Is cost stickiness associated with management earnings forecasts?

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Abstract

Purpose – The literature suggests that management discretion to adjust resources in response to changes in sales can create asymmetric cost behavior and management incentives to move stock prices can influence its decision to release management earnings forecasts (MEF). The purpose of this paper is to investigate the association between a firm's degree of cost stickiness and its propensity to release MEF. The authors propose that both MEF and cost stickiness are influenced by management strategic choices and provide two possible explanations along with supportive evidence. First, when management is optimistic about future performance, it tends to increase both cost stickiness and is willing to disclose the optimistic expectations through MEF. Second, cost stickiness increases information asymmetry between management and investors, thus management tends to issue earnings forecast to mitigate the perceived information asymmetry.

Design/methodology/approach – The authors collect firm-level fundamental data from the COMPUSTAT database, and market data from the CRSP database during 2005 and 2016. The data used to measure variables related to institutional ownership and financial analysts are, respectively, obtained from the Thomson Reuters and the I/B/E/S databases. The quarterly MEF data are from two databases. The authors obtain the data before 2012 the from Thomson First Call's Company Issued Guidance database and manually collect the data between 2012 and 2016 from the Bloomberg database for the largest 3,000 publicly traded US companies. The measurement of cost stickiness is based on the industry-level measurement developed by Anderson *et al.* (2003) and the firm-level measurements developed by Weiss (2010). The authors construct two measurements, management's propensity to issue MEF and the frequency of MEF, to capture management's voluntary disclosure strategy.

Findings – The analyses of a sample between year 2005 and 2016, indicate that the firm-level cost stickiness is positively associated with the firm's propensity to issue MEF and the frequency of MEF. Moreover, the authors find that the level of cost stickiness is associated with more favorable earnings news forecasted by management. Additional tests suggest that both information asymmetry and managerial optimism may explain the relationship between cost stickiness and MEF. Finally, the authors find that the association between cost stickiness and MEF behaviors is more pronounced when the resource adjustment cost is high and when the firm efficiency is high. The results are robust after using alternative measurements of cost stickiness and MEF.

Originality/value – First, this paper attempts to build a bridge between managerial accounting and financial accounting by providing evidence of managerial incentives and discretions that affect both cost structure and earnings. The authors contribute to, and complement, prior studies that primarily disentangle the complicated accounting information system by focusing on either the internal information system or the external information system. Second, the paper complements prior studies that examine cost stickiness and its determinants of asymmetric cost behavior by providing additional evidence for the value-relevance of cost stickiness strategy and its link to MEF releases in mitigating information asymmetry. Third, the findings are also relevant to current debates among policymakers, academia and practitioners regarding modernization of mandatory and voluntary disclosures through discussing the managerial incentive behind the managerial disclosure strategies as reflected in MEF releases (SEC, 2013). Fourth, the authors provide evidence regarding management's role in influencing cost asymmetry and MEF releases, which support the theoretical argument that management discretions affect the firms' cost structure and MEF disclosures.

Keywords Cost behaviour, Cost stickiness, Voluntary disclosures, Management earnings forecasts

Paper type Research paper

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1. Introduction

Cost management and financial reporting are two important functions and responsibilities of management. One stream of research (e.g. Anderson *et al.*, 2003; Banker and Chen, 2006; Banker and Byzalov, 2014; Banker *et al.*, 2016; Banker, Byzalov and Plehn-Dujowich, 2014; Banker, Byzalov, Ciftci and Mashruwala, 2014) suggests that the cost asymmetry is affected by management discretion over resource adjustment in response to changes in sales[1]. Another stream of research investigates market reactions to management earnings forecasts (MEF) releases (e.g. Pownall *et al.*, 1993; Soffer *et al.*, 2000; Hutton *et al.*, 2003), analysts' forecast revisions in response to MEF (e.g. Cotter *et al.*, 2006), earnings manipulation through MEF (Skinner, 1994; Richardson *et al.*, 2004) and management earnings credibility through MEF (Mercer, 2004; Cohen *et al.*, 2018).

The two streams of research suggest that management has discretion over unutilized resources when a temporary drop in sales happens and has incentives to disclose earnings information to influence stock prices. The discretion and incentives are interweaved in the day-to-day operation of a company. Thus, examining the relationship between MEF and cost stickiness is essential to understand the effect of cost structure on earnings, which, in turn, affects MEF releases and is further explained in Section 3.

Motivated by prior research, our study attempts to disentangle whether internal managerial discretion over costs in the form of cost stickiness is linked to management external voluntary disclosure choice, specifically the propensity to issue MEF. Prior research (e.g. Anderson *et al.*, 2003; Weiss, 2010; Chen *et al.*, 2012; Banker, Byzalov, Ciftci and Mashruwala, 2014) on cost stickiness links management strategy of retaining unused capacity (leading to cost stickiness) to management's earnings optimism. We posit that decisions on both MEF and cost stickiness are explained by management strategic choices and propose two viable explanations on the association between the degree of cost stickiness and the propensity to issue MEF. First, when management expects an ascending trend in future earnings, the optimism increases both cost stickiness and management's willingness to reveal its expectations in earnings. Banker, Byzalov, Ciftci and Mashruwala (2014) document that management's optimistic expectations may result in a higher level of cost stickiness and Khan *et al.* (2013) and Cohen *et al.* (2018) find that MEFs are typically optimistic.

Second, cost stickiness increases the information asymmetry between management and investors (Banker, Chen and Park, 2014). Therefore, management may opt to issue earnings forecasts to mitigate the information asymmetry associated with cost stickiness. We will discuss these two explanations in detail in Section 3[2]. It is possible that management makes resource adjustment decisions based on the availability of unutilized resources. It is also possible that management decisions are based on expectations about future demand and earnings that could affect both cost stickiness and MEF releases. These possibilities and explanations give rise to our research question about whether cost stickiness and MEF are associated.

We obtain our sample by merging fundamental cost management data to management guidance data from Thomson First Call's Company Issued Guidance (CIG) database. To control the effect of the information reporting environment and firm characteristics, we collect market data from the CRSP database, financial analyst data from the I/B/E/S database and fundamental data from the COMPUSTAT database. The industry-level measurement of cost stickiness is based on the measurement developed by Anderson *et al.* (2003) and the firm-level measurements follow Weiss (2010).

We employ two measurements, management's propensity to issue MEF and the frequency of MEF releases, to capture management's voluntary disclosure strategies. Our findings, based on a sample between year 2005 and 2016, indicate that firm's level of cost stickiness is positively associated with management's propensity to issue MEF and MEF frequency. Moreover, we find that firm's level of cost stickiness is positively associated with favorable earnings forecasts. Additional tests suggest that both information asymmetry

and managerial optimism theories may account for the relationship between cost stickiness and MEF behaviors. Additional tests indicate that our findings may be conditional on resource adjustment cost and firm efficiency. Our results are robust when using alternative measurements of cost stickiness and MEF.

Our study on the link between asymmetric cost behavior and MEF releases contribute to the accounting literature in several ways. First, this paper attempts to build a bridge between managerial accounting and financial accounting by providing evidence that managerial incentives and discretions can affect both internal cost management and external earnings disclosure. We complement prior studies that primarily disentangle the complicated accounting information system by focusing on either internal or external information systems. Both Beyer *et al.* (2010) and Beyer and Guttman (2012) suggest future research to develop the complete corporate information environment by examining the interdependencies between management's disclosure strategy and business decisions. Our study provides insight into the integrated system of the corporate information environment, which consists of internal managerial information systems and external financial information systems, through discussing the interrelation between cost management strategy (cost stickiness) and management disclosure discretion (MEF releases). Our paper integrates two relatively independent literature of financial (MEF releases) and managerial (cost asymmetry) research (Chen *et al.*, 2012; Kama and Weiss, 2013; Banker *et al.*, 2016).

Second, our paper contributes to prior studies that examine cost stickiness and the determinants of asymmetric cost behavior by providing additional evidence of the value-relevance of cost stickiness strategy and its link to MEF releases in mitigating information asymmetry. Our findings imply that the positive association between the degree of cost stickiness and good MEF news underscores the importance of management incentives and discretions in shaping both the degree of cost asymmetry and the propensity for MEF releases. Third, our paper also has referential value for the current debates among policymakers, academia and practitioners regarding modernization of mandatory and voluntary disclosures through discussing the managerial incentive behind the managerial disclosure strategies as reflected in MEF releases (SEC, 2013).

Limited existing research studies the association between cost management behavior and MEF. Ciftci and Salama (2018) focus on how financial analysts' forecast errors as proxy for information asymmetry influence the management's propensity to issue earnings forecasts. Our paper studies in depth, firm efficiency, adjusting costs and management expectation, which represent firm characteristics. Chen *et al.* (2017) study the tone in the forward-looking statements (FLS). Our paper focuses on the earnings information in MEF which is a different disclosure from FLS. Through investigating the interactions between financial accounting and managerial accounting, our paper provides additional evidence on how companies maneuver their internal accounting information system. The internal accounting information system is known to be a "black box" and few outsiders know about its interior. Moreover, we discuss the information sharing and withholding between financial and managerial accounting department within the same company, our findings suggest that agency costs exist in the collaboration and competition among different departments. Therefore, our paper has the implication for practitioners that cost information can be used by managers to make decisions related to future earnings forecasts. Effective information sharing and integration through resources management and efficiency enhancement can foster decision making and strategic interactions among different departments/units within an organization. Third, our paper contributes to the literature by examining the effect of cost management behavior on management's expectation of a firm's future earnings. Prior studies (such as Cheng *et al.*, 2005, 2011; Houston *et al.*, 2010) suggest a possible managerial myopia or an expectation management game existed in MEF, and yet our paper provides additional evidence on how managers strategically decide the good-news or bad-news forecasted in earnings guidance

based on their cost structure or implemented managerial accounting strategies. Through unveiling the "black box" of strategies deliberately chosen by managers, our paper has the implication for outside stakeholders, including investors, financial analysts and governments, to take the expectation management and cost management into account when evaluating firms' future performance.

The rest of this paper is organized as follows: Section 2 presents a review of literature on cost stickiness and MEF. Section 3 discusses hypothesis development. Section 4 explains our methodology, including research models and sample selection. Results are presented in Section 5, and Section 6 concludes the paper.

2. Literature review

2.1 Cost stickiness

Cost structure is an important managerial strategy for managing costs as both costs and sales affect the bottom line. Traditionally, firms have used the volume-driven method to allocate certain operating expenses, such as selling, general and administrative expenses (SG&A), to each product/service (Miller and Vollman, 1985; Cooper and Kaplan, 1988). To mitigate some shortcomings of cost allocation, several studies, going back to Cooper and Kaplan (1992) develop the activity-based costing (ABC) to more precisely assign the resource usage on the basis of organizational activities. However, prior research also documents that any cost allocation systems including ABC may overstate the overhead costs based on the assumption that costs are proportional to activities (Noreen and Soderstrom, 1994, 1997). To further address this issue, Anderson *et al.* (2003) develop a new model to explain the cost behaviors in the real business world by building their theory based on two assumptions: resource adjustment costs and deliberate managerial actions.

Anderson *et al.* (2003) theoretically address the asymmetric cost behavior and empirically testify that cost is sticky. Specifically, they find that some SG&A expenses decrease by a smaller amount when the corresponding sales decrease but increase by a larger amount when the sales increase. This cost asymmetry is driven by management expectations of future demand. Resource adjustment costs are incurred, when management decides to cut the committed resource (when sales decrease) or restore the committed resource (when sales restore). Therefore, when sales decrease, management trades-off between the costs of adjusting the committed resource(s) with respect to sales reduction and the costs of maintaining the current resource(s') level with unused capacity. When sales are expected to be restored in the short-term period, resource adjustment costs are considered to be larger than the costs of maintaining unused capacity, thus management is inclined to deliberately keep current resource level and costs turn out to be sticky thereby. Prior research (e.g. Anderson *et al.*, 2003; Chen *et al.*, 2012; Banker, Byzalov, Ciftci and Mashruwala, 2014) also documents an asymmetric cost behavior and associates such cost behavior with management discretion to retain some unused resources when sales decrease to avoid adjustment costs (e.g. disposal costs; severance payments to dismissed employees) whereas management utilizes additional resources to meet the demand for sales increases.

A new line of research was advanced pursuant to the Anderson *et al.* (2003) cost stickiness phenomenon. For example, Balakrishnan and Gruca (2008), Calleja *et al.* (2006) and Subramaniam and Weidenmier (2016), respectively, find evidence of cost stickiness through department level, industry level and country level comparison. Banker, Byzalov and Chen (2013) conclude that cost stickiness is a prevalent global phenomenon by using large panel data from 1988 to 2008 for all countries in the Global Compustat database. Although many prior studies empirically find evidence of cost stickiness, there is no ultimate conclusion regarding the determinants of cost stickiness. Several papers are in favor of the asymmetric cost behavior which is caused by resource adjustment costs and deliberate management choice (e.g. Anderson *et al.*, 2003; Subramaniam and Weidenmier, 2016; Banker, Fang and

Mehta, 2013). Other research suggests that asset intensity (e.g. Subramaniam and Weidenmier, 2016; Anderson *et al.*, 2003), capacity utilization (e.g. Balakrishnan *et al.*, 2004; Cannon, 2014), organizational core competency (e.g. Balakrishnan and Gruca, 2008), loan financing (e.g. Banker and Fang, 2013), economic crisis (e.g. Banker, Byzalov and Chen, 2013), fixed costs and scale of diseconomies (e.g. Balakrishnan *et al.*, 2014), the change of regulation (e.g. Holzhacker *et al.*, 2015a), demand uncertainty on fixed and variable costs (e.g. Banker, Byzalov and Plehn-Dujowich, 2014), prior sales change (e.g. Banker, Byzalov, Ciftci and Mashruwala, 2014) and unemployment labor risk (e.g. Kim and Wang, 2014) may give rise to cost stickiness.

