Commitment is An Act: How Does Management Forecast Affect Corporate Selective Hedging?

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Abstract

This paper investigates how management earnings forecast behavior impacts the adoption of corporate selective hedging strategies. Selective hedging is a profit-oriented strategy that enables managers to speculate by incorporating their market views into corporate derivative programs. Using hand-collected data of detailed firm-quarter-level corporate derivative positions of U.S. S&P 500 firms, I find that firms with management earnings forecasts are more likely to engage in selective hedging, especially when managers make overestimated earnings forecasts. However, an underestimated forecast provides no motivational effects in speculative derivatives. I use a forecast maintainer subsample test and instrumental variable (IV) to help establish a more direct causal link. The increased selective hedging activities are mainly driven by the use of foreign exchange speculative derivatives. I find no forecast-driven increase in firm hedging derivatives.

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1 Introduction

Selective hedging is forecast-based hedging behavior aiming to generate profits (Glaum, 2002; Stulz, 1996). Both academic research and survey evidence have shown that managers frequently incorporate their active market views in their derivatives transactions and vary the size and timing of the derivatives transactions (see, e.g., Adam, Fernando, and Golubeva, 2015; Adam, Fernando, and Salas, 2017; Bodnar, Hayt, and Marston, 1998; Bodnar, Giambona, Graham, Harvey, and Marston, 2012; Brown, Crabb, and Haushalter, 2006; Jankensgård, 2019). Selective hedging is a speculative strategy that attempts to time the market (Adam, Fernando, Brown, Crabb, and Haushalter, 2006; Chernenko and Faulkender, 2011; Géczy, Minton, and Schrand, 2007; Loss, 2012).[1] The company speculatively leaves some of its position unhedged based on forecasts of future market prices to generate profits from market movements (Glaum, 2002; Stulz, 1996).

Selective hedging magnifies financial losses when managers wrongly predict movement. In addition, unhedged cash flow volatility can raise additional indirect costs such as underinvestment (Froot, Scharfstein, and Stein, 1993), costly financial distress (Mayers and Smith, 1982; Smith and Stulz, 1985), and greater tax burden (Mayers and Smith, 1982; Smith and Stulz, 1985). Bartram (2019) suggests that while derivatives can be effective and efficient tools for corporate hedging, they are equally well suited for speculative purposes, possibly even under the guise of hedging (Chernenko and Faulkender, 2011). Investigating what affects a firm's selective hedging practice is valuable to help investors realize the potential risks embedded in corporate derivative use.

[1] Following prior literature, I use the terms "selective hedging" and "speculation" interchangeably in this study (see, e.g., Adam et al., 2017; Brown et al., 2006; Stulz, 1996).

Managers' view of future market movements can influence the extent to which they hedge, resulting in speculative deviations from a full hedging position (Stulz, 1996). By doing this, managers incorporate profit considerations into the risk management decisions of selective hedging. Why are firms motivated to do this? This study focuses on management earnings forecast behavior to explain the firm's selective hedging activities, as they are highly related to a firm's earnings prospects.

A long line of accounting research examines why management voluntarily provides forecasts. For example, voluntary disclosures can increase firm value by reducing information asymmetry and increasing stock liquidity (Glosten and Milgrom, 1985; Kim and Verrecchia, 1991; Easley and O'Hara, 2004), by decreasing the cost of capital through lower estimation risk (Botosan 1997; Francis, Nanda, and Olsson 2008; Cheynel, 2013) or by increasing the precision and quantity of information (Easley and O'Hara, 2004). Management earnings forecasts represent (MEF, hereafter) one of the key voluntary disclosure mechanisms through which managers establish or alter the market's earnings expectations, which are also associated with costs. The costs can be associated with issuing forecasts that later turn out to be less than perfectly accurate, including legal exposure and management's loss of reputation for accuracy (Hirst, Koonce, and Venkataraman, 2008). In addition, the expected costs are higher for firms with reported earnings falling below the management forecast than those exceeding the forecast (Kasznik, 1999).

