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INVESTORS' REACTIONS TO MANAGEMENT EARNINGS FORECASTS: THE EFFECTS OF CHANGES IN FORECAST PRECISION AND INVESTOR PREFERENCES

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BY

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ABSTRACT

This study examines the effects of changes in management earnings forecast precision (i.e., changes in the width of the forecast range) and investor preferences on investor judgments. In general, prior research finds that more precise management forecasts are more credible than less precise management forecasts (e.g., Baginski et al. 1993). Nevertheless, when economic uncertainty is high, investors do not prefer very precise forecasts over less precise forecasts (Du et al. 2011). Based on the concept of credibility from Mercer (2005) and motivated reasoning theory from Kunda (1990), I predict that investors' reactions to changes in forecast specificity will be based on their preferences for firm performance. Specifically, I predict that investors holding a long position will judge management to be more competent when the forecast range narrows, but more trustworthy when the forecast range widens. In contrast, I predict that investors holding a short position will judge management to be less trustworthy when the forecast range narrows, but less competent when the forecast range widens. I use an experiment to test these predictions. While results do not support the predictions above, I do find evidence that: (1) changes in forecast specificity affect investors' judgments of economic uncertainty, and (2) investors' perceptions of managerial trustworthiness and competence have predictable consequences for firm management. Specifically, in regard to the former, I find that investors perceive the greatest increase in economic uncertainty when holding a long position and the forecast range widens; conversely, I find that investors perceive a decrease in economic uncertainty when holding a short position and the forecast range narrows. In regard to the

consequences of managerial credibility, I find investors' belief that the manager is manipulating earnings is decreasing in perceived managerial trustworthiness. In addition, I find that investors' willingness to retain the CEO is increasing in perceived managerial competence, but, after controlling for perceived managerial competence, investors' decision to retain the CEO is not reliably related to perceived managerial trustworthiness.

CHAPTER I. INTRODUCTION

This study examines how changes in management earnings forecast (MF) precision combines with investors' preferences for firm performance to impact perceived managerial credibility. Management earnings forecasts are important voluntary disclosures and are the subject of much attention in the accounting literature (Healy and Palepu 2001).[1] For example, Beyer et al. (2010) find that MF provide over half of the accounting-based information used by the stock market; that is, MF explain more quarterly stock market return variance than do earnings announcements, earnings preannouncements, analysts forecasts, and SEC filings combined. Further, MF are of continuing interest to accounting researchers because of the extensive variation in forecast characteristics, and because relatively subtle differences in earnings forecast characteristics can be important to investors (e.g., Jensen and Plumlee 2013; Hirst et al. 2008; Mercer 2004).

Prior research on MF precision usually compares point versus range forecasts (e.g., Pownall et al. 1993; Baginski and Hassell 1997; Hirst et al. 1999) and narrow versus wide range forecasts (e.g., Libby et al. 2006). In contrast, there is little research on the effects of *changes* in forecast precision over time.[2] Nevertheless, managers can and do change earnings forecast precision, as is depicted by the following news excerpt:

[1] Management earnings forecasts are management's *prediction* of earnings that are released prior to the earnings announcement date (King et al. 1990). These forecasts are distinct from earnings preannouncements, which are the disclosure of tentative earnings made shortly before the formal earnings announcement (Soffer et al. 2000).

[2] One exception is a working paper by Jensen and Plumlee (2013) that examines changes in forecast range for updated earnings forecasts as the year progresses.

> Procter & Gamble Co. gave a wider-than-normal outlook for the coming year, reflecting broad uncertainty due to global economic jitters, another big increase in commodity costs and whether price increases will stick entirely. (Ziobro 2011)

In this study, I employ theories from two areas of accounting and psychology research to examine the effects of changes in management earnings forecast precision. The first theory I employ is motivated reasoning theory from social psychology (Kunda 1990). Motivated reasoning theory predicts that decision makers process information in a manner that is consistent with their preferences. Recent research in accounting indicates that investors engage in motivated reasoning, even when they have economic incentives to objectively process information (e.g., Hales 2007; Han and Tan 2010). For instance, Hales (2007) finds that investors are motivated to agree with information that indicates they will make money on their investment and disagree with information that suggests they will lose money on their investment. In general, studies such as Han and Tan (2010) and Hales (2007) operationalize directional preferences by comparing investors who are "long" a stock to investors who are "short" a stock. Investors hold a long position in a stock when they purchase the stock before selling it; in contrast, investors hold a short position in a stock when they borrow the stock, sell it to another investor, and then purchase the stock at a later date. Therefore, investors who are long a stock profit when the company's stock performs well (because they purchase the stock before selling it); in contrast, investors who are short a stock profit when a company's stock performs poorly (because they purchase the stock after they sell it). The implication of this operationalization is that investors who are long a stock

interpret information about the company optimistically (in terms of company performance) and investors who are short a stock interpret information about the company pessimistically (in terms of company performance) (Hales 2007; Han and Tan 2010).[3] On the whole, these studies support a growing body of research in behavioral economics that indicates investor sentiment affects market participants' interpretation of economic information (Akerlof and Shiller 2009).

The second theory I employ is managerial credibility.[4] Perceived credibility contains two components: beliefs about management's trustworthiness and beliefs about management's competence (Mercer 2005; Hovland et al. 1953; Giffin 1967).[5] As such, decision makers' judgments about managerial credibility are driven by their beliefs about management's trustworthiness, competence or both. Nevertheless, current accounting research has only focused on the overall concept of perceived credibility rather than on the subcomponents of trustworthiness and competence (e.g., Hirst et al. 1999; Hirst et al. 2007; Mercer 2005).[6] In this study, I develop specific predictions about how perceptions of managerial competence and trustworthiness are affected by changes in earnings forecast precision, depending on investors' preference for company performance.

[3] Note that a number of auditing and tax studies investigate motivated reasoning in different contexts (Bonner 2008).

[4] Attribution theory (e.g., Kelley 1967; Weiner 1992), whereby investors make internal or external attributions regarding voluntary disclosures, provides an alternative framework for investigating MF. However, in the current study I develop hypotheses based on the theories of motivated reasoning and managerial credibility.

[5] Mercer (2005) defines managerial reporting credibility as "investors' beliefs about management's trustworthiness and competence in financial disclosure." In this paper I adapt Mercer's (2005) definition to encompass *overall* managerial credibility. Further, as in Mercer (2005), I define managerial credibility as determined by investors' perception rather than a "true" (but unobservable) underlying credibility.

[6] Although prior research measures trustworthiness and competence (e.g., Mercer 2005) these studies make and test hypotheses on composite indices of these two components.

Corporate managers emphasize the importance of developing a track record of credibility (Graham et al. 2005), but the implications of forecast precision on credibility are uncertain. Several studies find that more precise earnings forecasts are perceived by investors as more credible (e.g., Baginski et al. 1993; Hirst et al. 1999). Nevertheless, disclosing precise forecasts is inherently risky in that it increases the chance of missing the forecast (Mercer 2004). I posit that investors are aware of this inherent tension, and that investors' directional preferences (e.g., due to long or short positions) lead them to interpret changes in management earnings guidance precision in accordance with their motivational preferences—in other words, I expect investors with a long position to interpret changes in forecast precision optimistically (in terms of company performance) and investors with a short position to interpret changes in forecast precision pessimistically (in terms of company performance). However, I expect that these relations are not direct, but are caused by changes in the underlying components of credibility—trustworthiness and competence.

In particular, I predict that in the case where management widens the forecast range from the prior period, investors with a long position will (optimistically) perceive management as *more* credible because they are *more trustworthy* than previously; conversely, I predict that investors with a short position will (pessimistically) perceive management as *less* credible because they are *less competent* than previously. I expect the opposite relations in the case where management narrows the forecast range from the prior period. In particular, I predict that investors with a long position will (optimistically) perceive management

as *more* credible because they are *more competent* than previously; conversely, I predict that investors with a short position will (pessimistically) perceive management as *less* credible because they are *less trustworthy* than previously.[7]

I use an experiment to test these predictions. Although theoretical and empirical-archival research on management earnings guidance precision is possible (see, e.g., Baginski et al. 1993; Rogers and Stocken 2005; Pownall et al. 1993; Jensen and Plumlee 2013), an experiment allows me to hold constant factors such as actual earnings realizations and other features of the information environment. In addition, investors' judgments of competence, trustworthiness, and credibility are not available in archival databases. Therefore, an experiment is necessary to test my predictions.

Overall, results do not support my predictions regarding changes in managerial credibility. Consistent with prior research, I find that the two components of managerial credibility (trustworthiness and competence) seem to measure the same construct—a result that is inconsistent with my predictions. In addition, I find small, positive changes in perceived credibility for investors holding a short position, and small, negative changes in perceived credibility for investors holding a long position. Investors holding a long (short) position reported initial perceptions of managerial credibility that were relatively high (low). Therefore, my main results may be driven by mean reversion rather than motivated reasoning.

In addition to my hypotheses related to credibility, I make complementary predictions about investor perceptions of economic uncertainty and about the

[7] In this study I hold the level of earnings constant across conditions.

consequences of investor perceptions of managerial trustworthiness and competence. I do find support for these additional predictions. In particular, I find that investors perceive the greatest increase in economic uncertainty when holding a long position and the forecast range widens; conversely, I find that investors perceive a decrease in economic uncertainty when holding a short position and the forecast range narrows. In addition, I find that investors' belief that the manager is manipulating earnings is decreasing in perceived managerial trustworthiness, and that investors' willingness to retain the CEO is increasing in perceived managerial competence, but, when controlling for perceived competence, investor willingness to retain the CEO is not reliably related to perceptions of managerial trustworthiness.

Although I test my hypotheses in the context of management earnings forecasts, the theory should be relevant to a number of managerial decisions, because there are many such choices that can be interpreted in multiple ways. For example, reductions in segment disclosure could be interpreted as either increasing agency costs or reducing proprietary costs (e.g., Berger and Hann 2007). A second example is that an increase in inventory level can be interpreted positively (e.g., as an indication of higher future sales) or negatively (e.g., as an indication that management cannot adequately control working capital) (Bernard and Stober 1989). Other examples include increases in backlog, which could indicate either growing demand or an inability to complete projects (Dutta and Trueman 2002), and a decrease in market share, which could indicate a either a lack of competitiveness or disciplined operations in the face of irrational competition (Schifrin and Touryalai

2012). Overall, in the case of any of these management disclosures, investors' motivated preferences are likely to affect their evaluation of management credibility through predictable effects on perceived management competence and/or trustworthiness. Thus, although I focus on one specific disclosure choice, the theoretical contribution applies broadly to management disclosure and other choices.

This study makes use of an important and frequent aspect of the financial reporting environment—changes in management earnings forecast precision —to make several contributions to the accounting and psychology literatures. First, I answer the call of Hirst et al. (2008) to contribute to our understanding of the interactions between management earnings forecast antecedents, characteristics, and consequences. Specifically, I examine how changes in MF precision affect investors' perception of managerial trustworthiness and competence. Second, and relatedly, my study has implications for corporate managers. Executives surveyed by Graham et al. (2005) report that they pay a lot of attention to their own personal reputation, and that many executives issue earnings guidance to manage market expectations. While my main predictions are not supported, I do find evidence that investors' perception of economic uncertainty is affected by investor position and changes in forecast precision. In addition, I find that, controlling for perceived trustworthiness, investors' decision to retain the CEO is positively related to perceived competence. In contrast, I find that, controlling for perceived competence, investors' decision to retain the CEO is not reliably related to perceived trustworthiness.

The next section discusses the background for the paper and hypothesis development. Section three develops my experimental design. Section four describes my experimental results. Section five concludes.

CHAPTER II. BACKGROUND, THEORY, AND HYPOTHESES

This section discusses three areas of prior literature and theory: management earnings forecasts, managerial credibility, and investor preferences. I follow this discussion with development of my hypotheses.

Management Earnings Forecasts

Management earnings forecasts (MF) is important to financial reporting, both in terms of the information content provided to capital markets (e.g., Beyer et al. 2010), and in terms of importance to the accounting literature (e.g., Hirst et al. 2008; Healy and Palepu 2001). My study is closely related to several areas in this literature. I begin this section with a discussion of MF and MF characteristics. Then, I discuss prior research on MF precision.

Background and Earnings Forecast Characteristics

Management earnings forecasts are voluntary disclosures containing management's prediction of earnings (King et al. 1990; Hirst et al. 2008).[8] Such forecasts provide important information to investors; Beyer et al. (2010) find that MF provide about 55% of accounting-based information used by the stock market. Specifically, MF explain more quarterly stock return variance than earnings announcements, earnings pre-announcements, analysts' forecasts, and SEC filings combined.

[8] The term earnings "guidance" is synonymous with earnings forecasts (Hirst et al. 2008).

In addition to the choice of *whether* to issue earnings forecasts (see, e.g., Frankel et al. 1995; Hirst et al. 2008; Chen et al. 2011),[9] managers who choose to issue earnings forecasts have significant discretion in the characteristics of the forecast, including forecast form. Generally, earnings forecasts can take either qualitative (i.e., nonnumeric)[10] or quantitative formats. Examples of quantitative formats include point, range, minimum estimate, maximum estimate, or hybrids of these forms (Hirst et al. 2008; Han and Tan 2007).[11]

Prior research finds that managers employ this wide array of forecast formats, but the frequency of the alternative MF formats is changing over time. Early research on MF form found a wide distribution of formats, including point forecasts, range forecasts, and other forecast formats (Baginski et al. 1993; Baginski et al. 2004; Hutton et al. 2003). In contrast, the most recent archival research finds that the mix of MF formats shifted markedly toward range formats; by 2010, 87.5% of forecasts were in range format, 11.3% were in point format, and only 1.2% were in other quantitative or qualitative formats (Ciconte et al. 2013, Table 1). Next, I discuss prior archival and experimental research on MF precision that is related to my study.

[9] Jensen and Plumlee (2013, Table 1) find 3,717 distinct firms that issue at least one annual MF in the period August 2000 – June 2011. Therefore, firms that issue annual MF constitute a substantial minority of all of the publicly-traded companies in the United States.

[10] Examples of qualitative MF are as follows. "We anticipate EPS to be higher/lower next quarter." "We anticipate EPS to be roughly flat year over year."

[11] Examples of quantitative MF formats are as follows. Point: "We anticipate EPS of $1.05." Range: "We anticipate EPS to be between $1.04 and $1.06." Minimum: "We anticipate EPS of at least $1.04." Maximum: "We anticipate EPS of at most $1.06." Hybrid: "We anticipate EPS of $1.05 plus or minus $0.01."

The Impact of Management Forecast Precision

Baginski et al. (1993) study the stock market reactions to various levels of MF precision. Based on theory by Kim and Verrecchia (1991), Baginski et al. (1993) find that stock market reactions to signals in MF are increasing in MF precision. In addition, based on a Bayesian belief revision model in Morse et al. (1991), Baginski et al. (1993) find that the dispersion of *analysts'* ex post earnings forecasts increases when the precision of MF signals greater uncertainty than impounded by analysts' prior (ex ante) earnings forecasts.[12] Bamber and Cheon (1998) examine both the determinants and the consequences of MF precision. They find that managers who are more exposed to legal liability (specifically, in firms with large nonaffiliated block shareholders and declining earnings trend) disclose less specific MF, and that analysts' ratings of investor relations are increasing in MF precision.