The studies mentioned above have predominantly explained the existence of cost stickiness and its economic determinants. Managerial incentives and corporate governance behind the sticky cost phenomenon has not yet been conclusively discussed in accounting literature. Recent studies start to shift their research attention from the phenomenon itself to the association between organizational mechanism and cost stickiness. Chen *et al.* (2012) suggest that severe agency problems from excessive free cash flow, CEO tenure, CEO horizon and CEO compensation will encourage managers to "build the empire" and shift SG&A cost stickiness from its optimal level while the negative effect of agency problem can be mitigated by corporate governance. Kim *et al.* (2019) empirically find SG&A costs are sticker for firms with internal control weakness and the effect is primarily attributable to internal information control problems existing within the organizations. Holzhacker *et al.* (2015b) suggest hospitals use a sticky (anti-sticky) cost strategy to manage the demand uncertainty and financial risk associated with cost structure. Moreover, prior papers suggest that agency costs derived from self-interested managers, such as managerial incentives to meet earnings expectation, will lead to an intentionally diminished cost stickiness (Kama and Weiss, 2013; Dierynck *et al.*, 2012). Furthermore, Chen *et al.* (2013) complement the accounting literature by proposing managerial overconfidence as a behavioral explanation for SG&A cost stickiness. Finally, He *et al.* (2018) further investigate the effect of asymmetry cost behavior on corporate governance and find a negative association between cost stickiness and dividend policy.

There are also several papers, which address the effects of cost stickiness on earnings. For example, Banker and Chen (2006) suggest that firm's cost stickiness plays an important role in predicting future earnings. Anderson *et al.* (2007) further find that cost stickiness can lead to positive abnormal return. Cost stickiness may also influence financial analysts' earnings forecasts through its impact on earnings. For example, Weiss (2010) finds that stickier cost structures reduce the precision of analysts' earnings forecasts. Ciftci *et al.* (2016) further suggest that the enhancing analysts' awareness of cost stickiness improves the quality of financial analysts' forecasts. Prior research also finds that asymmetric cost behavior not only influences the earnings forecast but also the stock market and macro-economy. For example, Banker, Chen and Park (2014) suggest that the asymmetric cost behavior tends to increase the long-horizon return. Moreover, Rouxelin *et al.* (2018) suggest that the level of cost stickiness derived from recent corporate filings is positively associated with the overstatement of future macro-level unemployment rates. A contemporaneous study by Chen *et al.* (2017) finds that firms incur the highest level of cost stickiness when management has positive expectations about the future demand, and there is a high magnitude of adjustment costs with a low degree of unutilized resources. Overall, prior research suggests that management may retain resources in the revenue-down period to take advantage of the revenue-up period that could cause cost stickiness, which could result in information asymmetry between management and investors.

2.2 Management earnings forecasts

MEF have been used in the literature as a primary proxy for increased disclosure (Coller and Yohn, 1997; Rogers and Buskirk, 2013) and as a direct measure of a firm's disclosure policy

(Hirst *et al.*, 2008). The costs and benefits of voluntary MEF disclosures have been extensively addressed in prior studies, but no conclusion has been reached. The perceived benefits are improved liquidity, reduced information asymmetry, lower stock volatility and lower cost of capital (Healy and Palepu, 2001), while the perceived costs are encouraging management, financial analysts and even investors to focus on short-term performance at the expense of long-term sustainable performance (The Conference Board, 2015).

Prior studies also address the value-relevance of MEF by investigating market reactions to MEF releases (e.g. Pownall *et al.*, 1993; Soffer *et al.*, 2000; Hutton *et al.*, 2003), testing analysts' forecast revisions in response to MEF (e.g. Cotter *et al.*, 2006), examining earnings manipulation by disclosing more favorable news (e.g. Skinner, 1994; Cohen *et al.*, 2018) and investigating management credibility by suggesting good-news forecasts are less credible than bad-news forecasts (Mercer, 2004; Cohen *et al.*, 2018). Moreover, managerial incentives also play an important role in the decision of MEF, because MEF as a voluntary disclosure rests on the management discretion based on the firm strategies. Specifically, MEF behaviors are influenced by managers' demographic characteristics (Bamber *et al.*, 2010), insider trading activities (Cheng *et al.*, 2013) and executive compensations (Nagar *et al.*, 2003; Cheng *et al.*, 2014).

2.3 Cost stickiness and management earnings forecast

Prior studies have discussed the interaction between internal managerial accounting and external financial reporting. Bushman and Smith (2001) suggest two-way directions between financial accounting information and corporate governance. On the one hand, financial accounting systems provide an important source of information to governance mechanisms that help alleviate the agency problem derived from the separation of management and financing (Sloan, 2001). On the other hand, the content, process and quality of financial reporting information are also regulated by various internal control and monitoring mechanisms (e.g. Warfield *et al.*, 1995; Bushman *et al.*, 2004; Hoitash *et al.*, 2009). However, Hall (2010) suggests there is still much to be learned about the role of financial accounting information in managerial work. This interaction between managerial accounting and financial accounting discussed in prior literature shed light on our paper, since both practitioners and academic research recently pay attention to investigate an integration of financial and managerial accounting system (Weißenberger and Angelkort, 2011).

Taken together, prior research on cost stickiness suggests that many factors, including management characteristics, firm-specific attributes and macroeconomic factors, may influence the asymmetric cost behavior that is earnings respond more (less) to sales decreases (increases), which, in turn, may increase the information asymmetry between management and investors. Studies pertaining to MEF suggest that although MEF releases improve market efficiency by reducing analysts' earnings forecast errors and dispersions, they can be detrimental to sustainable financial performance by encouraging short-termism. Management's incentives to avoid cost adjustments or to meet financial analysts' earnings forecasts could be reflected via both cost stickiness and MEFs. Thus, the tension in existing literature on both cost stickiness and MEF raises us a research question, which focuses on the link between the asymmetric cost behavior and management voluntary disclosure of quarterly MEF releases.

3. Hypothesis development

3.1 Cost stickiness and management incentives to issue MEF

Consistent with the related literature reviewed in Section 2, we propose two arguments for the possible link between the level of cost stickiness and the propensity to release MEF. Both arguments are based on information asymmetry and managerial optimism theories.

First, information asymmetry theory provides a new and insightful explanation to the interplay between operational decisions and voluntary disclosure. Management operational decisions determine whether to retain some unused resources when sales decrease to avoid adjustments costs as reflected in cost stickiness. The separation of ownership and control under the agency theory inevitably results in information asymmetry, thereby cost management decisions, including cost stickiness, are not directly observed by outsiders, which, in turn, leads to a "lemon problem" and market inefficiency (Akerlof, 1970). Lack of monitoring, greater cost stickiness makes it more difficult for investors, financial analysts and economists to assess firm performance because they do not fully understand/observe either asymmetric cost behavior or derived complex forward-looking decisions that can have a long-lasting effect on future performance[3]. Since the information asymmetry derived from sticky cost strategies chosen by managers will bring about significant agency costs, prior research suggests that management has incentive to voluntarily disclose information to reduce information asymmetry and increase market liquidity (e.g. Healy and Palepu, 2001; Shroff *et al.*, 2013). Thus, managers recognizing the possibility of the information asymmetry caused by the asymmetric cost behavior would be likely to voluntarily provide additional information (i.e. MEF disclosures) to reduce uncertainty caused by internal resource allocation decisions.

Second, management optimistic theory suggests that self-interested management's optimistic expectations for future earnings influences management's decision to maintain unused resources when sales decrease to avoid adjustment costs (e.g. Anderson *et al.*, 2003). Prior studies (Banker and Byzalov, 2014) argue that cost asymmetry is driven by management expectations for future sales and the extent of unutilized resources. Thus, management with optimistic sales expectations is more likely to "build empire" and enhance cost stickiness by intentionally avoiding resource adjustments in the sales downward period and increasing resource adjustments in the sales upward period.

Similarly, management also has discretion over MEF releases. On the one hand, management inclined to choose a sticky cost strategy tends to be more optimistic about future sales and decides to maintain the unused capacity when the sales decrease. On the other hand, consistent with the signaling theory of voluntary disclosure, management with superior performance tends to voluntarily disclose more information to differentiate itself from others with inferior performance (Grinblatt and Hwang, 1989; Lys *et al.*, 2015). Thus, when management is optimistic about its future sales and makes cost stickiness decisions, it also has incentive to signal good MEF news to the public. Therefore, we conjecture that firms with stickier costs will be more likely to release quarterly MEF. Given that, cost stickiness increases information asymmetry and MEFs are intended to mitigate the information asymmetry, we expect to find a positive association between cost stickiness and quarterly MEF releases. We state our first hypothesis as follows:

H1. The degree of cost stickiness is positively associated with management's propensity to issue quarterly MEF.

3.2 Cost stickiness and management earnings expectation

As discussed in Section 2, prior research suggests managerial discretion plays a significant role in both the asymmetric cost behavior and the type of MEF. Managerial incentives can also influence management financial reporting strategies on the timing and choice of good news/bad news (Matsumoto, 2002; Cotter *et al.*, 2006). Chen *et al.* (2017) provide evidence of the link between the cost asymmetry (cost stickiness and anti-cost stickiness) and management optimism and pessimism, where optimism (pessimism) is determined by a positive (negative) tone on management's FLS in the management discussion and analysis section (MD&A) of 10,000 reports. Therefore, optimistic (pessimistic) expectations of future earnings will

encourage management to maintain (remove) unused resources when sales decrease and also prompt management to voluntarily release MEF good (bad) news. Moreover, Chen *et al.* (2013) suggest that managerial overconfidence may explain cost stickiness, and overconfident management may also tend to overestimate future earnings. When management feels optimism (pessimism) about future earnings, it tends to release more (less) favorable earnings forecasts than that of analysts and investor. Therefore, the types of MEF are influenced by management's expectations of future earnings, as good-news forecasts are noisier and less credible than bad MEF news (Hilary *et al.*, 2014; Cohen *et al.*, 2018).

The distribution of MEF news in the observed forecasts depends on both unconditional distribution of news and management's discretion to issue a forecast conditional on the level of news. Cost stickiness is likely associated with both the level and distribution of MEF news. Management, who believes their sales will increase in the future, is more likely to choose a stickier cost strategy through maintaining unused capacity during a sales downturn. However, the relative effect of management expectations on both cost behavior and MEF releases is likely to be weaker when sales fall than when sales rise. Hence, we conjecture that firms with stickier costs are more likely to issue good MEF news. We argue that, conditional on a given level of good or bad news, cost stickiness can affect managerial decision on whether to issue a forecast to disclose the news. For example, if management of firms with sticky costs increase voluntary disclosure to mitigate information asymmetry, then it might be more willing to disclose not only good-news but also moderately bad news. We posit that management with positive expectations, who chooses the sticky cost strategy also has the incentive to release more favorable MEF news. Thus, we suggest that the degree of cost stickiness is positively (negatively) associated with good MEF news (bad MEF news) as stated in the following hypotheses:

H2a. The degree of cost stickiness is positively associated with good MEF news.

H2b. The degree of cost stickiness is negatively associated with bad MEF news.

4. Methodology

4.1 Variable measurement

4.1.1 Management earnings forecasts. Our data of quarterly MEF are obtained from the Thomson First Call's CIG database. However, Chuk *et al.* (2013) suggest that the CIG database is subject to coverage bias compared to hand-collected data from press releases. Therefore, we limit our sample year after a certain year, because Chuk *et al.* (2013) find that press releases issued after 1997 have higher probabilities of being represented on CIG compared to press releases issued in 1997. We also remove the forecast observations with announcement dates more than 30 days after the associated firm-quarter's fiscal period end date. Furthermore, we exclude observations for which the MEF occurs within three days of either the analyst survey date, or the announcement date of realized earnings for that quarter. Following Kothari *et al.* (2009), we also exclude the extreme 1 percent of MEF relative to analyst expectations and the extreme 1 percent of MEF forecast errors relative to realized EPS to mitigate the potential effects of miscoded data. Finally, we exclude "bundled" MEF issued concurrently with the earnings announcement, because Rogers and Buskirk (2013) suggest that the traditional calculation of bundled forecast news without any adjustments is subject to material measurement errors.

To measure MEF behaviors, we develop two measurements. First, a dummy variable (ISSUE) equals to 1 when a sample firm issues at least one quarterly MEF during a sample year, and 0 otherwise. Second, we capture the frequency of MEF (Frequency) by summing the number of quarterly earnings forecasts during each firm year. In the testing of *H2*, we consider the median of quarterly earnings expectations from the most recent analyst as the benchmark.

Then the good or bad MEF is defined according to the sign of the difference between each MEF and the corresponding median of financial analysts' forecasts, scaled by the absolute value of financial analysts' forecast median[4]. In particular, NEWS = (MEF−Analyst_Median)/|Analyst_Median|. For the value of both MEF and financial analysts' forecast, we consider the effect of stock dividends and stock splits on EPS and make adjustment by using the factor to adjust shares published in the CRSP database. In addition, we include only those analyst forecasts which are dated before MEF release because financial analysts tend to revise their forecasts based on the MEF. Following Kothari *et al.* (2009), we only include MEF where the absolute value of NEWS is greater than one percent, and the absolute value of Analyst_Median is greater than 5 cents per share. Finally, we winsorize the top and bottom one percentile of NEWS observations. Therefore, it is defined as good news (bad news) if the variable NEWS is more positive (negative).