Bourveau, Lou, and Wang (2018) suggest that the litigate risk on the biases of management forecasts are asymmetric. Managers are afraid of being sued for making optimistic earnings forecasts that are not realized, but it is unlikely that investors would take legal action against managers for being too pessimistic and achieving higher earnings than expected. Meanwhile, the voluntary and non-audited nature of management forecasts leads to concerns about the credibility of these forecasts (e.g., Jennings, 1987; Skinner, 1994; Rogers and Stocken, 2005;

Hutton and Stocken, 2007), where investors assess the credibility of a firm's forecast relative to the prevailing consensus analyst forecast when valuing the firm. Investors are naturally skeptical about good news forecasts (i.e., forecasts that exceed analyst expectations) with the understanding that managers benefit from higher stock prices from the good news release (Hutton, Miller, and Skinner, 2003). I hypothesize that managers use profit-oriented selective hedging strategies to mitigate these costs. Specifically, the selective hedging strategy can be viewed as the purchase of "well-out-of-the-money put options" that managers eliminate the downside while making earnings from forecasted future market movements. I argue that when managers provide forecasts, particularly aggressive forecasts, they are motivated to use selective hedging to manage earnings toward their forecast to show the veracity of a forecast increase in earnings.

Selective hedging has received little attention in the literature on corporate risk management, possibly due to a lack of adequate firm-specific data on derivatives usage (Adam and Fernando, 2006). The enhanced transparency of the firm's mandatory derivative disclosures under FAS 161 issued by the Financial Accounting Standards Board (FASB) allows me to better understand how firms use derivatives and helps to understand why firms do selective hedging.[2] FAS 161 requires firms to disclose the classification of derivatives as hedge and non-hedge instruments and the fair value disclosure of derivatives in the balance sheet and income statement segregated by purpose and risk type (FASB, 2008). The standard also increases the frequency of derivative disclosures, and firms should prepare both quarterly and annual reports to disclose their derivatives.

In this study, I hand-collect detailed firm derivative positions to develop measures for selective hedging. I employ four proxies for firm selective hedging activities. My first two

[2] See Appendix A for discussion on accounting for derivatives.

measures rely on the firm derivative accounting disclosures separately for purposes under the requirement of FAS 161. Specifically, I look at the notional amounts and the fair value of firm non-hedge derivatives.[3] I also complement my selective hedging measures by following prior literature. Following Adam et al. (2015), my third selective hedging proxy relies on the time-series volatility in firm derivative holdings. The excess volatility implies frequent changes in derivative positions based on managers' market views (Adam and Fernando, 2006). My fourth selective hedging proxy is developed as the deviation of derivative holdings that is not explained by fundamentals. A greater deviation of the residuals indicates that a firm is more likely to use derivative time in the market (Adam et al., 2017; Beber and Fabbri, 2012).

I find that firms with management earnings forecasts provided by the manager are more likely to use selective hedging. Selective hedging likelihood increases by 6.3% to 9.3% when the manager provides MEF. I also find that managers increase the level of their speculative derivative activities following MEF issuance, and the effects on speculative derivative activities are strong when managers provide more frequent forecasts.

I further examine how the concern of falling below forecasted earnings affects selective hedging activities. I find managers with overestimated forecasts relative to actual earnings (optimistic MEF) have a higher level of selective hedging but no significant increase in speculative derivative if the manager underestimates earnings (pessimistic MEF). In addition, I find an increase in the extent of selective hedging when the manager issues an overestimated forecast relative to analyst consensus (good news MEF) and no association between selective hedging and bad news MEF. These asymmetric effects indicate different biases of management forecasts have different costs and, thus, different motivative effects on selective hedging.

[3] 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, I use both notional and fair value information to construct my selective hedging measures.

Managers face greater costs when they provide overestimated forecasts and, therefore, have stronger incentives to attain earnings via speculative derivatives.

To further support the hypothesis that managers speculate via derivatives when they expect earnings might fall below their previously disclosed forecast. I further examine how the effects of management forecast on selective hedging vary with the aggressiveness of the forecast. I measure the aggressiveness of the forecast relative to the actual benchmark and analyst expectations. If the manager uses selective hedging to mitigate the concern of falling below forecasted earnings, easily attainable forecasts should have little motiving effect (e.g., Hirst, 1987; Black, Gipper, and Stocken, 2021). I document that management earnings forecasts incentivize selective hedging only when the forecast is more and most aggressive.