As part of a larger study on MF precision, Jensen and Plumlee (2013) examine the effects of changes in managers' annual earnings forecasts as the year progresses, and find that MF generally become more precise as the yearend earnings release approaches. Jensen and Plumlee (2013) contend that this result indicates managers have higher confidence in their estimates as the reporting year progresses. Further, Jensen and Plumlee (2013) examine investors' and analysts' reactions to changes in MF precision as the year progresses. They find that decreases in MF precision as the year progresses have a statistically significant negative impact on

[12] In contrast to several of the studies discussed, Pownall et al. (1993) find that MF are *less* informative than earnings announcements. Also, Pownall et al. (1993) do *not* find statistically significant differences in stock price reactions to different MF precision.

both analysts' earnings forecasts and on stock returns, likely because such decreases in precision contrast with the general tendency for managers to be more confident in their annual earnings forecasts as the yearend reporting date approaches.

In addition to this archival literature, a number of experimental studies examine the effects of MF precision (Han 2013). Hirst et al. (1999) examine the effects of point versus range MF, both when prior MF were accurate and when prior MF were inaccurate. They find no effect of MF precision on investors' own EPS forecasts; however, they find that investors' confidence in their own forecasts is influenced by MF precision, but only when prior forecast accuracy is high.[13] Libby et al. (2006) study the effects of MF precision (point, narrow range, wide range) and MF bias. They find evidence for a "range precision effect" whereby analysts attribute MF precision to different factors. In the case of wide range MF, the analysts apparently attributed MF bias to temporary, situational factors, such as uncertainty in the business environment, with less credit or blame given to management (Tan and Lipe 1997). In the case of narrow range, Libby et al. (2006) posit that the analysts made more dispositional attributions because either the managers failed to anticipate actual uncertainty in their MF, or they were unable to manage the uncertainty.[14]

Han and Tan (2010) examine the effects of investment position (long vs. short), news valence implied by MF (positive vs. negative) and MF precision (point

[13] This finding is also supported by Han and Tan (2007), who find that nonprofessional investors have greater confidence in their own earnings estimates when management forecasts explicitly provide point estimates.

[14] Libby et al. (2006) do not test these psychological explanations directly (for example, through a mediation analysis). Instead, they infer the range precision effect using two experiments.

vs. range). They find that nonprofessional investors' position (which, as discussed below, influences information processing) affects their own earnings forecasts when both news valence implies positive news for the firm *and* earnings guidance is in range format, but not when news valence is negative or earnings guidance is in point format. Han and Tan (2010) posit that investor position does not affect EPS forecasts when MF implies negative news for the firm because negative news is inherently more credible than positive news (Sansing 1992). In addition, Han and Tan (2010) contend that investor position manifests in investors' EPS forecasts (i.e., investors with a long position predict higher EPS than investors with a short position) with range MF (and not point MF) because of the greater uncertainty and vagueness implied by the range.

Rupar (2011) examines the effects of forecast form (point vs. range) and environmental uncertainty (high vs. low) on perceptions of managerial credibility and on investors' estimated stock prices. She hypothesizes that when there is a misalignment between forecast form and environmental uncertainty (i.e., if MF is in point [range] form and environmental uncertainty is high [low]), investors will judge management to have relatively low credibility, and thus investors will predict relatively low stock valuations. Rupar's (2011) results generally confirm these predictions.

In a series of related studies, Du (2009), Du et al. (2011) and Christensen et al. (2013) also examine precision formats. Similar to Han and Tan (2010), Du (2009) examines MF precision (point vs. range) and MF favorability (favorable vs. unfavorable); she finds that nonprofessional investors allocate the most resources to

companies issuing favorable range MF. Du et al. (2011) and Christensen et al. (2013) examine the "congruity hypothesis," which predicts that people prefer messages (e.g., management forecasts) to be communicated in a form that is congruent with the underlying uncertainty regarding the message being communicated.

Specifically, Du et al. (2011) examine point, narrow range, and wide range forecasts, along with low and high business uncertainty. Overall, they find that nonprofessional investors prefer narrow range forecasts to both point and wide range forecasts; in addition, they find when investors compare forecasts for two companies side by side (one point and one range), range forecasts are judged as more informative, more accurate and more credible than are point forecasts. Furthermore, the preference for narrow range over point forecasts is stronger when environmental uncertainty is high than when environmental uncertainty is low. Christensen et al. (2013) extend Du et al. (2011) to the financial statements themselves—a setting that in practice *only* uses point estimates (e.g., allowance for doubtful accounts = $100). They find that, when environmental uncertainty is relatively high, investors prefer both narrow and wide ranges to point amounts; in addition, investors view both narrow and wide ranges as more accurate, more credible, and more informative than point amounts, especially during high environmental uncertainty.

My study is similar to Rupar (2011), Du et al. (2011), and Christensen et al. (2013) but differs in at least three important ways. First, Rupar (2011) finds (in her situation) that the components of credibility (competence and trustworthiness)

measure the same construct (as measured by Cronbach's alpha) while Du et al. (2011) and Christensen et al. (2013) measure credibility as a univariate construct; as I discuss below, I predict that (in contrast to prior research) the two components of credibility measure *separate* constructs, at least in the context of changing MF precision. Second, these three studies experimentally manipulate environmental uncertainty, while I predict investors will actively construct beliefs about the importance of environmental uncertainty to reach their preferred conclusions about managerial credibility. Third, these three studies examine one form versus another (e.g., point vs. range), while I examine a common yet little-studied setting—*changes* in MF precision over time. Thus, my study complements Rupar (2011), Du et al. (2011), and Christensen et al. (2013) in that I predict investors actively construct judgments about environmental uncertainty to make preferred judgments of the components of managerial credibility (trustworthiness and competence), and these predictions about the components of credibility contrast with prior research that assumes trustworthiness and competence measure the same underlying construct.

Overall, although several of the aforementioned studies examine the effects of various levels of MF precision, very little research examines a common MF issue—changes in forecast precision over time. Managers who provide range forecasts can and do vary the width of the range over time (e.g., Ziobro 2011; Jensen and Plumlee 2013). For example, for updated MF as the year progresses, Jensen and Plumlee (2013) find that approximately 21 percent of forecasts are less precise than the prior forecast, 38 percent are more precise than the prior forecast, and that 41 percent are unchanged from the prior forecast. In the remainder of this

section, I employ theories of managerial credibility and investor preferences (i.e., motivated reasoning) to develop hypotheses about the consequences of this important yet unexamined feature of the voluntary disclosure environment.

Managerial Credibility

In this paper, I build on Mercer's (2004, 2005) definition of credibility in that the credibility of a disclosure or manager is determined by investors' perceptions, and is not a "true," objective (but unobservable) measure of underlying credibility. In this section I discuss two related but distinct concepts: *disclosure* credibility and *managerial* credibility. Mercer (2004) delineates four factors that influence *disclosure* credibility: (1) characteristics of the disclosure, including precision,[15] (2) management's credibility, (3) the degree of external and internal assurance, and (4) management's situational incentives at the time of the disclosure. In the current study, I focus on the first two factors above; in particular, I treat MF precision as a cue that investors (sometimes fallibly) use to judge the credibility of management, a construct that is not directly observable (Libby 1981, 4-7). Therefore, while managerial credibility is a component of disclosure credibility (Mercer 2004), characteristics of a disclosure can also serve as a cue that investors use to determine managerial credibility.

Mercer (2005), defines *managerial* credibility as "investors' beliefs about management's trustworthiness and competence in financial disclosure" (Hovland et al. 1953; Giffin 1967).[16] An important feature of this definition is that it contains

[15] Other disclosure characteristics include venue, timing, amount of supporting information, and inherent plausibility (Mercer 2004).
[16] Hovland et al. (1953, 21) use the term "expertness" instead of competence.

two components—both competence *and* trustworthiness; and, at least in theory, one of these components could vary while the other remains constant. For example, two managers could both be completely trustworthy but differ in competence. Nevertheless, to date, research on managerial credibility treats credibility as a single construct, albeit often a composite of several measures (e.g., Mercer 2005; Cianci and Kaplan 2010; Rennekamp 2012).[17] In this study I separately examine the aggregate measure of credibility *and* the more elemental constructs of trustworthiness and competence, and make specific hypotheses about these elements. Below, I discuss some basic findings on MF credibility, followed by a discussion of trustworthiness in MF and competence in MF.

Archival research on MF credibility goes back several decades. Jennings (1987) finds that investor reactions to MF depend on both the news contained in the forecast (i.e., the earnings surprise implied by the forecast) and the "believability" of the forecast. That is, "two management projections with the same surprise…but with different levels of believability will elicit different responses from investors" (Jennings 1987, 91). Pownall and Waymire (1989) compare the information content of MF versus annual earnings announcements, and find that, on average, MF are associated with larger price reactions than are earnings announcements, implying that MF are generally credible.[18]

The theory and evidence behind managerial trustworthiness in MF is mixed. On the one hand, a large stream of literature predicts and finds that MF are, on

[17] An exception is Hirst et al. (2007), who use factor analysis to decompose the credibility of the disclosure into perceived precision, perceived clarity, and perceived financial reporting quality.
[18] Note that this result is supported by Beyer et al. (2010). See, e.g., Rogers and Stocken (2005) for an analysis of non-credible MF.

average, truthful, likely because the accuracy of MF is easily confirmed ex post (e.g., Penman 1980; Ajinkya and Gift 1984; Lev and Penman 1990). On the other hand, managers do have incentives to be opportunistic in their MF; for example, managers have incentives to issue optimistic MF immediately before selling stock. In the other direction, managers have incentives to issue pessimistic MF before receiving stock options. Rogers and Stocken (2005) examine this issue, and find that managers issue less truthful MF under conditions where the market is unable to detect biased forecasts.

Relatively little evidence exists on the relation between managerial competence and MF, probably because managerial competence is difficult to disentangle from overall firm performance (Baik et al. 2011; Demerjian et al. 2012). Trueman (1986) develops an analytical model that predicts managers issue forecasts to signal their own ability. Specifically, he theorizes that the issuance of MF affects investors' perceptions of the manager's ability to anticipate and adapt to the future economic environment. Baik et al. (2011) empirically test Trueman's (1986) theory, and find the likelihood that a manager issues an earnings forecast is increasing in CEO ability.[19] In addition, Baik et al. (2011) find that MF accuracy increases with CEO ability; however, Baik et al. (2011) do not examine MF precision.

In summary, archival evidence suggests that MF are generally truthful, but that opportunities exist for opportunistic MF. In addition, more competent

[19] Baik et al. (2011) measure CEO ability three ways: (1) number of press citations for the CEO (e.g., Milbourn 2003), (2) data envelopment analysis on measures of firm and managerial efficiency (Demerjian et al. 2012), and (3) industry-adjusted return on assets (Rajgopal et al. 2006).

managers seem to be more likely to issue forecasts, and, for companies that issue forecasts, MF accuracy is increasing in managerial ability. Nevertheless, the relations between perceived managerial trustworthiness, perceived managerial competence, and MF precision are unclear. Because managerial credibility is determined by investors' perception, I contend that investors' preferences for firm performance will affect their interpretations of managerial credibility when MF precision changes. In the next section, I discuss investor preferences and how they can affect information processing.

Investor Preferences

Building on motivated reasoning research from social psychology (Kunda 1990), a growing accounting literature documents that people selectively process accounting information in a manner that is consistent with their preferences. Although much of this work to date is outside of financial accounting (e.g., Bonner 2008; Tayler 2010), motivated reasoning theory is becoming more influential in the study of investors' interpretation of financial accounting information. For example, Hales (2007) investigates investors' own earnings forecasts when the investors either have a long position (i.e., their investment makes money when the company does well) or a short position (i.e., their investment makes money when the company does poorly). He finds that, when the consensus analysts' forecast implies a gain for the investor, the mean investor forecast does not differ between long and short positions. On the other hand, when consensus analysts' forecast implies a loss for the investor, long (short) investors predict relatively high (low) earnings. Further, both of these directional biases obtain even when the investors have

economic incentives to be as accurate in their judgments as possible. Hales (2007, 609) notes that his results support research in behavioral finance that shows investors to be optimistic (in terms of their own investment performance) (e.g., Daniel et al. 1998; Simon and Odean 2001).

While several studies examine the effects of motivated reasoning on the interpretation of information such as analysts' reports (e.g., Thayer 2011), analysts' forecasts (e.g., Hales 2007), and management's earnings forecasts (e.g., Han and Tan 2010), relatively little research exists regarding how investor preferences affect inferences *about the preparers* of such accounting information. One study in psychology is pertinent to my research question. Klein and Kunda (1992) contend that, when people are motivated to hold particular beliefs about another person, they will actively construct justifications to support the desired beliefs, and such justifications could be based on their knowledge of the other person in particular or on their knowledge of people and the environment in general. Furthermore, Klein and Kunda (1992) posit that, in the process of constructing these justifications, people will also construct beliefs about the nature of other people and events that will allow them to justify the desired beliefs about the person being judged.

In one experiment, Klein and Kunda (1992) asked subjects to participate in a game with one other "target" person who was previously unknown to them. For half of the participants the target was to be their partner, for the other half their opponent. Participants were given an example of the target's performance at the game which indicated high ability. Klein and Kunda (1992) assumed that—consistent with their preferences—participants would be motivated to judge a

partner (opponent) to be good (bad) at the game, even though the target ability was the same under all conditions. Results indicate that participants rated the ability of targets intended to be their partners higher than targets intended to be their opponents. Further, in a hypothesized effort to justify these perceptions of target ability, participants judged the *average* person's ability to be lower (higher) in the partner (opponent) condition; that is, judgments of partners' high ability were justified by perceived low average ability and judgments of opponents' low ability were justified by perceived high average ability. In addition, participants in the partner condition responded that luck played a smaller role in the target's excellent performance than did participants in the opponent condition.

In summary, research in psychology and accounting indicates that people are motivated to make judgments that are consistent with their own preferences. Further, Klein and Kunda (1992) suggest that, when making judgments about another person, people will actively construct beliefs about people in general and about external factors such as luck to justify their motivated beliefs about the person being judged. In the next section, I hypothesize that the ambiguity inherent in range MF allows investors to justify their motivated beliefs about company management through the elements of managerial credibility, trustworthiness and competence.

Hypotheses

In the current study I focus on changes in range MF because of its variability and because range is by far the most common MF form in recent years (Ciconte et al. 2013). It is my aim to examine the effects of changes in range MF precision

using the theories of credibility and motivated reasoning discussed above. To do so, I first summarize prior findings regarding MF in the context of these two theories.

1) MF precision is a function of a manager's credibility (competence and trustworthiness) and environmental uncertainty (Mercer 2004, 2005; Libby et al. 2006).
2) Trustworthy managers intend for realized earnings to fall within the MF range (Jensen and Plumlee 2013).
3) Holding managerial trustworthiness and environmental uncertainty constant, perceived managerial competence is increasing in MF precision (Baginski et al. 1993; Mercer 2004; Bamber and Cheon 1998).
4) Holding managerial trustworthiness and competence constant, MF precision is decreasing in environmental uncertainty (Mercer 2004; Libby et al. 2006).
5) The uncertainty inherent in range MF provides opportunity for investors to make motivated justifications for their desired beliefs (Klein and Kunda 1992; Han and Tan 2010).