4.1.2 Cost stickiness. Anderson *et al.* (2003) and other related studies have continuously improved the measuring for the degree of cost stickiness. The original model by Anderson *et al.* (2003) is based on the piecewise-linear relation between the change of natural log of costs and the concurrent change in natural log of sales:

$$\Delta \ln \mathrm{COST}_{i,t} = \beta_0 + \beta_1 \times \Delta \ln \mathrm{SALES}_{i,t} + \beta_2 \times \mathrm{DEC}_t \times \Delta \ln \mathrm{SALES}_{i,t} + \varepsilon_t, \quad (1)$$

where, $\Delta \ln \mathrm{COST}_{i,t}$ is the natural log format of changes in costs from the previous $t-1$ period, $\Delta \ln \mathrm{SALES}_{i,t}$ the natural log format of changes in sales from the previous $t-1$ period. DEC, a dummy variable, equals to 1 when the $\Delta \ln \mathrm{SALES}_{i,t} < 0$ and 0 otherwise. All variables in Equation (1) are adjusted for the inflation effect. According to Anderson *et al.* (2003), the degree of cost stickiness demonstrates the change of cost in response to the sales decrease. Therefore, when a firm takes a cost stickiness (anti-stickiness) strategy, a negative (positive) coefficient (β_2) is expected. A greater β_2 implies a lower degree of cost stickiness. We run regressions based on Equation (1) for each industry and each year and obtain the industry-level cost stickiness (ABJ_Sticky) based on Anderson *et al.* (2003) model, abbreviated as ABJ_Sticky.

Weiss (2010) developed a model, pertaining to investigating the consequences of cost stickiness model by constructing the firm-level cost stickiness:

$$\mathrm{STICKY}_{i,t} = \log\left(\frac{\Delta \mathrm{COST}}{\Delta \mathrm{SALES}}\right)_{i,\tau^-} - \log\left(\frac{\Delta \mathrm{COST}}{\Delta \mathrm{SALES}}\right)_{i,\tau^+}, \quad (2)$$

$$\mathrm{STICKY}_{i,t} = \log\left(\frac{\Delta \mathrm{COGS}}{\Delta \mathrm{SALES}}\right)_{i,\tau^-} - \log\left(\frac{\Delta \mathrm{COGS}}{\Delta \mathrm{SALES}}\right)_{i,\tau^+}, \quad (3)$$

$$\mathrm{STICKY}_{i,t} = \log\left(\frac{\Delta \mathrm{SG\&A}}{\Delta \mathrm{SALES}}\right)_{i,\tau^-} - \log\left(\frac{\Delta \mathrm{SG\&A}}{\Delta \mathrm{SALES}}\right)_{i,\tau^+}, \quad (4)$$

where, $\tau^-(\tau^+)$ represents the most recent quarter with a sales decrease (increase) over the last four quarters. Following Weiss (2010), we define cost stickiness based on three different types of costs, including the costs which are the difference between sales revenues and income before extraordinary items, the cost of goods sold and the SG&A. By applying Weiss (2010) model, we get the firm-level cost stickiness (Cost_Sticky, COGS_Sticky and SGA_Sticky) and directly examine the effect of cost stickiness on the MEF.

We implement both Anderson *et al.* (2003) and Weiss (2010) models to capture cost stickiness (Equations 1–4), because both models have their own advantages and supplement each other. First, Anderson *et al.* (2003) model provides an easiest approach to capture the

degree of cost stickiness but does not include other determinants of cost stickiness. Second, Banker and Byzalov (2014) suggest that Weiss (2010) extended model has advantages over investigating the consequences of cost stickiness. Third, Weiss (2010) model matches the objective of our study by measuring firm-level cost stickiness. However, Weiss model requires sample firms to experience both sales increases and decreases during past four quarters, and this requirement reduces our sample size significantly. In summary, because the two models are supplemental to each other, we use both to measure our cost stickiness. Model derived variables, including Cost_Sticky, COGS_Sticky, SGA_Sticky and ABJ_Sticky, inversely measure the level of cost stickiness. To simplify interpretations, we simply multiple them by −1, and thus a greater value of the variable indicates a higher level of cost stickiness.

4.1.3 Control variables. Prior research suggests that MEF is influenced by forecasting environment, information asymmetry, litigation risk and proprietary cost (Hirst *et al.*, 2008). First, we control institutional ownership (Inst_Owner) which is measured as the percentage of ownership stake held by the institutional investors at the year end. Then, we control the effect of financial analysts by using the number of financial analysts following during the previous period (No_Analyst). To control the firm's information asymmetry level, we follow prior literature and employ return volatility (Ret_Vol) which is the standard deviation of monthly raw return over 36 months prior to the period *t*. Greater return volatility indicates a higher level of information asymmetry. Moreover, following Gong *et al.* (2013), we control proprietary costs using MEF_Cost, which is the industry-level weighted average entry cost as it relates to firms' competency to handle the threat of new entrants, following Gong *et al.* (2013). We multiply the MEF_Cost by −1, and thus the greater value indicates lower entry costs and higher proprietary costs.

Prior research suggests that management expectation, earnings predictability, earnings response coefficients and earnings non-synchronicity may influence management's earnings forecasts. Following Banker, Byzalov and Plehn-Dujowich (2014), Banker, Byzalov, Ciftci and Mashruwala (2014) and Banker, Chen and Park (2014), we use the direction of sales changes from periods *t*−1 to t to measure the management expectation. The dummy variable (Sale_Incr) equals 1 when sales increase from period *t*−1 to *t*, and 0 otherwise. We calculate the earnings predictability (Earn_Predict) as the logarithm of R^2 derived from regressing return-on-assets (ROA) of the period *t* on ROA of period *t*−4 over a rolling window of 16 quarters. The earnings response coefficient (ERC) results from regressions of three-day cumulative market adjusted stock returns on unexpected earnings over 36 months prior to the period *t*. Following Gong *et al.* (2013), we also compute the earnings non-synchronicity (Nonsynch) which captures firm-specific factors in explaining the earnings predictability. In this paper, we use the mean of the top 4 highest R^2 to calculate earnings non-synchronicity.

According to Matsumoto (2002) and Kothari *et al.* (2009), management earnings expectations are influenced by institutional ownership (Inst_Owner), earnings coefficient response, managerial incentive (Mana_Own), financing strategies(SEO), growth prospects (Growth), reliance on implicit claim (Durable) and litigation risk (Litigation). First, we measure the financing strategies by constructing a dummy variable (SEO) which equals 1 when a firm issues new stocks in the period t+1 and 0 otherwise as prior research suggests that management's financing strategies influence their MEF decisions (Beyer *et al.*, 2010). Second, we use the difference between total assets of present and previous year scaled by previous year's total assets to capture the growth prospects (Growth). Third, we define litigation risk as a dummy variable which equals 1 when a firm pertains to a high-risk industry[5] and 0 otherwise. According to Matsumoto (2002), firms with greater reliance on implicit claims with stakeholders are more likely to take actions to avoid negative earnings surprises because the major customer dependence existed in the durable goods industry will lead to a more sensitive reaction to any good-news or bad-news forecasted by managers. To control the reliance on

implicit claims, we apply a dummy variable (Durable) which equals 1 if a firm is in the durable goods industry (SICs 150–179, 245, 250–259, 283,301, 324–399) and 0 otherwise.

We control firm characteristics in our tests of both hypotheses, including firm size (SIZE), which is the natural logarithm of total assets at year end, firm leverage (LEV) measured as total long-term liabilities scaled by total assets, profitability (ROA) measured as the return-on-assets, dichotomous operating performance indicator (LOSS) which equals 1 if the firm experiences a negative income before tax in the year t and 0 otherwise, the changes in earnings (ΔEPS), the firm risk level (BM) measured as the book-to-market ratio and a dummy variable (Distress) which equals 1 if the sample year is 2008 or 2009 to control the unexpected economic downturn.

4.2 Sample selection

We collect firm-level fundamental data from the COMPUSTAT database, and market data from the CRSP database during 2005 and 2016. The data used to measure variables related to institutional ownership and financial analysts are, respectively, obtained from the Thomson Reuters and the I/B/E/S databases. The quarterly MEF data are from two databases. We obtain the data before 2012 the from Thomson First Call's CIG database[6] and manually collect the data between 2012 and 2016 from the Bloomberg database for the largest 3,000 publicly traded US companies[7]. As mentioned above, our sample is from and after year 2005 to improve the representativeness of voluntary disclosure sample. Finally, our sample year starts in 2005 and ends in 2016, and each observation is a firm year. The sample sizes vary when we use different measurements of cost stickiness and when we, respectively, test *H1* and *H2*. The detailed sample selection procedures are demonstrated in Table I.

4.3 Method

We develop the following model to test the relation between cost stickiness and management's propensity to issue MEF (*H1*):

$$\begin{aligned} \text{MEF} = {} & \beta_1 \text{Sticky} + \beta_2 \text{Sale\_Incr} + \beta_3 \text{ERC} + \beta_4 \text{Earn\_Predict} \\ & + \beta_5 \text{Nonsynch} + \beta_6 \text{Ret\_Volatility} + \beta_7 \text{Inst\_Owner} \\ & + \beta_8 \text{No\_Analyst} + \beta_9 \text{MEF\_Cost} + \beta_{10} \text{SIZE} + \beta_{11} \text{LEV} \\ & + \beta_{12} \text{ROA} + \beta_{132} \text{BM} + \beta_{14} \text{Distress} + \beta_{15} \text{Time} + \beta_{16} \text{Industry} + \varepsilon_1, \end{aligned} \tag{5}$$

where, MEF refers alternatively to either the issuance of MEF (Issue) or the frequency of MEF (Frequency). Where Sticky represents alternatively to either the three firm-level measurements of cost stickiness following Weiss (2010) model or the industry-level measurement of cost stickiness following Anderson *et al.* (2003) model.

	Sample size
1. Compustat Raw Data between 2005 and 2016	148,675
2. Merge with Institutional Ownership Database	75,694
4. Delete observations with missing values in other control variables	28,311
5. Delete observations with missing values to calculate the industry-level cost stickiness based on Anderson *et al.* (2003) model	24,995
6. Delete observations with missing values to calculate the firm-level cost stickiness based on Weiss (2010) model. This step further reduced the sample size, respectively, to 4,842, 4,996 and 3816 depending on the specific type of expenses to calculate stickiness	
7. In the test of *H2*, the missing values in management earnings expectation measured by either good news or bad news further reduced the sample size	

Table I. Sample selection procedure

We also develop the following model to test the relation between managements' earnings expectation and cost stickiness (*H2*)[8]:

$$\begin{aligned} \text{NEWS} = {} & \beta_1 \text{Sticky} + \beta_2 \text{ERC} + \beta_3 \text{Ret\_Volatility} + \beta_4 \text{Inst\_Owner} + \beta_5 \text{No\_Analyst} \\ & + \beta_6 \text{SEO} + \beta_7 \text{Growth} + \beta_8 \text{Durable} + \beta_9 \text{Litigation} + \beta_{10} \text{SIZE} + \beta_{11} \text{ROA} \\ & + \beta_{12} \text{LOSS} + \beta_{13} \text{LEV} + \beta_{14} \text{BM} + \beta_{15} \Delta\text{EPS} + \beta_{16} \text{Distress} \\ & + \beta_{17} \text{Time} + \beta_{18} \text{Industry} + \varepsilon_1, \end{aligned} \tag{6}$$

where, the NEWS represents managements' earnings expectation relative to the market expectation (Good_News and Bad_News). The definitions of all variables in the Module (5) and (6) are demonstrated in the Appendix and except dummy variables and No_Analyst, all other variables are winsorized at the top and bottom 1 percent[9]. We control both the fixed time effect and fixed industry effect as well. All independent variables and control variables in our regressions are standardized for better interpreting the relative importance of each variable. Finally, all the standard errors present in the OLS and logistic regressions are adjusted for the firm-level and year-level clustering[10].

5. Results

5.1 Cost stickiness and MEF

5.1.1 Cost stickiness and issuance of MEF. Table II displays the descriptive statistics of the sample for testing *H1*. We find that the values of four measurements of cost stickiness indicate that cost stickiness is a widespread phenomenon in the real business world and a common strategic decision by management. Table III demonstrates the Pearson correlation between each pair of variables of *H1* sample. Consistent with our conjecture, the four measures of cost stickiness are positively and significantly correlated with the issuance and frequency of MEF. Moreover, the four measurements of cost stickiness have positive and high correlation with each other. Besides univariate test, we further test the association between cost stickiness and MEF using multivariate regression.