Next, I investigate whether the positive association between management forecast behaviors and corporate selective hedging can be interpreted as causal evidence. In particular, a potential concern is that management's decision to issue a 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. I take several steps to address endogeneity concerns. First, I include firm, year, and quarter fixed effects in my estimates, which control for time-invariant factors that affect manager forecast decisions and selective hedging policy. Second, I rerun my tests by focusing on firms that maintain forecast issuance to ease the concern that my results are driven by factors affecting manager decisions in providing the forecast or not. My results do not change under the forecast maintainers sample.

Third, I utilize instrumental variable (IV) to establish a more direct causal link between MEF issuance and selective hedging. I create an IV based on the disclosure transparency of peer firms in the same industry. The identifying assumption is that the instrument affects corporate selective hedging primarily through its effect on firm forecast decisions. Forecast

disclosures made by industry peers induce firm MEF due to reduced uncertainty about the external environment and raising the capital market costs of nondisclosure (Seo, 2021). It seems reasonable to assume that industry peers' forecast behavior is uncorrelated to a firm's selective hedging decisions. I continue to find a significant relationship between MEF issuance and a higher level of selective hedging activities.

By benefiting from the detailed derivative information disclosures under FAS 161, I further decompose firm speculative derivatives used by risk types. I find the positive relation between MEF issuance and speculative derivatives is mostly driven by the use of foreign exchange derivatives. Therefore, I conduct analyses by particularly focusing on the use of foreign exchange speculative derivatives. By doing this, I can then specifically control the firm's foreign exchange rate risk exposures as managers design derivative strategies accordingly (Beber and Fabbri, 2012). I find that the forecast behaviors of the managers lead to increases in firm foreign exchange speculative derivatives.

To further understand the firm derivative use, I examine the relation between management earnings forecast behaviors and firm derivatives used for hedging purposes. Managers use selective hedging as it allows the manager to generate profits from price movement to attain forecasted earnings. There should be no incentive for managers to increase derivatives for hedging when the manager is concerned about being unable to achieve forecasted earnings, as hedging adds value to the firm only via reduced volatility in earnings (Pincus and Rajgopal, 2002). My results show an increase in firm total derivatives use induced by management forecast but no significant difference in the level of firm hedging derivatives. The results further address the measurement error concerns. The hedge designation disclosures under FAS 161 that my study relies on are informative regarding firm derivative uses.

This study makes contributions to the current risk management literature in several ways. First, my investigation of corporate derivative use is explored in greater depth than previously.

Prior research largely assumes hedging as the purpose of using derivatives and suffered from the inability to distinguish between hedge or speculation before FAS 161 (Chernenko and Faulkender, 2011). Second, as argued by Stulz (1996), financial situations and managers' belief in informational advantages are the prerequisites for exercising selective hedges. Subsequent studies focus on the factors associated with fundamental financial characteristics, corporate governance, and manager's 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). My study considers the unexplored angle, management earnings forecast behavior, to explain a firm's selective hedging activities.

I also contribute broadly to the literature on management earnings forecasts. Prior literature primarily focuses on why managers issue guidance (Hirst, Koonce, and Venkataraman, 2008). I am the first to show, with novel data, that a manager's incentive to attain forecasted earnings affects a firm's selective hedging activities. My 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. I 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 there is no motivational effect on a firm's production function to raise performance when managers issue aggressive forecasts. My results indicate a challenging forecast encourages managers' risk-taking by using derivatives for speculative purposes.

Literature has documented that managers may use accrual earnings management or market expectation adjustment to meet their forecasts (e.g., Kasznik, 1999; Gong, Li, and Xie, 2009; Xu, 2010; Yamada, 2016; Beyer, 2008; Hurwitz, 2018). However, earnings management incurs litigation risk and drives expectations down, causing negative market reactions (Matsumoto,

2002). Moreover, earnings management and expectation management have no impact on the firm's real cash flows (Dutta and Gigler, 2002), while selective hedging strategies enable managers to generate earnings from market movements.