Therefore, consistent with prior research on motivated reasoning, I predict that investors will interpret changes in MF precision in accordance with their directional preferences. That is, in terms of firm performance and managerial credibility, I predict that investors with a long position will interpret changes in earnings forecast precision optimistically while investors with a short position will interpret changes in earnings forecast precision pessimistically. In addition, investors need to be able to justify their perceptions of management (Klein and Kunda 1992). I contend that they do so through the components of credibility—trustworthiness and

competence—and through perceptions of environmental uncertainty (Libby et al. 2006). These general relations are depicted graphically in Figure 1.[20]

[Insert Figure 1]

I first consider the case where management reduces forecast precision (i.e., widens the forecast range). Increased MF range could imply one or more of the following: (1) management is of low competence, (2) management is honestly attempting to keep realized earnings within the MF range (for whatever reason), or (3) there is increased environmental uncertainty.[21] I predict investors who are motivated to interpret information optimistically (in terms of firm performance) will infer that management is honestly attempting to keep realized earnings within the MF range (in the face of environmental uncertainty); thus, I expect these investors will consider management to be more trustworthy than before. In the other direction, I predict investors who are motivated to interpret the change pessimistically (in terms of firm performance) will consider increased MF range an indication of low competence. This discussion leads to my first set of hypotheses, stated in alternative form (see Figure 2):

[Insert Figure 2]

[20] Most accounting literature defines sentiment (i.e., optimism and pessimism) as a bias in the mean predicted EPS. For example, Willis (2001) finds that mutual fund analysts issue optimistically-biased forecasts of earnings for firms in which they are invested. In the current study I make predictions about the effects of investor sentiment on perceived managerial credibility and its components, not on investors' own EPS forecasts. Thus, in my paper investor sentiment refers to investor desires and beliefs about a firm's (good or bad) performance, but not necessarily investors' own earnings forecasts.

[21] An additional (but unlikely) possibility is that management is communicating *more* uncertainty than they really have.

Hypothesis 1: When management earnings forecast precision decreases:

H1a: Investors who hold a long position will perceive a positive change in managerial trustworthiness (and therefore overall credibility), but investors who hold a short position will not perceive a change in managerial trustworthiness.

H1b: Investors who hold a short position will perceive a negative change in managerial competence (and therefore overall credibility), but investors who hold a long position will not perceive a change in managerial competence.

Next, I consider the case where management increases MF precision (i.e., narrows the forecast range). Decreased MF range could imply one or more of the following: (1) increased managerial competence, (2) management is attempting to communicate more certainty than they really have (i.e., they are being untrustworthy), or (3) there is decreased environmental uncertainty. I predict investors who are motivated to interpret information optimistically (in terms of firm performance) will judge management to be more competent than previously. On the other hand, I predict investors who are motivated to view information pessimistically (in terms of firm performance) will judge management to be less trustworthy than previously (i.e., the manager is communicating more certainty that they really have).[22] This discussion leads to my second set of hypotheses, stated in alternative form (see Figure 3):

[Insert Figure 3]

[22] An alternative possibility is that pessimistic investors will attribute increased MF precision to reduced environmental uncertainty rather than managerial competence (i.e., the investors are giving the "credit" of the increased precision to lower environmental uncertainty rather than to high managerial competence).

Hypothesis 2: When management earnings forecast precision increases:

H2a: Investors who hold a long position will perceive a positive change in managerial competence (and therefore overall credibility), but investors who hold a short position will not perceive a change in managerial competence.

H2b: Investors who hold a short position will perceive a negative change in managerial trustworthiness (and therefore overall credibility), but investors who hold a long position will not perceive a change in managerial trustworthiness.

I group my hypotheses by changes in MF precision for ease of exposition. However, because I expect differential impacts on perceived trustworthiness and competence depending on investor position and changes in MF precision, I operationally test my hypotheses based on particular investor judgments. That is, I test H1a and H2b together (testing the effects on judgments of trustworthiness) and H1b and H2a together (testing the effects on judgments of competence).

Additional Predictions

An interesting result of the hypothesized relations is that, although perceptions of competence and trustworthiness differ, both increasing *and* decreasing MF precision increases (decreases) perceived overall credibility for investors who are optimistic (pessimistic) about firm performance. That is, looking at credibility as an overall construct (as in prior studies) would reveal only an effect of investor sentiment. If, overall, my hypotheses indicate that optimistic (pessimistic) investors will always perceive increased (reduced) credibility, does it matter whether the perceived credibility is mediated by trustworthiness or

competence? I approach this question using two important contexts in the financial reporting environment.

First, I examine the consequences of perceived trustworthiness using the context of earnings management. Specifically, I expect that investors' perception of the possibility that management is manipulating earnings is inversely related to perceived trustworthiness. To the extent investors believe management is not accurately reporting earnings, managers may be subject to litigation, regardless of the protections afforded to forward-looking statements (see, e.g., Beyer et al. 2010, for a discussion).

Second, I examine the consequences of perceived competence using the context of the managerial retention decision. To the extent investors believe firm performance is due to high managerial competence (rather than environmental factors and luck), they should be more willing to renew the manager's contract.[23] Thus, my overall experiment gathers investor judgments of management competence, trustworthiness, and credibility, along with their consequent judgments of potential earnings management, and a vote on extending manager employment. These latter decisions and judgments indicate the potential importance of the individual factors (i.e., competence and trustworthiness) that comprise overall management credibility.

[23] Perceived trustworthiness could also be a factor in the managerial retention decision. As outlined in the results section, I also include perceived trustworthiness in this test.

CHAPTER III. EXPERIMENTAL METHOD

Participants

Participants are 126 volunteers recruited from Amazon Mechanical Turk, an online service that is becoming a popular source of participants for accounting studies (see, e.g., Rennekamp (2012) and Koonce et al. (2013) for examples) in addition to many other disciplines (for an overview, see Mason and Suri (2012) and Goodman et al. (2013)).[24,25,26] Participants were required to meet all of the following criteria before participating in the experiment: (1) they must be located in the United States, (2) they must have successfully completed at least 100 previous Mechanical Turk tasks, and (3) their Mechanical Turk task approval rate from prior tasks must be at least 97 percent.[27] Participants reported taking an average of 1.8 accounting classes and 1.6 finance classes, as well as an having an average of 15.5 years of total work experience. The experimental task in this study is of low integrative complexity, indicating that these are well-matched participants for my research questions (Elliott et al. 2007).[28]

[24] In total, 147 participants completed the experiment, but 21 are removed from the analysis because they provided incorrect responses to attention and manipulation check questions, or were outliers. See Table 2 for a detailed reconciliation.
[25] An example of using Amazon Mechanical Turk in Psychology research is Paolacci et al. (2010), who recruit participants to replicate some classic studies in the heuristics and biases literature.
[26] The experiment was conducted on August 1, 2013 from approximately 6:59 p.m. until 9:13 p.m., Central Daylight Time.
[27] The statistics for these criteria are compiled and maintained by Amazon.
[28] Integrative complexity refers to two factors: (1) the number of distinct characteristics of the information set and (2) the need to develop connections between these characteristics in order to make a judgment or decision (Elliott et al. 2007).

Procedure

The procedure of this study is based on Thayer (2011). Participants assume the role of an investor in a hypothetical company. Participants reviewed basic background information about the firm. To enhance participants' commitment to the task, each participant chose one of two firms in which to invest. The two firms are described so as to be equally attractive. Although two firms are presented, the actual financial information presented during the task is the same for all participants; thus this feature is not an experimental manipulation. Then, participants read management's earnings release for Year 1, along with a 19-cent range forecast of Year 2 earnings. After answering the first set of dependent measures (discussed below), participants then read the Year 2 earnings release (with actual earnings at the midpoint of the forecasted range), along with a (manipulated) range forecast of Year 3 earnings. Finally, participants answered a second set of dependent measures, as well as answered manipulation check and demographic questions (see Figure 4).

[Insert Figure 4]

Experimental Manipulations

I employ a 2 × 2 between-subjects factorial design with random assignment. The first factor is investor sentiment, which, following prior literature, I operationalize as participants' taking a long or short position in the stock (*POSITION: long, short*) (Hales 2007; Han and Tan 2010; Thayer 2011).[29] The

[29] As discussed in Chapter II under "Investor Preferences," investors holding a "long" position make money when the company performs well, while investors holding a "short" position make money when the company performs poorly (Hales 2007).

second factor is change in MF precision (*PRECISION: wider, narrower*). Half of participants received management earnings forecasts for Year 3 where the forecast range is wider (49 cents) than the nineteen-cent forecast range for Year 2 (*wider*), while the other half of participants received a Year 3 earnings forecast range that is narrower (three cents) than the nineteen-cent Year 2 forecast range (*narrower*).

Compensation

Participants are compensated (1) for participation, (2) to motivate attention to the task ("accuracy" compensation), and (3) to help induce the experimental manipulations; thus, there are three sources of compensation. First, participants receive 25 participation points at the beginning of the study. Second, to motivate attention to the task, participants earn up to an additional 25 "accuracy" points if actual Year 2/Year 3 earnings equal the participant's forecast, but one point is deducted from these additional 25 points for each cent of difference between the actual EPS and the participant's forecast. So, the total "accuracy" points awarded to each participant equals: 25 - (forecast error for Year 2 + forecast error for Year 3). This "accuracy" goal provides an incentive to pay close attention to the experimental task (Thayer 2011; Hales 2007).[30] Note that these "accuracy" points are the only points that are not predetermined.

The third source of compensation is intended to help induce the *POSITION* manipulation. The intuition behind this manipulation is that, despite the incentive to make accurate judgments (described above), participants with a long (short) position

[30] The earnings forecasts, earnings realizations, and EPS benchmarks (described below) are hypothetical. Thus, this "accuracy" goal is not true accuracy, but rather an attempt to motivate attention to the experimental task.

should want the company to perform relatively well (poorly). Following Hales (2007), participants with a long position will make (lose) two points for each cent that actual EPS beats (misses) a benchmark EPS. In the other direction, participants with a short position will make (lose) two points for each cent that actual EPS misses (beats) a benchmark EPS. This system of payoffs is repeated for both Year 2 MF/Earnings and Year 3 MF/Earnings. The "actual" experimental earnings realizations are predetermined, so that the actual *POSITION* compensation is fixed at the same level for all participants. Therefore, following Thayer (2011), I employ two experimental design features to induce the *POSITION* manipulation: (1) as discussed above, I allow participants to choose one of two companies in which they wish to take a long/short position, and (2) I provide a compensation system in which participants are compensated for (good or bad) company performance.

Overall, the sources of fixed compensation are: (1) 25 points for participation, and (2) 12 points based on the firm's actual performance above (for participants with a long position) or below (for participants with a short position) an EPS benchmark; variable compensation is a maximum 25 points, based on "accuracy." At the end of the study, points were converted into U.S. dollars. Participants earned an average of $3.32 each and took an average of 16 minutes and 56 seconds to complete the experiment.

Dependent Measures

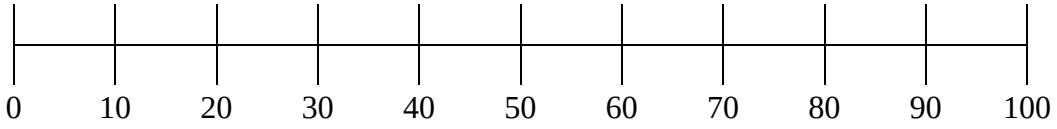
My main dependent measures relate to participants' judgments of the components of managerial credibility. Because my research question relates to the judgmental effects of changes in management earnings guidance, I elicit responses

to the dependent variables twice, once after viewing the Year 1 release, and again after viewing the Year 2 release (see Exhibit 4), and I use change scores as dependent measures.

Credibility Questions from Mercer (2005)

To enhance comparability to prior research, I first use the exact six credibility questions used by Mercer (2005); three of these questions measure perceived competence and three measure perceived trustworthiness. My first dependent measure follows:

I believe that management is very competent at providing financial disclosures.



Completely Disagree — Neutral — Completely Agree

The five other questions are: (1) *I believe that management has little knowledge of the factors involved in providing useful disclosures,* (2) *I believe that few people are as qualified as management to provide useful financial disclosures about the company,* (3) *I believe that management is very trustworthy,* (4) *I believe that management is very honest,* and (5) *I believe that management may not be truthful in their financial disclosures.*

Additional Dependent Measures

Note that Mercer (2005) uses measures that are related to managerial competence in financial reporting, not managerial competence per se, which is the focus of my study. Thus, I also ask dependent measures related to general managerial competence: (1) *I believe that management is very competent at running the company*, (2) *I believe that management has little knowledge of the factors involved in running the business*, and (3) *I believe that few people are as qualified as management to operate the company*.

Next, I ask participants to respond to several additional questions. Consistent with prior studies on MF, I ask participants for their own EPS forecasts, as well as their confidence in their forecasts (I do not make hypotheses regarding these judgments). In addition, to determine if participants believe that environmental factors are responsible for MF precision, I ask participants to respond to the following questions about environmental uncertainty: (1) *I believe that economic conditions outside of management's control are affecting company performance*, and (2) *I believe that economic uncertainty is high*. As discussed in the background and hypothesis section, I predict investors will actively construct justifications to support their desired judgments about management. Therefore, I do not manipulate environmental uncertainty, nor do I include strong assertions about environmental uncertainty in the experimental materials in an attempt to hold it constant across experimental conditions. Rather, I predict investors will actively construct beliefs about environmental uncertainty—or perceptions of its

importance—to justify desired beliefs about managerial trustworthiness and competence.

As discussed above, I make additional predictions regarding the impact of judgments of the components of credibility—trustworthiness and competence—and so I collect dependent measures to test these additional predictions. First, to test the effect of perceived trustworthiness, I ask participants to rate the possibility that management is manipulating earnings. Second, to test effects of perceived managerial competence, I ask participants to "vote" on whether to retain the CEO.

Pilot Test

Before conducting my main experiment, I performed a pilot test using 100 participants recruited from Amazon Mechanical Turk. The pilot test differed from the main experiment in two ways. First, in the pilot test, there was an upward trend of earnings from year to year (both implied by the midpoint of the ranges and the actual realized earnings); in the main experiment the underlying trend of earnings was flat from year to year. Second, in the pilot test the *PRECISION* manipulation was operationalized by changing from an initial seven-cent range to either a three-cent range (in the *narrower* condition) or an eleven-cent range (in the *wider* condition). The main experiment strengthened the *PRECISION* manipulation: an initial 19-cent range was changed to a three-cent range (in the *narrower* condition) or a 49-cent range (in the *wider* condition).

