Commitment is An Act: Do Firms Speculate to Meet Management Forecasts?*

Abe de Jong[†] Taoran Guo[‡] Lubna Rahman[§]

November 20th 2024

Abstract

This paper examines whether firms use selective hedging strategies to meet management earnings forecasts. Selective hedging is speculation and allows managers to incorporate market predictions into derivative programs. We find that firms with management earnings forecasts are more likely to engage in selective hedging. This speculative activity is especially prevalent when management forecasts overestimate earnings and is most noticeable with foreign exchange derivatives. As can be expected, speculating firms often report earnings below the forecast, which results in a negative abnormal return of 3.4%. We find no effects for non-speculative derivative usage.

Key Words:
Jel:

This paper has benefited from the comments of participants at the Monash University PhD workshops.
[†] Department of Banking and Finance, Monash University and University of Groningen, Email: abe.dejong@monash.edu. Phone: +61 3 99032049.
[‡] Department of Banking and Finance, Monash University, Australia. Email: taoran.guo@monash.edu. Phone: +61 3 9905 5423.
[§] Department of Banking and Finance, Monash University, Australia. Email: lubna.rahman@monash.edu. Phone: +61 3 9905 141

1 Introduction

Management earnings forecasts (MEFs) have long been a central focus of accounting research, particularly in exploring the motivations behind these forecasts (Glosten and Milgrom, 1985; Kim and Verrecchia, 1991; Botosan, 1997; Easley and O'Hara, 2004; Francis, Nanda, and Olsson, 2008; Cheynel, 2013). Firms that frequently issue MEFs often adopt strategies to meet or exceed these targets, reflecting the strong incentives associated with achieving forecasted earnings. When earnings fall short, some companies may resort to misstating financial statements to meet forecasted goals—a strategy that carries substantial risks, including heightened litigation exposure and reputational damage (Kasznik, 1999; Dutta and Gigler, 2002; Rogers and Stocken, 2005). Alternatively, selective hedging, which enables firms to engage in speculative activities by either opening new derivative positions or strategically leaving existing ones unhedged, offers a potentially lucrative pathway to meet MEFs without financial misrepresentation (Stulz, 1996; Glaum, 2002; Géczy et al., 2007; Chernenko and Faulkender, 2011; Bodnar et al., 2012; Adam et al., 2015). This study investigates the relationship between MEFs and selective hedging. We examine how earnings forecasts shape firms' risk management choices and assess the broader financial implications of these practices on market perception.

Understanding the connection between MEFs and selective hedging is critical, for at least two reasons. First, although extensive research highlights the pressures firms face to meet or exceed MEFs, the mechanisms by which companies attempt to achieve these targets without resorting to financial misstatements remain underexplored. By analyzing hand-collected data on firm-level selective hedging practices, this study aims to determine whether MEFs act as a catalyst for risky speculative strategies that could enhance reported earnings. Second, though selective hedging is ostensibly a risk management tool, it is susceptible to misuse for speculative purposes, particularly when managers misjudge market conditions (Chernenko and Faulkender, 2011). Such speculative hedging can expose firms to significant financial risks, and failure to properly manage cash flow volatility may result in indirect costs, including underinvestment (Froot, Scharfstein, and Stein, 1993), financial distress (Mayers and Smith, 1982; Smith and Stulz, 1985), and increased tax burdens (Mayers and Smith, 1982; Smith and Stulz, 1985). Consequently, understanding the drivers of selective hedging is essential for investors and stakeholders aiming to assess the broader financial implications of corporate derivative use and its impact on firm stability.

Management forecasts are value-relevant in financial markets because of the commitment and information advantage of the firm's management. Our study builds on the premise that adjusting a forecast harms credibility while failing to meet it poses an even greater risk by undermining credibility and increasing litigation exposure. Thus, when firms have private information indicating an expected earnings shortfall, they may use profit-oriented selective hedging to offset adverse outcomes. Given the asymmetric shareholder response to meeting versus missing forecasts, we argue that firms may find speculative hedging advantageous, as the benefits of just meeting forecasts can outweigh the costs of a larger miss, thereby reinforcing forecast credibility and mitigating reputational and legal risks.

Research on drivers of firms' selective hedging has been limited by the scarcity of detailed firm-level data on derivative use (Adam and Fernando, 2006). However, FAS 161 by the Financial Accounting Standards Board (FASB) has improved transparency, providing new insights into selective hedging practices. FAS 161 mandates that firms classify derivatives as hedge or non-hedge instruments and disclose their fair values in financial statements, organized by purpose and risk type (FASB, 2008). This study addresses data limitations by manually collecting detailed data on firms' derivative positions to construct measures of selective hedging—defined as non-hedge derivative use disclosed by firms. We develop four proxies, for FAS 161 disclosures on the (1) notional amounts, (2) fair values of non-hedge derivatives,[1] (3) time-series volatility in derivative holdings as a signal of market-driven adjustments, and (4) residual-based deviations in holdings unexplained by fundamental factors. Together, these proxies provide a robust framework for analyzing selective hedging and its implications for risk management strategies.

Our findings reveal that firms that choose to make MEFs are more likely to engage in selective hedging, with the likelihood increasing by 6.3% to 9.3% when a MEF is provided. Managers also elevate speculative derivative activities following MEF issuance, particularly when forecasts are frequent. We further examine how the risk of missing forecasted earnings influences selective hedging. Managers issuing optimistic forecasts relative to actual earnings

[1] FAS 161 requires firms to disclose the fair market values of derivatives contracts but removes the mandatory disclosure of the notional values that were previously required by FAS 119. Campello et al. (2011) note that, compared with notional value information, the fair value information reported reveals only limited information about derivatives usage. Therefore, we use both notional and fair value information to construct our selective hedging measures.

exhibit higher levels of selective hedging, while there is no significant increase in speculative derivatives with pessimistic forecasts. Additionally, selective hedging increases when forecasts are overestimated relative to analyst consensus (i.e., "good news" MEFs) but shows no association with "bad news" MEFs. These asymmetric effects suggest that meeting and missing MEFs entail different costs, influencing managers' incentives to use speculative derivatives to achieve projected earnings when forecasts are optimistic.

To further test the hypothesis that managers use derivatives speculatively when expecting to miss their previously disclosed earnings forecast, we examine how selective hedging varies with forecast aggressiveness. We define aggressiveness by comparing the forecast to actual benchmarks and analyst expectations by distinguishing five groups from least to most aggressive. If managers use selective hedging to address the risk of missing forecasts, less challenging forecasts should have minimal impact (e.g., Hirst, 1987; Black, Gipper, and Stocken, 2021). Our findings show that MEFs drive selective hedging primarily when the forecast is aggressive.

We next assess whether the positive relationship between MEF behavior and selective hedging can be interpreted causally. A potential concern is that forecast issuance and selective hedging policy may be determined simultaneously, or selective hedging could motivate forecast issuance. We take several steps to address endogeneity concerns. First, we include firm, year, and quarter fixed effects to control for time-invariant factors influencing both forecasting and hedging decisions. Second, we re-run our analysis focusing on firms that consistently issue forecasts to mitigate concerns that selective forecast issuance drives the results. Our findings remain robust in this sample.

Third, we explore the mandatory adoption of *Revenue from Contracts when Customers* (Topic 606, "ASC 606") as a quasi-exogenous increase in MEFs, effective December 2017. The key feature of ASC 606 is that it increased managerial discretion around revenues and expenses. ASC 606 was a material change to accounting standards and materially affected earnings. Lee and Lee (2020) find earnings were less predictable under ASC 606, and the effects were not anticipated. Glaze, Skinner, and Stephan (2023) suggest that the ASC 606 was an exogenous investor uncertainty increase. Therefore, we expect an increase in MEFs in the uncertain environment following the adoption of ASC 606. Our results are consistent with a causal effect as we show that when the firm provides more MEF due to adopting ASC 606, it increases the speculative derivative activities.

Fourth, we use COVID-19 as an exogenous shock that likely affects managers' incentives to disclose pessimistic forecasts. COVID-19 has significantly increased macroeconomic uncertainty (Baker et al., 2020), the literature suggests that firms that are more severely affected by COVID-19 disclose pessimistic unfavorable forecasts because they face high COVID-19-induced uncertainty (Chen et al., 2022). We look at the hospitality and retail industry, whose earnings have been impacted severely by the pandemic and are more likely to act pessimistically when providing MEF. Our results indicate that hospitality or retail firms that provide MEF reduced their speculative derivatives during the COVID-19 pandemic, which was caused by the prismatic forecast they issued.

Fifth, we apply an instrumental variables (IV) approach to strengthen the causal link between MEFs and selective hedging. Our instrument leverages disclosure transparency among industry peers, assuming that peer disclosures influence a firm's decision to issue forecasts without directly affecting its hedging behavior. When industry peers release earnings forecasts, they reduce external uncertainty and increase the capital market costs of nondisclosure, encouraging firms to issue MEFs (Seo, 2021). We argue that peer forecast activity is unlikely to correlate with a firm's selective hedging. Our analysis consistently shows that MEF issuance significantly increases selective hedging. Further tests reinforce a causal effect, as management forecasts represent firm-level commitments with high retraction costs, while speculative derivatives can be adjusted more flexibly.

Are shareholders aware of the manager's discretion in using speculative derivatives to meet their forecasts? We investigate the equity value implications by looking at how investors respond to earnings announcements when the firm is more likely to have used speculative derivatives to attain their forecasts. Generally, when a firm's reported earnings fall below the forecasted amount (a "miss"), the market responds negatively. On the other hand, if the firm's reported earnings exceed the forecasted amount (a "beat"), the market tends to react positively. This is true for companies that do not use derivatives or only use them for hedging purposes. Consistent with our forecast-induced speculation, we find a more negative market reaction for firms that tried to speculate through derivatives and still failed to meet their forecasted earnings. Missing the forecasts gives a -2.4% return, and when the firm has speculated -3.4% will be added, bringing the total effect to -5.8% for speculators. These results imply that the investor can observe the firm's speculative derivative activities, and managers will be punished through the stock market if they fail in the speculative strategy.

We further decompose speculative derivative use by risk type by leveraging detailed derivative disclosures under FAS 161. We find that foreign exchange derivatives primarily drive the positive association between MEF issuance and speculative derivative activity compared to derivatives for interest rate and commodity price risk. To investigate this further, we focus specifically on foreign exchange speculative derivatives, allowing us to control for firms' foreign exchange rate risk exposures, which influence managers' derivative strategies (Beber and Fabbri, 2012). Our results indicate that MEF behaviors are associated with increased use of foreign exchange speculative derivatives.

Next, we perform a placebo test to examine the relationship between MEF behavior and using derivatives for hedging purposes. We hypothesize that managers, when concerned about the possibility of failing to meet their forecasted earnings, would have little incentive to increase hedging activity, as hedging primarily adds value by reducing earnings volatility (Pincus and Rajgopal, 2002). Our results indeed show no significant change in the level of derivatives used for hedging. This provides further evidence that the observed relationship between MEF issuance and selective hedging is not driven by firms' hedging needs per se. These findings also help address potential concerns regarding measurement error, as the hedge designation disclosures required under FAS 161, which our study relies on, offer reliable information about firms' derivative usage.

We also look at how our results vary with the managers' compensation structure, because equity-based compensation is expected to increase the speculative derivative usage. Specifically, we investigate the incentive compensations grated to CEOs, which are measured by wealth-to-stock volatility (Vega), pay-performance sensitivity (Delta), and inside equity (Firm-related wealth). Our findings indicate that when firms offer higher incentive compensation to managers who provide earnings forecasts, there is an increased tendency for risky speculative activities.

This study contributes to the current risk management literature in several important ways. First, it provides a more detailed examination of corporate derivative use than previous research. While prior studies have largely assumed that derivatives are used for hedging purposes, they often fail to distinguish between hedging and speculation, a limitation that persisted until the introduction of FAS 161 (Chernenko and Faulkender, 2011). Second, building on Stulz's (1996) argument that financial conditions and managers' belief in their informational advantages are key prerequisites for selective hedging, subsequent research

has explored the role of fundamental financial characteristics, corporate governance, and managerial beliefs in explaining selective hedging (e.g., Adam et al., 2015; Adam et al., 2017; Brown et al., 2006; Bajo, Jankensgard, and Marinelli, 2022; Beber and Fabbri, 2012; Géczy et al., 2007). Our study introduces a novel perspective by considering MEF behavior as a factor influencing a firm's selective hedging activities.

We also contribute broadly to the literature on MEFs. The voluntary, non-audited nature of these forecasts raises concerns about their credibility (e.g., Jennings, 1987; Skinner, 1994; Rogers and Stocken, 2005; Hutton and Stocken, 2007). Investors assess forecast credibility relative to consensus analyst predictions, with missing a forecast damaging credibility more than beating it by the same amount (Hirst, Koonce, and Venkataraman, 2008). MEFs serve as a commitment device, and firms that issue them are expected to continue doing so (Black, Gipper, and Stocken, 2021). While prior research has primarily focused on understanding why managers issue guidance (Hirst et al., 2008), we are the first to demonstrate, using novel data, that a manager's incentive to meet forecasted earnings influences a firm's selective hedging activities.

Our findings are different from the analysis in Black et al. (2021), where the focus is on managers benefiting from offering forecasts to commit the firm to improve performance by altering its operating activities *ex-ante*. In order words, they capture the ex-ante incentive to issue forecasts as a commitment drive for firm efforts. We focus on *ex-post* incentives of managers who use speculative derivative action to attain a level of performance previously forecasted. Moreover, Black et al. (2021) find no motivational effect on a firm's production function to raise performance when managers issue aggressive forecasts. Our results indicate a challenging forecast encourages managers' risk-taking by using derivatives for speculative purposes.

The literature has highlighted that managers may resort to accrual forecasts or adjusting market expectations to meet their MEFs (e.g., Kasznik, 1999; Gong, Li, and Xie, 2009; Xu, 2010; Yamada, 2016; Beyer, 2008; Hurwitz, 2018). However, such MEFs carry litigation risks and can lead to negative market reactions, as they often lower investor expectations (Matsumoto, 2002). Furthermore, both MEFs and expectation manipulation do not directly affect a firm's actual cash flows (Dutta and Gigler, 2002). In contrast, selective hedging strategies allow managers to potentially generate earnings through market movements, offering a means to achieve forecasted earnings without affecting the firm's underlying financial performance.

Our study contributes to the literature on MEFs and corporate derivatives. Campbell, Downes, and Shwartz (2015) find that while analysts and investors initially struggle with hedge accounting information, their understanding improves with managerial forecasts, focusing on how management disclosure aids market comprehension. Campbell, Khan, and Pierce (2021) extend this line of inquiry, noting that FAS 161 has further enhanced users' ability to interpret hedge accounting. More closely aligned with our work, Campbell, Cao, Chang, and Chiorean (2023) observe that MEF frequency increases with effective hedging. Leveraging FAS 161's improved reporting transparency, we show that MEFs significantly impact firms using speculative, rather than hedging, derivatives.

2 Hypotheses development

2.1 Actual earnings announcement

The literature consistently highlights that MEFs offer critical information for investors assessing a firm's future performance (e.g., Hassell, Jennings, and Lasser, 1988; Healy and Palepu 1993, 2001; Beyer, Cohen, Lys, and Walther, 2010; Hutton, Lee, and Shu, 2012; Kim and Verrecchia, 1991). While managers' forecast decisions depend on the incentives and perceived benefits of a forecast, issuing earnings forecasts could be costly for firms and managers (Beyer et al., 2010).

For example, forecast inaccuracies can expose firms to litigation risks (Skinner, 1994, 1997), undermine analysts' coverage and accuracy (Trueman, 1994), and cause declines in market value (Beyer, 2009). Meanwhile, MEF errors can also expose managers to the risk of loss in perceived ability (Kato, Skinner, and Kunimura, 2009), compromising forecasting reputation (Williams, 1996), increasing executive turnover (Lee, Matsunaga, and Park, 2012), and decreasing managerial pay (Zamora, 2009). The costs associated with MEF errors are particularly severe when reported earnings fall short of forecasts, with the severity of the forecast error amplifying these costs (Kasznik, 1999). Therefore, managers and investors attach significant importance to firms achieving forecasted earnings (Bartov, Givoly, and Hayn, 2002; Skinner and Sloan, 2002; Brown and Caylor, 2005).