Variable	Mean	SD	25th Pctl	Median	75th Pctl
Frequency	0.9225	2.6198	0.0000	0.0000	0.0000
Cost_Sticky	−0.0188	1.0169	−0.4281	0.0165	0.4281
COGS_Sticky	−0.0311	0.9487	−0.4433	−0.0012	0.4433
SGA_Sticky	0.0586	1.3687	−0.7078	0.0769	0.7078
ABJ_Sticky	0.1067	0.5473	−0.0998	0.0644	0.0998
Earn_Predict	−2.8369	1.8460	−4.0464	−2.7945	−1.5990
Nonsynch	−0.5536	0.8706	−1.0642	−0.5055	−0.0179
ERC	11.8443	19.1244	2.0454	7.2336	16.6171
Ret_Volatility	0.1327	0.0684	0.0844	0.1152	0.1622
Inst_Owner	0.7246	0.2884	0.5647	0.7509	0.8873
No_Analyst	15.4139	20.6227	0.0000	8.0000	23.0000
MEF_Cost	−8.6296	1.3546	−9.6745	−8.8605	−7.5252
SIZE	6.9052	1.7543	5.6244	6.7955	8.1338
LEV	0.1715	0.1851	0.0257	0.1007	0.2695
ROA	0.0002	0.1590	−0.0081	0.0421	0.0768
BM	0.5435	0.4405	0.2872	0.4589	0.6908
ΔEPS	0.1178	1.8662	−0.3900	0.1200	0.6400

Table II.
Descriptive statistics of *H1* sample

Notes: This table illustrates the descriptive statistics of the sample to test the relation between cost stickiness and the managerial incentive to issue management earnings forecasts. Dummy variables are not presented. All the variables are winsorized at 1 percent level, except NO_Aanalyst

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Frequency	1									
(2) Issue	*0.618*	1								
(3) Cost_Sticky	*0.044*	*0.037*	1							
(4) COGS_Sticky	*0.060*	*0.042*	*0.427*	1						
(5) SGA_Sticky	*0.029*	*0.014*	*0.336*	*0.094*	1					
(6) ABJ_Sticky	*0.034*	*0.030*	0.006	*0.034*	−0.009	1				
(7) Earn_Predict	*0.008*	*0.049*	*0.044*	0.011	−0.012	0.001	1			
(8) Nonsynch	*0.036*	*0.069*	*0.031*	−0.006	−0.027	0.034	0.002	1		
(9) ERC	*0.159*	*0.218*	−0.021	*−0.054*	−0.025	−0.006	*0.063*	*0.073*	1	
(10) Ret_Volatility	*−0.193*	*−0.173*	*0.078*	*0.058*	*0.064*	0.015	*−0.029*	*−0.082*	*−0.031*	1
(11) Inst_Owner	*0.105*	*0.165*	*−0.037*	−0.007	0.007	0.022	*0.027*	*0.158*	*0.158*	*−0.063*
(12) No_Analyst	*0.158*	*0.249*	−0.008	*−0.030*	−0.015	−0.006	*0.036*	*0.045*	*0.168*	*−0.073*
(13) Sale_Incr	*0.098*	*0.265*	*0.009*	*0.026*	*0.019*	0.031	*0.086*	*0.148*	*0.197*	*0.126*
(14) MEF_Cost	*−0.032*	*−0.116*	0.013	*0.034*	0.010	0.031	*0.031*	*0.150*	*0.057*	*0.176*
(15) SIZE	*0.047*	*0.079*	*−0.061*	−0.002	*−0.051*	−0.032	*−0.025*	*−0.030*	−0.006	*−0.391*
(16) LEV	*0.016*	*0.001*	−0.022	*0.037*	−0.010	−0.008	*0.033*	*0.145*	*−0.057*	*0.055*
(17) ROA	*0.083*	*0.136*	*−0.049*	*−0.043*	*−0.068*	0.005	*0.067*	*0.085*	*0.139*	*−0.392*
(18) BM	*−0.104*	*−0.158*	*0.057*	*0.077*	*0.054*	−0.011	*−0.031*	*−0.079*	*−0.161*	*0.099*
(19) Distress	*−0.007*	*−0.007*	−0.013	−0.012	−0.030	*0.020*	*0.069*	0.009	*0.025*	*0.155*

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) Frequency									
(2) Issue									
(3) Cost_Sticky									
(4) COGS_Sticky									
(5) SGA_Sticky									
(6) ABJ_Sticky									
(7) Earn_Predict									
(8) Nonsynch									
(9) ERC									
(10) Ret_Volatility									
(11) Inst_Owner	1								
(12) No_Analyst	*0.179*	1							
(13) Sale_Incr	*0.169*	*0.174*	1						
(14) MEF_Cost	*0.227*	*0.166*	*0.325*	1					
(15) SIZE	*0.197*	*0.249*	*−0.252*	*−0.095*	1				
(16) LEV	*0.209*	−0.003	*0.096*	*0.155*	*0.061*	1			
(17) ROA	*0.177*	*0.147*	*0.132*	*−0.047*	*0.260*	*−0.0238*	1		
(18) BM	*−0.147*	*−0.156*	*−0.276*	*−0.157*	*0.053*	*−0.1380*	*−0.081*	1	
(19) Distress	*0.011*	*−0.023*	*−0.091*	0.002	*−0.025*	*−0.0257*	*−0.073*	*0.206*	1

Notes: This table displays the Pearson correlations among variables in the sample of *H1*. The italic figures indicate that the correlation is significant at 5 percent level

Table III.
Pearson correlation of *H1* sample

Table IV presents the regression results of the association between cost stickiness and firm's MEF behaviors. Panel A demonstrates results of two measures of MEF behavior and three firm-level measures of cost stickiness (Cost_Sticky, COGS_Sticky and SGA_Sticky) following Weiss (2010) model. We find coincident results for all three firm-level measurements of cost stickiness which are positively associated with the firms' MEF behaviors. Specifically, Cost_Sticky is positively and significantly correlated with whether firm issues the quarterly MEF (coefficient = 0.0183 and p-value = 0.0207) and the frequency of MEF release (coefficient = 0.0181, p-value = 0.0367). The COGS_Sticky is also positively and significantly associated with the frequency of MEF release (coefficient = 0.0141, p-value = 0.0415), and it is positively correlated with whether a firm issues the quarterly MEF (coefficient = 0.0121 and p-value = 0.0438) and the relation is significant at 5 percent. Consistently, the SGA_Sticky is positively associated with whether a firm issues the

Table IV.
The relation between cost stickiness and management earnings forecast

Panel A: firm-level cost stickiness

	Dependent variable = Issue						Dependent variable = Frequency					
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Cost_Sticky	0.0183	0.0207					0.0181	0.0367				
COGS_Sticky			0.0141	0.0415					0.0121	0.0438		
SGA_Sticky					0.0095	0.0635					0.0047	0.0757
Sale_Incr	0.0241	0.0281	0.0234	0.0292	0.0246	0.0153	0.0352	0.0162	0.0372	0.0099	0.0347	0.0225
Earn_Predict	0.0457	0.0319	0.0418	0.0477	0.0536	0.0028	0.0541	< 0.0001	0.0535	< 0.0001	0.0712	< 0.0001
Nonsynch	0.0321	0.0247	0.0275	0.0312	0.0390	0.1381	0.0221	0.0196	0.0283	0.0944	0.0202	0.0275
ERC	0.1327	< 0.0001	0.1345	< 0.0001	0.1261	< 0.0001	0.0755	< 0.0001	0.0823	< 0.0001	0.0787	< 0.0001
Ret_Volatility	−0.0875	0.0021	−0.0896	0.0015	−0.0901	0.0090	−0.0187	0.0298	−0.0212	0.0235	−0.0884	< 0.0001
Inst_Owner	0.1866	< 0.0001	0.1826	< 0.0001	0.1546	< 0.0001	0.0825	< 0.0001	0.0875	< 0.0001	0.0324	0.0433
No_Analyst	0.3374	< 0.0001	0.3300	< 0.0001	0.3233	< 0.0001	0.1677	< 0.0001	0.1631	< 0.0001	0.1926	< 0.0001
MEF_Cost	−0.0486	0.0158	−0.0538	0.0112	−0.0133	0.0577	−0.0552	0.0109	−0.0571	0.0078	−0.0545	0.0190
SIZE	0.0696	0.0246	0.0638	0.0353	0.0741	0.0926	0.0038	0.0088	0.0051	0.0074	0.0055	0.0504
LEV	0.0523	0.0407	0.0521	0.0366	0.0433	0.0481	0.0628	0.0020	0.0504	0.0119	0.0694	0.0013
ROA	0.1241	< 0.0001	0.1402	< 0.0001	0.0867	0.0040	0.0018	0.0917	0.0069	0.0681	0.0150	0.3083
BM	−0.0329	0.0155	−0.0378	0.0988	−0.0362	0.0901	−0.0388	0.0079	−0.0389	0.0066	−0.0487	< 0.0001
Distress	−0.1504	< 0.0001	−0.1291	< 0.0001	−0.1144	0.0002	−0.0661	0.0010	−0.0562	0.0046	−0.0446	0.0720
Industry fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Year fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	4,842		4,996		3,816		4,842		4,996		3,816	
No. of forecasts	1,864		1,915		1,542							
No. of non-forecasts	2,978		3,081		2,274							
R^2	0.3082		0.3098		0.3074		0.1823		0.1799		0.23	

Panel B: industry-level cost stickiness

	Coefficient	*p*-value	Coefficient	*p*-value
ABJ_Sticky	0.0250	0.0340	0.0090	0.0145
Sale_Incr	0.0531	< 0.0001	0.0189	0.0146
Earn_Predict	0.0192	0.0851	0.0203	0.0010
Nonsynch	0.0193	0.1572	0.0050	0.0049
ERC	0.0991	< 0.0001	0.0792	< 0.0001
Ret_Volatility	−0.0615	< 0.0001	0.0174	0.0319
Inst_Owner	0.2067	< 0.0001	0.0861	< 0.0001

(continued)

No_Analyst	0.2115	< 0.0001	0.1062	< 0.0001
MEF_Cost	0.0092	0.6207	0.0033	0.0709
SIZE	0.1531	< 0.0001	−0.0110	0.1285
LEV	−0.0123	0.3469	0.0653	< 0.0001
ROA	0.1311	< 0.0001	0.0273	0.0002
BM	−0.0441	0.0009	−0.0230	0.0007
Distress	−0.2026	< 0.0001	−0.0992	< 0.0001
Industry fixed effect	Yes		Yes	
Year fixed effect	Yes		Yes	
Observations	24,935		24,935	
No. of forecasts	7,275			
No. of non-forecasts	17,660			
R^2	0.3224		0.1476	

Notes: This table illustrates the association between cost stickiness and the managers' propensity to issue management earnings forecasts (MEF). In Panel A, the cost stickiness is measured by the three firm-level variables developed by Weiss (2010). In Panel B, the cost stickiness is measured by the industry-level variable developed by Anderson *et al.* (2003). In the first six columns, the dependent variable is the dummy variable whether the firm issues at least one quarterly earnings forecast during the sample year. In the last six columns, the dependent variable is the frequency of quarterly MEF issued during the sample year. All the *p*-values are presented after clustering standard errors at the firm-level and year-level

Table IV.

quarterly MEF (coefficient = 0.095 and *p*-value = 0.0635), the frequency of MEF release (coefficient = 0.0047, *p*-value = 0.0757), and the relations are significant at 10 percent.

In Panel B, we use the Anderson *et al.* (2003) model to measure the industry-level cost stickiness and investigate its association with firm's MEF behaviors. Consistently, we find that the industry-level cost stickiness (ABJ_Sticky) is positively and significantly associated with whether a firm issued at least one MEF (coefficient = 0.0250, *p*-value 0.0340) and the frequency of MEF release (coefficient = 0.0090, *p*-value = 0.0145). In conclusion, our multivariate regressions show that cost stickiness is positively associated with a firm's MEF behaviors. This suggests that firms with a higher level of sticky cost tend to be more likely to issue MEF.

Our results are consistent with prior studies (Gong *et al.*, 2013). Firms' expectation of future sales, earnings predictability, market reactions to earnings, institutional ownership, financial analyst following, firm size, leverage level and ROA are significantly and positively associated with managers' propensity and frequency to issue MEF, while other control variables such as firms' level of existing information asymmetry, proprietary cost of voluntary disclosure, book-to-market ratio and financial crisis are significantly and negatively associated with the likelihood and frequency of issuing MEF. In summary, empirical results of Table IV suggest that on average one percent increases in cost stickiness level will increase the likelihood of issuing MEF by approximate 0.5 percent.

5.1.2 Baseline tests and empirical results. 5.1.2.1 Conditional on information asymmetry. Information asymmetry plays a critical role in explaining the relation between the level of cost stickiness and the management's incentive to issue MEFs. Under agency theory, we expect that firms with a higher degree of cost stickiness are more likely to voluntarily disclose earnings information to the public when the level of information asymmetry is higher. We disaggregate our original sample into subsamples based on the level of information asymmetry which is measured as the bid-ask spread. The criterion of subsampling is the degree of information asymmetry (high or low). Specifically, information asymmetry is higher (low) if its level of bid-ask spread is greater (less) than the median[11]. Table V illustrates the results about the relation between cost stickiness and MEF issuance conditional on information asymmetry[12]. Panel A demonstrates results for high information asymmetry subgroup. We find a positive and significant relation between three measures of cost stickiness by Weiss (2010) and the management's incentive to issue MEF. Panel B demonstrates results for the low information asymmetry subgroup. We find consistent results but much smaller and less pronounced coefficients. In summary, our evidence shows that information asymmetry as predicted explains why firms with a higher degree of cost stickiness are more likely to issue voluntary MEFs.

5.1.2.2 Conditional on managerial optimism. In this section, we conduct additional tests to investigate whether managerial optimism may explain the relation between cost stickiness and MEF issuance. Prior research suggests that short-horizon MEF is usually pessimistically biased and long-horizon MEF instead is usually optimistically biased (Choi and Ziebart, 2004; Rogers and Stocken, 2005). Therefore, management who is optimistic to disclose long-horizon (short-horizon) MEF are also more (less) likely to adopt a sticky cost strategy by maintaining unused capacity when sales decrease[13]. We define the short-horizon MEF as that issued within 90 days prior to the forecast period and long-horizon MEF as that issued more than 90 days prior to the forecast period. Table VI shows how cost stickiness is associated with short-horizon or long-horizon MEF behaviors[14].