Overall, results of the pilot test do not support my hypotheses. For example, results of the pilot test suggest that wider ranges lead to increased ratings of financial disclosure competence and decreased perceptions of economic uncertainty

for investors assigned to a long position. I speculate that this unexpected result is due to the underlying trend of earnings. Specifically, when there is a continuous upward trend of earnings (and the expected earnings is the midpoint of the range), a wider range can imply more "upside" than a narrower range for investors who hold a long position. Conversely, when there is a continuous upward trend of earnings (and the expected earnings is the midpoint of the range), a narrower range can imply less "downside" than a wider range for investors who hold a short position. As a consequence, for my main experiment I present a flat underlying earnings trend. In addition, I strengthen the *PRECISION* manipulation with the intention of producing a stronger effect than was observed in the pilot test.

CHAPTER IV. RESULTS

Attention, Manipulation and Randomization Checks

Participants responded to five attention check questions unrelated to the experiment. Such questions are recommended by Goodman et al. (2013) as a means of providing confidence that participants are carefully reading the experimental materials.[31] Ten participants provided incorrect responses to two or more of the five attention check questions, and so are removed from the sample.

I also ask the following manipulation check question for *PRECISION*: *During this survey, you read two earnings releases, along with two earnings forecasts for the upcoming year. Both earnings forecasts were a range of possible earnings. Which earnings forecast had the wider (larger) range, the first forecast (for 2014), or the second forecast (for 2015)? (0—The first forecast was wider than the second forecast, 100—The second forecast was wider than the first forecast).* Asking this manipulation check question on a 101-point scale allows participants to indicate uncertainty. Participants passed the manipulation check if they indicated a 40 or less in the narrower condition or a 60 or more in the wider condition;[32] nine

[31] An example attention check question, adapted directly from Goodman et al. (2013, 223), is: Research in decision making shows that people, when making decisions, prefer not to pay attention and minimize their effort as much as possible. If you are reading this question and have read all the other questions, please select the choice marked "other" below. Do not select "Predictions of investment performance." Thank you very much for participating and taking the time to read through the questions carefully!

What was this study about?

a. Predictions of investment performance
b. Predictions about the technology industry
c. Predictions about the television industry
d. Other

[32] In other words, participants failed the manipulation check if they responded 41 or higher in the narrower condition or 59 or lower in the wider condition.

participants incorrectly answered the manipulation check question and are not included in the analyses.

Participants also answered questions about their understanding of the *POSITION* manipulation, including the compensation scheme. To strengthen the *POSITION* manipulation, participants who provided incorrect responses were given immediate feedback and allowed to change their responses; accordingly, all participants passed the manipulation checks for *POSITION*. Analysis of the *levels* (both pretest and posttest) of the nine credibility questions indicates that *POSITION* had a statistically-significant impact on participants' judgments. Specifically, participants assigned to a long position reported higher perceptions of managerial credibility than did investors assigned to a short position (untabulated). Finally, two participants are removed as outliers.[33] In total, 147 participants completed the experiment but 126 are used in the analyses (see Table 2 for a reconciliation).

[Insert Table 2]

Randomization checks indicate that the cells are balanced by age, gender, accounting/finance work experience, total work experience, number of finance courses taken, and whether participants had ever invested directly in common stocks. Despite random assignment, the experimental conditions are not balanced on number of accounting courses taken or whether participants have ever used financial statements to evaluate a company's performance. Specifically, for number of accounting courses, participants in the *short/narrower* (mean=2.26) and

[33] Two participants provided EPS forecasts that were far different from the other participants (e.g., $5,000,000 for 2014 and $10,000,000 for 2015, in contrast to actual EPS of $1.27), and so are considered outliers.

long/narrower (mean=2.48) reported having taken more accounting courses than participants in the long/wider (mean=1.19) and short/wider (mean=1.30) conditions.[34] In addition, 81% of participants in the *long/narrower* and 84% of participants in the *long/wider* condition report having ever used a company's financial statements to evaluate a company's performance, while 72% of participants in the short/narrower and 57% of participants in the short/wider conditions report having used a company's financial statements to evaluate a company's performance.[35] Nevertheless, including the number of accounting courses taken or whether participants have ever used financial statements to evaluate a company's performance as covariates does not affect my statistical conclusions; therefore, I omit these two variables from my analyses.

Hypothesis Tests

As with Mercer (2005), my predictions relate to changes in managerial credibility; therefore, my main analysis uses difference scores. First, I perform tests on the underlying constructs of credibility: trustworthiness and competence. Correlations between the main dependent measures are presented in Table 3.

[Insert Table 3]

Table 4, Panel A indicates a Cronbach's alpha of 0.83 for the nine credibility responses suggests that the measures of competence (both financial reporting and

[34] Statistically, conducting an analysis of variance (ANOVA) with number of accounting courses as the dependent variable and *POSITION* and *PRECISION* (and an interaction term) as independent variables results in a statistically-significant main effect of *PRECISION*.

[35] Statistically, conducting a factorial logistic regression with whether the participant has used a company's financial statements to evaluate its performance as the dependent variable and *POSITION* and *PRECISION* (and an interaction term) as independent variables results in a statistically-significant effect of *POSITION*.

overall) and trustworthiness are measuring the same construct; this result is not consistent with the overall tenor of my predictions.[36] In Table 4, Panel B, factor analysis on the nine credibility responses indicates that the nine credibility questions load on two factors. Specifically, I find evidence that two questions ([1] *I believe that few people are as qualified as management to provide useful financial disclosures about the company,* and [2] *I believe that few people are as qualified as management to operate the company*) measure a different construct from the other seven questions.[37,38] Although the foregoing analysis suggests competence and trustworthiness measure a single credibility construct, based on my *ex ante* predictions I test my hypotheses with the following two composite measures: (1) overall competence (i.e., the average of two financial reporting and two operational competence questions, omitting the two competence questions that did not load on the factor), and (2) trustworthiness (i.e., the average of the three trustworthiness questions).

[Insert Table 4]

I test both sets of hypotheses using analysis of variance (ANOVA) and planned comparisons for my specific predictions. Specifically, I estimate two models, one with changes in trustworthiness as the dependent variable and another

[36] Mercer (2005, 731) reports a Cronbach's alpha of 0.78 for her six main dependent measures.
[37] Analyzing the financial reporting competence and operating competence questions separately also suggests that the questions are not measuring the same constructs. Specifically, as reported in Table 4, Panel C, the Cronbach's alpha for the three financial reporting questions is 0.56 and the Cronbach's alpha for the three operating competence questions is only 0.55. A factor analysis reported in Table 4, Panel D suggests that these low coefficients are caused by the third question in each grouping.
[38] Note these two questions ask "relative" judgments while the other seven credibility questions ask "absolute" judgments. Therefore, these results suggest that, at least in this situation, participants' relative judgments differ from their absolute judgments.

with changes in competence as the dependent measure. Independent variables are *POSITION* and *PRECISION* (along with an interaction term).

Hypotheses 1a and 2b would be supported by main effects of both *POSTION* and *PRECISION*, but no interaction effect in the ANOVA for trustworthiness. To test my specific hypotheses, I use planned comparisons with the following contrast weights to test for the predicted changes in perceived trustworthiness: long/narrower [0], long/wider [1], short/narrower [-1], and short/wider [0]. Descriptive statistics and hypothesis tests are presented in Table 5. Results do not support H1a or H2b. Specifically, there is a statistically-significant main effect of *POSTION* ($p=0.03$), but in the opposite-from-predicted direction; the main effect of *PRECISION* is not statistically significant ($p=0.57$). In addition, the planned comparison is not statistically significant ($p=0.25$).

[Insert Table 5]

Hypotheses 1b and 2a would also be supported by main effects of both *POSTION* and *PRECISION*, but no interaction effect in the ANOVA for competence. To test my specific hypotheses, I use planned comparisons with the following contrast weights to test for the predicted changes in perceived trustworthiness: long/narrower [1], long/wider [0], short/narrower [0], and short/wider [-1]. Descriptive statistics and hypothesis tests are presented in Table 6. Results do not support H1a or H2b. Specifically, there is a statistically-significant main effect of *POSTION* ($p=0.03$), but in the opposite-from-predicted direction; the main effect of *PRECISION* is not statistically significant ($p=0.54$). In addition, the planned comparison is not statistically significant ($p=0.26$).

[Insert Table 6]

Next, I perform a test of the effects of *POSITION* and *PRECISION* on the composite measure of changes in credibility (i.e., using the average of changes in seven measures as the dependent variable) using analysis of variance (ANOVA). As previously explicated, I expect only a main effect of *POSITION* for this composite test; this is the only effect that could be investigated when, as in prior studies, the components of overall credibility are simply added (or averaged) together. Descriptive statistics and the prediction test are tabulated in Table 7. Results indicate a statistically-significant main effect of *POSITION* (p=0.02), but in the opposite direction from my prediction.

[Insert Table 7]

In addition, I complement my hypothesized findings by performing an analysis of variance (ANOVA) with changes in investors' perception that environmental factors affected firm performance as the dependent variable. In contrast to the other analyses, I expect a statistically significant interaction, but no main effects in this ANOVA, as depicted in Figure 5, Panel E. Table 8, Panel B does not indicate a statistically-significant interaction (p=0.62). As an additional, more specific test, I examine how investors attribute credit or blame for changes in forecast precision based on *POSTION*. Specifically, investors assigned to a short position may attribute a narrower range to low economic uncertainty, but not attribute a wider forecast range to high economic uncertainty (i.e., management gets the "blame" for less precise forecasts, but does not get the "credit" for more precise forecasts); conversely, investors assigned to a long position may attribute a wider

forecast range to high economic uncertainty, but not attribute a narrower forecast range to low economic uncertainty (i.e., management does not get the "blame" for less precise forecasts, but does get the "credit" for more precise forecasts). I use the following contrast code to test this conjecture: long/narrower [-1], long/wider [3], short/narrower [-3], and short/wider [1]. Table 8, Panel C reports that this contrast is marginally statistically significant (p=0.067).

[Insert Table 8]

I further complement my hypotheses by estimating a model with changes in investors' perception that economic uncertainty is high as a dependent variable. This test is related to (but not the same as) the test in the paragraph above (tabulated in Table 8). Again, the intuition is that investors assigned to a short position may attribute a narrower range to low economic uncertainty, but not attribute a wider forecast range to high economic uncertainty (i.e., management gets the "blame" for less precise forecasts, but does not get the "credit" for more precise forecasts); conversely, investors assigned to a long position may attribute a wider forecast range to high economic uncertainty, but not attribute a narrower forecast range to low economic uncertainty (i.e., management does not get the "blame" for less precise forecasts, but does get the "credit" for more precise forecasts). Specifically, I test the following contrast: long/narrower [-1], long/wider [3], short/narrower [-3], and short/wider [1]. Descriptive and inferential statistics are presented in Table 9. Results support this conjecture; Table 9, Panel C reports that the contrast is statistically significant (p=0.044).

[Insert Table 9]

Additional Analyses

My additional analyses relate to levels rather than changes in investors' judgments, so I use the post-test measures rather than difference scores in the following analyses. In addition, the independent variables (i.e., perceived trustworthiness, competence, and an interaction term) are centered (i.e., each observation is deviated from the mean) to facilitate interpretation (Judd et al. 2009, 144 - 146).[39,40] First, I predict investors' assessment that the manager is manipulating earnings is decreasing in perceived trustworthiness. To test this prediction, I conduct a regression with perceived earnings manipulation as the dependent variable and perceived trustworthiness as the independent variable, and I expect a negative coefficient on perceived trustworthiness. In addition to trustworthiness, I include competence (and a trustworthiness by competence interaction term) to ensure the predicted relation obtains when controlling for the other variable, and to test whether the predicted manipulate-trustworthiness relation is affected by the level of perceived competence. Results support my prediction. Table 10, Panel A indicates that investors' perception that the manager is manipulating earnings is decreasing in perceived trustworthiness ($p<0.001$), but that

[39] Specifically, centering the predictor variables assists interpretation in the following way. In a regression model, the intercept represents the estimated mean of the dependent variable when the value of all independent variables is zero. In addition, the "main effects" of the independent variables represent the estimated slope when the value of all other independent variables is zero. By centering the independent variables, the regression intercept represents the estimated mean of the dependent variable when all of the independent variables are at their mean. In addition, the "main effects" of the independent variables represent the estimated slope when the value of all other independent variables is are at their mean (Judd et al. 2009).

[40] The posttest mean competence rating is 65.226 and the posttest mean trustworthiness rating is 57.910.

the perception that the manager is manipulating earnings is not reliably related to perceived competence (p=0.12).

I also predict that investors will be more likely to renew the employment contract of managers who they view as being more competent. To test this prediction, I conduct a regression with the decision of whether to renew the manager's contract as the dependent variable and perceived competence as the independent variable, and expect a positive coefficient on perceived competence. In addition to competence, I include trustworthiness (and a trustworthiness by competence interaction term) to ensure the predicted relation obtains when controlling for the other variable, and to test whether the predicted retain-competence relation is affected by the level of perceived trustworthiness. Results support this prediction. Table 10, Panel B indicates that investors' decision of whether to retain the CEO is increasing in perceived competence (p=0.0007), but that, controlling for perceived competence, the decision of whether to retain the CEO is statistically unrelated to perceived trustworthiness (p=0.5198).[41] Further, a statistically-significant interaction term indicates that the positive relation between perceived competence and the decision to retain the manager is increasing in perceived trustworthiness (p=0.0235).[42]

[Insert Table 10]

[41] This result does *not* imply that the decision to keep the CEO is unrelated to perceived trustworthiness; when excluding perceived competence from the model (untabulated), perceived trustworthiness is (positively) statistically related to the decision to retain the CEO (p<0.001).
[42] Because there is a statistically-significant interaction, uncentering the independent variables affects statistical inferences regarding competence. Specifically, when the independent variables are not centered, perceived competence is not statistically related to the decision to retain the CEO (untabulated).

CHAPTER V. CONCLUSION

Summary

This study examines how changes in management earnings forecast (MF) precision combines with investors' preferences for firm performance to impact managerial credibility. Employing theories of motivated reasoning and managerial credibility, I predict that changes in MF precision affect the individual components of managerial credibility, but the relation is conditional on investor preferences. Overall, results do not support my predictions regarding changes in managerial trustworthiness and competence. Consistent with prior research, I find that the two components of managerial credibility (trustworthiness and competence) seem to measure the same construct—a result that is inconsistent with my predictions. In addition, I find small, positive changes in perceived credibility for investors holding a short position, and small, negative changes in perceived credibility for investors holding a long position. Investors holding a long (short) position reported initial perceptions of managerial credibility that were relatively high (low). Therefore, my main results may be driven by mean reversion rather than motivated reasoning.

However, I do find support for my additional predictions. In particular, I find that investors perceive the greatest increase in economic uncertainty when holding a long position and the forecast range widens; conversely, I find that investors perceive a decrease in economic uncertainty when holding a short position and the forecast range narrows. In addition, I find that investors' belief that the manager is manipulating earnings is decreasing in perceived managerial trustworthiness, and that investors' willingness to retain the CEO is increasing in

perceived managerial competence; however, when controlling for perceived competence, investor willingness to retain the CEO is not reliably related to perceptions of managerial trustworthiness.