Managers, as firm insiders, possess private information that is not available to outside analysts or investors. After committing to a forecast, they may receive bad news that threatens the forecasted earnings, prompting them to take corrective action. Given the asymmetric market reaction to missing versus meeting forecasts (Beyer, 2009), rational managers are likely to act to avoid the larger costs of missing the forecast. Kasznik (1999)

finds that firms with overestimated earnings (i.e., those reporting below forecast) tend to engage in higher levels of accrual earnings management. This behavior intensifies with the risk and potential costs of litigation. Other studies show a positive relation between accruals and forecast errors (Gong, Li, and Xie, 2009; Xu, 2010; Yamada, 2016). However, some studies argue that greater disclosure reduces information asymmetry, which in turn limits earnings management (Lobo and Zhou, 2001; Jo and Kim, 2007).

Earnings management can lead to legal and reputational costs when manipulations are uncovered (Ding and Jaggi, 2021). This risk became particularly evident after the Enron scandal in 2001.[2] Several studies suggest that managers may manipulate reported earnings or issue pessimistic forecasts to avoid failing to meet expectations (Beyer, 2008). Increased litigation risks and legal liabilities often incentivize managers to adopt conservative forecasts to protect against falling short of earnings targets (e.g., Choi and Ziebart, 2004; Hurwitz, 2018; Matsumoto, 2002; Rostamy et al., 2008; Skinner and Sloan, 2002; Soffer et al., 2000). Overall, the literature underscores the critical importance of meeting forecasted earnings, with managers using earnings management to achieve this goal.

Managers use both MEFs and expectation management to avoid overestimating earnings, but each mechanism entails costs. Earnings management is challenging due to scrutiny from auditors and boards, with Valahzagharda and Mirzamomen (2013) finding a positive correlation between earnings management and top management turnover. Additionally, since accruals reverse over time, managers cannot consistently use abnormal accruals to boost earnings. This form of "window dressing" improves reported earnings without affecting real cash flows or economic performance (Dutta and Gigler, 2002). The second mechanism, expectation management, involves providing pessimistic forecasts, but this can also backfire, as downward-adjusted expectations may trigger negative stock market reactions (Hirst et al., 2008).

Prior studies indicate that managers may engage in derivative transactions as a tool for earnings smoothing (Barton, 2001; Brown, 2001; Pincus & Rajgopal, 2002; Graham et al., 2005;

[2] In October 2001, Enron announced a $1 billion charge for accounting "errors," triggering a series of events that led to the company's collapse and the downfall of its external auditor, Arthur Andersen. Enron's bankruptcy, then the largest in U.S. history, was soon surpassed by WorldCom, whose more rudimentary accounting fraud resulted in a larger restatement of earnings, an even bigger bankruptcy, and extensive civil and criminal investigations. In the aftermath, federal and state regulators launched fraud probes at numerous companies, including Adelphia, HealthSouth, McKesson, Tyco, and Qwest (Kon et al., 2008, p. 1069).

Chernenko & Faulkender, 2011). Brown (2001) presents field-study evidence suggesting that corporate hedging decisions are influenced in part by objectives to stabilize reported earnings. Barton (2001) and Pincus and Rajgopal (2002) propose that firms use both accounting accruals and derivatives interchangeably to achieve smoother earnings. Chernenko and Faulkender (2011) further document that firms are more likely to utilize interest rate swaps during periods associated with managed earnings. Similarly, Manchiraju et al. (2014) report that speculative gains from derivatives are linked to a higher likelihood of meeting or exceeding consensus analyst forecasts and prior-year earnings targets. Firms have also acknowledged in business media that selective hedging strategies are sometimes employed to enhance reported earnings. For instance, Chesapeake Energy Corp., an active derivatives trader, has leveraged its derivative activities to generate profits.[3]

Hedging with derivatives adds firm value by managing volatility, though it sacrifices potential gains. Selective hedging, however, is profit-driven, aiming to control downside risk while retaining upside potential (Glaum, 2002; Stulz, 1996). Firms selectively hedge only positions expected to incur losses, leaving profitable ones open to capitalize on anticipated gains (Glaum, 2002). Stulz (1996) describes selective hedging as akin to acquiring "well-out-of-the-money put options"—limiting losses while preserving gains. Managers may be motivated to use derivatives for speculation, as successful bets yield high rewards with relatively limited costs if unsuccessful (Lins et al., 2011).

Derivative hedging provides firms with protection against financial market uncertainties (Mayers, 1977) and helps smooth income by reducing earnings variability over time (Pincus & Rajgopal, 2002). However, when managers possess private information indicating potential shortfalls in forecasted earnings, reducing volatility alone is insufficient. Instead, selective hedging may help prevent earnings from falling below projections. Thus, corporate selective hedging strikes a balance between stabilizing earnings and enhancing reported income. The combined benefits of hedging and selective exposure motivate its use among firms providing MEFs. Accordingly, we propose the following hypothesis:

Hypothesis 1: Firms with MEFs are more likely to conduct selective hedging.

[3] Chesapeake Energy Corp. claims, "We don't hedge just to say we're hedged, we hedge to make money," and "Between 2006 and the end of 2011, Chesapeake generated $22.4 billion in gas sales -- and $8.7 billion in gains from gas hedges." (Russell Gold, WSJ, 2012).

We further categorize earnings forecasts into optimistic and pessimistic forecasts, based on their relation to actual realized earnings. This distinction is important, as the motivational impacts of these forecasts differ. Bourveau et al. (2018) suggest that managers face litigation risk if optimistic forecasts fail to materialize, whereas investors are unlikely to pursue legal action when actual earnings exceed a conservative (pessimistic) forecast. Thus, managers issuing optimistic forecasts are likely more motivated to meet these projections to avoid litigation costs. As Kasznik (1999) indicates, managers tend to manage earnings upward when they anticipate a shortfall relative to their forecasts, leading those who overestimate earnings to take corrective actions to minimize forecast errors. By contrast, forecasts that are easily achievable (i.e., pessimistic forecasts) provide little incentive for additional managerial effort.

Hypothesis 2: Firms with optimistic MEFs are more likely to conduct selective hedging.

2.2 Good news forecast

MEFs are a crucial voluntary disclosure tool, enabling managers to shape market expectations, reduce litigation risks, and enhance their reputation for transparency (Hirst et al., 2008). Investors' reactions to forecasts depend on the new information provided and the perceived credibility of the forecast (Jennings, 1987). Credibility concerns arise because MEFs are voluntary, unaudited, and subject to managerial discretion (Healy & Palepu, 2001). Good and bad news forecasts, defined relative to analyst consensus, are made for different reasons and affect stock prices in distinct ways. Verrecchia (1983) suggests managers issue good news forecasts to boost stock prices, but investors, aware of managers' incentives—especially with stock-based compensation—tend to view such forecasts skeptically. To enhance the credibility of optimistic forecasts, managers must ensure they are realistic and take steps to improve their plausibility.

Hutton et al. (2003) find that managers who provide good news forecasts are more likely to supplement verifiable forward-looking statements, which can be used to bolster the credibility of good news forecasts. They also show that good news forecasts are only informative when accompanied by verifiable forward-looking statements, which suggests the importance of verifying the good news forecast. They do not find that verifiable forward-looking statements are provided with bad news forecasts.

In line with the notion in Kasznik (1999) that managers find ways to meet their forecasts, managers might face questions about their abilities if the achieved earnings are below their forecasts (Trueman, 1986). In addition, if managers do not meet their forecasts, analysts

estimate benchmarks reduce managers' ability to excuse this performance (Hutton et al., 2003). Missing a forecast is bad for a firm's credibility, and has a stronger negative effect, when compared with beating a forecast by the same amount (Hirst et al., 2008). Managers who provide good news forecasts are more motivated to recognize the good news than those who provide bad news (Bourveau et al., 2018). For good news forecast providers, we argue that managers who have private information that they will miss the forecast after the good news forecast is made will increase the credibility of their earnings forecasts by speculating. Based on these arguments, we predict that:

Hypothesis 3: Firms with good news earnings forecasts are more likely to conduct selective hedging.

3 Data

We select firms that are part of the S&P 500 Index as of December 2021. The panel comprises the firm-quarter observations between 2017 and 2021. We hand-collect the derivative positions data from the 10-K and 10-Q fillings. We obtain the MEFs, analyst earnings forecasts, and actual earnings data from I/B/E/S, financial performance data from Compustat, and stock return data from the CRSP. Our initial sample consists of 496 firms in the S&P 500 that are shown on the Compustat dataset. 130 financial firms and utilities were excluded because they are heavily regulated. Balancing the sample and requiring non-missing firm character data bring the number of firms to 266. This study focuses on derivative use. Therefore, 52 firms that do not employ derivatives and do not apply hedge accounting are also excluded from the sample. We end up with a sample of 214 firms and 4,280 firm-quarter observations.

3.1 Selective hedging and MEFs

We use hand-collect data from the FAS 161 disclosures to develop proxies for the firm's derivative positions (hedge and selective hedging) from derivative notional value disclosure and balance sheet recognition.[4] The first set of selective hedging measures is based on the firm's gross notional amounts of derivatives disclosed for non-hedge purposes. It was not compulsory to report the gross notional amounts of derivatives. Still, FAS 161 required enhanced disclosure of an entity's derivative and hedging activities to improve the transparency of financial reporting. In compliance with FAS 161, 75.6% of firms in our sample

[4] This measure of selective hedging is consistent with Campbell et al. (2023) and Manchiraju et al. (2014), who classify hedgers and speculators based on the restrictive requirements for hedge designation. Manchiraju et al., (2014) further ascertain the measure by finding that the use of non-hedge derivatives that for speculative purposes increases firm risk

report the details of notional amounts of derivatives. We measure selective hedging, $Speculation\ Notional$ as the notional value of the non-hedge derivative contracts scaled by total assets. The second set of measures of selective hedging is based on the firm's balance sheet disclosure about the fair value of derivatives that are not designated as hedges (Campbell et al., 2023; Manchiraju et al., 2014). $Speculation\ FV$ is the natural logarithm of one plus the ratio of the sum of the fair value of non-hedge derivative assets and liabilities scaled by 1,000.

To show the robustness of our selective hedging proxies, we also follow prior literature to measure firm selective hedging behavior as the volatility and the deviations from a firm's derivative position.

We follow Adam et al. (2015) to measure the extent of speculation by the time-series volatility in derivative notional value. Specifically, selective hedging is calculated as the absolute value of the difference in the natural logarithms of the notional value of the derivative at each quarter's beginning and end. The excess volatility implies frequent changes in derivative positions based on managers' market views (Adam and Fernando, 2006).

$$Speculation\ Volatility_{i,t} = ABS\left[Ln\left(\frac{Notional_{i,t}}{Notional_{i,t-1}}\right)\right] \quad (1)$$

Our fourth measure of selective hedging is the deviations from a firm's derivative position. First, we follow Adam et al. (2017) and Beber and Fabbri (2012) to regress the notional value of derivatives scaled by the book value of total assets on several fundamental firm characteristics. We also include firm and quarterly dummy variables to control for any predictable firm and intra-year variation in the extent of derivative use. The firm characteristics that control for fundamentals are firm size, the market-to-book ratio of assets, dividend policy, liquidity, and leverage (see, e.g., Tufano, 1996; Haushalter, 2000).

$$Notional_{i,t} = \sum Fundamental_{i,t} + \varepsilon_{i,t} \quad (2)$$

Next, we measure the extent of selective hedging by the standard deviation of the quarterly residuals ($\varepsilon_{i,t}$) over the past four-quarters window. Firms with a large standard deviation of residuals are likely to be firms where the hedging strategy deviates the most from full hedging and are thus more likely to be speculators.

$$Sepeculation\ Deviation_{i,t} = \sqrt{\frac{1}{4}\sum_{t=1}^{4}\left(\varepsilon_{i,t}\right)^2} \quad (3)$$

This study utilizes I/B/E/S guidance data to identify quarters in which firms issue both annual and quarterly earnings per share (EPS) forecasts. For firms providing management forecasts, we focus on the initial forecast issued within the current fiscal period (Black et al., 2021; Hirst et al., 2008; Roger & Stocken, 2005). Forecasts released outside the current fiscal period, whether before or after, are excluded from the analysis. Management forecasts issued prior to the forthcoming earnings announcement within the fiscal period, commonly known as preannouncement forecasts, do not serve a commitment role, as they pertain to periods already concluded. Instead, these preannouncement forecasts aim to temper the impact of potential negative surprises in earnings announcements (e.g., Skinner, 1994; Soffer et al., 2000).

We obtain the analyst earnings forecast from the I/B/E/S Unadjusted files.[5] We drop forecasts made by unidentified analysts (i.e., forecasts with an analyst identifier equal to zero) and forecasts for stocks with reported earnings measured in a currency other than U.S. dollars. We follow the analyst literature and filter for potential entry errors by excluding forecasts with an absolute forecast error greater than 10 (O'Brien, 1988; Lim, 2001; Bernhardt et al., 2006). To calculate the consensus earnings forecast, we follow the literature and restrict the sample to earnings forecasts made with 90 days before the management forecast (e.g., Clement, 1999; Harford et al., 2019). Next, we define the consensus earnings forecast as the mean of all analysts' most recent earnings forecasts issued prior to the earnings announcement.

We hypothesize that the managers who provided earnings forecasts are motivated to achieve earnings towards the forecasts. We examine the following four variables to capture a manager's forecast behavior. First, (MEF) is an indicator variable that equals one if a firm makes the earnings forecast in a fiscal period and zero otherwise. Second, $MEF\ Frequency$ is the total number of earnings forecasts a firm makes in a fiscal period. In defining optimistic forecasts and good news forecasts, we focus on economically meaningful MEFs (Kothari, Shu, and Wysocki, 2009; Bourveau et al., 2018). An $Optimistic\ (Pessimistic)\ MEF$ is the

[5] Following Diether et al. [2002], we rely on the IBES data that is unadjusted for stock splits in order to properly identify cases where firms meet versus miss consensus analyst expectations. Relying on IBES data adjusted for splits, which are rounded to the nearest cent, would lead to a non-trivial number of observations being transformed to (rounded) 0¢ earnings surprises, while instead the firm met or missed the consensus forecast. We adjust the unadjusted forecasts for stock splits using CRSP split factors better to align the (unrounded) forecasts and actuals.

forecast with the difference between the management forecast and the actual earnings scaled by the absolute value of actual earnings greater than 10% (smaller than -10%). A $Good\ (Bad)\ News\ MEF$ is the forecast if the difference between the management forecast and the consensus analyst forecast scaled by the absolute value of the consensus analyst forecast is greater than 10% (smaller than -10%). To be consistent with previous literature, the value of the above forecast variables is set to zero when the manager does not provide guidance (e.g., Black et al., 2023; Houston, Lin, Liu, Wei, 2019).

3.2 Control variables

Consistent with prior research, we control for various firm-specific characteristics. Firm size, measured as the natural logarithm of total book assets, is included due to its potential role in selective hedging. Stulz (1996) suggests that larger firms possess informational advantages, enabling them to better anticipate market movements and engage in selective hedging. Additionally, financial strength is crucial for selective hedging, as firms without adequate resources may struggle to absorb potential losses from this strategy (Stulz, 1996). While financial strength is necessary for selective hedging, it does not fully explain the incentive to hedge when firms are financially robust. The goal of selective hedging is to generate extra returns, and, as Stulz (1996) acknowledges, even firms in financial distress may use selective hedging to seek additional gains. Campbell and Kracaw (1999) further note that financially constrained firms with promising investment opportunities may increase speculation to raise capital for optimal investments.

We account for financial condition by including the debt ratio to assets ($Leverage$), dividend payment ($Dividend$), and Altman's (1968) Z-score (Z). To control the explanatory power that growth of investment opportunities has on corporate derivative use, the market-to-book ratio of the assets (MTB) and $Capital\ Expenditure$ is employed (Haushalter, 2000). We also include tax carryforward loss (Tax) to control the firm's derivatives in response to tax incentives (Graham and Rogers, 2002).

A manager's belief in private market information is not observable. Studies claim that the manager's belief in private information is derived from the manager's overconfidence or behavioral bias (Adam et al., 2015; Beber and Fabbri, 2012). In this study, the CEO's characteristics, such as gender, age, and tenure, are controlled. We also control corporate governance by including institutional ownership when selective hedging does not benefit shareholders (Adam et al., 2015).