My study also adds to the research on management forecasts and corporate derivatives. My study also adds to the research on management forecasts and corporate derivatives. Campbell, Downes, and Shwartz (2015) find that analysts and investors fail to understand corporate hedge accounting information but can better process hedge information when managers provide forecasts. Their focus is the usefulness of management disclosure to the market, which differs from my study. Campbell, Khan, and Pierce (2021) re-examine the investors' and analysts' disability in understanding hedge accounting, and FAS 161 improved financial statement users' understanding of the information conveyed by hedge accounting. More closely related to my studies, replying to the disclosure under FAS 133, Campbell, Cao, Chang, and Chiorean (2023) find that management forecast frequency increased when firms use derivatives to hedge effectively. My investigation under FAS 161 allows me to take advantage of the enhanced usefulness of financial reporting by showing the effect of management forecast only exists in firm speculative derivatives rather than hedging derivatives.

2 Hypotheses development

2.1 Actual earnings announcement

It is well documented in the literature that management earnings forecasts provide valuable information to investors for evaluation of firms' 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, inaccuracy in forecasting can expose

firms to litigation risks (Skinner 1994, 1997), negatively affect analysts' coverage and their accuracy (Trueman, 1994), and cause declines in market value (Beyer 2009). Meanwhile, earnings forecast 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). In addition, the costs associated with management earnings forecast errors are particularly high for firms with reported earnings falling below the management forecast earnings and increasing in the magnitude of the forecast error (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).

Kasznik (1999) finds that the wish to avoid the potential cost for both the managers and the firm creates an incentive for managers to manage earnings towards the forecast. Specifically, the firms with overestimated earnings (actual reported earnings below the forecasted earnings) have significantly higher accruals earning management. Kasznik (1999) also shows that the earnings management level increases with the probability and costs of potential litigation in connection with previous earnings forecasts. Discretionary accruals are widely used as a proxy for earning management. The literature provides evidence for a positive relation between a firm's level of accruals and management earnings forecast errors (Gong, Li, and Xie, 2009; Xu, 2010; Yamada, 2016). In the same spirit, Shaw (2003) shows that firms with better disclosure use accruals to smooth earnings more aggressively to support their disclosure during bad stock return years. However, several studies provide a contrary relation between management disclosures and earning management from the information asymmetry perspective. Lobo and Zhou (2001) and Jo and Kim (2007) argue for a negative relation between firms with better disclosure and earning management activities. They argue that

information asymmetry reduces as the level of corporate disclosure increases, which reduces the extent of opportunistic earnings management.

Earnings management activities will likely result in legal and reputation costs when actual numbers are revealed, and earnings manipulations are detected (Ding and Jaggi, 2021). The danger of earning management was highlighted after the Enron accounting scandal, which broke out in October 2001.[4] Several studies detect that managers may manipulate reported earnings or disclose pessimistic forecasts to avoid failing to meet expectations (Beyer, 2008). Specifically, the increased litigation risk and legal liability incentivize managers to disclosure conservatism forecasts to avoid falling below estimated earnings (e.g., Choi and Ziebart, 2004; Hurwitz, 2018; Matsumoto, 2002; Rostamy, Aghaee, and Biglari, 2008; Skinner and Sloan, 2002; Soffer, Thiagarajan, and Walther, 2000). To sum up, the literature has well documented the importance of achieving forecasted earnings, and managers use earnings management to ensure that forecast earnings are met.

While managers use earnings and expectation management to avoid overestimated earnings, both mechanisms entail costs. The first mechanism, earnings management, is difficult because auditors and boards of directors scrutinize questionable accounting practices. Valahzagharda and Mirzamomen (2013) find a significant positive correlation between earnings management and top management turnover. Moreover, because accruals reverse in subsequent periods, managers are unlikely to be able to use abnormal accruals to increase earnings above expectations every period continually. Earnings management is modeled as a "window dressing" action undertaken by the manager. Such a nonproductive action can

[4] In October 2001, Enron announced a $1 billion nonrecurring charge for accounting "errors", triggering a chain of events that eventually led to the demise of both the company and its external auditor, Arthur Andersen. Enron's record as the largest bankruptcy in U.S. history was soon eclipsed by WorldCom, whose less sophisticated accounting fraud led to a larger restatement of earnings, a larger bankruptcy filing, and equally far-reaching civil and criminal investigations. Federal and state regulators subsequently initiated fraud investigations at dozens of corporations, including Adelphia, HealthSouth, McKesson, Tyco, and Qwest (Kon et al., 2008, p 1069)

improve the firm's reported accounting earnings and have no impact on the firm real cash flows or economic earnings (Dutta and Gigler, 2002). The second mechanism that managers can use is expectation management. Intentionally providing pessimistic forecasts could also induce the cost of inaccuracy. And driving the expectation downward can cause the stock market to react negatively (Hirst et al., 2008).