Discussion

Contribution

These results will interest corporate managers and accounting researchers for several reasons. First, I answer the call of Hirst et al. (2008) to contribute to our understanding of the interactions between management earnings forecast antecedents, characteristics, and consequences. Specifically, I examine how changes in MF precision affect investors' perception of managerial trustworthiness and competence. Second, and relatedly, my study has implications for corporate managers. Executives surveyed by Graham et al. (2005) report that they pay a lot of attention to their own personal reputation, and that many executives issue earnings guidance to manage market expectations. My results provide further evidence regarding how investor perceptions of competence and trustworthiness affect their subsequent judgments and decisions.

The Relation between Perceived Trustworthiness and Competence

Prior studies such as Mercer (2005) find that perceived trustworthiness and competence measure the same overall construct of credibility. In this study, I make (unsupported) predictions that, in certain situations, perceived trustworthiness and competence can vary independently of one another. However, a third possibility exists—does the level of perceived competence *depend* on the level of perceived trustworthiness (or vice versa)? As posited in my hypothesis development section,

it is logical that two managers with high trustworthiness could differ in competence (e.g., a high trustworthiness/high competence manager vs. a high trustworthiness/low competence manager). However, it may be difficult or impossible to discern between managers of high and low competence when trustworthiness is low. Therefore, it is plausible that high trustworthiness is a necessary condition (but not a sufficient one) for investors to be able to judge a manager to be high competence. On the other hand, high competence is neither a necessary nor a sufficient condition for investors to be able to determine managerial trustworthiness.

If valid, the logic of the above paragraph has implications for the results of my paper. Specifically, in tests of my additional predictions, the statistically-significant competence by trustworthiness interaction in Table 10, Panel B suggests that the effect of perceived competence on investors' willingness to retain the manager is increasing in perceived trustworthiness. Additionally, in regard to my main hypothesis tests, the results for changes in perceived trustworthiness tabulated in Table 5, Panel A, may have led to the results of changes in perceived competence Tabulated in Table 6, Panel A. Specifically, investors holding a long position perceived a decrease in trustworthiness, which may have, in turn, led to a decrease in perceived competence.

Limitations and Future Directions

This study is subject to several limitations. First, it is possible that my experimental participants are not good proxies for nonprofessional investors. While Elliott et al. (2007) find that MBA students are suitable proxies for nonprofessional

investors (especially for tasks of low integrative complexity), there is scant direct evidence that participants recruited from Amazon Mechanical Turk are also good proxies for nonprofessional investors. Second, regarding the results of my additional tests, perceived managerial competence and trustworthiness are measured rather than experimentally manipulated variables. As such, any causal inference regarding the effects of trustworthiness and competence on the perception that management is manipulating earnings and the decision to retain the CEO may be (but is not necessarily) weaker than if competence and trustworthiness were experimentally manipulated.

The results of this study have implications for future research. For example, the results of my main hypothesis tests suggest that participants' perception of managerial trustworthiness and competence may have been affected by mean reversion and not reflect motivated reasoning. Future experiments could address this mean reversion by eliciting participants' initial credibility judgments before the investor position manipulation. Furthermore, regarding changes in participants' perception of managerial trustworthiness and competence, my results indicate that the absolute magnitudes of changes in these judgments were relatively small compared to the standard deviations of the changes in these judgments. This result may have obtained because participants could not access their initial credibility judgments when making their final judgments. Allowing participants to access their initial judgments may reduce the noise in participants' difference scores.

In addition to the aforementioned adjustments to this study, future research can examine other related research questions. For example, in this study, realized

earnings were at the midpoint of the range. Future studies can examine the judgmental effects when realized earnings fall in the lower or upper end of the forecast range, or, as in Libby et al. (2006), realized earnings fall outside the forecast range. Finally, future research can examine the credibility effects of the "inclusiveness" of forecast ranges (i.e., whether forecasted earnings includes all income statement items or only selected income statement items). In particular, prior research finds that managers opportunistically report pro-forma (i.e., non-GAAP) earnings, implying that GAAP earnings are more credible than non-GAAP earnings. However, managers would be able to provide relatively more precise forecasts if pro-forma earnings forecasts exclude highly variable items. Therefore, future research could examine whether investors prefer forecasts of relatively wider GAAP forecasts or relatively narrower non-GAAP forecasts.

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APPENDIX A—TABLES AND FIGURES

This appendix contains Tables 1 through 10, which provide participant demographic information and results of my hypothesis tests. In addition, this appendix contains Figures 1 through 5, which graphically present my predictions and experimental procedure.

TABLE 1—Participant Demographics

Panel A: Participants' Investing Experience (n=126)

	Participant Response			
	Yes	No	Response/Uncertain/Prefer Not to Say	Total
1. Ever directly invested in common stocks.	69	46	11	126
2. Plan to invest in common stocks in the future.	61	9	56	126
3. Ever used a company's financial statements to evaluate its performance.	92	26	8	126
4. Ever read (or heard) a company's earnings release.	102	12	12	126

Panel B: Participant Background

	Courses Taken		Years' Work Experience		
	Accounting	Finance	Accounting/Finance	Overall	Age
Minimum	0.0	0.0	0.0	0.0	20.0
Mean	1.8	1.6	3.4	15.5	35.9
Standard Deviation	2.1	2.3	7.2	11.0	11.5
Median	1.0	1.0	0.0	14.0	34.0
Maximum	12.0	12.0	43.0	50.0	70.0
Number of Participants Reporting "Zero"	34	43	53	1	n/a
Number of "No Responses"	15	13	22	9	4

Panel C: Participant Gender

	Female	Male	No Response	Total
Gender	63	61	2	126

TABLE 2—Reconciliation of the Total Sample to the Sample Used for Analysis

Condition:	Long/Narrower	Long/Wider	Short/Narrower	Short/Wider	Total
Total Submissions	37	38	39	39	153
Less: incomplete submissions	0	(4)	0	(2)	(6)
Completed Submissions	37	34	39	37	147
Less: participants who failed attention check questions	(3)	(2)	(3)	(2)	(10)
Less: participants who failed a manipulation check question[a]	(3)	0	(6)	0	(9)
Less: outliers[b]	0	(1)	(1)	0	(2)
Final Sample for Analysis	31	31	29	35	126

[a] To determine whether participants attended to my manipulation, I asked the following question: "During this survey, you read two earnings releases, along with two earnings forecasts for the upcoming year. Both earnings forecasts were a range of possible earnings. Which earnings forecast had the wider (larger) range, the first forecast (for 2014), or the second forecast (for 2015)?" Participants indicated their responses on a 101-point scale, with zero indicating "The first forecast (for 2014) was wider than the second forecast (for 2015)", 50 indicating uncertainty, and 100 indicating "The second forecast (for 2015) was wider than the first forecast (for 2014)." Participants passed the manipulation check if they responded with a 40 or less for the narrower condition or a 60 or more for the wider condition.

[b] Two participants provided EPS forcasts that were far different from the other participants (e.g., $5,000,000 for 2014 and $10,000,000 for 2015, in contrast to actual EPS of $1.27), and so are considered outliers.

TABLE 3—Correlations between Main Dependent Measures

Pearson Correlation Coefficients (N = 126) [p-value in italics] [a]

		Financial Disclosure Competence			Operating Competence			Trustworthiness		
Financial Disclosure Competence		**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
I believe that management is very competent at providing financial disclosures.	**1**	1								
I believe that management has little knowledge of the factors involved in providing useful disclosures. [b]	**2**	0.52872 *<.0001*	1							
I believe that few people are as qualified as management to provide useful financial disclosures about the company.	**3**	0.21915 *0.0137*	0.17779 *0.0464*	1						
Operating Competence										
I believe that management is very competent at running the company.	**1**	0.64282 *<.0001*	0.44473 *<.0001*	0.27055 *0.0022*	1					
I believe that management has little knowledge of the factors involved in running the business. [b]	**2**	0.42496 *<.0001*	0.39372 *<.0001*	0.06216 *0.4893*	0.47412 *<.0001*	1				
I believe that few people are as qualified as management to operate the company.	**3**	0.2454 *0.0056*	0.16007 *0.0734*	0.23549 *0.0079*	0.23474 *0.0081*	0.21207 *0.0171*	1			
Trustworthiness										
I believe that management is very trustworthy.	**1**	0.57776 *<.0001*	0.47785 *<.0001*	0.21889 *0.0138*	0.62524 *<.0001*	0.3015 *0.0006*	0.13842 *0.1222*	1		
I believe that management is very honest.	**2**	0.67518 *<.0001*	0.40654 *<.0001*	0.27438 *0.0019*	0.65326 *<.0001*	0.41722 *<.0001*	0.27843 *0.0016*	0.71994 *<.0001*	1	
I believe that management may not be truthful in their financial disclosures. [b]	**3**	0.4788 *<.0001*	0.29642 *0.0008*	0.25544 *0.0039*	0.5055 *<.0001*	0.47653 *<.0001*	0.29186 *0.0009*	0.47251 *<.0001*	0.62941 *<.0001*	1

[a] Participants responded to nine main dependent measures on a 101-point scale (0 represents total disagreement and 100 represents total agreement). Three questions relate to financial disclosure competence, three questions relate to operating competence, and three questions relate to trustworthiness. The correlation coefficients above are calculated from difference scores (posttest - pretest).

[b] Reverse-scored

TABLE 4—Cronbach's Alpha and Factor Analysis for the Main Dependent Measures

Panel A: Cronbach's Alpha for All Nine Dependent Measures [a]

Variables	Alpha
Raw	0.834039
Standardized	0.849828

Panel B: Factor Pattern for All Nine Dependent Measures [b]

		Factor Pattern			
		Factor1		Factor2	
Fin. Reporting Competence	**1**	81	*	-13	
	2	64	*	-23	
	3	38		68	*
Operating Competence	**1**	82	*	-8	
	2	62	*	-19	
	3	39		66	*
Trustworthiness	**1**	78	*	-19	
	2	86	*	-2	
	3	73	*	12	

Panel C: Cronbach's Alpha Calculated Separately for the Three Financial Disclosure Competence, the Three Operational Competence, and the Three Trustworthiness Measures [a]

Variables	**Financial Reporting Competence** Alpha	**Operating Competence** Alpha	**Trustworthi-ness** Alpha
Raw	0.560228	0.546670	0.810820
Standardized	0.572414	0.570606	0.822668

Panel D: Factor Pattern Calculated Separately for the Three Financial Disclosure Competence, the Three Operational Competence, and the Three Trustworthiness Measures [b]

		Factor Pattern					
		Financial Reporting Competence		**Operating Competence**		**Trustworthi-ness**	
Question	**1**	84	*	81	*	85	*
	2	82	*	80	*	92	*
	3	51	*	57	*	80	*

[a] Participants responded to three questions related to managerial trustworthiness and six questions related to managerial competence on a 101-point scale (0 corresponds to complete disagreement, 100 corresponds to complete agreement). Three of the questions related to operational competence, and three of the questions related to financial reporting competence. The statistics in this table are calculated using difference scores (posttest - pretest). The nine questions are listed in Table 3.

[b] The numbers represent the unique variance each factor contributes to the variance of the observed variable. Variables with a loading of 40 or greater are marked with an asterisk ("*").

TABLE 5—Tests Related to Changes in Perceived Trustworthiness

Panel A: Mean {Directional Prediction} (Standard Deviation) [number of participants][a]

Condition	*Narrower*	*Wider*	Row Mean
Short	2.56 {-}	4.82 {0}	3.80
	(16.76)	(16.67)	(16.62)
	[29]	[35]	[64]
Long	-3.53 {0}	-2.42 {+}	-2.97
	(18.80)	(13.29)	(16.16)
	[31]	[31]	[62]
Column Mean	-0.58	1.42	0.47
	(17.95)	(15.50)	(16.68)
	[60]	[66]	[126]

Panel B: Overall ANOVA

Source of Variance	*df*	SS	MS	*F*	*p*
Model	3	1543.09	514.36	1.89	0.135
POSITION	1	1392.56	1392.56	5.11	0.026
PRECISION	1	88.67	88.67	0.33	0.569
POSITION × PRECISION	1	10.34	10.34	0.04	0.846
Error	122	33217.82	272.28		

Panel C: Planned Contrast[b]

Contrast	*df*	SS	MS	*F*	*p*
H1a and H2b	1	371.98	371.98	1.37	0.245

[a] Participants responded to three questions related to managerial trustworthiness on a 101-point scale (0 corresponds to completely untrustworthy, 100 corresponds to completely trustworthy). The statistics in this table are calculated from the mean of the difference scores (posttest - pretest) for the responses to the three trustworthiness questions.

[b] The planned contrast to test H1a and H2b is: long/narrower (0), long/wider (1), short/narrower (-1), short/wider (0).

TABLE 6—Tests Related to Changes in Perceived Competence

Panel A: Mean {Directional Prediction} (Standard Deviation) [number of participants][a]

Condition	*Narrower*	*Wider*	Row Mean
Short	3.59 {0}	-0.19 {-}	1.53
	(15.27)	(18.11)	(16.86)
	[29]	[35]	[64]
Long	-4.74 {+}	-4.48 {0}	-4.61
	(18.39)	(11.67)	(15.27)
	[31]	[31]	[62]
Column Mean	-0.71	-2.2	-1.49
	(17.33)	(15.46)	(16.33)
	[60]	[66]	[126]

Panel B: Overall ANOVA

Source of Variance	*df*	SS	MS	*F*	*p*
Model	3	1413.54	471.18	1.80	0.151
POSITION	1	1249.80	1249.80	4.78	0.031
PRECISION	1	96.82	96.82	0.37	0.544
POSITION × *PRECISION*	1	128.36	128.36	0.49	0.485
Error	122	31907.07	261.53		

Panel C: Planned Contrast[b]

Contrast	*df*	SS	MS	*F*	*p*
H1b and H2a	1	341.27	341.27	1.30	0.256

[a] Participants responded to six questions related to managerial competence on a 101-point scale (0 corresponds to totally incompetent, 100 corresponds to completely competent). Three of the questions related to operational competence, and three of the questions related to financial reporting competence. The statistics in this table are calculated from the mean of the difference scores (posttest - pretest) for the responses to four of the competence questions. The responses for two of the competence questions did not load on the same factor as the other four responses (see Table 4), and so are omitted from this analysis.

[b] The planned contrast to test H1a and H2b is: long/narrower (1), long/wider (0), short/narrower (0), short/wider (-1).

TABLE 7—Tests Related to Changes in Overall Credibility

Panel A: Mean {Directional Prediction} (Standard Deviation) [number of participants][a]

Condition	*Narrower*	*Wider*	Row Mean
Short	3.08 {-}	2.32 {-}	2.66
	(14.98)	(15.93)	(15.39)
	[29]	[35]	[64]
Long	-4.13 {+}	-3.45 {+}	-3.79
	(17.20)	(11.56)	(14.53)
	[31]	[31]	[62]
Column Mean	-0.65	-0.39	-0.51
	(16.43)	(14.24)	(15.26)
	[60]	[66]	[126]

Panel B: Overall ANOVA

Source of Variance	*df*	SS	MS	*F*	*p*
Model	3	1327.94	442.65	1.94	0.126
POSITION	1	1320.21	1320.21	5.80	0.018
PRECISION	1	0.04	0.04	0.00	0.989
POSITION × PRECISION	1	16.46	16.46	0.07	0.789
Error	122	27787.95	227.77		

[a] Participants responded to three questions related to managerial trustworthiness and six questions related to managerial competence on a 101-point scale (0 corresponds to total disagreement, 100 corresponds to completely agreement). Three of the questions related to operational competence, and three of the questions related to financial reporting competence. The statistics in this table are calculated from the mean of the difference scores (posttest - pretest) for the responses to the three trustworthiness questions and four of the competence questions. The responses for two of the competence questions did not load on the same factor as the other four responses (see Table 4), and so are omitted from this analysis.