Panel A demonstrates the relation between firm's level of sticky cost and the firm's propensity to issue short-horizon (Issue_SH) or long-horizon MEF (Issue_LH). We find that Cost_Sticky (coefficient = 0.0211, *p*-value = 0.0959) and COGS_Sticky (coefficient = 0.0447, *p*-value = 0.0688) are positively and significantly correlated with the firm's propensity to issue short-horizon MEF at 10 percent significant level. However, the result does not hold when we

	Dependent variable = News_Issue					
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Panel A: when information asymmetry is high						
Cost_Sticky	0.0502	0.0133				
COGS_Sticky			0.0375	0.0218		
SGA_Sticky					0.0480	0.0183
Sale_Incr	0.0206	0.0563	0.0138	0.0682	0.0183	0.0642
Earn_Predict	0.0599	0.0417	0.0277	0.0376	0.0477	0.0202
Nonsynch	0.0065	0.0280	0.0160	0.0689	0.0275	0.0566
ERC	0.1091	0.0003	0.0930	0.0010	0.0987	0.0056
Ret_Volatility	−0.0649	0.0109	−0.0637	0.0956	−0.0832	0.0620
Inst_Owner	0.1626	< 0.0001	0.1693	< 0.0001	0.1529	0.0002
No_Analyst	0.2003	< 0.0001	0.1893	< 0.0001	0.2147	< 0.0001
MEF_Cost	−0.0205	0.0707	−0.0306	0.0553	0.0146	0.0803
SIZE	0.1107	0.0183	0.1364	0.0022	0.0970	0.0551
LEV	0.0354	0.0375	0.0110	0.0764	0.0275	0.0539
ROA	0.1401	0.0055	0.1932	0.0001	0.0796	0.0112
BM	−0.0547	0.0144	−0.0404	0.0248	−0.0243	0.0544
Distress	−0.1755	< 0.0001	−0.1734	< 0.0001	−0.1644	0.0002
Industry fixed effect	Yes		Yes		Yes	
Year fixed effect	Yes		Yes		Yes	
Observations	2,421		2,498		1,908	
No. of forecasts	850		924		708	
No. of non-forecasts	1,571		1,574		1,200	
R^2	0.3628		0.3599		0.3432	
Panel B: when information asymmetry is low						
Cost_Sticky	0.0133	0.0687				
COGS_Sticky			0.0192	0.0519		
SGA_Sticky					0.0082	0.0817
Sale_Incr	0.0278	0.0387	0.0299	0.0342	0.0277	0.0454
Earn_Predict	0.0217	0.4936	0.0357	0.2520	0.0206	0.5724
Nonsynch	0.0430	0.2888	0.0288	0.4549	0.0248	0.5916
ERC	0.1210	0.0001	0.1309	< 0.0001	0.1064	0.0022
Ret_Volatility	−0.0656	0.1010	−0.0589	0.1304	−0.0446	0.3570
Inst_Owner	0.0643	0.0581	0.0557	0.0905	0.0052	0.0892
No_Analyst	0.4569	< 0.0001	0.4506	< 0.0001	0.4380	< 0.0001
MEF_Cost	−0.0799	0.0928	−0.0971	0.0363	−0.0644	0.2165
SIZE	−0.1321	0.0016	−0.1230	0.0027	−0.1312	0.0050
LEV	0.1262	0.0018	0.1056	0.0068	0.1229	0.0091
ROA	0.0364	0.3295	0.0336	0.3615	0.0204	0.6285
BM	0.0156	0.6706	−0.0011	0.9755	−0.0519	0.2500
Distress	0.0130	0.8465	0.0348	0.5983	0.1089	0.1394
Industry fixed effect	Yes		Yes		Yes	
Year fixed effect	Yes		Yes		Yes	
Observations	2,421		2,498		1,908	
No. of forecasts	930		921		768	
No. of non-forecasts	1,491		1,577		1,140	
R^2	0.3253		0.3334		0.3229	

Notes: This table illustrates how information asymmetry may influence the relation between cost stickiness and the management's propensity to issue quarterly MEF. In Panel A, we test the subgroup under the higher level of information asymmetry. In Panel B, we test the subgroup under the lower level of information asymmetry. All the *p*-values are presented after clustering standard errors at the firm-level and year-level

Table V. The effect of information asymmetry on the relation between cost stickiness and MEF issuance

use SGA_Sticky as the measurement of cost stickiness. In contrast, when we test the relation between all three measurements of cost stickiness and long-horizon MEF, the coefficients are all positive at 5 percent significant level (Cost_Sticky: coefficient = 0.0410, *p*-value = 0.0129; COGS_Sticky: coefficient = 0.0689, *p*-value = 0.0080; SGA_Sticky: coefficient = 0.0095, *p*-value = 0.0481).

Table VI.
The effect of cost stickiness on long-horizon and short-horizon management earnings forecast

Panel A: whether firms issue MEF

	Dependent variable = Issue_LH						Dependent variable = Issue_SH					
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Cost_Sticky	0.0410	0.0129					0.0211	0.0959				
COGS_Sticky			0.0689	0.0080					0.0447	0.0688		
SGA_Sticky					0.0095	0.0481					0.0021	0.4485
Sale_Incr	0.0448	0.0142	0.0519	0.0090	0.0546	0.0127	0.0012	0.9645	0.0007	0.9981	−0.0014	0.9633
Earn_Predict	0.0060	0.0191	0.0050	0.0467	0.0281	0.0325	−0.0135	0.5814	−0.0174	0.4725	0.0450	0.0968
Nonsynch	0.1137	0.0029	0.1030	0.0054	0.1393	0.0013	0.0744	0.0272	0.0648	0.0474	0.0992	0.0083
ERC	0.0759	0.0013	0.0675	0.0040	0.0691	0.0104	0.1258	< 0.0001	0.1344	< 0.0001	0.1190	< 0.0001
Ret_Volatility	−0.2756	< 0.0001	−0.2774	< 0.0001	−0.2709	< 0.0001	−0.0701	0.0237	−0.0753	0.0139	−0.0732	0.0333
Inst_Owner	0.0834	0.0109	0.0729	0.0275	0.0862	0.0147	0.2316	< 0.0001	0.2418	< 0.0001	0.2169	< 0.0001
No_Analyst	0.0642	0.0428	0.0651	0.0363	0.0142	0.0695	0.1643	< 0.0001	0.1642	< 0.0001	0.1295	0.0003
MEF_Cost	−0.0753	0.0662	−0.0748	0.0631	−0.0137	0.0761	−0.0653	0.0972	−0.0541	0.1662	−0.0130	0.7593
SIZE	0.2844	< 0.0001	0.2702	< 0.0001	0.3259	< 0.0001	0.1173	0.0015	0.1012	0.0046	0.1052	0.0089
LEV	0.1089	0.0003	0.1178	0.0001	0.0894	0.0114	0.0060	0.8375	0.0064	0.8225	−0.0043	0.8945
ROA	0.2107	< 0.0001	0.2210	< 0.0001	0.2006	0.0003	0.1344	0.0001	0.1429	< 0.0001	0.0774	0.0265
BM	0.0129	0.6962	0.0007	0.9821	0.0260	0.4749	−0.0523	0.0513	−0.0561	0.0337	−0.0626	0.0313
Distress	−0.0976	0.0030	−0.0629	0.0531	−0.0558	0.1237	−0.1603	< 0.0001	−0.1376	< 0.0001	−0.1075	0.0006
Industry fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Year fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	4,604		4,765		3,621		4,604		4,765		3,621	
No. of forecasts	964		988		789		1,394		1,448		1,150	
No. of non-forecasts	3,640		3,777		2,832		3,210		3,317		2,471	
R^2	0.3771		0.3734		0.3621		0.2867		0.2902		0.2971	

Panel B: the frequency of MEF

	Dependent variable = Frequency_LH						Dependent variable = Frequency_SH					
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Cost_Sticky	0.0131	0.0343					0.0091	0.3546				
COGS_Sticky			0.0133	0.0289					0.0049	0.0915		
SGA_Sticky					0.0091	0.0591					0.0017	0.5542
Sale_Incr	0.0434	0.0025	0.0449	0.0013	0.0408	0.0032	0.0317	0.0243	0.0332	0.0169	0.0280	0.0631
Earn_Predict	0.0277	0.0096	0.0271	0.0073	0.0324	0.0359	0.0466	< 0.0001	−0.0462	< 0.0001	0.0691	< 0.0001
Nonsynch	0.0659	< 0.0001	0.0641	0.0002	0.0862	< 0.0001	0.0266	0.0964	0.0326	0.0417	0.0341	0.0515

(*continued*)

Table VI.

ERC	0.0248	0.0439	0.0280	0.0209	0.0278	0.0294	0.0616	< 0.0001	0.0658	< 0.0001	0.0634	0.0008
Ret_Volatility	−0.0637	0.0190	−0.0687	0.0154	−0.1889	< 0.0001	−0.0109	0.0782	−0.0134	0.0733	−0.0829	< 0.0001
Inst_Owner	0.0334	0.0468	0.0320	0.0489	0.0281	0.0618	0.0801	0.0300	0.0897	0.0160	0.0363	0.0222
No_Analyst	0.0654	0.0003	0.0625	0.0004	0.0394	0.0290	0.0763	< 0.0001	0.0672	< 0.0001	0.0714	0.0001
MEF_Cost	−0.0393	0.0163	−0.0425	0.0082	−0.0322	0.1593	−0.0604	0.0014	−0.0614	0.0009	−0.0554	0.0162
SIZE	0.1357	< 0.0001	0.1314	< 0.0001	0.1498	< 0.0001	0.0843	< 0.0001	0.0742	< 0.0001	0.0948	< 0.0001
LEV	0.0054	0.0745	0.0075	0.0670	0.0434	0.0108	−0.0255	0.1062	−0.0279	0.0889	−0.0246	0.1519
ROA	−0.0109	0.7728	−0.0119	0.7301	−0.0083	0.5456	−0.0010	0.9733	0.0050	0.8611	0.0098	0.5145
BM	−0.0057	0.0649	−0.0121	0.0268	−0.0190	0.1167	−0.0376	0.0019	−0.0405	0.0002	−0.0549	< 0.0001
Distress	−0.0289	0.2332	−0.0189	0.4307	0.0015	0.9539	−0.0724	0.0032	−0.0641	0.0095	−0.0534	0.0411
Industry fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Year fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	4,604		4,765		3,621		4,604		4,765		3,621	
R^2	0.2011		0.1976		0.2835		0.159		0.1552		0.2714	

Notes: This table illustrates the effect of managerial optimism on the relation between cost stickiness and MEF issuance. In Panel A, the dependent variables are whether the firm issues at least one quarterly MEF during the sample year. In Panel B, the dependent variables are the frequency of MEF issued during the sample year. In the first six columns, MEFs are long-horizon oriented. In the last six columns, MEFs are long-horizon oriented. All the p-values are presented after clustering standard errors at the firm-level and year-level

Panel B shows the relation between firm's level of sticky cost and the frequency of short-horizon (Frequency_SH) or long-horizon MEF (Freqneucy_LH) releases. Our results are similar to that of preceding test. We find that the positive correlation between cost stickiness and MEF is more pronounced when the MEF is long-horizon oriented. The results are consistent with our prediction that managerial optimism may explain the relation between cost stickiness and MEF issuance. Moreover, our results are consistent with findings of prior research that management is under more scrutiny to focus on long-horizon MEF (The Conference Board, 2015) and the cost stickiness typically represents a long-term strategy and is designed to increase the long-horizon return (Banker, Chen and Park, 2014).

5.2 Cost stickiness and management earnings expectation

In this section, we test the association between the firm's level of cost stickiness and management's earnings expectation. Table VII exhibits the descriptive statistics of *H2* sample and Table VIII shows the Pearson correlations between variables of *H2* sample. We find that the four measurements of cost stickiness are positively and significantly associated with good news, consistent with what we expect, but do not find the parallel results for bad news. More evidence is provided in the multivariate tests.

Table IX presents the results of the relation between cost stickiness and managements' earnings expectation. In Panel A, we use the firm-level measurements of cost stickiness based on the Weiss (2010) model, and find that Cost_Sticky (coefficient = 0.0411, p-value = 0.0291), COGS_Sticky (coefficient = 0.0218, p-value = 0.0176) and SGA_Sticky (coefficient = 0.0126, p-value = 0.0206) are positively and significantly correlated with MEF of good. We find insignificant correlations for two measures of cost stickiness (COGS_Sticky and SGA_Sticky) and less significant correlation for Cost_Sticky (at 10 percent significant level), when the dependent variable becomes bad news. In Panel B, we run the regression by using the industry-level cost stickiness measurement. Consistently, we find that the industry-level measurement, ABJ_Sticky, is positively and significantly correlated with MEF of good news (coefficient = 0.0279, p-value = 0.0135), but we don't find a significant correlation between ABJ_Sticky and bad news.

	Mean	SD	25th Pctl	Median	75th Pctl
Good_News	1.0118	1.8693	0.0000	0.0455	1.2121
Bad_News	−0.1945	0.4520	−0.1534	0.0000	0.0000
Cost_Sticky	−0.0431	0.9709	−0.4429	0.0057	0.3818
COGS_Sticky	−0.0495	0.9068	−0.4877	−0.0003	0.3614
SGA_Sticky	0.0730	1.3824	−0.6681	0.0953	0.8209
ABJ_Sticky	0.1081	0.5516	−0.0964	0.0589	0.2897
ERC	16.6569	24.5332	2.2855	9.7835	23.5355
Ret_Volatility	0.1099	0.0602	0.0674	0.0943	0.1351
Inst_Owner	0.7536	0.2507	0.5935	0.7786	0.9103
No_Analyst	18.5747	25.4081	0.0000	11.0000	29.0000
Growth	0.1037	0.2219	−0.0035	0.0670	0.1597
SIZE	7.9037	1.8731	6.5687	7.7995	9.0318
LEV	0.1732	0.1647	0.0292	0.1350	0.2701
ROA	0.0343	0.0923	0.0113	0.0364	0.0744
BM	0.5237	0.3946	0.2874	0.4476	0.6557
ΔEPS	0.0464	1.6857	−0.3400	0.1300	0.5300

Table VII.
Descriptive statistics of *H2* sample

Notes: This table illustrates the descriptive statistics of the sample to test the relation between cost stickiness and the management earnings expectation (good news/bad news). Dummy variables are not presented. All the variables are winsorized at 1 percent level, except No_Analyst

