effect of firm age on the reaction of stock return to monetary surprises.

	Dependent variable: *Return*
	(1)
***Surprise* × Firm_age**	**0.123****
	(0.055)
Controls	Yes
Surprise × *Controls*	Yes
Main effects on controls	Yes
Firm and date fixed effects	Yes
Clustering on firm and industry*year	Yes
Num. obs.	234,950
Adjusted R^2	0.082

The table reports the estimate of the effect of firm age on the reaction of stock return to monetary surprise, based on the following model:

$$Return_{i,t} = \alpha + \beta_1 firm\_age_{i,t} + \beta_2 firm\_age_{i,t} \times Surprise_t + \beta_n Controls_{i,t-1} + \beta_m Controls_{i,t-1} \times Surprise_t + \delta_i + \gamma_t + \varepsilon_{i,t}$$

Return is the daily stock return on the day of the announcement. *Surprise* is the basis point change in the median quote of one-month OIS rate from the window 13:25-13:35 before the press release to the median quote in the window 14:00-14:10 after the release on monetary policy announcement dates (Altavilla et al. 2019). *Firm_age* and controls are defined in table A1. All regressions include firm and announcement date fixed effects. The two-way (firm and industry×year) cluster robust standard errors are in parentheses. Levels of significance are indicated by *, **, and *** for 10%, 5%, and 1%, respectively.