Prior research suggests managers can also use derivatives for smoothing earnings (Barton, 2001; Brown, 2001; Pincus and Rajgopal, 2002; Graham et al., 2005; Chernenko and Faulkender, 2011). Brown (2001) provides field-study evidence that corporate hedging decisions are partly motivated by a desire to smooth accounting earnings. Barton (2001) and Pincus and Rajgopal (2002) argue that firms use accounting accruals and derivatives as substitutes to smooth earnings. Chernenko and Faulkender (2011) show that interest rate swaps are greater in years when firms are more likely to have managed earnings. Manchiraju et al. (2014) find that speculation gains are associated with the likelihood of meeting or beating consensus analyst earnings and the previous year's earnings. Firms admit in the business press that they use (selective) hedging to boost their reported earnings. For example, Chesapeake Energy Corp, as an active trader in the derivative market, has successfully relied on derivatives to generate profits.[5]

Using derivatives for hedging purposes creates value for the firm by managing volatility risks, but it simultaneously foregoes opportunities to obtain additional returns. On the other hand, selective hedging is a profit-oriented behavior (Glaum, 2002; Stulz, 1996). It attempts to minimize the exposure to adverse price movements and maintains the upward benefits. In particular, the firm hedges only those positions on which they expect a loss while leaving open positions on which they expect a gain (Glaum, 2002). They intentionally leave some of their

[5] 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).

position unhedged to generate profits from managers' active market views on future price movements. Stulz (1996) views the aim of selective hedging as the purchase of "well-out-of-the-money put options" that eliminate the downside while preserving the upside benefits. Managers are motivated to use derivatives for speculative purposes, given that they can often reap large gains for success but bear relatively few costs for failed ones (Lins et al., 2011).

Firms can benefit from derivative hedges against uncertainty in the financial market (Mayers, 1977). Using hedging derivatives can help the firm smooth income by reducing the time-series variability in reported earnings (Pincus and Rajgopal, 2002). However, under the concern of being unable to achieve forecasted earnings, mitigation of earning volatility cannot solve the problem. Instead, selective hedging could alleviate the threat of falling below forecasted earnings. In other words, mitigation of earnings volatility and enhancement of earnings are well-balanced as the objectives of corporate selective hedging use. The benefits brought from both derivative hedging and speculating are contemplated, which drives the application of selective hedging for management earnings forecast providers. Therefore, the first hypothesis is:

Hypothesis 1: Firms with management earnings forecasts are more likely to conduct selective hedging.

I further classify earnings forecasts into optimistic and pessimistic forecasts. Optimistic and pessimistic forecasts are defined relative to the actual realized earnings. I do so because the motivational effect of those management forecasts could be different. Bourveau et al. (2018) suggest managers are afraid of being sued for making optimistic earnings forecasts that are not realized. Still, it is unlikely that investors would take legal action against managers for being too pessimistic and achieving higher earnings than expected. Therefore, I expect managers who provide optimistic forecasts to have a stronger incentive to attain the forecast earnings to avoid litigation costs. As suggested by Kasznik (1999), managers are motivated to manage the

earnings towards the forecasted number when they expect earnings might fall below their previously disclosed forecasts. In other words, managers who overestimate earnings are more likely to take action to mitigate their forecast errors. However, the easily attainable forecasts (i.e., prismatic forecasts) have little motivating effects.

Hypothesis 2: Firms with optimistic management earnings forecasts are more likely to conduct selective hedging.