TABLE 8—Changes in Perception that Environmental Uncertainty is Affecting Company Performance

Panel A: Mean (Standard Deviation) [number of participants][a]

Condition	*Narrower*	*Wider*	Row Mean
Short	-3.41	0.74	-1.14
	(19.23)	(15.48)	(17.27)
	[29]	[35]	[64]
Long	-3.26	4.00	0.37
	(16.23)	(18.95)	(17.88)
	[31]	[31]	[62]
Column Mean	-3.33	2.27	-0.40
	(17.59)	(17.14)	(17.52)
	[60]	[66]	[126]

Panel B: Overall ANOVA

Source of Variance	*df*	SS	MS	*F*	*p*
Model	3	1162.50	387.50	1.27	0.287
POSITION	1	91.30	91.30	0.30	0.585
PRECISION	1	1021.36	1021.36	3.35	0.070
POSITION × PRECISION	1	75.40	75.40	0.25	0.620
Error	122	37191.66	304.85		

Panel C: Contrast[b]

	df	SS	MS	*F*	*p*
Contrast	1	1041.06	1041.06	3.41	0.067

[a] Participants responded to a question asking if they thought environmental uncertainty was affecting company performance (0 corresponds to not at all, 100 corresponds to very much). The statistics in this table are calculated from the mean of the difference scores (posttest - pretest) for the responses to this question.

[b] The contrast code is: long/narrower (-1), long/wider (3), short/narrower (-3), short/wider (1).

TABLE 9—Changes in Perception that Economic Uncertainty is High

Panel A: Mean (Standard Deviation) [number of participants][a]

Condition	*Narrower*	*Wider*	Row Mean
Short	-4.41	2.66	-0.55
	(14.88)	(14.68)	(15.08)
	[29]	[35]	[64]
Long	5.26	6.55	5.90
	(23.49)	(18.87)	(21.14)
	[31]	[31]	[62]
Column Mean	0.58	4.48	2.63
	(20.24)	(16.76)	(18.52)
	[60]	[66]	[126]

Panel B: Overall ANOVA

Source of Variance	*df*	SS	MS	*F*	*p*
Model	3	2128.94	709.65	2.12	0.101
POSITION	1	1442.01	1442.01	4.32	0.040
PRECISION	1	548.02	548.02	1.64	0.203
POSITION × PRECISION	1	261.94	261.94	0.78	0.378
Error	122	40762.53	334.12		

Panel C: Contrast[b]

	df	SS	MS	*F*	*p*
Contrast	1	1386.58	1386.58	4.15	0.044

[a] Participants responded to a question asking if they thought economic uncertainty was high (0 corresponds to not at all, 100 corresponds to very much). The statistics in this table are calculated from the mean of the difference scores (posttest - pretest) for the responses to this question.

[b] The contrast code is: long/narrower (-1), long/wider (3), short/narrower (-3), short/wider (1).

TABLE 10—Tests of Additional Predictions

Panel A: Regression Results for *MANIPULATE* = $\beta_0 + \beta_1 \times$ *TRUSTWORTHINESS* + $\beta_2 \times$ *COMPETENCE* + $\beta_3 \times$ *TRUSTWORTHINESS* × *COMPETENCE* + ε [b]

Independent Variable	Estimate	Std. Error	t-value	*p*
Intercept	39.6383	1.92317	20.61	<.0001
COMPETENCE	-0.2059	0.13263	-1.55	0.1231
TRUSTWORTHINESS	-0.6224	0.11476	-5.42	<.0001
COMPETENCE × TRUSTWORTHINESS	0.0028	0.00410	0.67	0.5015
Model F-Statistic	36.76			<.0001
Adj. R^2	0.4619			
N	126			

Panel B: Regression Results for *RETAIN* = $\beta_0 + \beta_1 \times$ *TRUSTWORTHINESS* + $\beta_2 \times$ *COMPETENCE* + $\beta_3 \times$ *TRUSTWORTHINESS* × *COMPETENCE* + ε [b]

Independent Variable	Estimate	Std. Error	t-value	*p*
Intercept	59.1542	2.66715	22.18	<.0001
COMPETENCE	0.6366	0.18394	3.46	0.0007
TRUSTWORTHINESS	0.1028	0.15916	0.65	0.5198
COMPETENCE × TRUSTWORTHINESS	0.0130	0.00568	2.29	0.0235
Model F-Statistic	15.76			<.0001
Adj. R^2	0.2616			
N	126			

[a] Participants responded to a question asking whether they believed company management was manipulating earnings on a 101-point scale (0 corresponds to a strong belief that management is not manipulating earnings, 100 corresponds to a strong belief that management is manipulating earnings). Independent variables are perceived competence and trustworthiness as defined in Tables 5 and 6, respectively. This regression uses post-test measures (rather than the difference scores used in Tables 4 - 9). The independent variables are centered. Because there is no statistically-significant interaction, inferences regarding the coefficients are not affected by uncentering the independent variables.

[b] Participants responded to a question asking whether the CEO should be retained on a 101-point scale (0 corresponds to absolutely replace the CEO, 100 corresponds to absolutely keep the CEO). Independent variables are perceived competence and trustworthiness as defined in Tables 5 and 6, respectively. This regression uses post-test measures (rather than the difference scores used in Tables 4 - 9). The independent variables are centered. Because the interaction term is statistically significant, the estimated coefficients change when the independent measures are uncentered. Specifically, the estimated coefficient for *COMPETENCE* changes from statistically significantly positive when the independent measures are centered (tabulated above) to not statistically significantly different from zero when uncentered (untabulated).

FIGURE 1—Conceptual Model of the Relations between Change in Management Earnings Forecast Precision, Investors' Preferences, and Managerial Credibility

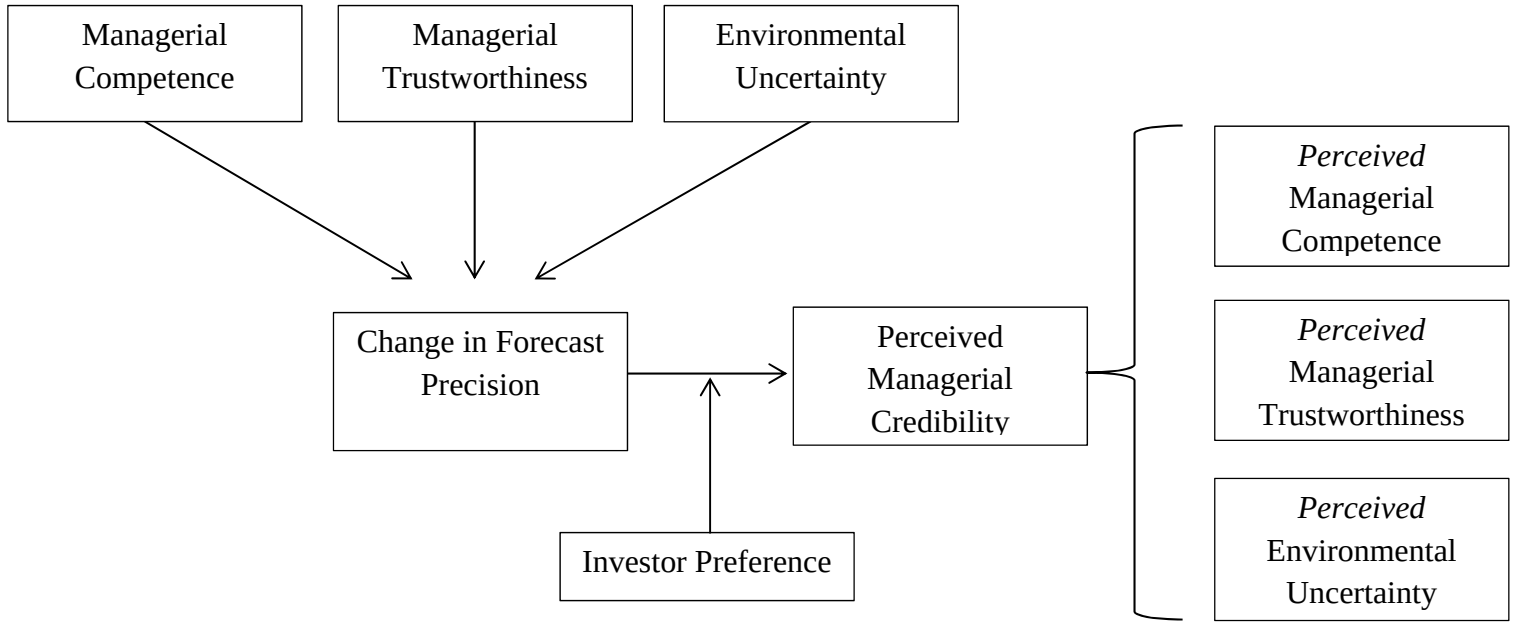
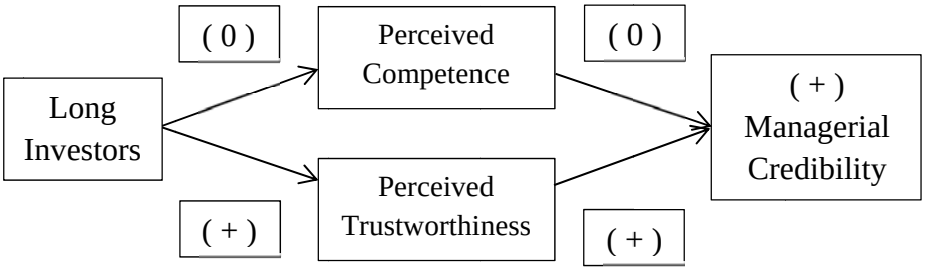
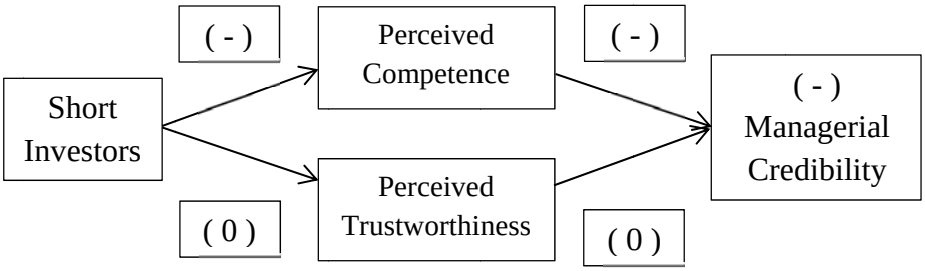


FIGURE 2—Predicted Relations between Investor Position and Perceived Competence, Trustworthiness, and Credibility of Management when Earnings Guidance Widens

Panel A: (H1a) Long Investors' Perception of Management Earnings Forecast Credibility when the Forecast Range Widens.



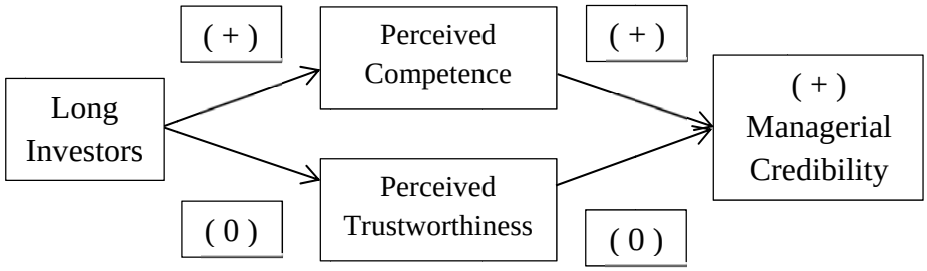
Panel B: (H1b) Short Investors' Perception of Management Earnings Forecast Credibility when the Forecast Range Widens.



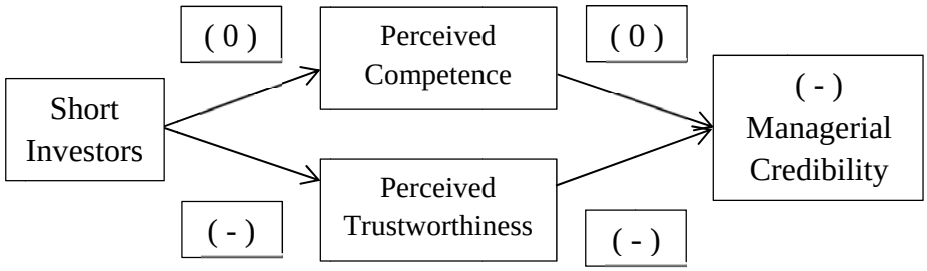
Note: A "+" indicates a hypothesized positive relation, a "-" indicates a hypothesized negative relation, and a "0" indicates no hypothesized relation.

FIGURE 3—Predicted Relations between Investor Position and Perceived Competence, Trustworthiness, and Credibility of Management when Earnings Guidance Narrows

Panel A: **(H2a) Long Investors' Perception of Management Earnings Forecast Credibility when the Forecast Range Narrows.**

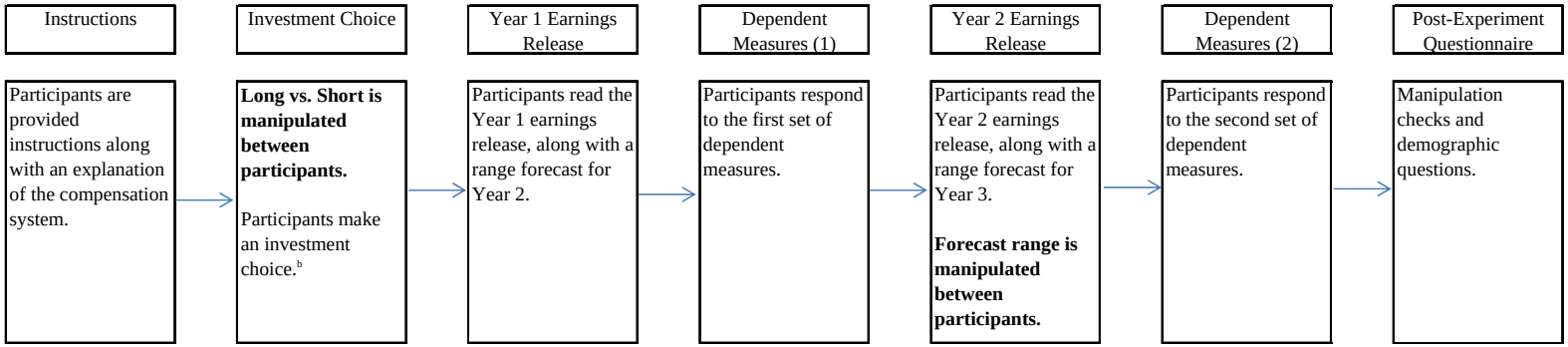


Panel B: **(H2b) Short Investors' Perception of Management Earnings Forecast Credibility when the Forecast Range Narrows.**



Note: A "+" indicates a hypothesized positive relation, a "-" indicates a hypothesized negative relation, and a "0" indicates no hypothesized relation.