Table VIII. Pearson correlation of *H2* sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Good_News	1										
(2) Bad_News	*0.233*	1									
(3) Cost_Sticky	*0.042*	*−0.0528*	1								
(4) COGS_Sticky	*0.039*	−0.0374	*0.447*	1							
(5) SGA_Sticky	*0.017*	0.0410	*0.339*	*0.122*	1						
(6) ABJ_Sticky	*0.022*	*−0.0472*	0.009	*0.057*	−0.021	1					
(7) ERC	−0.012	*0.0335*	−0.017	*−0.088*	−0.026	−0.008	1				
(8) Ret_Volatility	*−0.094*	*−0.2314*	0.034	0.027	0.030	−0.006	*−0.025*	1			
(9) Inst_Owner	−0.003	*0.0473*	−0.029	−0.025	0.026	0.011	*0.159*	*−0.053*	1		
(10) No_Analyst	*−0.052*	*−0.0602*	−0.008	*−0.059*	0.009	−0.019	*0.111*	*−0.145*	*0.125*	1	
(11) Growth	*0.057*	*0.1429*	*0.010*	0.038	*0.014*	0.013	*0.030*	−0.019	*0.102*	0.002	1
(12) Litigation	*−0.086*	*−0.0824*	−0.034	−0.002	0.040	−0.005	*0.104*	*0.282*	*0.069*	*0.149*	*0.034*
(13) Durable	*−0.038*	*−0.0904*	−0.023	*−0.053*	−0.039	*−0.064*	*0.074*	*0.181*	*0.136*	*0.146*	0.013
(14) SEO	−0.017	*−0.0363*	−0.003	−0.004	−0.018	*−0.053*	*0.090*	*0.150*	*0.139*	*0.114*	0.007
(15) SIZE	*0.033*	*0.1298*	−0.011	0.018	−0.032	0.021	*−0.071*	*−0.436*	−0.016	*0.243*	−0.007
(16) Loss	*−0.085*	*−0.2524*	0.034	*0.057*	0.038	*0.025*	*−0.110*	*0.173*	*−0.158*	*−0.128*	*−0.190*
(17) LEV	*−0.023*	*0.0043*	0.021	*0.060*	0.005	*0.040*	*−0.069*	*−0.091*	*0.090*	−0.002	*0.000*
(18) ROA	*0.124*	*0.3209*	−0.023	*−0.088*	−0.031	−0.007	*0.132*	*−0.303*	*0.194*	*0.151*	*0.285*
(19) BM	*−0.074*	*−0.1840*	0.024	*0.057*	*0.087*	0.019	*−0.150*	*0.170*	*−0.102*	*−0.186*	*−0.167*
(20) ΔEPS	*0.060*	*−0.1229*	*0.065*	0.017	0.044	−0.009	0.013	0.014	−0.009	*0.031*	*0.132*
(21) Distress	*−0.008*	−0.0515	*−0.050*	*−0.057*	−0.017	*−0.074*	*0.040*	*0.060*	*0.104*	*−0.054*	*−0.135*

	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1) Good_News										
(2) Bad_News										
(3) Cost_Sticky										
(4) COGS_Sticky										
(5) SGA_Sticky										
(6) ABJ_Sticky										
(7) ERC										
(8) Ret_Volatility										
(9) Inst_Owner										
(10) No_Analyst										

(continued)

Table VIII.

(11) Growth										
(12) Litigation	1									
(13) Durable	*0.214*	1								
(14) SEO	*0.213*	*0.266*	1							
(15) SIZE	*−0.259*	*−0.221*	*−0.303*	1						
(16) Loss	*−0.037*	*−0.107*	*−0.649*	*0.050*	1					
(17) LEV	*−0.159*	*−0.081*	*0.041*	*0.139*	−0.010	1				
(18) ROA	*−0.060*	0.008	*0.061*	*0.075*	*−0.515*	*−0.045*	1			
(19) BM	*−0.098*	*−0.053*	0.014	0.018	*0.271*	*−0.055*	*−0.309*	1		
(20) ΔEPS	*0.025*	0.012	−0.003	0.015	−0.302	*−0.045*	*0.367*	−0.205	1	
(21) Distress	0.002	0.014	*0.026*	0.000	*0.057*	−0.006	*−0.094*	*0.199*	*−0.125*	1

Notes: This table displays the Pearson correlations among variables in the sample of *H2*. The italic figures indicate that the correlation is significant at 5 percent level

Table IX.
The relation between cost stickiness and management earnings expectation

Panel A: firm-level cost stickiness

	Dependent variable = Good_News						Dependent variable = Bad_News					
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Cost_Sticky	0.0411	0.0291					−0.0387	0.0632				
COGS_Sticky			0.0218	0.0176					−0.0265	0.1485		
SGA_Sticky					0.0126	0.0206					−0.0277	0.3440
ERC	0.0020	0.0404	0.0036	0.0486	0.0069	0.0583	−0.0034	0.8758	−0.0066	0.7724	−0.0052	0.8306
Ret_Volatility	−0.0565	0.0021	−0.0853	0.0010	−0.0788	0.0071	−0.1170	0.0008	−0.1210	0.0004	−0.1186	0.0039
Inst_Owner	−0.1651	0.4055	−0.0262	0.2470	−0.0406	0.1041	−0.0075	0.7426	−0.0084	0.7065	−0.0060	0.8168
No_Analyst	−0.0023	0.2331	−0.0387	0.1276	−0.0328	0.2325	−0.0790	0.0024	−0.0783	0.0016	−0.0890	0.0003
Growth	0.0346	0.0112	0.0393	0.0095	0.0571	0.0468	0.0300	0.0824	0.0409	0.0163	0.0239	0.2367
Litigation	−0.0879	0.0627	−0.0228	0.0574	−0.0536	0.1955	0.0253	0.4863	0.0212	0.5430	0.0391	0.2964
Durable	0.2896	0.4132	0.0838	0.2823	0.0976	0.2321	0.0691	0.1017	0.0717	0.0865	0.0600	0.2466
SEO	0.0361	< 0.0001	0.0344	0.0377	0.0458	0.0006	−0.0040	0.1409	0.0196	0.1752	−0.0017	0.8616
Size	0.0564	0.1169	0.0680	0.0222	0.0496	0.1350	0.0930	0.0057	0.0914	0.0046	0.1175	0.0004
Loss	−0.3425	0.0110	−0.0786	0.0026	−0.0766	0.0099	−0.1716	< 0.0001	−0.1782	< 0.0001	−0.1753	0.0001
LEV	−0.0294	0.0928	−0.0206	0.0441	−0.0401	0.1003	0.0254	0.3858	0.0328	0.2453	0.0136	0.6626
ROA	−0.0482	0.9133	−0.0122	0.6094	−0.0102	0.7080	−0.1620	0.0048	−0.1513	0.0059	−0.1323	0.0228
BM	−0.2639	0.0172	−0.0444	0.0199	−0.0507	0.0246	−0.1105	0.0024	−0.1240	0.0007	−0.1393	0.0003
ΔEPS	0.0534	0.0814	0.0338	0.0207	0.0142	0.0596	−0.0380	0.1634	−0.0327	0.2082	−0.0289	0.3079
Distress	−0.2012	0.0267	−0.0351	0.2293	−0.0133	0.6786	−0.0599	0.1000	−0.0563	0.1324	−0.0807	0.0651
Industry fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Year fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	1,880		1,928		1,575		1,880		1,928		1,575	
R^2	0.2224		0.2255		0.2161		0.1806		0.1299		0.1569	

Panel B: industry-level cost stickiness

	Dependent variable = Good_News		Dependent variable = Bad_News	
	Coefficient	*p*-value	Coefficient	*p*-value
ABJ_Sticky	0.0279	0.0135	−0.0135	0.1177
ERC	0.0078	0.4901	0.0076	0.4759
Ret_Volatility	−0.0878	< 0.0001	−0.0691	0.0011

(*continued*)

Table IX.

Inst_Owner	−0.0130	0.3410	0.0278	0.0433
No_Analyst	0.0289	0.0387	−0.0292	0.0196
Growth	0.0376	0.0011	0.0393	0.0008
Litigation	−0.0016	0.0313	−0.0074	0.9972
Durable	−0.0493	0.1518	0.0149	0.6142
SEO	0.0208	0.0292	−0.0015	0.8571
Size	−0.0235	0.1561	0.0868	< 0.0001
Loss	−0.0563	< 0.0001	−0.2157	< 0.0001
LEV	−0.0215	0.1055	−0.0044	0.7893
ROA	0.0082	0.5434	−0.1472	< 0.0001
BM	−0.0614	< 0.0001	−0.0932	< 0.0001
ΔEPS	0.0269	0.0490	−0.0250	0.1278
Distress	−0.0380	0.0372	−0.0647	0.0012
Industry fixed effect	Yes		Yes	
Year fixed effect	Yes		Yes	
Observations	6,371		6,371	
R^2	0.2158		0.1812	

Panel C: conditional on management expectation

	Dependent variable = Good_News				Dependent variable = Bad_News			
Management optimism:	High		Low		High		Low	
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
COGS_Sticky	0.0355	0.0021	0.0197	0.0512	−0.0476	0.0334	0.0331	0.3783
ERC	0.0045	0.8468	−0.0119	0.6606	−0.0125	0.6263	−0.0297	0.5609
Ret_Volatility	−0.0696	0.0195	−0.0516	0.3763	−0.1670	0.0004	−0.1049	0.1027
Inst_Owner	−0.0016	0.0949	−0.1232	0.0427	0.0347	0.2702	−0.0587	0.1936
No_Analyst	−0.0288	0.0392	−0.0661	0.1132	−0.0083	0.0077	−0.1488	0.0041
Growth	0.0336	0.0206	0.0017	0.9640	0.0319	0.1170	−0.0368	0.5000
Litigation	−0.0468	0.3563	0.0100	0.8947	0.0528	0.2465	−0.0231	0.7310
Durable	0.1121	0.1936	0.1977	0.0625	0.0605	0.0998	0.1996	0.1760
SEO	0.0424	0.0090	−0.0054	0.4259	−0.0039	0.0503	0.0331	0.0018
Size	0.1032	0.0031	−0.0287	0.6431	0.0058	0.8764	0.1999	0.0014

(*continued*)

Table IX.

Loss	−0.0544	0.0085	−0.1352	0.0173	−0.1260	0.0230	−0.1854	0.0022
LEV	−0.0321	0.3338	0.0233	0.6426	−0.0003	0.9915	0.0403	0.4604
ROA	−0.0168	0.5765	0.0695	0.1080	−0.1224	0.0388	0.1343	0.1339
BM	−0.0369	0.0861	−0.0246	0.6155	−0.0760	0.0722	−0.0940	0.1595
ΔEPS	0.0428	0.0184	−0.0662	0.1308	−0.0498	0.0931	−0.0466	0.3864
Distress	−0.0225	0.0378	0.0529	0.3830	−0.0261	0.6749	−0.0105	0.8613
Industry fixed effect	Yes		Yes		Yes		Yes	
Year fixed effect	Yes		Yes		Yes		Yes	
Observations	1,381		547		1,381		547	
R^2	0.2279		0.1528		0.2883		0.2831	

Notes: This table illustrates the relation between cost stickiness and management earnings expectation (good news/bad news). In Panel A, we use the firm-level three measures developed by Weiss (2010) to measure cost stickiness. In Panel B, we use the industry-level measure developed by Anderson *et al.* (2003) to measure cost stickiness. In Panel C, we test how managerial optimism influences the relation between cost stickiness and good news/bad news. In the left-side columns, the dependent variables are good news issued by the sample firm. In the right-side columns, the dependent variables are bad news. All the *p*-values are presented after clustering standard errors at the firm-level and year-level

In both Panel A and Panel B, we find that the firm-level ERC, seasonal equity offering strategy, and changes in earnings encourage managers to forecast a higher level of good news. With more financial analyst following and better ROA performance, firms tend to avoid disclosing bad news. Moreover, high-growth firm is more likely to surprise the market through disclosing good or bad news that are out of market expectations. Finally, under a higher level of information asymmetry, managers' forecasts of good news and bad news converge to market expectations. In summary, we find consistent evidence for the positive relation between cost stickiness and good news. This suggests that firms with higher level of sticky cost are optimistic about their future earnings and thus tend to issue MEF of good news. Specifically, one unit of standard deviation increase in cost stickiness will on average increase good-news MEF by 2.55 percent compared to its mean. However, we do not find a significant correlation between cost stickiness and bad news of MEF. This may suggest that the release of bad news is influenced to a great degree by macro-factors instead of firm-specific strategies. One plausible explanation is management skepticism, management may tend to verify the information before disclosing it (e.g. Kothari *et al.*, 2009; Soffer *et al.*, 2000). Another explanation is management conservatism. Management may be less optimistic regarding asymmetric cost behavior as reflected in cost stickiness and influenced by management overconfidence (Chen *et al.*, 2013).

In Panel C, we conduct additional tests to investigate whether managerial optimism may moderate the relation between cost stickiness and management earnings expectation[15]. Following prior research (Banker, Byzalov and Plehn-Dujowich, 2014; Banker, Byzalov, Ciftci and Mashruwala, 2014; Banker, Chen and Park, 2014; Chen *et al.*, 2017), we use the direction of sales changes from period $t-1$ to period t to measure managerial optimism. We disaggregate our sample into two subgroups based on sales changes (increase or decrease) from the prior period. The empirical results suggest that cost stickiness is positively and significantly associated with management's issuance of good news (coefficient = 0.0355, p-value = 0.0021) when the management optimism is high. In contrast, the positive relation is only significant at a 10 percent level, when the management optimism is low. Moreover, we find a significant and negative relation between cost stickiness and bad news when managerial optimism is high (coefficient = −0.0476, p-value = 0.0334). Consistent with our main tests, we do not find a significant and negative relation between cost stickiness and bad news when managerial optimism is low. In summary, additional tests suggest that managerial optimism may play an important role in the relation between cost stickiness and management earnings expectation. Specifically, with more optimistic expectation, managers are more likely to disclose good news and simultaneously maintain unused capacity indicating a higher level of cost stickiness.

5.3 Robustness tests

Our analysis so far suggests a positive relationship between cost stickiness and MEF releases. However, a potential endogeneity may exist in our analysis. We testify the robustness of our main results and alleviate the endogeneity concern by performing the following analyses.