2.2 Good news forecast

Management forecasts represent one of the key voluntary disclosure mechanisms through which managers establish or alter the market's earnings expectations, preempt litigation concerns, and influence their reputation for transparent and accurate reporting (Hirst et al., 2008). Investors' reaction to the news in the forecast is expected to be a function of the new information about future cash flows and the credibility of the forecast (Jennings, 1987), where credibility refers to the extent to which investors perceive the forecast to be believable. The concern about credibility arises because management forecasts are voluntary and unaudited disclosures over which managers have substantial discretion (Healy and Palepu, 2001). Good and bad news management earnings forecasts are made for different reasons, in different ways, and have different effects on stock prices. Good and bad news forecasts are defined relative to the analyst consensus estimates. Verrecchia (1983) suggests that managers release good news forecasts to increase their firms' stock prices. Because investors understand managers benefit from higher stock prices, they are naturally skeptical about good news earnings forecasts. Managers benefit from these higher stock prices when they have stock-based compensation. If managers release good news forecasts to increase their firm's stock prices, they must be credible to investors. Therefore, managers need to take action to improve the plausibility of firms meeting managers' earnings forecasts, thus enhancing the credibility of their optimism (compared to analyst consensus).

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). Furthermore, as documented in the literature, managers are incentivized to avoid litigation risks and costs (e.g., Choi and Ziebart, 2004; Rogers and Stocken, 2005; Xu, 2009). 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, I argue that managers can increase the credibility of their earnings forecasts by conducting selective hedging to achieve their projections. Based on these arguments, I predict that:

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

3 Data

I 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. I hand-collect the derivative positions data from the 10-K and 10-Q fillings. I obtain the management earnings forecasts, analyst earnings forecasts, and actual earnings data from I/B/E/S, financial performance data from Compustat, and stock returns data from the CRSP. My 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. I end up with a sample of 214 firms and 4,280 firm-quarter observations.

3.1 Selective hedging

I 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. [6]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 my sample report the details of notional amounts of derivatives. I 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 fair value of non-hedge derivative assets and liabilities scaled by 1,000.

[6] 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

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

I 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).

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

My fourth measure of selective hedging is the deviations from a firm's derivative position. First, I 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. I 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, I 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.

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

3.2 Management earnings forecast

This paper uses I/B/E/S guidance to identify firm quarters in which managers issue both annual and quarterly forecasts of earnings per share (EPS). For those firms offering management forecasts, I use the first forecast offered during the current fiscal period (Black et al., 2021; Hirst et al., 2008; Roger and Stocken, 2005). If a management forecast was offered for the current fiscal period prior to or after the current fiscal period, then such guidance is excluded. Management forecasts issued before the current period's upcoming earnings announcement (i.e., preannouncement forecasts) and outside the current fiscal period cannot help the manager commit because the period has ended. Instead, these preannouncement forecasts aim to reduce the magnitude of negative surprises when earnings are announced (e.g., Skinner, 1994; Soffer et al., 2000).

I obtain the analyst earnings forecast from the I/B/E/S Unadjusted files.[7] I 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. I 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, I follow the literature and restrict the sample to earnings forecasts with a horizon between one and twelve months (e.g., Clement, 1999; Harford et al., 2019). Next, I define the consensus earnings forecast as the mean of all analysts' most recent earnings forecasts issued prior to the earnings announcement.

I hypothesize that the managers who provided earnings forecasts are motivated to achieve earnings towards the forecasts. I examine the following four variables to capture a manager's forecast behavior. First, management earnings forecast (MEF) is an indicator variable that

[7] Following Diether et al. [2002], I 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. I adjust the unadjusted forecasts for stock splits using CRSP split factors in order to better align the (unrounded) forecasts and actuals.

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, I focus on economically meaningful management earnings forecasts (Kothari, Shu, and Wysocki, 2009; Bourveau et al., 2018). An $Optimistic\ (Pessimistic)\ MEF$ is the 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).

3.3 Control variables

Following previous studies, I control for a set of firm characteristics. $Size$ is defined as the logarithm of total book assets. Stulz (1996) suggests the explanatory power of firm size in selective hedging, as large firms have informational advantages in predicting market movements. Besides the private information of market movement, the second condition to take the selective hedges is adequate financial strength a firm has (Stulz, 1996). Without adequate financial strength, taking the risk of selective hedging could make the firm intolerant of potential losses. Though adequate financial strength is discussed as a condition in Stulz (1996), it does not explain the incentive to selectively hedge when firms are financially strong. After all, the purpose of selective hedging is to obtain extra returns. Taking into account the purpose of selective hedging, Stulz (1996) admits that firms in financial distress could also hedge selectively for extra returns. As pointed out by Campbell and Kracaw (1999), financially constrained firms with good projects may speculate more to generate more funds for optimal investment. I 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). I also include tax carryforward loss (Tax) to control for 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. I 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. My sample consists of 4,280 firm-quarter observations of S&P 500 firms over 2017-2021. I winsorize all the continuous variables at 1st and 99th percentiles to lessen the influence of outliers. $Speculation\ Notional\ Dummy$ and $Speculation\ FV\ Dummy$ indicate where firms in my sample do not designate at least a subset of their derivatives as hedges. I 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.[8] In my sample, the higher