4 Empirical results

4.1 Descriptive statistics

Table 2 presents descriptive statistics for the variables used in this study. The sample consists of 4,280 firm-quarter observations of S&P 500 firms over 2017-2021. We winsorize all the continuous variables at the 1st and 99th percentiles to lessen the influence of outliers. $Speculation\ Notional\ Dummy$ and $Speculation\ FV\ Dummy$ indicate where firms in our sample do not designate at least a subset of their derivatives as hedges. We find that 42.2% of the sample firm-quarters report the notional value of derivatives for non-hedge purposes, and 57.7% report the fair value of non-hedge derivatives. Comparably, Campbell et al. (2023) report that 61.25% of their sample firms report non-designated derivatives.[6] In our sample, the higher proportion of non-hedge fair value reporting is possibly due to a larger proportion of reporting the fair value of derivatives (84.7%) compared to reporting the notional value of derivatives (75.6%).

The mean value of the non-hedge notional value of the derivative scaled by the book value of assets is 0.038. The mean value of $Speculation\ FV$ is 0.062. The volatility measure of speculation ($Speculation\ Volatility$) is 0.160, and the mean of the $Speculation\ Deviation$ is 0.080. Compared with the mean, the maximum standard deviation of residual derivative holdings is much more significant (0.851). This indicates that some firms use derivatives dramatically differently in some periods, which can hardly be explained by fundamental derivative hedging theories.

Table 2 also presents statistics for management forecast variables. In our sample, 37.6% of firm-quarters provide MEFs, with a frequency of 0.951 each fiscal quarter. The mean of $Optimistic\ MEF$ (0.118) is slightly larger than $Pessimistic\ MEF$ (0.091). This could be because we use the first MEF issued each fiscal period. Hirst et al. (2008) highlight the fact that when releasing the first forecasts, managers tend to be more optimistic than when the fiscal period end is close. Similarly, we report a higher proportion of the good news forecast than the bad news forecast, which is consistent with the literature that managers are likely to

[6] This high fraction of firms using derivatives not designated as hedges seems surprising, given the popular perception that firms use derivatives predominantly to hedge (which is also what firms state publicly). However, this finding is consistent with the evidence in prior studies indicating that firms sometimes use derivatives for non-hedging purposes and our conjecture that such derivatives would not qualify for hedge accounting designation (Campbell et al., 2023; Manchiraju et al., 2014; Manchiraju et al., 2016; Pierce, 2020).

release good news earlier than bad news (Acharya, DeMarzo, and Kremer, 2011; Kothari et al., 2009).

INSERT TABLE 2 ABOUT HERE

4.2 Management earning forecast

Hypothesis 1 predicts that firms with MEFs are more likely to conduct selective hedging. Table 3 presents the marginal effects of the logit regression results in testing the hypothesis. Columns 1 and 2 provide the regression results when the dependent variable is $Speculation\ Notional\ Dummy$, columns 3 and 4 provide the results with the *Speculation FV Dummy* as the dependent variable. The regression includes firm, year, and quarter fixed effects to control for time-invariant unobservable characteristics. In column 1, the regression, which includes the MEF indicator and firm-level controls, indicates a significant positive association between MEF issuance and corporate selective hedging use. In column 2, we add the manager-level controls. The positive and significant coefficient on the *MEF* confirms that firm selective hedging activities are more likely to be conducted after the manager issues the MEF. Regarding economic magnitude, selective hedging likelihood increases by 6.3% (7.5%) in column 1 (2) when the manager provides MEF. Columns 3 and 4 show the estimation results when selective hedging is measured based on the fair value of derivative disclosure. We continue to observe the strong relationship between MEF issuance and the likelihood of selective hedging. The marginal effect on *MEF* shows that firms issuing MEF are 7.9% to 9.3% more likely to engage in selective hedging compared to firms that do not issue MEF.

INSERT TABLE 3 ABOUT HERE

We then investigate whether the issuance of MEF has explanatory power to the extent of firm selective hedging. Four proxies are used to measure firm selective hedging activities. $Speculation\ Notional$ and $Speculation\ FV$ are the proxies based on the firm's accounting disclosure of notional value and fair value of non-hedge derivative contracts. $Speculation\ Volatility$ is measured based on the volatility of derivative holdings of derivative holdings, and $Speculation\ Deviation$ is the standard deviation of residual derivatives holdings. Table 4 presents the estimations of the OLS analysis. As shown in columns 1 to 4, the issuance of MEF is positively associated with both the notional and fair value speculation proxies. Firms with earnings forecasts provided by the manager exhibit a higher level of selective hedging activities. The economic magnitudes are substantial. For example, if the manager provides the earning forecast, the extent of selective hedging

activities will increase by 0.004 when selective hedging is proxied based on notional amount disclosure. We also find substantively similar results when we add manager-level control in column 2 and column 4.

We observe a positive relation between MEF issuance and the volatility in derivative holdings, which is robust to model specification in columns 5 and 6. This indicates a consistent result that the issuance of MEF will lead to a higher level of speculative activities. Columns 7 and 8 present whether MEF issuance explains the standard deviation of residual derivative holdings. We continue to observe positive and significant coefficients on the *MEF*, indicating that firms with a forecast issued by the manager speculate more than those without a forecast. The results described above support our hypothesis in the association between MEF issuance and corporate selective hedging behavior, and the results are not sensitive to the measures of selective hedging.

INSERT TABLE 4 ABOUT HERE

We also complement our management forecast measure with the frequency of forecasts provided by the manager during the fiscal period. MEF frequency quantifies the intensity of managers' forecasting practices. Botosan and Harris (2000) suggest that managers can proffer their commitment to disclosure, they can only credibly signal such commitment by providing disclosures more frequently. We expect the firm with more forecasts provided by the managers to conduct more speculatively activities via derivatives because the managers have a stronger incentive to meet their commitments. The results of the frequency of MEF appear in Table 5. As shown by the positive and significant coefficient of $MEF\ Frequency$, the corporate selective hedging activities increase with the intensity of the manager's forecasts. An increase in the frequency of MEF by one standard deviation from the mean is associated with an increase in $Speculation\ Notional$ by around 0.007. Given that the mean value of $Speculation\ Notional$ is only 0.038, this represents an increase of 18% in the selective hedging activities. Compared to the results in Table 4, the impact of $MEF\ Frequency$ is more pronounced both statistically and economically. We find consistent results across the other three proxies of selective hedging.

INSERT TABLE 5 ABOUT HERE

4.3 Optimistic forecast

Thus far, our analysis shows that the MEF issued by the managers motivates them to speculate via derivatives in order to attain the target. Whether the motivation of the forecast

is likely to affect the firm's selective hedging activities depends on the optimism of the forecast. The costs of the differences between management forecasts and realizations are asymmetric. Managers are likely afraid of being sued for making optimistic forecasts that are not realized, but it is unlikely that investors would take legal action against managers for being pessimistic and achieving higher earnings than expected (Bourveau et al., 2018). Therefore, managers who provide optimistic forecasts have greater incentives to take action to mitigate their forecast errors (Kasznik, 1999). Thus, to further understand the role of a forecast as a commitment device, we examine the optimism of the forecast relative to the actual earnings. The forecast is optimistic (pessimistic) if the difference between the management forecast and reported actual earnings scaled by the absolute value of reported actual earnings is greater than 10% (smaller than -10%).

We present the test results of our Hypothesis 2 in Table 6. We find a positive relation between optimistic forecast and all four proxy variables of selective hedging, which are robust to model specifications regarding both magnitude and statistical significance. However, we do not observe any relationship with the pessimistic forecast. This result indicates that forecast-induced selective hedging activities are driven by the optimistic forecast provided by the manager but not the pessimistic forecasts. This finding is consistent with the hypothesis that the forecast is useful as a commitment device for motivating selective hedging when managers overestimate earnings. The forecast is less useful for committing to attaining targets via derivatives if managers underestimate earnings.

INSERT TABLE 6 ABOUT HERE

4.4 Good news forecast

We then investigate the aggressiveness of the forecast relative to external performance expectations, which are analysts' expectations (Hypothesis 3). We expect managers to have stronger incentives to enhance the credibility of their aggressive forecast relative to analyst consensus, while low thresholds that do not require effort to attain have little motivating effects (e.g., Chow, 1983; Hirst, 1987). We apply the same cutoff in defining good (bad) news forecasts.

Table 7 reports the corresponding results. The coefficient on $Good\ News\ MEF$ is significant and positive for all four proxies of selective hedging, but no association between the $Bad\ News\ MEF$ and our speculation variables. The results are consistent with the

prediction that managers who overestimate earnings than analysts' expectations use selective hedging to a greater extent than managers who underestimate earnings.

INSERT TABLE 7 ABOUT HERE

4.5 Forecast aggressiveness

Black et al. (2021) find that the commitment device's effect varies with the management forecast's aggressiveness. We then investigate whether the forecast is likely to affect the selective hedging depending on the aggressiveness of the forecast. Specifically, we examine the aggressiveness of the forecast relative to the actual benchmark and analyst expectations. Following Black et al. (2021), aggressiveness is defined as the difference between the management forecast and the actual earnings or the consensus analyst forecast scaled by the stock price at the end of the previous fiscal period. Aggressiveness is then partitioned into quintiles with the lowest quintile reflecting firms with the least aggressiveness ($Least\ Aggressiveness$) and the highest quintile reflects firms with the most aggressiveness ($Most\ Aggressiveness$). The aggressiveness indicator is set to zero when the manager does not provide a forecast.

Panel A of Table 8 reports the results when we define forecast aggressiveness using the actual earnings, each of which equals one if aggressiveness is in the indicated quintile and zero otherwise. Selective hedging is measured as previously defined. The results in all four models are broadly consistent and show that the forecast motivates selective hedging most when the forecasts are more and most aggressive. Conversely, the forecasts do not encourage managers to conduct selective hedging activities if the forecast is easy to achieve. Analogously, in the case of aggressiveness relative to analysts' expectations, we only find the effect of forecasts on selective hedging when they are aggressive.

In comparison to the findings of Black et al. (2021), we both observe that easily attainable forecasts have little motivational effect, as low thresholds that do not require significant effort to meet fail to incentivize managers (e.g., Chow, 1983; Hirst, 1987). However, Black et al. (2021) find that moderately aggressive forecasts effectively raise firm performance, while more aggressive forecasts do not show a similar relationship. They argue that difficult-to-attain forecasts may negatively impact the motivation of managers and employees by increasing pressure. In contrast, our results suggest that challenging forecasts encourage managers to take on more risk, particularly by using derivatives for speculative purposes. Selective hedging, in this context, serves as an effective tool for managers, allowing them to

potentially reap significant rewards from successful speculative positions while bearing limited costs for unsuccessful ones (Lins et al., 2011).

INSERT TABLE 8 ABOUT HERE

5 Endogeneity concerns

Our hypothesis assumes that managers who issue earnings forecasts manage reported earnings to meet their forecast, i.e., the issue of forecast leads to selective hedging activities. However, a potential concern is that management's decision to issue an earnings forecast is not exogenous. The decision to issue a forecast and selective hedging policy can be made simultaneously, or the selective hedging activities might motivate the issuance of an earnings forecast.

We note that in our analyses thus far, we employ firm, year, and quarter fixed effects models to account for time-invariant unobservable characteristics possibly correlated with the issuance of forecast and selective hedging policy.

5.1 Forecast maintainers

To address endogeneity concerns, we rerun our tests by focusing on firms that maintain forecast issuance to ease the concern that our results are driven by factors affecting manager forecast decisions. We define $MEF\ Maintainer$ as an indicator variable that equals one if the firms issued forecasts in both the prior fiscal period and the current period and equals zero if the firm issued a forecast in the prior period but gave no forecast in the current period. Table 9 reports the estimation results. The coefficients on $MEF\ Maintainer$ are significantly positive across all four proxies of selective hedging in columns 1 to 8. Therefore, focusing on the subsample of firms who continue providing forecasts, our results still hold.

Given the concerns of managers contemplating stopping the forecast (e.g., Chen, Matsumoto, and Rajgopal, 2011; Houston, Lev, and Tucker, 2010), prior forecast behavior will motivate managers to meet the guidance even if doing so induces them to manage earnings toward the forecast (Levitt, 2000). Our results indicate that forecast maintainers have a stronger incentive to use selective hedging to meet their forecasts than those who occasionally provide forecasts.

INSERT TABLE 9 ABOUT HERE

5.2 Identification

We exploit the implementation of ASC 606: Revenue from Contracts with Customers as a quasi-exogenous shock that increased investor uncertainty, thereby driving greater demand

for MEFs. Issued by the FASB in May 2014 and effective from December 2017, ASC 606 alters revenue recognition to reflect the consideration a company expects to receive (FASB, 2014a). The standard provides managers with greater flexibility in accounting for transactions, aligning financial statements more closely with a firm's economic reality (Deloitte, 2018). However, the relaxation of revenue recognition criteria and the shift to a principles-based standard made earnings less comparable to prior years, increasing unpredictability (Lee and Lee, 2020). As Glaze, Skinner, and Stephan (2020) note, ASC 606 heightened investor uncertainty about future operations and earnings, leading us to hypothesize that MEFs would rise in response.

Following Hionson, Pündrich, and Zakota (2024), we define the post-period indicator, *ASC 606*, equal to 1 for the first four fiscal quarters with ASC 606 disclosures. The one-year window helps mitigate noise from other changes. For example, for some firms, a two-year window would include the onset of the COVID-19 pandemic and the adoption of the ASC 842 *Lease*. Table 10 reports results from OLS regressions of selective hedging on MEFs after adopting ASC 606. The dependent variable selective hedging is measured based on the notional value of the non-hedge derivatives contracts. We continue to find a positive and significant effect of the issuance of MEF and the intensity of MEF on firm speculative derivatives. As expected, the adoption of ASC 606 has no effect on firm speculation. The main variables of interest are the interactions of the *MEF* indicator and *ASC 606* and the interactions of *MEF Frequency* and *ASC 606*. We find that firms with the issuance of MEF and with higher intensity of MEF post-ASC 606 implementation increase the level of speculation activities.

INSERT TABLE 10 ABOUT HERE

Next, we use COVID-19 as an exogenous shock that likely affects managers' incentives to disclose pessimistic forecasts. COVID-19 has significantly increased macroeconomic uncertainty (Baker et al., 2020). Chen et al. (2022) find firms that are more severely affected by COVID-19 disclose pessimistic forecasts because they face high COVID-19-induced uncertainty, and investor interpretation of firm-specific bad news following macro-level bad news is not as unfavorable as that disclosed during normal times (Acharya, DeMarzo, and Kremer, 2011).

We anticipate that companies in the hospitality or retail industry, whose earnings have been impacted severely by the pandemic, are more likely to act pessimistically when providing MEF. Our results in Table 11 indicate that hospitality or retail firms that provide

MEF reduced their speculative derivatives during the COVID-19 pandemic. This is because the MEF they provided is likely to be a pessimistic forecast, which does not motivate speculation. In column 3 of Table 11, we also accounted for the firms in the medical industry whose earnings are likely to be positively affected by COVID-19. As expected, we did not observe a decrease in speculative derivatives when medical firms provided MEF during the COVID-19 period.

INSERT TABLE 11 ABOUT HERE

We further utilize instrumental variable (IV) to establish a more direct causal link between MEFs and selective hedging. We instrument for MEFs using the disclosure choices of its industry peers. Formally, we estimate the following equations:

$$MEF_{i,t} = \alpha + \beta_1 \text{Ind MEF\%}_{\text{i,t}} + \beta_n Controls_{\text{i,t}} + Fixed\ Effects + \varepsilon_{i,t} \quad (4)$$

where MEF is an indicator variable equal to one if a firm makes the earnings forecast in a fiscal period and zero otherwise. $\text{Ind MEF\%}$ is the fraction of firms operating in the same industry that provide at least one earnings forecast in a fiscal period.

$$Selective\ Hedging_{i,t} = \alpha + \beta_1 \widehat{MEF}_{i,t} + \beta_n Controls_{\text{i,t}} + Fixed\ Effects + \varepsilon_{i,t} \quad (5)$$

where $Selective\ Hedging$ hedging is measured in four ways, which are based on the notional value of the non-hedge derivative contracts, the fair value of the non-hedge derivative contracts, the volatility of derivative holdings, and the standard deviation of residual derivatives holdings, respectively. $\widehat{MEF}$ is predicted values from equation (4).

A valid IV must satisfy two conditions (Larcker and Rusticus 2010; Roberts and Whited 2013). The relevance condition requires that the IV is correlated with the management earning forecast issuance after controlling for the set of control variables in our regressions. The exclusion restriction requires that conditioning on the full set of control variables, the IV is correlated with a firm's selective hedging activities only through its correlation with the management forecast behavior variable. Based on these criteria, we identify a plausibly valid instrument and present the results of this IV analysis in Table 12.