5.3.1 The effect of adjustment costs. Prior research suggests that highest degree of cost stickiness (anti-stickiness) should be observed when managements' positive (negative) expectations are accompanied by a high (low) magnitude of adjustment costs (Chen *et al.*, 2017). Therefore, we expect that the positive relation between cost stickiness and MEF issuance/good news is more pronounced when the level of resource adjustment cost is higher. Following prior research (Anderson *et al.*, 2003; Banker and Byzalov, 2014), we use both employee and asset intensity to measure the adjustment costs. Firms' with greater employee/asset intensity will generally incur higher adjustment costs when sales decrease. Table X illustrates the effect of adjustment cost on cost stickiness and MEF. In Panel A, we use the

Table X.
The effect of adjustment cost on the relation between Cost Stickiness and MEF

Variables	Dependent variable = News_Issue Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Variables	Dependent variable = Good_News Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Panel A: the effect of employee intensity													
Cost_Sticky	0.0416	0.0291					Cost_Sticky	0.0553	0.0077				
Cost_Sticky × EINT	0.0100	0.0378					Cost_Sticky × EINT	0.0552	0.0109				
COGS_Sticky			0.4079	0.0118			COGS_Sticky			0.1208	0.0060		
COGS_Sticky × EINT			0.4027	0.0169			COGS_Sticky × EINT			0.0700	0.0177		
SGA_Sticky					0.3802	0.0302	SGA_Sticky					0.0543	0.0183
SGA_Sticky × EINT					0.3518	0.0342	SGA_Sticky × EINT					0.0188	0.0243
EINT	0.0657	0.0856	0.0391	0.3058	0.0052	0.9026	EINT	−0.0274	0.3523	−0.0261	0.3818	−0.0383	0.2500
Sale_Incr	0.0620	0.0580	0.0640	0.0500	0.0483	0.1958	ERC	−0.0003	0.9868	0.0052	0.7927	−0.0044	0.8468
Earn_Predict	0.0696	0.0279	0.0755	0.0177	0.0786	0.0320	Ret_Volatility	−0.0837	0.0017	−0.0864	0.0013	−0.0890	0.0025
Nonsynch	−0.0260	0.5048	−0.0213	0.5811	−0.0374	0.3843	Inst_Owner	−0.0159	0.4928	−0.0104	0.6636	−0.0261	0.3167
ERC	0.1249	< 0.0001	0.1357	< 0.0001	0.0975	0.0013	No_Analyst	−0.0296	0.2480	−0.0265	0.3076	−0.0210	0.4378
Ret_Volatility	−0.1129	0.0136	−0.1266	0.0053	−0.1229	0.0213	Growth	0.0389	0.1031	0.0364	0.1341	0.0526	0.0673
Inst_Owner	0.1016	0.0039	0.0958	0.0055	0.0497	0.1993	Litigation	−0.0240	0.5629	−0.0188	0.6517	−0.0588	0.1701
No_Analyst	0.4258	< 0.0001	0.4108	< 0.0001	0.4227	< 0.0001	Durable	0.0749	0.3419	0.0883	0.2543	0.1236	0.1492
MEF_Cost	−0.1058	0.0350	−0.1119	0.0233	−0.1034	0.0582	SEO	0.0424	< 0.0001	0.0436	< 0.0001	0.0459	< 0.0001
SIZE	0.0022	0.9605	−0.0110	0.7996	−0.0130	0.7859	SIZE	0.0441	0.1319	0.0437	0.1369	0.0259	0.4194
LEV	0.0696	0.0875	0.0799	0.0462	0.1088	0.0148	Loss	−0.0644	0.0154	−0.0716	0.0095	−0.0699	0.0237
ROA	0.0042	0.9093	0.0209	0.5751	−0.0059	0.8806	LEV	0.0022	0.9324	0.0040	0.8777	−0.0090	0.7653
BM	−0.0430	0.1910	−0.0351	0.2948	−0.0641	0.0979	ROA	−0.0025	0.9199	−0.0056	0.8231	−0.0061	0.8257
Distress	−0.1948	0.2000	−0.1880	0.2216	−0.1363	0.4530	BM	−0.0454	0.0291	−0.0414	0.0470	−0.0439	0.0706
Industry fixed effect	Yes		Yes		Yes		ΔEPS	0.0495	0.0733	0.0395	0.1579	0.0187	0.4886
Year fixed effect	Yes		Yes		Yes		Distress	−0.0356	0.2454	−0.0352	0.2736	−0.0152	0.6666
Observations	4,814		4,567		3,617		Industry fixed effect	Yes		Yes		Yes	
No. of forecasts	1,858		1,774		1,463		Year fixed effect	Yes		Yes		Yes	
No. of non-forecasts	2,956		2,793		2,154		Observations	1,874		1,785		1,492	
R^2	0.3083		0.3104		0.2998		R^2	0.1634		0.1641		0.1958	
Panel B: the effect of asset intensity													
Cost_Sticky	0.0369	0.0295					Cost_Sticky	0.0974	0.0665				
Cost_Sticky × AINT	0.0339	0.0508					Cost_Sticky × AINT	0.0341	0.0833				
COGS_Sticky			0.0062	0.0054			COGS_Sticky			0.0118	0.0157		
COGS_Sticky × AINT			0.0399	0.0043			COGS_Sticky × AINT			0.0152	0.0127		
SGA_Sticky					0.0249	0.0493	SGA_Sticky					0.0587	0.0781

(*continued*)

Table X.

Variables	Dependent variable = News_Issue Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Variables	Dependent variable = Good_News Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
SGA_Sticky × AINT					0.0222	0.0554	SGA_Sticky × AINT					0.0349	0.0481
AINT	−0.0024	0.9545	−0.0160	0.7033	0.0116	0.7879	AINT	−0.0897	< 0.0001	−0.0895	< 0.0001	−0.0837	0.0004
Sale_Incr	0.0606	0.0629	0.0616	0.0589	0.0482	0.1956	ERC	0.0078	0.6867	0.0102	0.6073	0.0054	0.6981
Earn_Predict	0.0678	0.0325	0.0727	0.0223	0.0773	0.0349	Ret_Volatility	−0.0780	0.0028	−0.0827	0.0018	−0.0828	0.0047
Nonsynch	−0.0210	0.5896	−0.0128	0.7407	−0.0412	0.3315	Inst_Owner	−0.0127	0.5742	−0.0078	0.7364	−0.0224	0.3895
ERC	0.1262	< 0.0001	0.1382	< 0.0001	0.0955	0.0016	No_Analyst	−0.0252	0.3274	−0.0192	0.4610	−0.0102	0.7137
Ret_Volatility	−0.1179	0.0096	−0.1294	0.0042	−0.1235	0.0197	Growth	0.0550	0.0211	0.0538	0.0272	0.0680	0.0182
Inst_Owner	0.1073	0.0024	0.0966	0.0048	0.0513	0.1840	Litigation	−0.0167	0.6831	−0.0139	0.7368	−0.0524	0.2191
No_Analyst	0.4248	< 0.0001	0.4114	< 0.0001	0.4223	< 0.0001	Durable	0.0455	0.5624	0.0614	0.4263	0.0799	0.3479
MEF_Cost	−0.1134	0.0227	−0.1118	0.0209	−0.1041	0.0558	SEO	0.0417	< 0.0001	0.0425	< 0.0001	−0.0442	< 0.0001
SIZE	−0.0064	0.8850	−0.0135	0.7537	−0.0136	0.7768	Size	0.0597	0.0416	0.0610	0.0378	0.0414	0.1969
LEV	0.0761	0.0583	0.0861	0.0299	0.1100	0.0120	Loss	−0.0646	0.0146	−0.0688	0.0121	−0.0639	0.0365
ROA	−0.0024	0.9493	0.0177	0.6341	−0.0028	0.9437	LEV	0.0006	0.9797	0.0018	0.9447	−0.0140	0.6336
BM	−0.0373	0.2607	−0.0279	0.4080	−0.0616	0.1121	ROA	−0.0207	0.3838	−0.0214	0.3751	−0.0165	0.5373
Distress	−0.2162	0.1624	−0.2009	0.2017	−0.1440	0.4193	BM	−0.0356	0.0800	−0.0310	0.1330	−0.0346	0.1455
Industry fixed effect	Yes		Yes		Yes		ΔEPS	0.0508	0.0648	0.0424	0.1268	0.0202	0.4509
Year fixed effect	Yes		Yes		Yes		Distress	−0.0287	0.3333	−0.0279	0.3714	−0.0040	0.9064
Observations	4,834		4,584		3,630		Industry fixed effect	Yes		Yes		Yes	
No. of forecasts	1,864		1,780		1,465		Year fixed effect	Yes		Yes		Yes	
No. of non-forecasts	2,970		2,804		2,165		Observations	1,880		1,791		1,575	
R^2	0.3079		0.3214		0.3093		R^2	0.1657		0.1681		0.1817	

Notes: This table illustrates how resource adjustment cost may influence the relation between cost stickiness and MEF. In Panel A, the resource adjustment cost is measured by employee intensity. In Panel B, the resource adjustment cost is measured by asset intensity. In the left-side columns, the dependent variables are the management's propensity to issue quarterly MEF. In the right-side columns, the dependent variables are the good news disclosed by the sample firm. All the *p*-values are presented after clustering standard errors at the firm-level and year-level

employee intensity to measure adjustment costs. We alternatively use three variables to measure cost stickiness and use MEF issuance and MEF good news to measure firms' MEF behaviors. We find that higher level of adjustment costs may strengthen the positive relation between cost stickiness and MEF issuance/good news. In Panel B, we obtain similar results when we use asset intensity as proxy for adjustment costs. In summary, we find that firms with a higher level of cost stickiness are more likely to issue MEF and good news when they experience a higher level of adjustment costs for unused resources.

5.3.2 The effect of firm efficiency. As discussed above, cost stickiness is associated with management's deliberate choice of resource adjustment. MEF are also a type of managerial strategy relevant to managerial incentives and operation goals. According to the knowledge governance theory of management literature, superior knowledge governance processes including inter-department information sharing and integration, contributes to a sustainable competitive advantage (Foss *et al.*, 2010). Therefore, the firm's operating, investing and financing efficiency may significantly influence the interactions between financial accounting department and managerial accounting department to make decisions including cost stickiness and MEF. In this section, we investigate whether the relation between cost stickiness and MEF is influenced by firm efficiency. Table XI displays the results of multivariate results. The measure of firm efficiency is in accordance with Demerjian *et al.* (2012) who use the data envelopment analysis to generate firm efficiency, relative to its industry peers, in transforming the firm resources to revenues[16]. Each sample firm is classified as high efficiency when its efficiency level exceeds the median[17]. In Panel A, we test the effect of firm efficiency in the relation between cost stickiness and the firm's propensity to issue MEF. First, we find that all the measures of cost stickiness are positively correlated with the firm's propensity to issue MEF when the firm's efficiency is high (Cost_Sticky: coefficient = 0.0489, p-value = 0.0140; COGS_Sticky: coefficient = 0.0729, p-value = 0.0342; SGA_Sticky: coefficient = 0.0282, p-value = 0.0406). In contrast, the result is less significant when the firm efficiency is low. In Panel B, we test the effect of firm efficiency on the relation between cost stickiness and the frequency of MEF issuance and we obtain similar results. The empirical results are consistent with our conjecture and the knowledge governance theory. The financial reporting and managerial decision choices are interrelated, and their interdependencies are influenced by firms' information sharing channels and processes that are measured by firm efficiency in our tests.

5.3.3 Alternative measures of good/bad MEF news. In our main test, we construct management earnings expectation by using the measure, NEWS = (MEF−Analyst_median)/|Analyst_median|. Although it has been used in prior literature (i.e. Kothari *et al.*, 2009), small-denominator problem of |Analyst_median| make the scaling a potential challenge. The most common and simple treatment is to discard observations with small values of |Analyst_median|. However, these observations may have the cost stickiness patterns due to the management's incentive to avoid losses (Kama and Weiss, 2013). In our robustness check, we use a sounder denominator (e.g. beginning-of-year stock price) so that observations with small values of |Analyst_median| as well as with small values of NEWS are included in the sample. Our results still hold after using the alternative measures.

5.3.4 Possible lagged effects. We also conduct additional tests regarding possible lagged effects of cost stickiness on MEF. Untabulated results suggest that no robust and significant correlations between lagged cost stickiness and MEF issuance/MEF expectations are found. One possible reason is that all independent variables used in our main tests are their beginning balances and the measures of cost stickiness integrate the changes in sales and costs from prior period. Therefore, lagged measures will further incorporate sales and costs information from prior period. Second, according to prior research, the firm-level cost stickiness changes from period to period because it is

Table XI.
The effect of firm efficiency on the relation between cost stickiness and MEF

Panel A: whether firms issue MEF

	Dependent variable = News_Issue											
	when firm efficiency is high						when firm efficiency is low					
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Cost_Sticky	0.0489	0.0140					0.0181	0.0904				
COGS_Sticky			0.0729	0.0342					0.0029	0.0864		
SGA_Sticky					0.0282	0.0406					0.0193	0.1479
Sale_Incr	0.0053	0.0881	0.0110	0.0764	0.0228	0.0580	0.0016	0.0997	0.0054	0.0897	0.0281	0.0546
Earn_Predict	0.0468	0.0170	0.0584	0.0993	0.0604	0.1250	−0.0269	0.4385	−0.0117	0.7422	−0.0412	0.3058
Nonsynch	0.0877	0.0582	0.0984	0.0418	0.0971	0.0685	0.0092	0.8377	−0.0059	0.8979	0.0425	0.4263
ERC	0.1686	< 0.0001	0.1743	< 0.0001	0.1625	< 0.0001	0.0779	0.0117	0.0780	0.0146	0.0841	0.0175
Ret_Volatility	−0.1181	0.0053	−0.1199	0.0053	−0.1160	0.0131	−0.0740	0.0900	−0.0816	0.0630	−0.0278	0.5880
Inst_Owner	0.1854	< 0.0001	0.1784	< 0.0001	0.1652	0.0007	0.2598	< 0.0001	0.2513	< 0.0001	0.2657	< 0.0001
No_Analyst	0.2659	< 0.0001	0.2798	< 0.0001	0.2233	< 0.0001	0.2431	< 0.0001	0.2485	< 0.0001	0.2485	< 0.0001
MEF_Cost	−0.0552	0.2964	−0.0425	0.4350	0.0037	0.9481	−0.0694	0.2447	−0.0681	0.2556	−0.0090	0.8950
SIZE	0.0041	0.9280	−0.0169	0.7193	0.0097	0.8496	0.0935	0.0856	0.0950	0.0825	0.1056	0.0917
LEV	0.0340	0.3937	0.0693	0.0980	0.0303	0.5187	0.0227	0.6129	0.0308	0.5009	−0.0144	0.7862
ROA	0.0301	0.3850	0.0325	0.3497	0.0142	0.7190	0.1570	0.0025	0.1280	0.0098	0.1397	0.0112
BM	−0.0404	0.2518	−0.0517	0.1513	−0.0318	0.4569	−0.0205	0.6207	−0.0326	0.4367	−0.0357	0.4492
Distress	−0.2423	< 0.0001	−0.2254	< 0.0001	−0.1666	0.0011	−0.1167	0.0034	−0.1080	0.0065	−0.1091	0.0179
Industry fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Year fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	2,175		2,067		1,655		2,175		2,067		1,655	
No. of forecasts	1,024		972		800		602		584		477	
No. of non-forecasts	1,151		1,095		855		1,573		1,483		1,178	
R^2	0.3805		0.3931		0.3804		0.3155		0.3192		0.3216	