[8] 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 my 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).

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 my sample, 37.6% of firm-quarters provide management earnings forecasts, 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 I 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, I 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 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 management earnings forecasts 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, I 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. I 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

I 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.

I also find substantively similar results when I add manager-level control in column 2 and column 4.

I 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. I 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 my 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

I also complement my 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. I 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. I find consistent results across the other three proxies of selective hedging.

INSERT TABLE 5 ABOUT HERE

4.3 Optimistic forecast

Thus far, my 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 biases of management forecasts 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, I 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%).

I present the test results of my Hypothesis 2 in Table 6. I 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, I 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

I then investigate the aggressiveness of the forecast relative to external performance expectations, which are analysts' expectations (Hypothesis 3). I 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). I 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 my 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

5 Forecast aggressiveness

Black et al. (2021) find the commitment device's effect varies with the management forecast's aggressiveness. I then investigate whether the forecast is likely to affect the selective hedging depending on the aggressiveness of the forecast. Specifically, I 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 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 I 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, I only find the effect of forecasts on selective hedging when they are aggressive.

Compared with the results of Black et al. (2021), we both find easily attainable forecasts are ineffective, as low thresholds that do not require effort to attain have little motivating effect (e.g., Chow, 1983; Hirst, 1987). In contrast, Black et al. (2021) find using forecasts as an incentive is effective at raising firm performance for moderately aggressive forecasts but find no association with firm performance for the more aggressive forecasts. When they focus on a firm's production function to raise firm performance, forecasts that are difficult to attain adversely affect the motivation of managers and employees to exert themselves. My results indicate a challenging forecast encourages managers' risk-taking by using derivatives for speculative purposes. Selective hedging via derivatives is an appropriate tool for managers in this situation, as managers can often reap large rewards from successful bets but bear relatively few costs for failed ones (Lins et al., 2011).

INSERT TABLE 8 ABOUT HERE

6 Endogeneity Concerns

My 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.

I note that in my analyses thus far, I 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.

6.1 Forecast maintainers

To address endogeneity concerns, I rerun my tests by focusing on firms that maintain forecast issuance to ease the concern that my results are driven by factors affecting manager forecast decisions. I 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, my 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). My 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

6.2 Identification

I further utilize instrumental variable (IV) to establish a more direct causal link between management earnings forecast and selective hedging. I instrument for management earnings

forecast using the disclosure choices of its industry peers. Formally, I 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. 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 my 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, I identify a plausibly valid instrument and present the results of this IV analysis in Table 9.

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 9 presents the results of the two-stage least squares IV regressions that use $Ind\ MEF\%$ as IV for the firm's management earnings forecast 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 management earnings forecast is approximately 55.69, making it unlikely that I will encounter bias due to a weak instrument problem. Focusing on the second-stage results in columns 2 to 5, I continue to find the management forecast issuance effects in a firm's selective hedging activities.

INSERT TABLE 10 ABOUT HERE

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), I then examine how the firm uses different types of risk derivatives to attain the forecast target.

For brevity, I show the results when selective hedging is measured based on the notional value of different types of non-hedge derivatives. Table 11, 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 my 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 11 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. I 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 my expectations. In my 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, I 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 my sample (with a mean value of 0.0004).[9]

I then 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

[9] 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).

allows me to control for the exposure to exchange rate risk, which is proxied by foreign sales of the firm (Berber and Fabbri, 2012).

I show the results in Panel C. In column 1, I 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. I 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 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 11 ABOUT HERE

7.2 Do firms use hedging purpose derivatives to meet forecasts?

My 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 my 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 me to examine the relation between management earnings forecast behaviors and firm derivative use separately by purpose. I show the results in Table 12. I first show the results of how management earnings forecast 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 management earnings forecasts.