The instrument is the fraction of firms operating in the same industry that provide at least one earnings forecast. The IV should meet the relevance condition because disclosures made by industry peers induce firm disclosure due to reduced uncertainty about the external environment and raising the capital market costs of nondisclosure (Seo, 2021). For the IV to meet the exclusion restriction, it would have to affect a firm's selective hedging decision only

through its effect on the management forecast issuance. It seems reasonable to assume that industry peers' forecast behavior is uncorrelated to a firm's selective hedging decisions.

Table 12 presents the results of the two-stage least squares IV regressions that use $Ind\ MEF\%$ as IV for the firm's MEF issuance. The first-stage regression suggests that the industry peer's disclosure is a sufficiently strong predictor of the focal firm's disclosure since the coefficient estimate per firm's forecast is both economically and statistically significant. A positive relation between the management forecast issuance and $Ind\ MEF\%$, which is consistent with the findings in Seo (2021). The F-*statistic* on MEF is approximately 55.69, making it unlikely that we will encounter bias due to a weak instrument problem. Focusing on the second-stage results in columns 2 to 5, we continue to find the management forecast issuance effects in a firm's selective hedging activities.

INSERT TABLE 12 ABOUT HERE

6 Value implications

Investors' response to earnings announcements depends on how such outcomes are perceived. The stock market reacts differently to missing, meeting, or beating MEFs. Specifically, the market assigns a premium to firms with earnings exceeding their forecast compared to firms that disappoint investors by reporting earnings below their forecast (Beyer, 2009).

In this section, we present the results of our tests on market response to earnings announcements when firms use a speculative derivative strategy. We estimate abnormal returns by applying standard event-study methodology with daily returns as in Brown and Warner (1985). We use trading days -255 to -41 relative to the earnings announcement date as the estimation period, and the CRSP value-weighted market index serves as a proxy for the market portfolio. Following the literature, we label all announcements with reported earnings below management forecast as *Miss*. All announcements with reported earnings equal or exceed MEF by one cent are *Meet*. And the announcements with reported earnings that exceed MEF by more than one cent are *Beat* (Bhojraj et al., 2009; Hirst et al., 2008; Matsumoto, 2002).

Table 13 reports the mean cumulative abnormal returns (CARs) around earnings announcements, using a window from trading day -1 to +2 relative to the earnings announcement on day 0. We compare CARs between earnings announcements with and without management forecasts, as well as between reports where earnings meet, exceed, or

fall short of the forecast. The analysis includes both annual and quarterly forecasts (All) as well as quarterly forecasts only (Quarter only).

In Panel A, we compare CARs between firms using speculative derivatives and those that do not. Non-speculative firms generally experience more non-zero or positive abnormal returns when reported earnings meet or exceed the forecast. In contrast, speculative firms show lower returns when earnings meet the forecast and negative returns when earnings miss the forecast.

Panel B examines CARs for firms using speculative derivatives, hedging derivatives, and no derivatives. Compared to non-derivative users and hedgers, speculative firms experience more negative abnormal returns if they fail to exceed their own forecasts.

INSERT TABLE 13 ABOUT HERE

Table 14 shows the results of multivariate models explaining CARs around the earnings announcement. We observe significant negative abnormal announcement returns during the event window of the trading day (-1) to trading day (+2) with reported earnings below the management forecast. Meanwhile, we observe a positive and significant return if the firm successfully beats its own forecast. Comparing the absolute magnitude of coefficients between the abnormal returns of missed earnings and beat earnings, we also find the market "put more weights" on the firms that missed their forecast. The results are consistent with our expectation that the costs of the differences between forecasts and realizations are asymmetric.

We study the interaction variable *Speculation Notional Dummy* Miss*, which consists of two dummy variables: *Speculation Notional Dummy* (one for firms using speculative derivatives) and *Miss* (one for firms with reported earnings below management forecast). In Columns 1 and 2, we include both quarterly and annual earnings announcement returns. The coefficients for this interaction term are -0.010 and -0.023, both significantly negative at the 5% level. In Column 2, we focus on earnings announcement returns for firms using speculative derivatives, hedging derivatives, and no derivatives. Firms using speculative derivatives that miss their management forecast experience more negative returns (-0.023) compared to those using hedging derivatives or no derivatives (-0.010 and -0.013), both in terms of economic and statistical significance. Likewise, when we focus on the quarter earnings announcement return, the significantly negative coefficient of -0.032 and -0.034 on the interaction item *Speculation Notional Dummy* Miss* in Columns 3 and 4.

In Panel B, we focus on the MEF subsample. Thus, the reference group consists of firms that do not use speculative derivatives and do not meet the forecast. Across all specifications, the coefficients of *Miss* are negative, indicating that the firms without speculative derivatives missing forecasts experience an announcement return of -0.01 to -0.027 compared with their peers that meet forecasts. Further, if a firm speculates via derivatives but still misses the forecast, it has a more negative return than the reference group. In contrast, if a firm uses speculative derivatives to beat the forecast, it obtains a superior return of 0.024 to 0.035 relative to the reference group.

INSERT TABLE 14 ABOUT HERE

In total, our results show that firms receive a premium with earnings exceeding their forecast compared to those with reporting earnings below their forecast (Beyer, 2009). Interestingly, we observe a more negative return if the firm speculates through derivatives but still misses the forecasts. It implies that investors can observe the firm's speculative activities and give punishments if the firms fail in these speculative activities. The results also help to address the endogenous concerns in our paper because otherwise, the market will see through it, and we will not see any market reactions.

7 Robustness tests

7.1 Risk type

While FAS 161 requires the detailed disclosure of derivatives segregated by risk type (i.e., foreign exchange rate, interest rate, commodity), we then examine how the firm uses different types of risk derivatives to attain the forecast target.

For brevity, we show the results when selective hedging is measured based on the notional value of different types of non-hedge derivatives. Table 15, Panel A presents statistics by the three main risk categories. Based on the firm's notional value disclosure, foreign exchange derivatives are most commonly used in our sample (64.8%). 50.9% of firm-quarters use interest rate derivatives, but a small proportion are classified as non-hedge purposes (Pierce, 2020). Only 11.2% of firms use commodity derivatives, but a considerable proportion of commodity derivatives are designated for non-hedge purposes.

Panel B of Table 15 shows the effect of MEF issuance on the extent of firm foreign exchange rate, interest rate, and commodity selective hedging activities in columns 1 to 3, respectively. We find the issuance of MEF is significantly and positively associated with the notional value of firm foreign exchange rate non-hedge derivative holdings. The magnitude

of the coefficient is comparable to that in Table 4 in providing an MEF is associated with a 0.005 increase in the extent of selective hedging via foreign exchange rate derivatives.

Column 2 shows the results when focusing on interest rate derivatives, but there is no evidence that the firm would use interest rate selective hedging if the manager provides a MEF. This evidence is consistent with our expectations. In our sample, nearly all interest rate derivatives are designated as hedges. In untabulated results, the degree of variability of interest rate derivatives is the smallest among the three types of risk derivatives, which also implies the hedging purpose of the firms that use interest rate derivatives.

In Colum 3 of Panel B, we find a statistically significant effect of MEF issuance in explanting the firm commodity selective hedging activities, but the economic magnitude is small (<0.001). Though, among commodity derivative users, a substantial proportion of firms use commodity derivatives for non-hedge purposes, the extent of the speculative notional value of commodity derivatives is economically insignificant in our sample (with a mean value of 0.0004).[7]

We further isolate a common risk factor among firms by focusing on foreign exchange derivatives. While foreign exchange derivatives are the most commonly used derivatives, studies suggest a substantial variation in foreign exchange derivative holdings (e.g., Allayannis and Ofek, 2001; Berber and Fabbri, 2012). The variations are likely due to managers taking active positions using derivatives and changing their holdings frequently based on a market view of exchange rates (Glaum, 2002). In addition, focusing on foreign exchange derivatives allows us to control for the exposure to exchange rate risk, which is proxied by foreign sales of the firm (Berber and Fabbri, 2012).

We show the results in Panel C. In column 1, we continue to find a positive and significant effect of MEF issuance on firm foreign exchange selective hedging activities after including the exchange rate exposures control. We also find that the explanatory power of $MEF\ Frequency$ on firm foreign exchange selective hedging activities in column 2, an increase in the frequency of MEF by one standard deviation from the mean is associated with an increase in $Speculation\ FX$ by around 0.005. Consistent with prior findings, columns 3 to

[7] Studies that examine firm selective hedging behavior by commodity derivatives tend to focus on signal industries, for example, the gold mining firms in Adam and Fernando (2006) and oil and gas firms in Bajo et al. (2021).

4 show a more significant increase in foreign exchange selective hedging activities if the managers are more aggressive than the actual earnings or analysts' expectations.

INSERT TABLE 15 ABOUT HERE

7.2 Do firms use hedging purpose derivatives to meet forecasts?

Our analyses thus far show that managers employ selective hedging to meet the forecasts they make. Selective hedging allows the manager to generate profits from views on future price movement while eliminating downside risks. Using derivatives for hedging creates value for the firm by reducing time-series variability in reported earnings (Pincus and Rajgopal, 2002). Therefore, in our hypothesis, there is no incentive for the manager to use derivatives for hedging when the manager is concerned about being unable to achieve forecasted earnings.

The hedge designation disclosure requirement under FAS 161 allows us to examine the relation between MEF behaviors and firm derivative use separately by purpose. We show the results in Table 16. We first show the results of how MEF behaviors drive the firm total derivatives activities when the derivatives are measured based on the notional value of total derivatives in column 1 and the fair value of total derivatives in column 2. The positive sign on forecast variables across Panel A to Panel D indicates the increases in firm total derivative use following the MEFs.

We then examine whether managers use hedging purpose derivatives to mitigate the concern of falling below management forecasts. As expected, we find no association between our MEF variables and hedging derivatives, as shown in columns 3 and 4. By showing that the positive relation between management forecast behaviors and firm derivative use is driven by those derivatives used for speculative purposes rather than hedging purposes, our results also confirm the informativeness of the accounting designation of derivatives that our study relies on.

INSERT TABLE 16 ABOUT HERE

7.3 Compensation structure

In this section, we look at how the relation between firm selective hedging and the issuance of MEF varies with the incentive compensation of the CEO. For brevity, we show the results when selective hedging is measured based on the notional value of non-hedge derivatives. Table 17 shows the results. In column 1, both the coefficient of *MEF* and the coefficient of *MEF* × *Log (1+Vega)* are significantly positive. This indicates that, on average, a firm that

provides management forecast exhibit a higher level of selective hedging activities. Moreover, if the firm's CEO is awarded more incentive compensation Vega, the use of selective hedging is even higher. The result is consistent with the expectation that if CEOs are encouraged to take more risks (Coles, Daniel, and Naveen, 2006), they use more derivatives to achieve a speculative purpose, especially when they commit to meeting their own forecast. When we use alternative measures of incentive compensation in the next two columns. We see similar findings that the extent of speculative hedging increases when the CEO who provides forecasts is granted higher Delta or firm-related wealth compensation.

INSERT TABLE 17 ABOUT HERE

8 Conclusion

This study uses hand-collected, firm-quarter-level data on corporate derivatives positions to examine the relationship between MEFs and selective hedging behavior. We find that firms issuing MEFs are more likely to engage in selective hedging, particularly when managers issue overestimated earnings forecasts. This behavior is driven by managers' concerns about falling short of their forecasts, which heightens the need to enhance forecast credibility. Specifically, managers are more likely to engage in speculative derivative activities when their earnings forecasts exceed analyst consensus, suggesting that selective hedging serves as a tool to mitigate the risk of forecast failure.

In contrast, we find no evidence of increased selective hedging in firms with underestimated forecasts, indicating that easily attainable forecasts do not incentivize managers to take additional speculative risks. Our results further show that more aggressive earnings forecasts are linked to a significant increase in speculative derivative usage, with foreign exchange derivatives being the primary driver of this behavior. Notably, we observe no increase in derivative usage for hedging purposes driven by earnings forecasts.

By leveraging improved transparency from mandatory derivative disclosures, this study addresses the challenge identified in prior research regarding the difficulty in distinguishing between hedging and speculation. Our findings suggest that, under the pressure of unmet earnings targets, managers may be more willing to speculate through derivatives rather than use accounting adjustments to manage earnings, as noted by Graham et al. (2005).

The findings carry important practical and policy implications. Selective hedging introduces unpredictability and significant risks, which can have substantial consequences for stakeholders' wealth. While firms often justify derivative use as a hedging strategy, our study

underscores the potential for significant losses, as evidenced by firms that have suffered large-scale losses on their speculative derivative positions. Our research highlights the need for greater attention to a firm's risk profile and the broader implications of derivative use in corporate risk management.

Reference

Acharya, V. V., DeMarzo, P., & Kremer, I. (2011). Endogenous information flows and the clustering of announcements. *American Economic Review*, *101*(7), 2955-2979.

Adam, T. R., & Fernando, C. S. (2006). Hedging, speculation, and shareholder value. *Journal of financial economics*, *81*(2), 283-309.

Adam, T. R., Fernando, C. S., & Golubeva, E. (2015). Managerial overconfidence and corporate risk management. *Journal of Banking & Finance*, *60*, 195-208.

Adam, T. R., Fernando, C. S., & Salas, J. M. (2017). Why do firms engage in selective hedging? Evidence from the gold mining industry. *Journal of Banking & Finance*, *77*, 269-282.

Allayannis, G., & Ofek, E. (2001). Exchange rate exposure, hedging, and the use of foreign currency derivatives. *Journal of international money and finance*, *20*(2), 273-296.

Bajo, E., Jankensgård, H., & Marinelli, N. (2022). Me, myself and I: CEO narcissism and selective hedging. *European Financial Management*, *28*(3), 809-833.

Baker, S. R., Bloom, N., Davis, S. J., & Terry, S. J. (2020). Covid-induced economic uncertainty (No. w26983). National Bureau of Economic Research.

Barton, J. (2001). Does the use of financial derivatives affect earnings management decisions?. *The Accounting Review*, *76*(1), 1-26.

Bartov, E., Givoly, D., & Hayn, C. (2002). The rewards to meeting or beating earnings expectations. *Journal of accounting and economics*, *33*(2), 173-204.

Bartram, S. M. (2019). Corporate hedging and speculation with derivatives. *Journal of Corporate Finance*, *57*, 9-34.

Beber, A., & Fabbri, D. (2012). Who times the foreign exchange market? Corporate speculation and CEO characteristics. *Journal of Corporate Finance*, *18*(5), 1065-1087.

Bernhardt, D., Campello, M., & Kutsoati, E. (2006). Who herds?. *Journal of Financial Economics*, *80*(3), 657-675.

Beyer, A., 2008. Financial analysts' forecast revisions and managers' reporting behavior. *Journal of Accounting and Economics* 46, 334–348.

Beyer, A., Cohen, D. A., Lys, T. Z., & Walther, B. R. (2010). The financial reporting environment: Review of the recent literature. *Journal of accounting and economics*, *50*(2-3), 296-343.

Bhojraj, S., Hribar, P., Picconi, M., & McInnis, J. (2009). Making sense of cents: An examination of firms that marginally miss or beat analyst forecasts. *The journal of finance*, *64*(5), 2361-2388.

Black, D. E., Gipper, B., & Stocken, P. C. (2023). Management Guidance as a Commitment Device. *Tuck School of Business Working Paper*, (3837650).

Bodnar, G. M., Giambona, E., Graham, J. R., Harvey, C. R., & Marston, R. C. (2011, March). Managing risk management. In *AFA 2012 Chicago Meetings Paper*.

Bodnar, G. M., Hayt, G. S., & Marston, R. C. (1998). 1998 Wharton survey of financial risk management by US non-financial firms. *Financial management*, 70-91.

Botosan, C. A. (1997). Disclosure level and the cost of equity capital. *Accounting review*, 323-349.

Botosan, C. A., & Harris, M. S. (2000). Motivations for a change in disclosure frequency and its consequences: An examination of voluntary quarterly segment disclosures. *Journal of Accounting Research*, *38*(2), 329-353.

Bourveau, T., Lou, Y., & Wang, R. (2018). Shareholder litigation and corporate disclosure: Evidence from derivative lawsuits. *Journal of Accounting Research*, *56*(3), 797-842.

Brown, G. W. (2001). Managing foreign exchange risk with derivatives. *Journal of Financial Economics*, *60*(2-3), 401-448.

Brown, G. W., Crabb, P. R., & Haushalter, D. (2006). Are firms successful at selective hedging?. *The Journal of Business*, *79*(6), 2925-2949.

Brown, L. D. (2001). A temporal analysis of earnings surprises: Profits versus losses. *Journal of accounting research*, *39*(2), 221-241.