FIGURE 4—Experimental Procedure



[a] I employ a 2 × 2 between-subjects factorial design with random assignment. The first factor is investor sentiment, which, following prior literature, I operationalize as participants' taking a long or short position in the stock (*POSITION: long*, *short*) (Hales 2007; Han and Tan 2010; Thayer 2011). The second factor is change in MF precision (*PRECISION: wider*, *narrower*). Half of participants receive management earnings forecasts for Year 3 where the forecast range is wider (49 cents) than the forecast range for Year 2 (*wider*), while the other half of participants receive a Year 3 earnings forecast range that is narrower (three cents) than the Year 2 forecast range (*narrower*).

[b] To enhance participants' commitment to the task, each participant chooses one of two firms in which to invest. The two firms are described so as to be equally attractive. Although two firms are presented, the actual financial information presented during the task is the same for all participants; thus, this feature is not an experimental manipulation.

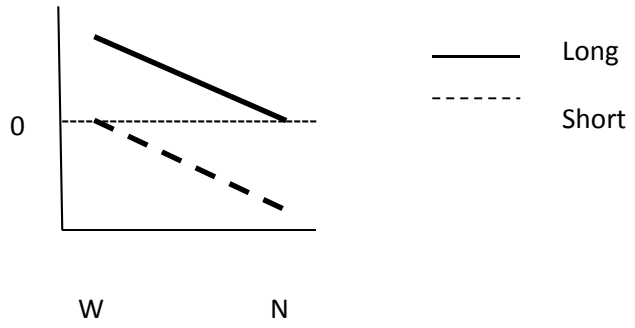
FIGURE 5—Experimental Design and Hypothesized Results

Panel A: Experimental design

		PRECISION	
		Wider	*Narrower*
POSITION	*Long*	1	2
	Short	3	4

Panel B: Change in perceived trustworthiness (H1a and H2b)

		PRECISION	
		Wider	Narrower
POSITION	*Long*	+	0
	Short	0	-



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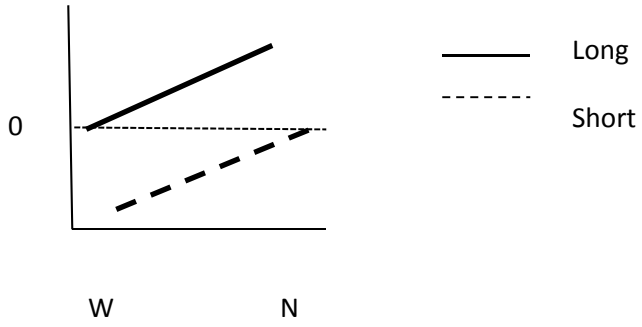
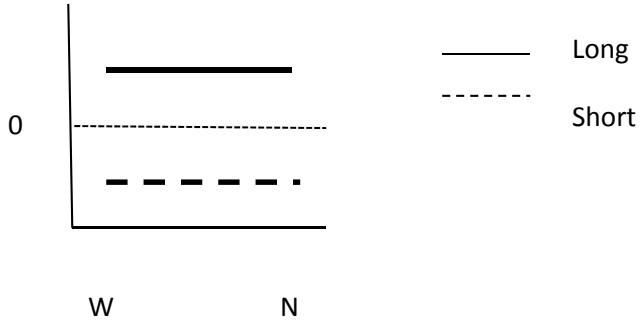
Panel C: Change in perceived competence (H1b and H2a)

		PRECISION	
		Wider	Narrower
POSITION	*Long*	0	+
	Short	-	0



Panel D: Change in perceived overall credibility

		PRECISION	
		Wider	Narrower
POSITION	*Long*	+	+
	Short	-	-



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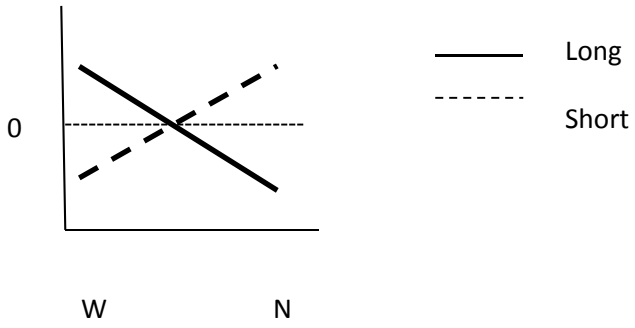
Panel E: Change in the perception that environmental factors are responsible for firm performance

		PRECISION	
		Wider	Narrower
POSITION	*Long*	+	-
	Short	-	+



APPENDIX B—EXPERIMENTAL INSTRUMENT

Part A

GENERAL INSTRUCTIONS

Thank you for your participation

In the following pages, you will have the opportunity to make an investment decision. During this process, you will have the chance to earn points that will be converted to dollars I will pay to you at the completion of the study (in approximately two weeks).

- **Participation Points**: you will earn 25 points for completing the materials. This is to thank you for your time.

- **Accuracy Points:** You can earn up to an additional 25 points for accurately forecasting earnings per share (described later). This is to encourage you to focus on the materials and information.

- **Investment Benchmark:** You may also earn or lose up to 25 points, depending on how your chosen investment performs.

At the end, points will be converted into dollars. *Overall, you can earn between a minimum of $2 and a maximum of $3.50*.

INVESTMENT CHOICE

After researching the industrial supplies industry, you concluded that two firms in the industry are **[overvalued/undervalued].** Based on your research, you would like to take a **[short/long]** position in one of these two stocks.

Note: A **[short/long]** investment position is like making a prediction and bet that the stock price will **[decrease/increase]**. In other words, when you take a **[short/long]** position, you hope that the company performs **[poorly/well]**. Your investment will make money when the company performs **[poorly/well]**.

After comparing the two firms, you have decided to make your decision based on the following information:

Firm Y

Last three years' growth rates for revenue and operating income

	2012	2011	2010
Revenue	1.0%	11.1%	15.3%
Operating Income	4.9%	4.4%	22.9%

Last three years' operating profit margin

Operating profit as a % of Sales	21.7%	20.9%	22.2%

R&D Expense as a % of total revenue: **5.5%**

New CEO, Irwin Thaler, earlier this year

Opened a new R&D center in Shanghai, China

Increased competition from other companies in the industrial coating segment

Firm Z

Last three years' growth rates for revenue and operating income

	2012	2011	2010
Revenue	8.3%	14.2%	17.2%
Operating Income	9.5%	8.5%	25.6%

Last three years' operating profit margin

Operating profit as a % of Sales	14.0%	14.7%	14.0%

R&D Expense as a % of total revenue: **8.2%**

Changed independent auditor last year

Major initiative to expand in Latin America and Southeast Asia

Expect patent expirations on two chemical products later this year

Except for the items above, all other information regarding the companies, including their stock prices, are very similar to each other.

Please remember that part of your total points depends on how the company performs. Now, please choose the firm in which you would like to take a [**short/long]** position. Remember that when you take a [short/long] position, this means your investment will do well when the firm performs **[poorly/well.]**

FIRM Y **FIRM Z**

Part B: Year 1 (2013)

EARNINGS RELEASE FOR YEAR 1 (2013)

You decided to take a **[short/long]** position in **[Firm Y/Firm Z]**. Below is **[Firm Y's/Firm Z's]** earnings press release for the year 2013.

For Immediate Release

[FIRM Y/FIRM Z] REPORTS 2013 EARNINGS OF $1.27 PER SHARE

Management Expects 2014 EPS in the range of $1.18 - $1.36

DALLAS, Texas—(Business Wire)—This morning [Firm Y/Firm Z] reported earnings for the year 2013 of $1.27 per share.

"We are pleased to have achieved solid earnings in 2013," said CEO Irwin Thaler. "Looking to next year, we feel confident that we can achieve our earnings target for 2014, in the range of $1.18 to $1.36 per share."

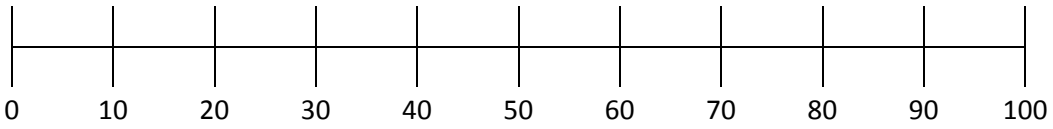
NOTE: During the remainder of this survey, you will be asked several questions about company performance and about your opinion of company management. Several questions are similar to each other, so it is important that you read the questions carefully.

Please note that, although there appear to be many questions, this entire survey should only take about 15 minutes in total.

QUESTIONS

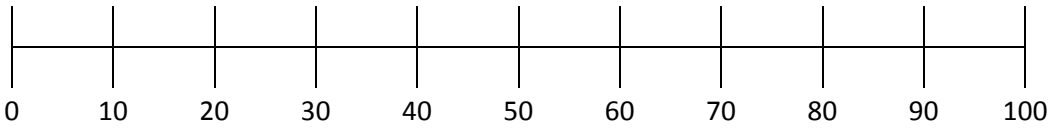
Based on your reading of the earnings release, please answer the following questions below. For each question, please mark your response with a slash (/) on the line provided.

1) I believe that management is very competent at providing financial disclosures.



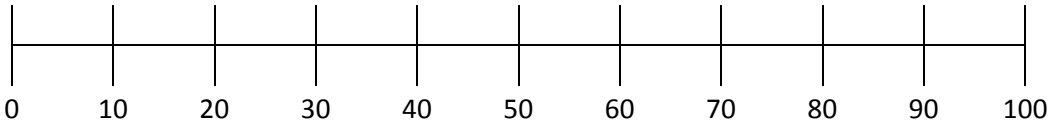
Completely Disagree — Neutral — Completely Agree

2) I believe that management has <u>little</u> knowledge of the factors involved in providing useful disclosures.



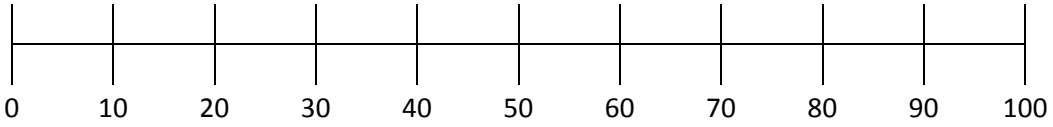
Completely Disagree — Neutral — Completely Agree

3) I believe that management is very trustworthy.



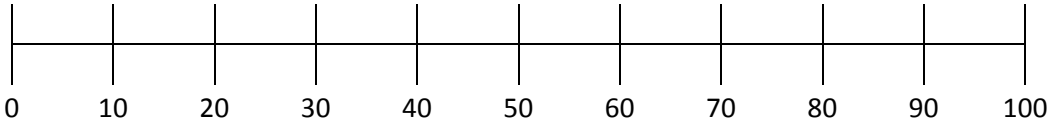
Completely Disagree — Neutral — Completely Agree

4) I believe that few people are as qualified as management to provide useful financial disclosures about the company.



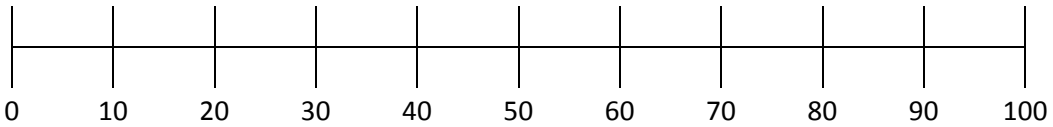
Completely Disagree — Neutral — Completely Agree

5) I believe that management is very honest.



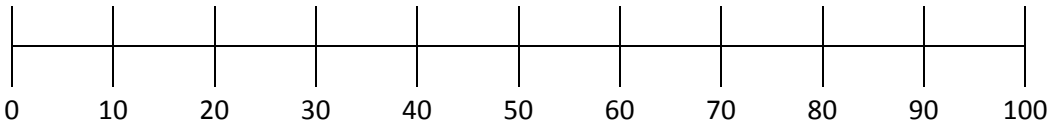
Completely Disagree — Neutral — Completely Agree

6) I believe that management may <u>not</u> be truthful in their financial disclosures.



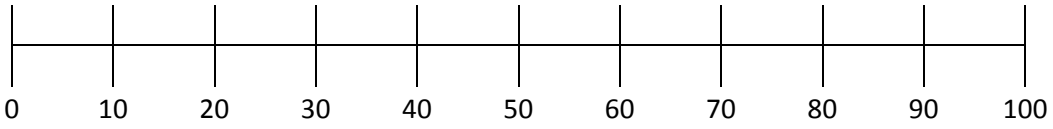
Completely Disagree — Neutral — Completely Agree

7) I believe that management is very competent at running the company.



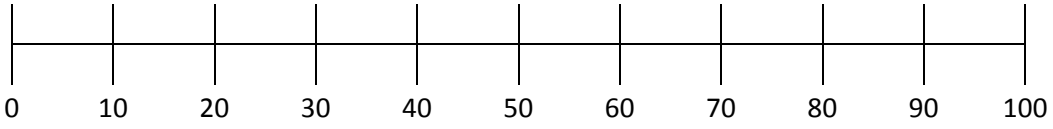
Completely Disagree — Neutral — Completely Agree

8) I believe that economic conditions outside of management's control are affecting company performance.



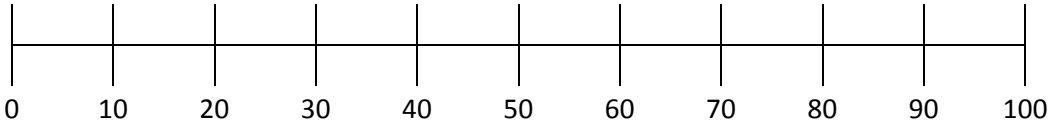
Completely Disagree — Neutral — Completely Agree

9) I believe that the company's management is manipulating the company's earnings.



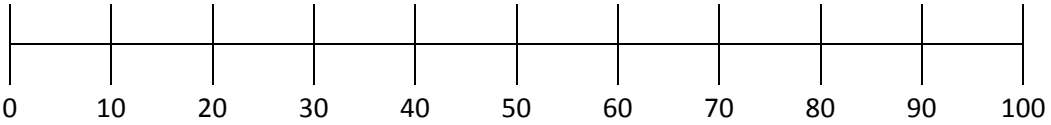
Completely Disagree — Neutral — Completely Agree

10) I believe that economic uncertainty is high.



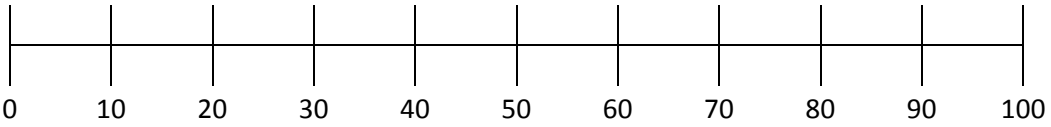
Completely Disagree — Neutral — Completely Agree

11) I believe that management has <u>little</u> knowledge of the factors involved in running the business.