I then examine whether managers use hedging purpose derivatives to mitigate the concern of falling below management forecasts. As expected, I find no association between my management earnings forecast 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, my results also confirm the informativeness of the accounting designation of derivatives that my study relies on.

INSERT TABLE 12 ABOUT HERE

8 Conclusion

Using hand-collected detailed firm-quarter-level data on corporate derivatives positions, I document that firms with management earnings forecasts are more likely to engage in selective hedging. There is an increase in speculative derivative activities when managers make overestimated earnings forecasts. This is because managers are concerned that earnings might fall below what they previously forecasted. The concern about forecast credibility also arises if managers provide overestimated forecasts compared to analyst consensus, which motivates the managers to increase selective hedging activities.

I find no evidence that managers with underestimated forecasts (relative to the actual earnings or analyst consensus) increase selective hedging. This implies that easily attainable forecasts provide little motivation. I find supportive evidence that more aggressive forecasts are associated with a substantial increase in speculative derivatives, whereas less aggressive forecasts yield no selective hedging. I also find that the use of foreign exchange speculative derivatives primarily drives increased selective hedging activities. Additional tests indicate no increase in derivative use for hedging purposes motivated by forecasts.

I recognize the following limitations in my study. I utilize the disclosure transparency of industry peers as an IV to help establish a causal link between MEF issuance and selective

hedging. By doing this, I assume that the IV would have to affect a firm's selective hedging decision only by affecting the management forecast issuance. The primary way this IV would fail the exclusion restriction is if industry economic factors affect both the disclosure of industry peers and firm selective hedging activity. For example, a positive industry expectations shock could increase industry peers' forecasting, and speculation might also increase because there will be more pressure on the firm to increase earnings. Although this seems unlikely, a focal firm can change all aspects of real operations (e.g., capital structure, budgeting, investment, etc.) in response to the peers' forecasting increase. For the next step, I will explore more on econometrics guidance to demand that this is not a weak IV.

Using the improved transparency of the firm's mandatory derivative disclosures, my research addresses the issue identified in previous studies concerning the inability to distinguish between hedge and speculation. Under the concern of unattained targets, survey evidence shows managers are willing to make sacrifices in the economic value. However, managers hesitate to employ accounting adjustments to manage earnings (Graham et al., 2005). My study reveals managers alternatively speculate via derivatives to attain earnings.

The results have practical implications. Using derivatives to hedge selectively creates unpredictability, and significant risk is associated with selective hedging. The risk management strategy of a firm has significant value implications for stakeholders' wealth. Firms using derivatives often claim that their use is to hedge their business and financial risks. Yet, several firms have suffered huge losses on their derivative positions. My study has significant policy implications regarding the firm's risk profile.

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.

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.

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.

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, 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.

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.

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.
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, 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
Earnings Forecast 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 bias is greater than 10% (smaller than -10%) and zero otherwise. Forecast bias 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 management earnings forecasts in both the current and previous quarters. The dummy variable is set to zero if the firm issues management earnings forecast in the previous quarter only.	I/B/E/S Guidance Detail
Firm Characters		
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

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. I 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
Management Earnings Forecast 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 Bias	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

Table 3: Logit Regression

The table reports marginal effects from logit regression of selective hedging on the issuance of management earnings forecast. 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 management earnings 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. 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 management earnings 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. 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 Ownership		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 management earnings forecast 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 bias is greater than 10% (smaller than -10%) and zero otherwise, where forecast bias 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 management earnings forecast 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 management earnings forecast 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 management earnings forecast 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 management earnings forecasts in both the current and previous quarters. The dummy variable is set to zero if the firm issues a management earnings forecast 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: Instrumental Variable Analysis

The table reports results from two-stage least squares regressions of selective hedging on management earnings forecast 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), I 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), I 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 11 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 management earnings forecast 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 management earnings forecast 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 12: 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

Appendix A: Accounting for derivatives

Derivative usage can be opaque to investors because the disclosure requirement for corporate derivatives is limited. In this section, I 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[10]. 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 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.[11] 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

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

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.[12] 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 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, I 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

[12] 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).

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 and 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).