Brown, L. D., and M. L. Caylor. 2005. A temporal analysis of quarterly earnings thresholds: Propensities and valuation consequences. *The Accounting Review* 80 (2): 423–40.

Brown, S. J., & Warner, J. B. (1985). Using daily stock returns: The case of event studies. *Journal of financial economics*, *14*(1), 3-31.

Campbell, J. L., Cao, S. S., Chang, H. S., & Chiorean, R. (2023). The implications of firms' derivative usage on the frequency and usefulness of management earnings forecasts. *Contemporary Accounting Research*, *40*(4), 2409-2445.

Campbell, J. L., Downes, J. F., & Schwartz, W. C. (2015). Do sophisticated investors use the information provided by the fair value of cash flow hedges?. *Review of Accounting Studies*, *20*, 934-975.

Campbell, J. L., Khan, U., & Pierce, S. (2021). The effect of mandatory disclosure on market inefficiencies: Evidence from FASB Statement No. 161. *The Accounting Review*, *96*(2), 153-176.

Campbell, T., & Kracaw, W. A. (1999). Optimal speculation in the presence of costly external financing. *Corporate Risk: Strategies and Management*.

Campbell, J. L., Mauler, L. M., & Pierce, S. R. (2019). A review of derivatives research in accounting and suggestions for future work*. Journal of Accounting Literature,* 42(1), 44-60.

Campello, M., Lin, C., Ma, Y., & Zou, H. (2011). The real and financial implications of corporate hedging. *The journal of finance,* 66(5), 1615-1647.

Chen, H., Liu, S., Liu, X., & Wang, J. (2022). Opportunistic timing of management earnings forecasts during the COVID-19 crisis in China. *Accounting & Finance, 62,* 1495-1533.

Chen, S., Matsumoto, D., & Rajgopal, S. (2011). Is silence golden? An empirical analysis of firms that stop giving quarterly earnings guidance. *Journal of Accounting and Economics*, *51*(1-2), 134-150.

Chernenko, S., & Faulkender, M. (2011). The two sides of derivatives usage: Hedging and speculating with interest rate swaps. *Journal of Financial and Quantitative Analysis*, *46*(6), 1727-1754.

Cheynel, E. (2013). A theory of voluntary disclosure and cost of capital. *Review of Accounting Studies*, *18*, 987-1020.

Choi, J. H., & Ziebart, D. A. (2004). Management earnings forecasts and the market's reaction to predicted bias in the forecast. *Asia-Pacific Journal of Accounting & Economics*, *11*(2), 167-192.

Chow, C. W. (1983). 1983 Competitive Manuscript Award: The Effects of Job Standard Tightness and Compensation Scheme on Performance: An Exploration of Linkages. *Accounting Review*, 667-685.

Clement, M., R. Frankel, and J. Miller. 2003. Confirming management earnings forecasts, earnings uncertainty, and stock returns. *Journal of Accounting Research* 41 (4): 653–79.

Deloitte (2018) *Applying judgment in a principles-based model for revenue ...* Available at: https://www2.deloitte.com/content/dam/Deloitte/us/Documents/audit/us-applying-judgment-in-a-principles-based-model-for-revenue-recognition.pdf (Accessed: 04

October 2024). Ding, K., & Jaggi, B. (2022). CEO career concerns and the precision of management earnings forecasts. *Review of Quantitative Finance and Accounting*, *58*, 69-100.

Dutta, S., & Gigler, F. (2002). The effect of earnings forecasts on earnings management. *Journal of accounting Research*, *40*(3), 631-655.

Easley, D., & O'hara, M. (2004). Information and the cost of capital. *The journal of finance*, *59*(4), 1553-1583.

Francis, J., Nanda, D., & Olsson, P. (2008). Voluntary disclosure, earnings quality, and cost of capital. *Journal of accounting research*, *46*(1), 53-99.

Froot, K. A., Scharfstein, D. S., & Stein, J. C. (1993). Risk management: Coordinating corporate investment and financing policies. *the Journal of Finance*, *48*(5), 1629-1658.

Géczy, C. C., Minton, B. A., & Schrand, C. M. (2007). Taking a view: Corporate speculation, governance, and compensation. *The Journal of Finance*, *62*(5), 2405-2443.

Glaum, M. (2002). The determinants of selective exchange risk management–evidence from German non-financial corporations. *Journal of Applied Corporate Finance*, *14*(4), 108-121.

Glaze, J. L., Skinner, A. N., & Stephan, A. (2024). When are concurrent quarterly reports useful for investors? Evidence from ASC 606. *Review of Accounting Studies*, *29*(2), 1360-1406.

Glosten, L. R., & Milgrom, P. R. (1985). Bid, ask and transaction prices in a specialist market with heterogeneously informed traders. *Journal of financial economics*, *14*(1), 71-100.

Gong, G., Li, L. Y., & Xie, H. (2009). The association between management earnings forecast errors and accruals. *The Accounting Review*, *84*(2), 497-530.

Graham, J. R., & Rogers, D. A. (2002). Do firms hedge in response to tax incentives?. *The Journal of finance*, *57*(2), 815-839.

Harford, J., Jiang, F., Wang, R., & Xie, F. (2019). Analyst career concerns, effort allocation, and firms' information environment. *The Review of Financial Studies*, *32*(6), 2179-2224.

Hassell, J. M., Jennings, R. H., & Lasser, D. J. (1988). Management earnings forecasts: Their usefulness as a source of firm-specific information to security analysts. *Journal of financial research*, *11*(4), 303-319.

Haushalter, G. D. (2000). Financing policy, basis risk, and corporate hedging: Evidence from oil and gas producers. *The Journal of Finance*, *55*(1), 107-152.

Healy, P. M., & Palepu, K. G. (1993). The effect of firms' financial disclosure strategies on stock prices. *Accounting horizons*, *7*(1), 1.

Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of accounting and economics*, *31*(1-3), 405-440.

Hinson, L. A., Pündrich, G. P., & Zakota, M. (2024). The Decision-Usefulness of ASC 606 Revenue Disaggregation. *The Accounting Review*, *99*(3), 225-258.

Hirst, D. E., Koonce, L., & Venkataraman, S. (2008). Management earnings forecasts: A review and framework. *Accounting horizons*, *22*(3), 315-338.

Hirst, M. K. (1987). The effects of setting budget goals and task uncertainty on performance: A theoretical analysis. *Accounting Review*, 774-784.

Houston, J. F., Lev, B., & Tucker, J. W. (2010). To guide or not to guide? Causes and consequences of stopping quarterly earnings guidance. *Contemporary accounting research*, *27*(1), 143-185.

Houston, J. F., Lin, C., Liu, S., & Wei, L. (2019). Litigation risk and voluntary disclosure: Evidence from legal changes. *The Accounting Review*, *94*(5), 247-272.

Hurwitz, H. (2018). Investor sentiment and management earnings forecast bias. *Journal of business finance & accounting*, *45*(1-2), 166-183.

Hutton, A. P., Lee, L. F., & Shu, S. Z. (2012). Do managers always know better? The relative accuracy of management and analyst forecasts. *Journal of Accounting Research*, *50*(5), 1217-1244.

Hutton, A. P., Miller, G. S., & Skinner, D. J. (2003). The role of supplementary statements with management earnings forecasts. *Journal of Accounting Research*, *41*(5), 867-890.

Hutton, A., & Stocken, P. (2007). Effect of reputation on the credibility of management forecasts. *Boston College and Dartmouth College, Working Paper*.

Jankensgård, H. (2019). Does managerial power increase selective hedging? Evidence from the oil and gas industry. *Journal of Risk and Financial Management*, *12*(2), 71.

Jennings, R. 1987. Unsystematic Security Price Movements, Management Earnings Forecasts, and Revisions in Consensus Analyst Earnings Forecasts. *Journal of Accounting Research* 25 (1): 90-110.

Jo, H., & Kim, Y. (2007). Disclosure frequency and earnings management. *Journal of Financial Economics*, *84*(2), 561-590.

Kasznik, R. (1999). On the association between voluntary disclosure and earnings management. *Journal of accounting research*, *37*(1), 57-81.

Kato, K., Skinner, D. J., & Kunimura, M. (2009). Management forecasts in Japan: An empirical study of forecasts that are effectively mandated. *The Accounting Review*, *84*(5), 1575-1606.

Kim, O., & Verrecchia, R. E. (1991). Trading volume and price reactions to public announcements. *Journal of accounting research*, *29*(2), 302-321.

Kothari, S. P., Shu, S., & Wysocki, P. D. (2009). Do managers withhold bad news?. *Journal of Accounting research*, *47*(1), 241-276.

Larcker, D. F., & Rusticus, T. O. (2010). On the use of instrumental variables in accounting research. *Journal of accounting and economics*, *49*(3), 186-205.

Lee, K., & Lee, S. (2020). Rules-based vs. Principles-based Accounting Standards: Earnings Quality and the Role of Earnings in Contracting (An Analysis employing the adoption of ASC 606). *Principles-based Accounting Standards: Earnings Quality and the Role of Earnings in Contracting (An Analysis employing the adoption of ASC 606)(July 20, 2020)*.

Lee, S., Matsunaga, S. R., & Park, C. W. (2012). Management forecast accuracy and CEO turnover. *The Accounting Review*, *87*(6), 2095-2122.

Levitt, A. (2000). Renewing the covenant with investors. *Remarks delivered at NYU Center for Law and Business, New York, NY, May*, *10*.

Lim, T., 2001. Rationality and analysts' forecast bias. *The Journal of Finance* 56, 369–385.

Lins, K. V., Servaes, H., & Tamayo, A. (2011). Does fair value reporting affect risk management? International survey evidence. *Financial Management*, *40*(3), 525-551.

Lobo, G. J., & Zhou, J. (2001). Disclosure quality and earnings management. *Asia-Pacific Journal of Accounting & Economics*, *8*(1), 1-20.

Loss, F. (2012). Optimal hedging strategies and interactions between firms. *Journal of economics & management strategy*, *21*(1), 79-129.

Manchiraju, H., Pierce, S., & Sridharan, S. (2014). Is Hedge Accounting Designation Informative About How Firms Use Derivatives?. *Available at SSRN 2417194*.

Matsumoto, D. A. (2002). Management's incentives to avoid negative earnings surprises. *The accounting review*, *77*(3), 483-514.

Mayers, D., & Smith, C. W. (1992). On the corporate demand for insurance. *Foundations of Insurance Economics: Readings in Economics and Finance*, 190-205.

Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of financial economics*, *5*(2), 147-175.

O'brien, P. C. (1988). Analysts' forecasts as earnings expectations. *Journal of accounting and Economics*, *10*(1), 53-83.

Pincus, M., & Rajgopal, S. (2002). The interaction between accrual management and hedging: Evidence from oil and gas firms. *The Accounting Review*, *77*(1), 127-160.

Roberts, M. R., & Whited, T. M. (2013). Endogeneity in empirical corporate finance1. In *Handbook of the Economics of Finance* (Vol. 2, pp. 493-572). Elsevier.

Rogers, J. L., & Stocken, P. C. (2005). Credibility of management forecasts. *The Accounting Review*, *80*(4), 1233-1260.

Rostamy, A. A., M. A. Aghaee, and V. Biglari. 2008. Empirical investigation of the ability of sensitivity of stock prices to earnings news in predicting earnings management and management forecast errors. Asia-Pacific Financial Markets 15 (3–4): 209–28.

Seo, H. (2021). Peer effects in corporate disclosure decisions. *Journal of Accounting and Economics*, *71*(1), 101364.

Shaw, K. W. (2003). Corporate disclosure quality, earnings smoothing, and earnings' timeliness. *Journal of Business Research*, *56*(12), 1043-1050.

Skinner, D. J. (1994). Why firms voluntarily disclose bad news. *Journal of accounting research*, *32*(1), 38-60.

Skinner, D. J. (1997). Earnings disclosures and stockholder lawsuits. *Journal of accounting and economics*, *23*(3), 249-282.

Skinner, D. J., & Sloan, R. G. (2002). Earnings surprises, growth expectations, and stock returns or don't let an earnings torpedo sink your portfolio. *Review of accounting studies*, *7*(2-3), 289-312.

Smith, C. W., & Stulz, R. M. (1985). The determinants of firms' hedging policies. *Journal of financial and quantitative analysis*, 391-405

Soffer, L. C., Thiagarajan, S. R., & Walther, B. R. (2000). Earnings preannouncement strategies. *Review of Accounting Studies*, *5*, 5-26.

Stulz, R. M. (1996). RETHINKING RISK MANAGEMENT. *Journal of Applied Corporate Finance*, *9*(3), 8-25.

Trueman, B. (1986). Why do managers voluntarily release earnings forecasts?. *Journal of accounting and economics*, *8*(1), 53-71.

Trueman, B., 1994. Analyst forecasts and herding behavior. *Review of Financial Studies* 7, 97–124.

Tufano, P. (1996). Who manages risk? An empirical examination of risk management practices in the gold mining industry. *the Journal of Finance*, *51*(4), 1097-1137.

Valahzaghard, M., & Mirzamomen, M. (2013). The relationship between top management turnover with earnings management and default risk and earnings forecast error in the Tehran Stock Exchange. *Management Science Letters*, *3*(4), 1273-1280.

Verrecchia, R. E. (1983). Discretionary disclosure. *Journal of accounting and economics*, *5*, 179-194.

Williams, P. A. 1996. The Relation between a Prior Earnings Forecast by Management and Analyst Response to a Current Management Forecast. *The Accounting Review* 71 (1): 103-115.

Xu, W. (2010). Do management earnings forecasts incorporate information in accruals?. *Journal of Accounting and Economics*, *49*(3), 227-246.

Yamada, A. (2016). Mandatory management forecasts, forecast revisions, and abnormal accruals. *Asian Review of Accounting*, *24*(3), 295-312.

Zamora, V. L. (2009). Do managers benefit from superior forecasting?. *Available at SSRN 1324204*.

Table 1: Variables, Definitions and Sources

Variable name	Definition	Source
Derivative Variables		
Notional Dummy	A dummy variable equals one if the firms disclose the notional value of the derivative contracts and zero otherwise.	Hand-collected derivative data from firm 10-Q and 10-K filings
Speculation Notional Dummy	A dummy equal one if the firms disclose the notional value of the non-hedge derivative contracts and zero otherwise.	Hand-collected derivative data from firm 10-Q and 10-K filings
Total Notional	The notional value of all derivative contracts scaled by the total assets.	Hand-collected derivative data from firm 10-Q and 10-K filings
Hedge Notional	The notional value of the hedge derivative contracts scaled by total assets.	Hand-collected derivative data from firm 10-Q and 10-K filings
Speculation Notional	The notional value of the non-hedge derivative contracts scaled by total assets.	Hand-collected derivative data from firm 10-Q and 10-K filings
FV Dummy	A dummy equal one if the firms disclose the fair value of the derivative assets and zero otherwise	Hand-collected derivative data from firm 10-Q and 10-K filings
Speculation FV Dummy	A dummy variable equals one if the firms disclose the fair value of the non-hedge derivative assets and zero otherwise	Hand-collected derivative data from firm 10-Q and 10-K filings
Total FV	The natural logarithm of one plus the ratio of the sum of the fair value of derivative assets and liabilities scaled by 1000.	Hand-collected derivative data from firm 10-Q and 10-K filings
Hedge FV	The natural logarithm of one plus the ratio of the sum of the fair value of hedge derivative assets and liabilities scaled by 1000.	Hand-collected derivative data from firm 10-Q and 10-K filings
Speculation FV	The natural logarithm of one plus the ratio of the sum of the fair value of non-hedge derivative assets and liabilities scaled by 1000.	Hand-collected derivative data from firm 10-Q and 10-K filings
Speculation Volatility	The absolute value of the ratio of natural logarithms of the notional value of derivatives used at each quarter's beginning and end.	Hand-collected derivative data from firm 10-Q and 10-K filings
Speculation Deviation	The standard deviation of the quarterly residuals from a regression of the total notional value of derivative on firm characteristics over the past four quarters.	Hand-collected derivative data from firm 10-Q and 10-K filings
Speculation FX	The notional value of the non-hedge foreign exchange derivative contracts scaled by total assets.	Hand-collected derivative data from firm 10-Q and 10-K filings