Panel B: frequency of MEF

	Dependent variable = Frequency											
	when firm efficiency is high						when firm efficiency is low					
	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value	Coefficient	*p*-value
Cost_Sticky	0.0195	0.0382					0.0070	0.0973				
COGS_Sticky			0.0184	0.0231					0.0260	0.0981		
SGA_Sticky					0.0020	0.0093					0.0130	0.5109
Sale_Incr	0.0334	0.0117	0.0331	0.0140	0.0325	0.0152	0.0216	0.2852	0.0198	0.7009	0.0090	0.9757

(*continued*)

Earn_Predict	0.0503	0.0029	0.0478	0.0050	0.0746	0.0020	0.0363	0.0674	0.0370	0.0184	0.0537	0.1680
Nonsynch	0.0151	0.5007	0.0202	0.3803	0.0075	0.7979	0.0416	0.0914	0.0385	0.0556	0.0543	0.3308
ERC	0.0759	0.0001	0.0788	< 0.0001	0.0847	0.0020	0.0451	0.0420	0.0490	0.0418	0.0528	0.0171
Ret_Volatility	−0.0116	0.0873	−0.0192	0.0799	−0.1087	0.0002	−0.0433	0.0622	−0.0503	0.0793	−0.0475	0.5178
Inst_Owner	0.1005	0.0749	0.1015	0.0802	0.0045	0.0431	0.0916	< 0.0001	0.0893	0.0022	0.0828	< 0.0001
No_Analyst	0.1220	< 0.0001	0.1198	< 0.0001	0.1416	< 0.0001	0.1143	< 0.0001	0.1154	0.0001	0.1132	< 0.0001
MEF_Cost	−0.0473	0.0913	−0.0445	0.0114	−0.0352	0.3179	−0.0799	0.0141	−0.0782	0.0289	−0.0790	0.5424
SIZE	0.0469	0.1471	0.0391	0.2556	0.0536	0.0923	0.0382	0.1918	0.0329	0.0542	0.0639	0.1614
LEV	−0.0314	0.2989	−0.0291	0.3748	−0.0227	0.4157	0.0259	0.2215	0.0351	0.7732	0.0076	0.8488
ROA	−0.0556	0.4658	−0.0607	0.4576	0.0053	0.8200	0.0481	0.0246	0.0399	0.1561	0.0344	0.0040
BM	−0.0464	0.1131	−0.0547	0.0754	−0.0481	0.0305	−0.0296	0.0873	−0.0357	0.0201	−0.0454	0.2716
Distress	−0.1177	0.0026	−0.1168	0.0056	−0.0737	0.0384	−0.0213	0.5361	−0.0216	0.8145	−0.0092	0.0115
Industry fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Year fixed effect	Yes		Yes		Yes		Yes		Yes		Yes	
Observations	2,166		2,064		1,640		2,166		2,064		1,640	
R^2	0.2174		0.2229		0.2662		0.1789		0.1775		0.2141	

Notes: This table illustrates how firm efficiency may influence the relation between cost stickiness and MEF issuance. In Panel A, the dependent variable is the management's propensity to issue quarterly MEF. In Panel B, the dependent variable is the frequency of MEF issued by the sample firm during the sample year. In the left-side columns, we conduct tests for the subgroup with a higher level of firm efficiency. In the right-side columns, we conduct tests for the subgroup with a lower level of firm efficiency. The measurement of firm efficiency is developed by Demerjian *et al.* (2012). All the p-values are presented after clustering standard errors at the firm-level and year-level

Table XI.

significantly influenced by both firm-specific and macroeconomic factors. As cost management strategy changes frequently, cost stickiness may not have a lagged effect on manager's quarterly earnings forecast.

6. Conclusion

This paper investigates how a firm's cost stickiness strategy is associated with its voluntary disclosure strategy. Prior research suggests that cost stickiness is a prevalent phenomenon in the business world and is a type of deliberate management choice. MEF are also a type of voluntary disclosure determined by management's choices. Therefore, we conjecture that the two managerial strategies are interdependent and should be integrated in achieving internal operational and external reporting objectives. Through empirical tests with a sample between 2005 and 2016, we find that the firm-level of sticky cost is positively and significantly correlated with the firm's propensity to issue MEF and the frequency of MEF.

Additional tests provide evidence that both information asymmetry and managerial optimism explain the relationship between cost stickiness and MEF releases. We also find that the level of sticky cost is associated with positive news announced by managers and the positive relation is more pronounced when management expectation is more optimistic. Our results are robust when we use alternative measurements of cost stickiness. Moreover, additional tests suggest that adjustment cost and firm efficiency moderate the relation between cost stickiness and MEF releases. In conclusion, our results suggest that managerial internal strategic and operational decisions are integrated with external voluntary financial disclosure decisions.

Our results contribute to accounting research by investigating the interdependent incentives behind each managerial strategy. First, cost stickiness is a prevalent phenomenon but has not obtained sufficient attention from accounting research to investigate its effect on firm operations. Second, this paper builds a link between financial accounting information (such as MEF) and managerial accounting information (such as cost stickiness), and thus provides new evidence regarding how management coordinates the external financial and internal managerial accounting information systems in achieving the organization's goals. Finally, we believe our paper provides new insights for future research regarding how management integrates external financial reporting with internal operating decisions.

Our paper is limited by a single data source, although we try to use alternative measures, robustness tests, sample selection criteria and other methods to limit or reduce any coverage biases or measurement errors. Following prior studies, we implement simple regression models to test the association between cost stickiness and MEF. The causality cannot be concluded from our results and possible nonlinear relations may exist. Moreover, Fan and Liu (2017) suggest that firms tend to misclassify cost of goods sold or SG&A expenses. Researchers need carefully interpret our results using either COGS or SGA to measure cost stickiness in the Weiss (2010) model. We suggest future research to improve these limitations and provide additional evidence on the interactions among different strategies determined by different departments within the same company. Future studies can also contribute to the accounting literature by discussing the effects of managerial accounting information on users' interpretations and reactions to financial accounting information.

Notes

1. We define cost stickiness as the asymmetric cost behavior to activity changes in the sense that costs decrease less in reaction to a sales decline than they increase for an equivalent sales growth (Anderson *et al.*, 2003; Banker, Byzalov, Ciftci and Mashruwala, 2014).
2. Another explanation can be the concept of "Lean Management" that management with greater focus on cost stickiness also has more incentives to disclose MEF.

3. Cost stickiness may also lead to information asymmetry, because it is derived from the internal managerial strategy which is not known by outsiders. Thus, management has information advantage regarding the firm's costs–sales relation than investors and financial analysts.
4. We calculate only the most recent management earnings forecast when managers issue multiple quarterly earnings forecasts during the same fiscal quarter for the same forecast period.
5. The high-risk industries are industries with SIC of 2833–2836, 3570–3577, 7370–7374, 3600–3674 and 5200–5961 (Matsumoto, 2002).
6. Thomson First Call's Company Issued Guidance (CIG) database is subject to coverage biases and measurement errors, although it provides a relatively larger size of MEF data. Following Chuk *et al.* (2013), we limit sample year after the Reg FD and drop certain types of observations that are known to have a higher risk of measurement errors following prior studies. We also implement alternative measures and various robustness tests to reduce or limit the impact of possible measurement error or coverage biases from one single data source.
7. We manually collect the data for the largest 3,000 US companies' quarterly management earnings forecast between 2012 and 2016 from the Bloomberg database. The largest 3,000 US companies cover companies from S&P 500 Index, Domini 400 Social Index, 1,000 Largest US companies, Large Cap Social Index, 2000 Small Cap US companies and Broad Market Social Index. The total number of companies covered per year is approximately 3,100.
8. Chen *et al.* (2017) measure management expectations by using the tone provided by management in forward-looking statements (FLS) in the MD&A section of the 10,000 reports. We believe that good-news/bad-news of MEF better reflect management expectations about future sales demand and related earnings.
9. We repeated tests by winsorizing the top 5 percent and bottom 5 percent of data. We also repeated tests without any winsorizing following Kothari *et al.* (2009). Our findings remain robust.
10. When independent variable is the likelihood of issuing MEF, we conduct the logistic regression. When independent variable is a continuous measure, such as frequency of issuing MEF, good-news and bad-news forecasted by managers, we conduct the OLS regressions.
11. When we repeated the test by using the top and bottom quartile of original sample our results still hold.
12. Untabulated results suggest similar conclusions when we use the frequency to measure the firm's MEF behaviors.
13. To test the relation between cost stickiness and short-horizon/long-horizon MEF, we drop the MEF observations manually collected from the Bloomberg database, since we do not have sufficient information to determine our hand-collected MEF data as short-horizon or long-horizon.
14. To test the relation between cost stickiness and short-horizon/long-horizon MEF, we drop MEF observations that are manually collected from the Bloomberg database, as we do not have sufficient information to distinguish short-horizon and long-horizon MEFs.
15. We use COGS_Sticky which generates the largest sample size to measure cost stickiness in Table IX. Untabulated results suggest consistent inferences when we use Cost_Sticky and SGA_Sticky to measure cost stickiness.
16. The data of firm efficiency are available on the author's website.
17. We repeat the tests by using the upper 25 percent as the group with high firm efficiency and the bottom 25 percent as the group with low firm efficiency. Untabulated results remain robust.

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Appendix. Variable description

Cost stickiness variables

- ABJ_Sticky = the cost stickiness measured by Anderson *et al.* (2003) model. We multiply this variable by −1.
- Cost_Sticky = the cost stickiness measured by Weiss (2010) model, and the cost is measured by difference between sales revenues and income before extraordinary items. We multiply this variable by −1.
- COGS_Sticky = the cost stickiness measured by Weiss (2010) model, and the cost is measured by cost of goods sold. We multiply this variable by −1.
- SGA_Sticky = the cost stickiness measured by Weiss (2010) model, and the cost is measured by the selling, general and administrative expenses. We multiply this variable by −1.

MEF variables

- News_Issue = the dummy variable which equals 1 if the sample firm issues at least one quarterly MEF during the sample year, and 0 otherwise.
- Frequency = the number of quarterly earnings forecasts released by the sample firm in the sample year.
- News = the difference between the MEF and the median of financial analyst forecast for the same forecast period, scaled by the absolute value of median of financial analyst earnings forecast.
- Good_News = Max. (NEWS, 0).
- Bad_News = Min. (NEWS, 0).

Control variables

- Sale_Incr = the dummy variable which equals 1 if sales increase from period $t-1$ to t, and 0 otherwise.
- Inst_Owner = the percentage of firm's shares owned by the institutional investors at the period end.
- No_Analyst = the number of financial analysts following the sample firm.
- Ret_Volatility = the standard deviation of monthly raw return over the 36 months prior to the sample period.
- MEF_Cost = the voluntary disclosure cost, measured by the industry-level weighted average entry costs to measure firms' competency to face the threat of new entrants. The value is multiplied by −1.
- Earn_Predict = the logarithm transformation of R^2 from regressing return-on-assets for the period t on return-on-assets for period $t-4$ over a rolling window of 16 quarters prior to period t.
- ERC = regressing three-day cumulative market adjusted stock returns on unexpected earnings over 36 months prior to the period t.
- Nonsynch = the earnings non-synchronicity which is the residual from the model which pair-wise regresses the specific firm i's return-on-asset (ROA) on its peer firms' (within the same two-digit SIC code, excluding firm i) ROA over the 16 quarters prior to quarter t, following Gong *et al.* (2013).
- SEO = a dummy variable which equals 1 if the firm issues new equity in the period $t+1$ and 0 otherwise.
- Growth = the difference between present total assets and previous year total assets scaled by previous year total assets.
- Litigation = the dummy variable which equals 1 if the firm is in the high-risk industry (SICs 2833–2836, 3570–3577, 7370–7374, 3600–3674 and 5200–5961), 0 otherwise.
- Durable = the dummy variable which equals 1 of the firm is in the durable goods industry (SICs 150–179, 245, 250–259, 283,301, 324–399), and 0 otherwise.
- ΔEPS = the changes in earnings from the previous year.
- LEV = long-term liabilities scaled by total assets.
- SIZE = natural logarithm of firm total assets.
- BM = book-to-market ratio.

- ROA = return-on-assets.
- Distress = dummy variable which equals 1 when the sample year is 2008 or 2009, and 0 otherwise.
- ISSUE_SH = the dummy variable which is equal to 1 if the firm issues at least one short-horizon MEF which is released within 90 days prior to the forecast period, 0 otherwise.
- ISSUE_LH = the dummy variable which is equal to 1 if the firm issues at least one long-horizon MEF which is released more than 90 days prior to the forecast period, 0 otherwise.
- Frequency_SH = the frequency of short-horizon MEF issued which is released within 90 days prior to the forecast period.
- Frequency_LH = the frequency of long-horizon MEF issued which is released more than 90 days prior to the forecast period.

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