Speculation IR	The notional value of the non-hedge interest rate derivative contracts scaled by total assets.	Hand-collected derivative data from firm 10-Q and 10-K filings
Speculation CM	The notional value of the non-hedge commodity derivative contracts scaled by total assets.	Hand-collected derivative data from firm 10-Q and 10-K filings
MEF Variables		
MEF	An indicator variable equals one if a firm makes an earnings forecast in a fiscal period and zero otherwise.	I/B/E/S Guidance Detail
MEF Frequency	The number of earnings forecasts the firm makes in a fiscal period. The value is set to zero when the manager does not provide forecast.	I/B/E/S Guidance Detail
Optimistic (Pessimistic) MEF	A dummy variable equals one if the forecast error is greater than 10% (smaller than -10%) and zero otherwise. Forecast error is the difference between the management forecast and the actual earnings scaled by the absolute value of actual earnings.	I/B/E/S Guidance Detail and I/B/E/S Actuals
Good (Bad) News MEF	A dummy variable equals one if the forecast news is greater than 10% (smaller than -10%) and zero otherwise. Forecast news is the difference between management forecast and consensus analyst forecast scaled by the absolute value of consensus analyst forecast.	I/B/E/S Guidance Detail and I/B/E/S Unadjusted Detail
Aggressiveness Actual	The difference between management forecast value and analyst consensus forecast divided by the share price at the end of the prior fiscal end date. The value is set to zero when the manager does not provide forecast.	I/B/E/S Guidance Detail
Aggressiveness Analyst	The difference between management forecast value and actual earning divided by the share price at the end of the prior fiscal end date. The value is set to zero when the manager does not provide forecast.	I/B/E/S Guidance Detail and I/B/E/S Unadjusted Detail
MEF Maintainers	A dummy variable is set to one if the firm issues MEFs in both the current and previous quarters. The dummy variable is set to zero if the firm issues MEF in the previous quarter only.	I/B/E/S Guidance Detail
Firm Characteristics		
Size	The logarithm of total book assets.	Compustat
Cash	Cash divided by total book assets.	Compustat
Leverage	Long-term debt plus debt in current liabilities divided by total book assets.	Compustat
Dividend	Dividend payout divided by total book assets.	Compustat
Tax	Tax Loss Carry Forward (TLCF) divided by total book assets.	Compustat
MTB	Book value of assets minus the book value of equity plus the market value of equity as the numerator of the ratio and the book value of assets as the denominator.	Compustat
Capital Expenditure	The ratio of capital expenditures to book assets.	Compustat
Z	Altman's (1968) Z-score	Compustat
Institutional Ownership	The percentage of common shares held by institutional investors.	Thomson 13F
CEO Gender	A dummy variable equals one if the manager is a male and zero otherwise.	ExecuComp
CEO Age	Log of manager age, where age is the number of years since the manager was born.	ExecuComp
CEO Tenure	Log of manager tenure, where tenure is the number of years since the manager joined the firm.	ExecuComp

Compensation Variables		
Log (1+Vega)	The natural logarithm of one plus the change in the value of the sensitivity of executive's wealth to stock return volatility.	Coles, Daniel and Naveen (2006)
Log (1+Delta)	The natural logarithm of one plus the change in the dollar value of the executive's wealth for a one percentage point change in stock price.	Coles, Daniel and Naveen (2006)
Log (1+Firm-related wealth)	The natural logarithm of one plus the value of the CEO's stock and option portfolio.	Coles, Daniel and Naveen (2006)

Table 2: Descriptive Statistics

Table 2 presents descriptive statistics for the firm-quarter-level variable used in the analyses. Variable definitions are in Table 1. We winsorize all continuous variables at 1% and 99 percentiles

	N	Mean	SD	Min	P10	P25	Median	P75	P90	Max
Derivative Variables										
Speculation Notional Dummy	4280	0.422	0.494	0.000	0.000	0.000	0.000	1.000	1.000	1.000
Speculation FV Dummy	4280	0.577	0.494	0.000	0.000	0.000	1.000	1.000	1.000	1.000
Speculation Notional	3540	0.038	0.075	0.000	0.000	0.000	0.001	0.043	0.129	0.484
Speculation FV	4162	0.062	0.179	0.000	0.000	0.000	0.002	0.031	0.157	2.268
Speculation Volatility	3050	0.160	0.235	0.000	0.000	0.022	0.074	0.196	0.405	1.396
Speculation Deviation	3363	0.080	0.124	0.002	0.014	0.031	0.043	0.072	0.161	0.851
Speculation FX	3045	0.045	0.120	0.000	0.000	0.000	0.003	0.050	0.134	2.218
Speculation IR	3452	0.003	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.320
Speculation CM	3100	0.0004	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.037
Total Notional	3540	0.147	0.150	0.000	0.004	0.040	0.099	0.209	0.334	0.743
Total FV	4280	0.158	0.291	0.000	0.000	0.005	0.038	0.154	0.486	2.413
Hedge Notional	3540	0.090	0.111	0.000	0.000	0.000	0.055	0.133	0.231	0.572
Hedge FV	4162	0.107	0.232	0.000	0.000	0.000	0.016	0.093	0.314	2.306
MEF Variables										
MEF	4280	0.376	0.484	0.000	0.000	0.000	0.000	1.000	1.000	1.000
AEF Dummy	4280	0.992	0.090	0.000	1.000	1.000	1.000	1.000	1.000	1.000
MEF Frequency	4280	0.951	1.736	0.000	0.000	0.000	0.000	1.000	4.000	8.000
Forecast Error	1605	0.180	1.554	-0.976	-0.192	-0.097	-0.029	0.441	0.618	47.000
Optimistic MEF	4280	0.118	0.323	0.000	0.000	0.000	0.000	0.000	1.000	1.000
Pessimistic MEF	4280	0.091	0.288	0.000	0.000	0.000	0.000	0.000	0.000	1.000
Forecast News	1606	0.297	2.863	-0.978	-0.060	-0.016	0.000	0.482	0.692	102.920
Good News MEF	4280	0.129	0.335	0.000	0.000	0.000	0.000	0.000	1.000	1.000
Bad News MEF	4280	0.026	0.158	0.000	0.000	0.000	0.000	0.000	0.000	1.000
Aggressiveness Actual	1605	-0.001	0.005	-0.027	-0.005	-0.002	-0.001	-0.000	0.001	0.018
Aggressiveness Analyst	1606	0.001	0.005	-0.019	-0.003	-0.001	0.000	0.001	0.003	0.026
MEF Maintainers	1643	0.892	0.311	0.000	0.000	1.000	1.000	1.000	1.000	1.000
Firm Characteristics										
Size	4280	9.838	1.183	7.249	8.361	9.029	9.819	10.618	11.377	12.755
Leverage	4280	0.354	0.173	0.001	0.161	0.241	0.341	0.451	0.555	0.992
Dividend	4280	2.496	2.521	0.000	0.000	0.143	2.039	3.677	5.975	11.166
Tax	4280	4.798	3.321	0.000	0.000	0.000	5.816	7.454	8.471	10.284
MTB	4280	2.772	1.864	0.904	1.249	1.562	2.215	3.182	4.980	10.966
Capital Expenditure	4280	0.022	0.026	0.000	0.004	0.007	0.014	0.027	0.049	0.425
Z	4280	0.783	0.580	-0.551	0.076	0.387	0.739	1.119	1.555	2.498
Institutional Ownership	4280	0.524	0.393	0.000	0.000	0.000	0.718	0.849	0.917	1.000
CEO Gender	3540	0.959	0.198	0.000	1.000	1.000	1.000	1.000	1.000	1.000
CEO Age	3868	4.075	0.107	3.807	3.932	4.007	4.078	4.143	4.190	4.382
CEO Tenure	3860	1.723	0.815	0.000	0.693	1.099	1.792	2.303	2.773	3.296
Compensation Variables										
Log (1+Vega)	1764	3.703	2.642	0.000	0.000	0.000	4.694	5.818	6.448	7.427
Log (1+Delta)	1744	6.284	1.295	3.001	4.487	5.583	6.290	7.063	7.848	9.996
Log (1+Firm-related wealth)	1744	10.624	1.285	7.405	8.925	9.885	10.589	11.356	12.149	14.549

Table 3: Logit Regression

The table reports marginal effects from logit regression of selective hedging on the issuance of MEF. The dependent variable is $Speculation\ Notional\ Dummy$ in columns 1 and 2, which equals one if the firms disclose the notional value of the non-hedge derivative contracts and zero otherwise. The dependent variable is $Speculation\ FV\ Dummy$ in columns 3 and 4, which equals one if the firms disclose the fair value of the non-hedge derivative contracts and zero otherwise. The key independent variable is MEF, an indicator variable equals one if a firm makes an earnings forecast in a fiscal period and zero otherwise. All variable definitions are given in Table 1. All the regressions include firm, year, and quarter fixed effects. The standard errors are heteroscedasticity consistent and clustered at the firm level. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

	(1) Speculation Notional Dummy	(2) Speculation Notional Dummy	(3) Speculation FV Dummy	(4) Speculation FV Dummy
MEF	0.063***	0.075***	0.079**	0.093**
	(2.84)	(2.90)	(1.98)	(2.31)
Size	0.039	0.049**	0.119***	0.123***
	(1.31)	(1.98)	(4.45)	(4.64)
Leverage	-0.006	-0.064	-0.125	-0.131
	(-0.05)	(-0.50)	(-1.20)	(-1.22)
Dividend	-0.006	-0.008	-0.008	-0.010
	(-0.43)	(-0.52)	(-0.62)	(-0.69)
Tax	0.009**	0.009**	0.019**	0.019**
	(2.24)	(2.03)	(2.15)	(2.00)
MTB	0.030	0.043**	0.048**	0.048**
	(1.60)	(2.07)	(2.57)	(2.40)
Capital Expenditure	-1.030	-1.329	0.230	0.074
	(-0.97)	(-1.10)	(0.29)	(0.09)
Z	-0.042	-0.031	-0.028	-0.042
	(-0.73)	(-0.50)	(-0.53)	(-0.79)
Institutional Ownership		-0.132		0.023
		(-1.50)		(0.31)
CEO Gender		0.038		-0.074
		(0.27)		(-0.55)
CEO Age		-0.034		-0.067
		(-0.11)		(-0.23)
CEO Tenure		-0.032		0.029
		(-0.88)		(0.92)
Firm, Year, and Quarter Fixed Effects	Yes	Yes	Yes	Yes
N	4009	2959	4209	3207
Pseudo R^2	0.163	0.172	0.135	0.153

Table 4: OLS

The table reports results from OLS regression of selective hedging on the issuance of MEF. The dependent variable selective hedging is measured based on the notional value of the non-hedge derivative contracts, the fair value of the non-hedge derivative contracts, the volatility of derivative holdings, and the standard deviation of residual derivatives holdings in columns 1 to 8. The key independent variable is MEF, an indicator variable equals one if a firm makes an earnings forecast in a fiscal period and zero otherwise. All variable definitions are given in Table 1. All the regressions include firm, year, and quarter fixed effects. The standard errors are heteroscedasticity consistent and clustered at the firm level. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

	(1) Speculation Notional	(2) Speculation Notional	(3) Speculation FV	(4) Speculation FV	(5) Speculation Volatility	(6) Speculation Volatility	(7) Speculation Deviation	(8) Speculation Deviation
MEF	0.004***	0.004***	0.006**	0.005**	0.025**	0.032**	0.009***	0.010***
	(2.68)	(2.77)	(2.01)	(2.24)	(2.20)	(2.27)	(3.03)	(3.41)
Size	0.004	0.001	0.010	0.016	0.027	0.067*	0.016	0.038***
	(1.31)	(0.31)	(0.70)	(0.91)	(0.90)	(1.91)	(1.65)	(2.86)
Leverage	0.018	0.025	-0.023	-0.027	0.012	0.133	0.048	0.106***
	(1.24)	(1.41)	(-0.45)	(-0.51)	(0.10)	(1.15)	(1.57)	(3.16)
Dividend	-0.001	-0.001	-0.001	-0.006	-0.001	-0.001	-0.003	-0.003
	(-0.90)	(-1.24)	(-0.18)	(-0.91)	(-0.23)	(-0.23)	(-1.45)	(-1.15)
Tax	0.000	-0.000	0.003	0.004	0.005	0.006	0.007	0.008
	(0.20)	(-0.13)	(1.52)	(1.49)	(0.67)	(0.84)	(1.33)	(1.12)
MTB	0.002	0.004**	-0.001	0.002	-0.004	0.012	-0.000	0.003
	(1.44)	(1.98)	(-0.36)	(1.01)	(-0.40)	(1.00)	(-0.12)	(0.61)
Capital Expenditure	-0.053**	-0.074***	-0.430***	-0.296***	-0.110	-0.214	-0.114*	-0.103
	(-2.41)	(-2.66)	(-3.02)	(-3.13)	(-0.36)	(-0.56)	(-1.76)	(-1.39)
Z	0.002	0.002	-0.001	-0.005	0.018	0.014	0.006	0.010
	(0.44)	(0.47)	(-0.07)	(-0.60)	(0.67)	(0.44)	(0.86)	(1.12)
Institutional Ownership		0.007		0.029		-0.052		-0.003
		(1.10)		(0.99)		(-0.87)		(-0.16)
CEO Gender		-0.003		0.000		-0.053		-0.010
		(-0.81)		(0.01)		(-0.76)		(-1.08)
CEO Age		0.023		0.023		0.083		0.032
		(1.00)		(0.69)		(0.47)		(0.73)
CEO Tenure		0.000		0.003		0.003		-0.000
		(0.11)		(0.48)		(0.29)		(-0.06)
Firm, Year, and Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3509	2659	4249	3243	3021	2237	3335	2499
Adj. R^2	0.874	0.866	0.780	0.795	0.163	0.174	0.659	0.710

Table 5: Frequency of MEF

The table reports results from OLS regression of selective hedging on the frequency of MEF. The dependent variable selective hedging is measured based on the notional value of the non-hedge derivative contracts, the fair value of the non-hedge derivative contracts, the volatility of derivative holdings, and the standard deviation of residual derivatives holdings in columns 1 to 8. The key independent variable is $MEF\ Frequency$, the number of earnings forecasts the firm makes in a fiscal period. All variable definitions are given in Table 1. All the regressions include firm, year, and quarter fixed effects. The standard errors are heteroscedasticity consistent and clustered at the firm level. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

	(1) Speculation Notional	(2) Speculation Notional	(3) Speculation FV	(4) Speculation FV	(5) Speculation Volatility	(6) Speculation Volatility	(7) Speculation Deviation	(8) Speculation Deviation
MEF Frequency	0.004***	0.004***	0.005**	0.006**	0.020***	0.018***	0.009***	0.012***
	(4.08)	(4.15)	(2.29)	(2.44)	(3.61)	(3.06)	(3.08)	(3.41)
Size	-0.005	-0.002	0.009	0.017	0.020	0.059*	0.015	0.037***
	(-1.48)	(-0.56)	(0.66)	(0.96)	(0.68)	(1.69)	(1.56)	(2.78)
Leverage	0.017	0.023	-0.019	-0.022	0.007	0.127	0.045	0.103***
	(1.15)	(1.34)	(-0.37)	(-0.41)	(0.06)	(1.09)	(1.50)	(3.08)
Dividend	-0.001	-0.001	-0.002	-0.006	-0.001	-0.001	-0.003	-0.003
	(-0.87)	(-1.25)	(-0.29)	(-0.95)	(-0.12)	(-0.17)	(-1.41)	(-1.20)
Tax	0.000	-0.000	0.003	0.004	0.005	0.007	0.007	0.008
	(0.20)	(-0.13)	(1.53)	(1.46)	(0.72)	(0.90)	(1.33)	(1.11)
MTB	0.002	0.004*	-0.001	0.002	-0.004	0.012	-0.000	0.003
	(1.43)	(1.97)	(-0.54)	(0.96)	(-0.42)	(1.02)	(-0.12)	(0.61)
Capital Expenditure	-0.064***	-0.092***	-0.451***	-0.310***	-0.405	-0.480	-0.126*	-0.111
	(-2.83)	(-3.29)	(-3.20)	(-3.16)	(-1.23)	(-1.17)	(-1.79)	(-1.41)
Z	0.002	0.002	0.006	-0.000	0.017	0.013	0.006	0.010
	(0.38)	(0.44)	(0.75)	(-0.02)	(0.65)	(0.42)	(0.80)	(1.12)
Institutional		0.007		0.029		-0.050		-0.003
		(1.12)		(0.99)		(-0.81)		(-0.15)
CEO Gender		-0.003		0.001		-0.052		-0.010
		(-0.81)		(0.05)		(-0.76)		(-1.06)
CEO Age		0.023		0.023		0.075		0.031
		(0.97)		(0.69)		(0.42)		(0.71)
CEO Tenure		0.000		0.003		0.004		-0.000
		(0.15)		(0.50)		(0.35)		(-0.04)
Firm, Year, and Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3509	2659	4249	3243	3021	2237	3335	2499
Adj. R^2	0.874	0.866	0.781	0.795	0.167	0.178	0.659	0.710

Table 6: Optimistic MEF

The table reports results from OLS regression when the MEF is separately estimated for optimistic forecast and pessimistic forecast. The dependent variable selective hedging is measured based on the notional value of the non-hedge derivative contracts, the fair value of the non-hedge derivative contracts, the volatility of derivative holdings, and the standard deviation of residual derivatives holdings in columns 1 to 8. $Optimistic\ (Pessimistic)\ MEF$ is an indicator variable equal to one if the forecast error is greater than 10% (smaller than -10%) and zero otherwise, where forecast error is the difference between the management forecast and the actual earnings scaled by the absolute value of actual earnings. All variable definitions are given in Table 1. All the regressions include firm, year, and quarter fixed effects. The standard errors are heteroscedasticity consistent and clustered at the firm level. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

	(1) Speculation Notional	(2) Speculation Notional	(3) Speculation FV	(4) Speculation FV	(5) Speculation Volatility	(6) Speculation Volatility	(7) Speculation Deviation	(8) Speculation Deviation
Optimistic MEF	0.010***	0.010***	0.010***	0.009***	0.036***	0.035**	0.012**	0.015***
	(2.79)	(2.74)	(2.84)	(2.83)	(2.99)	(2.46)	(2.20)	(2.85)
Pessimistic MEF	0.002	0.002	0.000	-0.002	0.008	-0.009	0.001	0.002
	(1.06)	(1.23)	(0.01)	(-0.43)	(0.49)	(-0.55)	(0.33)	(0.46)
Size	-0.004	-0.001	0.010	0.017	0.025	0.063*	0.016*	0.038***
	(-1.32)	(-0.38)	(0.70)	(0.95)	(0.84)	(1.80)	(1.66)	(2.83)
Leverage	0.016	0.023	-0.019	-0.023	0.001	0.117	0.044	0.101***
	(1.13)	(1.32)	(-0.38)	(-0.41)	(0.00)	(1.01)	(1.46)	(3.05)
Dividend	-0.001	-0.001	-0.002	-0.006	-0.001	-0.002	-0.003	-0.003
	(-0.87)	(-1.24)	(-0.29)	(-0.95)	(-0.24)	(-0.28)	(-1.42)	(-1.16)
Tax	0.000	-0.000	0.003	0.004	0.005	0.006	0.007	0.008
	(0.20)	(-0.13)	(1.51)	(1.45)	(0.66)	(0.79)	(1.33)	(1.11)
MTB	0.002	0.004*	-0.001	0.002	-0.004	0.012	-0.000	0.003
	(1.43)	(1.96)	(-0.53)	(0.97)	(-0.41)	(1.00)	(-0.12)	(0.60)
Capital Expenditure	-0.050**	-0.078***	-0.440***	-0.309***	-0.206	-0.255	-0.090	-0.084
	(-2.16)	(-2.71)	(-3.14)	(-3.24)	(-0.67)	(-0.65)	(-1.45)	(-1.18)
Z	0.002	0.002	0.006	-0.000	0.017	0.013	0.006	0.009
	(0.36)	(0.40)	(0.76)	(-0.02)	(0.61)	(0.40)	(0.75)	(1.03)
Institutional Ownership		0.007		0.029		-0.053		-0.002
		(1.09)		(0.99)		(-0.85)		(-0.12)
CEO Gender		-0.003		0.001		-0.052		-0.010
		(-0.77)		(0.06)		(-0.75)		(-1.05)
CEO Age		0.023		0.023		0.080		0.031
		(0.99)		(0.69)		(0.45)		(0.72)
CEO Tenure		0.000		0.003		0.003		-0.000
		(0.13)		(0.49)		(0.29)		(-0.04)
Firm, Year, and Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3509	2659	4249	3243	3021	2237	3335	2499
Adj. R^2	0.873	0.866	0.781	0.795	0.873	0.866	0.781	0.795

Table 7: Good News MEF

The table reports results from OLS regression when the MEF is separately estimated for good news forecast and bad news forecast. The dependent variable selective hedging is measured based on the notional value of the non-hedge derivative contracts, the fair value of the non-hedge derivative contracts, the volatility of derivative holdings, and the standard deviation of residual derivatives holdings in columns 1 to 8. $Good\ (Bad)\ News\ MEF$ is an indicator variable equal to one if the forecast news is greater than 10% (smaller than -10%) and zero otherwise, where forecast news is the difference between management forecast and consensus analyst forecast scaled by the absolute value of consensus analyst forecast. All variable definitions are given in Table 1. All the regressions include firm, year, and quarter fixed effects. The standard errors are heteroscedasticity consistent and clustered at the firm level. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

	(1) Speculation Notional	(2) Speculation Notional	(3) Speculation FV	(4) Speculation FV	(5) Speculation Volatility	(6) Speculation Volatility	(7) Speculation Deviation	(8) Speculation Deviation
Good News MEF	0.003***	0.004***	0.005**	0.007***	0.036***	0.034**	0.014**	0.015*
	(2.92)	(3.08)	(1.98)	(2.62)	(3.19)	(2.53)	(2.17)	(1.87)
Bad News MEF	-0.001	0.001	-0.002	-0.003	0.038	0.000	0.007	0.004
	(-0.53)	(0.42)	(-0.42)	(-0.61)	(1.19)	(0.02)	(1.24)	(0.57)
Size	-0.004	-0.001	0.010	0.017	0.023	0.064*	0.016	0.038***
	(-1.36)	(-0.40)	(0.69)	(0.96)	(0.75)	(1.82)	(1.63)	(2.83)
Leverage	0.016	0.023	-0.019	-0.022	0.001	0.121	0.044	0.101***
	(1.10)	(1.30)	(-0.38)	(-0.41)	(0.01)	(1.04)	(1.47)	(3.06)
Dividend	-0.001	-0.001	-0.002	-0.006	-0.001	-0.002	-0.003	-0.003
	(-0.87)	(-1.25)	(-0.29)	(-0.95)	(-0.23)	(-0.25)	(-1.42)	(-1.16)
Tax	0.000	-0.000	0.003	0.004	0.004	0.006	0.007	0.008
	(0.18)	(-0.14)	(1.50)	(1.46)	(0.58)	(0.77)	(1.31)	(1.11)
MTB	0.002	0.004*	-0.001	0.002	-0.004	0.012	-0.000	0.003
	(1.43)	(1.97)	(-0.53)	(0.97)	(-0.39)	(1.02)	(-0.12)	(0.61)
Capital Expenditure	-0.048**	-0.077***	-0.438***	-0.308***	-0.262	-0.255	-0.096	-0.086
	(-2.13)	(-2.68)	(-3.11)	(-3.21)	(-0.85)	(-0.64)	(-1.50)	(-1.19)
Z	0.002	0.002	0.006	-0.000	0.015	0.012	0.005	0.009
	(0.35)	(0.41)	(0.75)	(-0.02)	(0.57)	(0.39)	(0.73)	(1.03)
Institutional Ownership		0.007		0.029		-0.053		-0.002
		(1.08)		(0.99)		(-0.87)		(-0.13)
CEO Gender		-0.003		0.001		-0.051		-0.010
		(-0.78)		(0.05)		(-0.75)		(-1.04)
CEO Age		0.023		0.023		0.082		0.031
		(1.00)		(0.69)		(0.46)		(0.72)
CEO Tenure		0.000		0.003		0.003		-0.000
		(0.11)		(0.49)		(0.28)		(-0.04)
Firm, Year, and Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3509	2659	4249	3243	3021	2237	3335	2499
Adj. R^2	0.873	0.866	0.781	0.795	0.164	0.174	0.659	0.709

Table 8: Forecast Aggressiveness

The table reports results from OLS regression when the MEF is separately estimated for different levels of forecast aggressiveness. The dependent variable selective hedging is measured based on the notional value of the non-hedge derivative contracts, the fair value of the non-hedge derivative contracts, the volatility of derivative holdings, and the standard deviation of residual derivatives holdings in columns 1 to 4, respectively. In Panel A, forecast aggressiveness is calculated relative to the actual earnings. In Panel B, forecast aggressiveness is calculated relative to the consensus analyst forecast. The MEF indicator is separated into five indicators based on quintiles of forecast aggressiveness. Firm-quarters with MEF issued and forecast aggressiveness is in the lowest quintile is indicated with $Least\ Aggressiveness$, 2nd, 3rd, 4th, and highest quintiles of forecast aggressiveness are indicated with $Less, Median, More, and\ Most\ Aggressivness$ indicators, respectively. All variable definitions are given in Table 1. All the regressions include firm, year, and quarter fixed effects. The standard errors are heteroscedasticity consistent and clustered at the firm level. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

Panel A: Aggressiveness Relative to Actual Earnings

	(1) Speculation Notional	(2) Speculation FV	(3) Speculation Volatility	(4) Speculation Deviation
Least Aggressiveness	0.002	<0.001	0.013	0.004
	(0.76)	(0.26)	(0.71)	(0.85)
Less Aggressiveness	0.003	0.004	0.019	0.007
	(1.11)	(1.09)	(0.71)	(1.42)
Median Aggressiveness	0.004	0.006	0.022	0.008*
	(1.62)	(1.41)	(1.19)	(1.67)
More Aggressiveness	0.005**	0.007**	0.042**	0.012**
	(2.29)	(2.00)	(2.18)	(2.44)
Most Aggressiveness	0.010***	0.008***	0.057***	0.013***
	(2.79)	(2.89)	(2.64)	(3.26)
Controls	Yes	Yes	Yes	Yes
Firm, Year, and Quarter Fixed Effects	Yes	Yes	Yes	Yes
N	2652	3235	2230	2492
Adj. R^2	0.867	0.796	0.174	0.710

Panel B: Aggressiveness Relative to Analysts' Expectations

	(1) Speculation Notional	(2) Speculation FV	(3) Speculation Volatility	(4) Speculation Deviation
Least Aggressiveness	0.002	-0.001	0.009	0.007
	(1.44)	(0.78)	(0.46)	(1.64)
Less Aggressiveness	0.003	-0.003	0.017	0.009*
	(1.32)	(0.95)	(0.90)	(1.74)
Median Aggressiveness	0.004*	0.003	0.035	0.009*
	(1.71)	(0.95)	(1.78)	(2.07)
More Aggressiveness	0.004**	0.006*	0.039*	0.010*
	(1.98)	(1.66)	(1.87)	(1.74)
Most Aggressiveness	0.008***	0.009***	0.046***	0.018***
	(2.98)	(3.16)	(2.87)	(2.67)
Controls	Yes	Yes	Yes	Yes
Firm, Year, and Quarter Fixed Effects	Yes	Yes	Yes	Yes
N	2652	3235	2230	2492
Adj. R^2	0.866	0.796	0.174	0.711

Table 9: Forecast Maintainers

The table reports results from OLS regression of selective hedging on MEF maintainers. The dependent variable selective hedging is measured based on the notional value of the non-hedge derivative contracts, the fair value of the non-hedge derivative contracts, the volatility of derivative holdings, and the standard deviation of residual derivatives holdings in columns 1 to 4. The $MEF\ Maintainer$ is an indicator variable set to one if the firm issues MEFs in both the current and previous quarters. The dummy variable is set to zero if the firm issues a MEF in the previous quarter only. All variable definitions are given in Table 1. All the regressions include firm, year, and quarter fixed effects. The standard errors are heteroscedasticity consistent and clustered at the firm level. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

	(1) Speculation Notional	(2) Speculation FV	(3) Speculation Volatility	(4) Speculation Deviation
MEF Maintainer	0.004***	0.006*	0.040**	0.013***
	(2.86)	(1.93)	(2.31)	(3.26)
Controls	Yes	Yes	Yes	Yes
Firm, Year, and Quarter Fixed Effects	Yes	Yes	Yes	Yes
N	1067	1272	932	1018
Adj. R^2	0.828	0.833	0.168	0.710

Table 10: Adoption of ASC 606

The table reports results from OLS regression of selective hedging on MEF after the adoption of ASC 606. The dependent variable selective hedging is measured based on the notional value of the non-hedge derivative contracts. *ASC 606* is an indicator equal to 1 for the first quarters with ASC 606 disclosures. The main variables of interest are the interactions of the *MEF* indicator and *ASC 606*, as well as the interactions of *MEF Frequency* and *ASC 606*. All variable definitions are given in Table 1. All the regressions include firm, year, and quarter fixed effects. The standard errors are heteroscedasticity consistent and clustered at the firm level. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

	(1) Speculation Notional	(2) Speculation Notional
MEF	0.003**	
	(2.01)	
ASC606	0.001	0.003
	(0.29)	(0.88)
MEF*ASC606	0.005**	
	(2.26)	
MEF Frequency		0.004***
		(3.39)
MEF Frequency*ASC606		0.004***
		(3.15)
Size	-0.002	-0.003
	(-0.61)	(-0.77)
Leverage	0.024	0.023
	(1.37)	(1.30)
Dividend	-0.001	-0.001
	(-1.23)	(-1.22)
Tax	-0.000	-0.000
	(-0.13)	(-0.12)
MTB	0.004**	0.004**
	(2.03)	(1.98)
Capital Expenditure	-0.073***	-0.090***
	(-2.68)	(-3.29)
Z	0.002	0.002
	(0.47)	(0.43)
Institutional Ownership	0.010	0.010
	(1.51)	(1.46)
CEO Gender	-0.003	-0.003
	(-0.80)	(-0.82)
CEO Age	0.024	0.023
	(1.03)	(0.99)
CEO Tenure	0.000	0.000
	(0.10)	(0.14)
Firm, Year, and Quarter Fixed Effects	Yes	Yes
N	2659	2659
Adj. R^2	0.866	0.866

Table 11: COVID-19

The table presents the results of OLS regression for selective hedging among firms that issued MEFs in various industries during the post-COVID-19 period. The dependent variable selective hedging is measured based on the notional value of the non-hedge derivative contracts. COVID-19 is an indicator equal to 1 for the post-COVID-19 period in 2020. The Hospitality industry is defined as the restaurant, hotel, and motel industry in the Fama-French 48 industry classification. Retail is defined as the retail industry in the Fama-French 48 industry classification. The Medical industry is defined as the healthcare, medical equipment, and pharmaceutical products industry in the Fama-French 48 industry classification. All variable definitions are given in Table 1. The standard errors are heteroscedasticity consistent and clustered at the firm level. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

MEF sample			
	(1)	(2)	(3)
	Speculation Notional	Speculation Notional	Speculation Notional
COVID-19	-0.002	-0.002	0.000
	(-0.33)	(-0.30)	(0.04)
Hospitality * COVID-19	-0.088**	-0.089**	-0.089**
	(-2.27)	(-2.27)	(-2.30)
Retail * COVID-19		-0.035**	-0.037**
		(-2.27)	(-2.43)
Medical * COVID-19			-0.011
			(-0.84)
Size	0.008	0.008	0.007
	(1.02)	(1.02)	(0.91)
Leverage	0.124**	0.124**	0.125**
	(2.01)	(2.02)	(2.02)
Dividend	-0.007**	-0.007**	-0.007*
	(-2.15)	(-2.15)	(-1.97)
Tax	0.000	0.000	0.000
	(0.01)	(0.02)	(0.06)
MTB	-0.002	-0.002	-0.003
	(-0.53)	(-0.53)	(-0.68)
Capital Expenditure	0.200	0.201	0.195
	(1.31)	(1.32)	(1.30)
Z	-0.004	-0.004	-0.003
	(-0.33)	(-0.34)	(-0.22)
Institutional Ownership	0.007	0.007	0.006
	(0.28)	(0.28)	(0.25)
CEO Gender	0.013	0.013	0.013
	(0.61)	(0.61)	(0.59)
CEO Age	0.063	0.063	0.064
	(0.84)	(0.84)	(0.81)
CEO Tenure	0.008	0.008	0.008
	(1.10)	(1.11)	(1.13)
Industry, Year, and Quarter Fixed Effects	Yes	Yes	Yes
N	1051	1051	1051
Adj. R^2	0.139	0.138	0.138

Table 12: Instrumental Variable Analysis

The table reports results from two-stage least squares regressions of selective hedging on MEF maintainers. The dependent variable selective hedging is measured based on the notional value of the non-hedge derivative contracts, the fair value of the non-hedge derivative contracts, the volatility of derivative holdings, and the standard deviation of residual derivatives holdings. MEF is an indicator variable that equals one if a firm makes an earnings forecast in a fiscal period and zero otherwise. In the first-stage regression (column 1), we regress MEF on the instrumental variable and controls. The instrument $Ind\ MEF\%$ is the fraction of firms operating in the same industry that provide at least one earnings forecast. In the second stage regressions (columns 2 to 5), we regress selective hedging variables on the fitted value of MEF from column 1. All variable definitions are given in Table 1. All the regressions include firm, year, and quarter fixed effects. The standard errors are heteroscedasticity consistent and clustered at the firm level. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

	(1) MEF	(2) Speculation Notional	(3) Speculation FV	(4) Speculation Volatility	(5) Speculation Deviation
Ind MEF%	2.118***				
	(7.46)				
MEF		0.013***	0.012**	0.059	0.021*
		(2.73)	(2.42)	(1.56)	(1.93)
Controls	Yes	Yes	Yes	Yes	Yes
Firm, Year, and Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes
First-Stage F-*Stat*	55.69				
N	2652	2652	3235	2230	2492
Adj. R^2	0.579	0.861	0.796	0.173	0.710

Table 13: Announcement Returns

This table shows cumulative average abnormal returns (CARs) around the earnings announcements, where the abnormal returns are defined as the firm's stock return minus the CRSP value-weighted market return. The earnings announcement window is from trading day -1 to trading day +2 around the earnings announcement day 0. We label all announcements with reported earnings that are below management forecast below MEF as *Miss*. All announcements with reported earnings that equal or exceed MEF by one cent are *Meet*. All announcements with reported earnings that exceed MEF by more than one cent are *Beat*. *Speculator* is a dummy variable when *Speculation Notional Dummy* equals one, zero otherwise. *Hedgers* is a dummy variable when *Speculation Notional Dummy* equals one, zero otherwise.

Panel A: Speculators

	All				Quarter only				
	Non speculators	N	Speculators	N		Non speculators	N	Speculators	N
No MEF	0.003	3026	0	1374	No MEF	0.003	2630	-0.002	1196
Miss	-0.007	242	-0.080	128	Miss	-0.018	93	-0.028	51
Meet	0.004	42	-0.002	35	Meet	<0.001	34	-0.022	31
Beat	0.001	1066	0.003	710	Beat	0.005	742	0.006	509

Panel B: Speculators and hedgers

	All						Quarter only					
	Non derivative users	N	Speculators	N	Hedgers	N		Non derivative users	N	Speculators	N	Hedgers	N
No MEF	0.004	1973	0	1374	0	2135	No MEF	0.003	1657	-0.001	1196	0	1921
Miss	-0.012	143	-0.080	128	0	213	Miss	-0.019	73	-0.028	51	-0.015	62
Meet	-0.004	26	-0.002	35	-0.013	48	Meet	-0.005	22	-0.022	31	-0.014	40
Beat	0.001	741	0.003	710	0.003	924	Beat	0.004	553	0.006	509	0.006	616

Table 14: Market Response to Earnings Announcements

This table shows multivariate models explaining cumulative abnormal returns (CARs) around the earnings annulments, where the abnormal returns are defined as the firm's stock return minus the CRSP value-weighted market return. The earnings announcement window is from trading day -1 to trading day +2 around the earnings announcement day 0. We label all announcements with reported earnings that are below management forecast below MEF as *Miss*. All announcements with reported earnings equal or exceed MEF by one cent are *Meet*. All announcements with reported earnings that exceed MEF by more than one cent are *Beat*. Columns 1 and 2 include both annual and quarter MEFs and Columns 3 and 4 only include quarter MEFs. Panel B focuses on the subsample of announcements with management forecasts. All the regressions include firm, year, and quarter fixed effects. The standard errors are heteroscedasticity consistent and clustered at the firm level. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

	(1) All CAR (-1,2)	(2) All CAR (-1,2)	(3) Quarter only CAR (-1,2)	(4) Quarter only CAR (-1,2)
Speculation Notional Dummy	-0.001	-0.002	-0.003	-0.004
	(0.18)	(0.38)	(0.45)	(0.71)
Miss	-0.009*	-0.013***	-0.023***	-0.024***
	(1.86)	(2.08)	(2.92)	(2.86)
Meet	0.002	0.010	0.005	0.010
	(0.22)	(1.46)	(0.63)	(0.14)
Beat	0.006*	0.003**	0.007*	0.001*
	(1.76)	(1.83)	(1.76)	(1.52)
Speculation Notional Dummy* Miss	-0.010**	-0.023***	-0.032**	-0.034***
	(2.07)	(2.64)	(2.22)	(2.82)
Speculation Notional Dummy* Meet	0.005	0.004	-0.002	-0.010
	(1.07)	(0.48)	(1.46)	(0.53)
Speculation Notional Dummy* Beat	0.006	0.008	0.007	0.006
	(1.09)	(1.36)	(1.63)	(1.55)
Hedge Notional Dummy		0.005		0.007*
		(1.24)		(1.77)
Hedge Notional Dummy* Miss		-0.010		-0.009
		(1.14)		(0.62)
Hedge Notional Dummy* Meet		0.024*		0.015
		(1.83)		(1.03)
Hedge Notional Dummy* Beat		0.005*		0.005**
		(1.86)		(2.31)
Constant	0.003	<0.001	0.003	<0.001
	(1.37)	(0.24)	(1.42)	(0.06)
Firm, Year, and Quarter Fixed Effects	Yes	Yes	Yes	Yes
N	6623	6623	5286	5286
Adj. R^2	0.033	0.033	0.033	0.033

Table 15: Risk Type

The table reports the results of how firms use different risk types of selective hedging. Panel A presents statistics by the three main risk categories. Panel B shows regression results of different risk types of selective hedging on MEF issuance. The dependent variable is $Speculation\ FX$, $Speculation\ IR$, and $Speculation\ CM$ in columns 1 to 3, respectively. Panel B shows regression results of foreign exchange selective hedging on MEF behaviors. All variable definitions are given in Table 1. All the regressions include firm, year, and quarter fixed effects. The standard errors are heteroscedasticity consistent and clustered at the firm level. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

Panel A: Derivative Use by Risk Type

	Notional Dummy	Hedge Notional Dummy	Speculation Notional Dummy
Foreign Exchange	0.648	0.413	0.376
Interest Rate	0.509	0.472	0.066
Commodity	0.112	0.073	0.050

Panel B: Types of Risk Exposures

	(1) Speculation FX	(2) Speculation IR	(3) Speculation CM
MEF	0.005**	<0.001	<0.001*
	(2.60)	(0.89)	(1.66)
Controls	Yes	Yes	Yes
Firm, Year, and Quarter Fixed Effects	Yes	Yes	Yes
N	2329	2587	2359
Adj. R^2	0.857	0.670	0.946

Panel C: Foreign Exchange Risk

	(1) Speculation FX	(2) Speculation FX	(3) Speculation FX	(4) Speculation FX
MEF	0.006***			
	(2.83)			
MEF Frequency		0.003***		
		(3.95)		
Optimistic MEF			0.005***	
			(2.65)	
Pessimistic MEF			0.002	
			(1.26)	
Good News MEF				0.005***
				(2.85)
Bad News MEF				0.002
				(0.66)
Foreign Sales	0.007*	0.007*	0.006*	0.006*
	(1.79)	(1.80)	(1.76)	(1.76)
Controls	Yes	Yes	Yes	Yes
Firm, Year, and Quarter Fixed Effects	Yes	Yes	Yes	Yes
N	2179	2179	2179	2179
Adj. R^2	0.855	0.855	0.855	0.855

Table 16: Total Derivative and Hedging Activities

The table reports results from OLS regressions. The dependent variable in columns 1 (3) is firm total derivative (hedging) activities measured based on the notional value of the total derivative contracts. The dependent variable in columns 2 (4) is firm derivative (hedging) activities measured based on the fair value of the total derivative contracts. The main independent variables are MEF, MEF Frequency, Optimistic MEF, and Good News MEF in Panels A, B, C, and D, respectively. All variable definitions are given in Table 1. All the regressions include firm, year, and quarter fixed effects. The standard errors are heteroscedasticity consistent and clustered at the firm level. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

	(1) Total Notional	(2) Total FV	(3) Hedge Notional	(4) Hedge FV
Panel A: MEF				
MEF	0.007**	0.005*	0.001	-0.004
	(2.26)	(1.78)	(0.34)	(-1.20)
N	2659	3243	2659	3168
Adj. R^2	0.861	0.872	0.860	0.896
Panel B: MEF Frequency				
MEF Frequency	0.003***	0.002*	0.001**	-0.005
	(4.80)	(1.75)	(1.98)	(-1.64)
N	2659	3243	2659	3168
Adj. R^2	0.862	0.872	0.860	0.896
Panel C: Optimistic MEF				
Optimistic MEF	0.009***	0.006*	0.003	0.004
	(2.99)	(1.80)	(1.18)	(0.91)
Pessimistic MEF	0.004	-0.001	0.003	-0.005
	(1.03)	(-0.25)	(1.17)	(-1.46)
N	2659	3243	2659	3168
Adj. R^2	0.861	0.872	0.860	0.896
Panel D: Good News MEF				
Good News MEF	0.007**	0.002	0.001	-0.007*
	(2.49)	(1.50)	(0.44)	(-1.96)
Bad News MEF	0.005	0.001	0.004	0.002
	(0.86)	(0.14)	(0.90)	(0.35)
N	2659	3243	2659	3168
Adj. R^2	0.861	0.872	0.860	0.896
Controls	Yes	Yes	Yes	Yes
Firm, Year, and Quarter Fixed Effects	Yes	Yes	Yes	Yes

Table 17: Compensation Structure

This table reports how the results of selective hedging on the issuance of MEF vary with the incentive compensation of the CEO. The dependent variable is Speculation Notional. The main variables of interest are the interactions of the MEF indicator and managerial incentive compensation variables. Managerial incentive compensation is measured by wealth-to-stock volatility (Vega) in column 1, pay-performance sensitivity (Delta) in column 2, and inside equity (Firm-related wealth) in column 3. All variable definitions are given in Table 1. All the regressions include firm, year, and quarter fixed effects. The standard errors are heteroscedasticity consistent and clustered at the firm level. ***, **, * indicate significance at the 1%, 5% and 10% levels, respectively.

	(1) Speculation Notional	(2) Speculation Notional	(3) Speculation Notional
MEF	0.004**	-0.013*	-0.039*
	(2.18)	(1.65)	(1.68)
Log (1+Vega)	0.001		
	(0.98)		
MEF × Log (1+Vega)	0.003*		
	(1.74)		
Log (1+Delta)		0.004	
		(1.11)	
MEF × Log (1+Delta)		0.004*	
		(1.75)	
Log (1+Firm-related wealth)			0.005
			(1.23)
MEF × Log (1+Firm-related wealth)			0.004*
			(1.79)
Controls	Yes	Yes	Yes
Firm, Year, and Quarter Fixed Effects	Yes	Yes	Yes
N	1152	1132	1132
Adj. R^2	0.862	0.861	0.861

Appendix A: Accounting for derivatives

Derivative usage can be opaque to investors because the disclosure requirement for corporate derivatives is limited. In this section, we discuss the evolution of derivative accounting and disclosure and current accounting for derivatives.

Evolution of derivative accounting

The accounting and disclosure regulations in the U.S. for derivatives have evolved significantly over time, primarily to keep up with the ever-growing use of derivatives. Before 1991, the derivatives accounting framework was largely regulated under two standards, FAS 52 and FAS 80. These standards were limited in scope and failed to address many types of commonly used derivatives, such as interest rate swaps and options contracts, which resulted in some derivatives contracts being recorded on the balance sheet but others not (Campbell et al., 2019). Following standards largely require only footnote disclosures of derivatives, such as FAS 105, 107, and 119. Moreover, most firms only disclosed information about foreign exchange and interest rate derivatives but not commodity derivatives under these standards because most commodity derivatives did not fall under the scope of these standards (Barton, 2001). When FAS 105 required the disclosure of derivative face, contract, or notional amount, FAS 107 expanded this by requiring fair values of firm derivatives position disclosure. FAS 119 required additional disclosure regarding firms' use of derivatives for trading or hedging purposes. The SEC issued FRR 48 in 1997, which further included commodity derivatives in the disclosure requirements. In addition, firms were required mandatorily to report quantitative information about their derivatives using one of the three allowable methods: value-at-risk, sensitivity analysis, or tabular disclosures.

FAS 133

The current derivatives accounting framework is primarily prescribed by FAS 133, which was released in 1998 and became effective in 2001. Specifically, it took a more comprehensive and standardized approach, as it is the first rule to provide complete reporting coverage for all derivative instruments[8]. FAS 133 allows for the use of hedge accounting. Suppose certain requirements are met to ensure it is a "highly effective" hedge, and a firm chooses to use hedge accounting for a derivative. In that case, the derivative is recognized on the balance

[8] The SFAS No. 133 expands coverage from just forward and futures contracts to all derivative instruments, including options and derivatives embedded in other contracts.

sheet at fair value. Still, the recognition of fair value changes is delayed until the offsetting earnings effect of the hedged risk is also recognized.

Under FAS 133, a firm applying hedge accounting is required to establish at the inception of the hedge the method it will use to assess the effectiveness of the hedging derivatives. To qualify for hedge accounting, a firm must specify the hedged item, identify the strategy and the derivative, and document by statistical or other means the basis for expecting the hedge to be highly effective in offsetting the designated risk exposure. In principle, a hedge is highly effective at offsetting changes in fair values or changes in the expected cash flows of the associated exposures due to the risk being hedged.9 Prospective testing to document highly effective hedging must also proceed with the actual hedging transaction to qualify for hedge accounting. In addition, the defined method must be consistent throughout the hedge period. The firm must also perform retrospective testing each quarter to verify how effective the hedging relationship has actually been. FAS 133 does not specify a single method, and the FASB suggests three primary methods for testing the hedging effectiveness of derivatives: the dollar-offset method, the variability-reduction method, and the regression method. The most commonly used dollar-offset method requires that the cumulative changes in the hedging derivative should offset between 80% and 125% of the cumulative changes in the fair value or cash flows of the hedged item.

There are two most common types of hedges: fair value and cash flow hedges.10 A fair value hedge is "a hedge of the exposure to changes in the fair value of a recognized asset or liability" (FAS 133, p. 5). A fair value hedge addresses the concern of earnings volatility by immediately recognizing both the change in the value of the fair value hedge and the change in the carrying value of the hedged asset or liability. A cash flow hedge is a "hedge of the exposure to variability in the cash flows of a recognized asset or liability, or a forecasted transaction" (FAS 133, p. 5). Cash flow hedge gains and losses are recognized in Other Comprehensive Income and then recorded on an after-tax basis in Accumulated Other Comprehensive Income (AOCI) in the equity section of the balance sheet. This results in the derivative being recognized on the balance sheet at its fair value without affecting current net

[10] FAS 133 also describes a type of hedge of net investment. A hedge of net investment is the hedge of currency exposure of the next investment in a foreign operation, which is accounted for similarly to the cash flow hedge (FAS 133, p.5).

income. When the gain or loss from the hedged item is realized in earnings, the offsetting amount from the cash flow hedge from AOCI is reclassified into earnings.

FAS 161

While FAS 133 comprehensively standardized and revised derivative accounting, it also removed the majority of derivative disclosures required by the standards it superseded. As a result, academics and practitioners criticized FAS 133 for not requiring sufficient information about derivatives and hedging activities (FASB, 2008). In response, the FASB issued FAS 161, effective in 2009, to require enhanced derivative disclosures. In Appendix B, we provide a detailed description and a portion of disclosures required under FAS 133 and FAS 161 by an example firm. While FAS 161 did not modify derivative accounting, it did require firms to provide "...enhanced disclosures about (a) how and why an entity uses derivative instruments, (b) how derivative instruments and related hedged items are accounted for under Statement 133 and its related interpretations, and (c) how derivative instruments and related hedged items affect an entity's financial position, financial performance, and cash flows" (FASB, 2008).

FAS 161 requires a tabular format of disclosures relating to hedging position and performance. One table describes the location and fair values of derivative instruments included in the balance sheet. Another table displays derivative gains and losses and related hedged items, where those amounts are reported in income or OCI. The tabular disclosures are required to distinguish between derivative instruments designated as hedging instruments and those not, and for the income statement, the disclosure is required to further segregate the designated hedging instruments as fair value, cash flow, or net investment hedges. Within these groupings, derivative instruments must be segregated by major types of instruments (e.g., interest rate contracts, foreign exchange contracts, equity contracts, commodity contracts, and credit contracts).