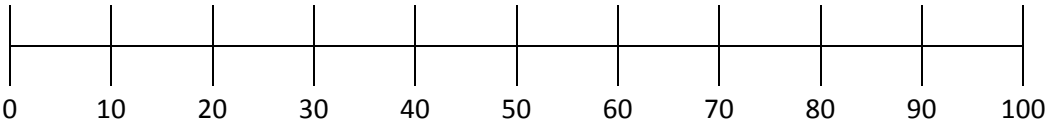
Completely Disagree — Neutral — Completely Agree

12) I believe that few people are as qualified as management to operate the company.



Completely Disagree — Neutral — Completely Agree

13) Overall, how confident are you in your judgments above?



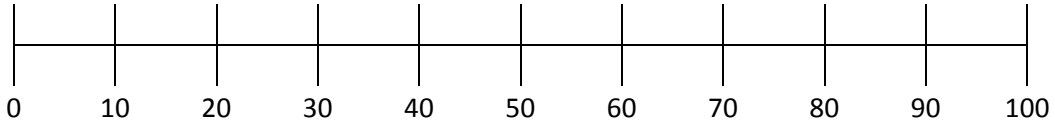
Not at all Confident — Neutral — Completely Confident

VOTE ON MANAGEMENT RETENTION

[Long Investors: Shareholders are entitled to vote on whether to retain the CEO each year. Please provide your opinion about whether the CEO should be retained for the next year.]

[Short Investors: Shareholders are entitled to vote on whether to retain the CEO each year. Although you are not a shareholder (you are betting against the company), please provide your opinion about whether the CEO should be retained for the next year.]

Please indicate your opinion regarding whether to replace or keep the CEO



Absolutely Replace the CEO

Neutral

Absolutely Keep the CEO

EARNINGS BENCHMARK FOR YEAR 2 (2014)

Recall that you decided to take a **[short/long]** position in **[Firm Y/Firm Z]**. That is, you hope that the company performs **[poorly/well]**.

In this study, to simulate how the firm's performance would affect an investor with a position like yours, you will earn two extra points (remember these will be converted to dollars paid to you) for every cent that the company's 2014 earnings per share is **[below $1.33/above $1.21]**. Also, for each cent that the company's 2014 earnings per share is **[above $1.33/below $1.21]** you lose two of these payment points.

Please see the examples in the table below:

Actual Earnings	Points	Explanation
Three cents above benchmark	6	3 cents × 2 points = 6 points total
One cent below benchmark	-2	-1 cent × 2 points = -2 points total

To ensure that you understand how this works, please answer the following questions. Remember that your benchmark is **[$1.33/1.21]**.

1) If the company's actual 2014 earnings per share is [$1.22/$1.30], then I would:

a. Earn two points
b. Lose two points
c. Earn six points
d. Lose six points

2) If the company's actual 2014 earnings per share is [$1.24/$1.32, then I would:

a. Earn two points
b. Lose two points
c. Earn six points
d. Lose six points

EARNINGS PER SHARE (EPS) FORECAST FOR YEAR 2 (2014)

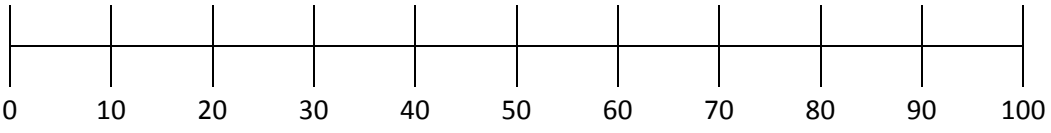
Now that you have read management's earnings forecast for the next year (2014), please make your own prediction of what you think EPS will be for [Firm Y/Firm Z].

Recall that you will earn points for accurately predicting EPS so you want to make the best estimate you can. To calculate how many points you get for this, I will start you with 25 accuracy points, and then for each penny that your prediction differs from the actual EPS, you will lose two points from these 25 accuracy points. So you want to be as accurate as you can. *(Note: total accuracy points cannot go below zero).*

You may read the earning press release again if you wish.

I predict that the company will earn $ _____ next year (2014).

How confident are you in your EPS prediction?



Not at all Confident — Neutral — Completely Confident

Part C: Year 2 (2014)

EARNINGS RELEASE FOR YEAR 2 (2014)

Recall that you decided to take a **[short/long]** position in **[Firm Y/Firm Z]** and that this means you hope that the company performs **[poorly/well]**. Below is **[Firm Y's/Firm Z's]** earnings press release for the year 2014.

For Immediate Release

FIRM Y/FIRM Z REPORTS 2014 EARNINGS OF $1.27 PER SHARE

Management Expects 2015 EPS in the range of $1.26 - $1.28

[Management Expects 2015 EPS in the range of $1.03 - $1.51]

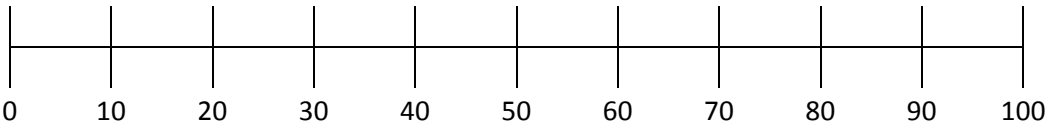
DALLAS, Texas—(Business Wire)—This morning [Firm Y/Firm Z] reported earnings for the year 2014 of $1.27 per share.

"Once again we had another good year," said CEO Irwin Thaler. "Looking forward, due to a number of changes in the upcoming year, we decided to **[narrow/widen]** our EPS range for 2015 when compared to 2014. Thus, we expect 2015 EPS to be in the range of **[$1.26 - $1.28 / $1.03 - $1.51]**."

QUESTIONS

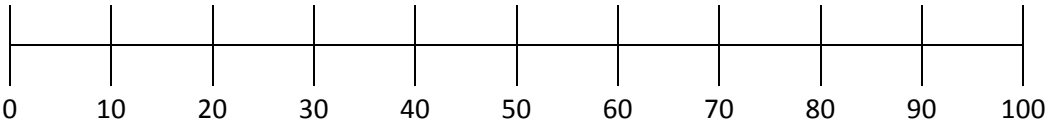
Based on your reading of the earnings press release, please answer the following questions below. For each question, please mark your response with a slash (/) on the line provided.

1) **I believe that management is very competent at providing financial disclosures.**



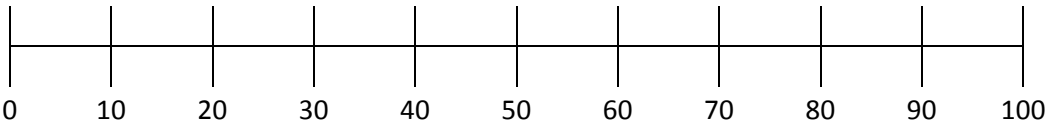
Completely Disagree — Neutral — Completely Agree

2) **I believe that management has <u>little</u> knowledge of the factors involved in providing useful disclosures.**



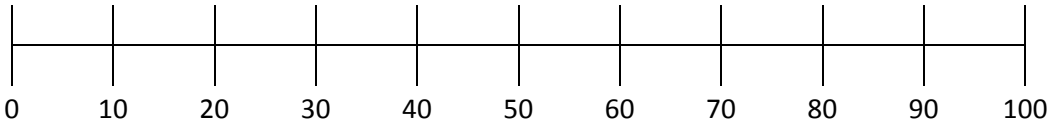
Completely Disagree — Neutral — Completely Agree

3) **I believe that management is very trustworthy.**



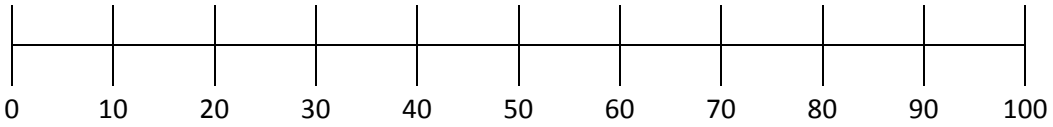
Completely Disagree — Neutral — Completely Agree

4) I believe that few people are as qualified as management to provide useful financial disclosures about the company.



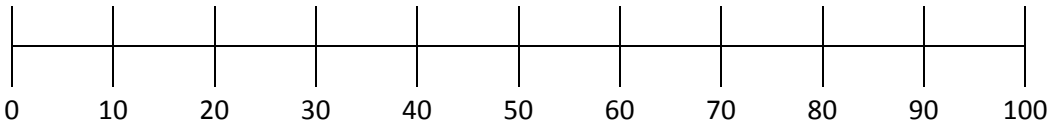
Completely Disagree — Neutral — Completely Agree

5) I believe that management is very honest.



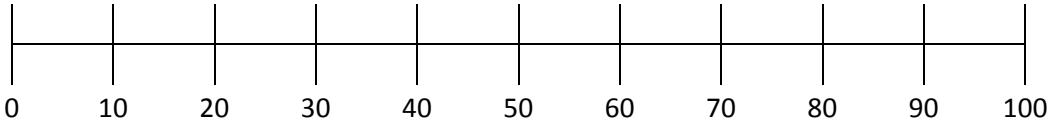
Completely Disagree — Neutral — Completely Agree

6) I believe that management may <u>not</u> be truthful in their financial disclosures.



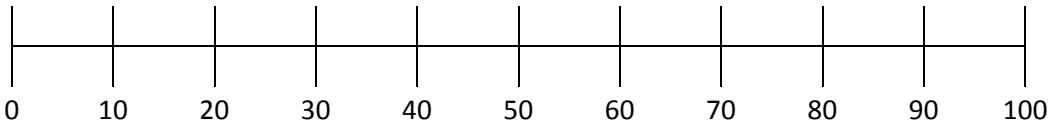
Completely Disagree — Neutral — Completely Agree

7) I believe that management is very competent at running the company.



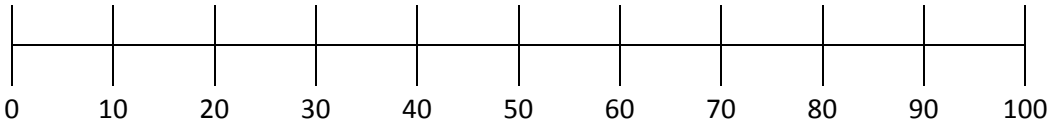
Completely Disagree — Neutral — Completely Agree

8) I believe that economic conditions outside of management's control are affecting company performance.



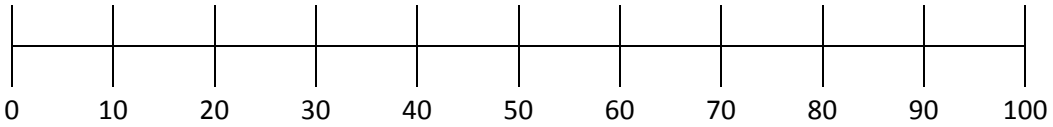
Completely Disagree — Neutral — Completely Agree

9) I believe that the company's management is manipulating the company's earnings.



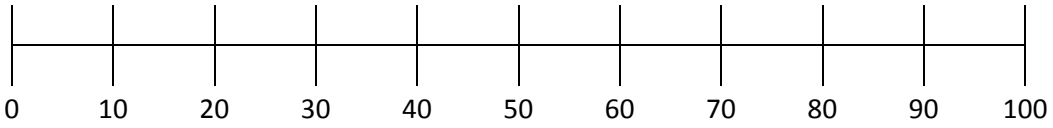
Completely Disagree — Neutral — Completely Agree

10) I believe that economic uncertainty is high.



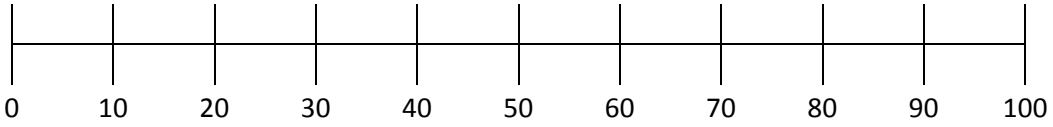
Completely Disagree — Neutral — Completely Agree

11) I believe that management has <u>little</u> knowledge of the factors involved in running the business.



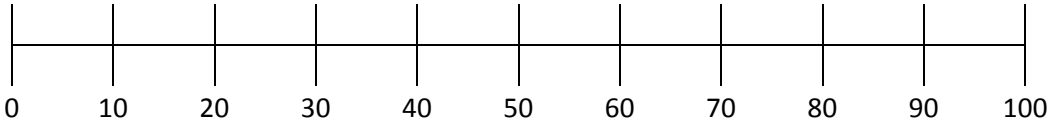
Completely Disagree — Neutral — Completely Agree

12) I believe that few people are as qualified as management to operate the company.



Completely Disagree — Neutral — Completely Agree

13) Overall, how confident are you in your judgments above?



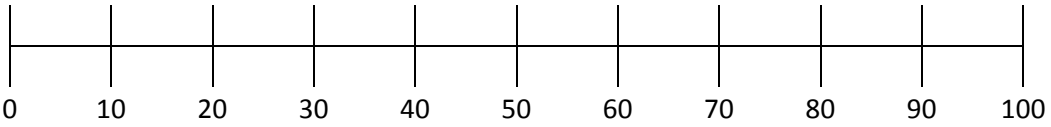
Not at all Confident — Neutral — Completely Confident

VOTE ON MANAGEMENT RETENTION

[Long Investors: Shareholders are entitled to vote on whether to retain the CEO each year. Please provide your opinion about whether the CEO should be retained for the next year.]

[Short Investors: Shareholders are entitled to vote on whether to retain the CEO each year. Although you are not a shareholder (you are betting against the company), please provide your opinion about whether the CEO should be retained for the next year.]

Please indicate your opinion regarding whether to replace or keep the CEO



Absolutely Replace the CEO

Neutral

Absolutely Keep the CEO

EARNINGS BENCHMARK FOR YEAR 3 (2015)

Recall that you decided to take a **[short/long]** position in **[Firm Y/Firm Z]**. That is, you hope that the company performs **[poorly/well]**.

In this study, to simulate how the firm's performance would affect an investor with a position like yours, you will earn two extra points (remember these will be converted to dollars paid to you) for every cent that the company's 2014 earnings per share is **[below $1.33/above $1.21]**. Also, for each cent that the company's 2015 earnings per share is **[above $1.33/below $1.21]** you lose two of these payment points.

Please see the examples in the table below:

Actual Earnings	Points	Explanation
Three cents above benchmark	6	3 cents × 2 points = 6 points total
One cent below benchmark	-2	-1 cent × 2 points = -2 points total

To ensure that you understand how this works, please answer the following questions. Remember that your benchmark is **[$1.33/$1.21]**.

1) If the company's actual 2015 earnings per share is [$1.22/$1.30], then I would:

a. Earn two points
b. Lose two points
c. Earn six points
d. Lose six points

2) If the company's actual 2015 earnings per share is [$1.24/$1.30], then I would:

a. Earn two points
b. Lose two points
c. Earn six points
d. Lose six points

EARNINGS PER SHARE (EPS) FORECAST FOR YEAR 3 (2015)

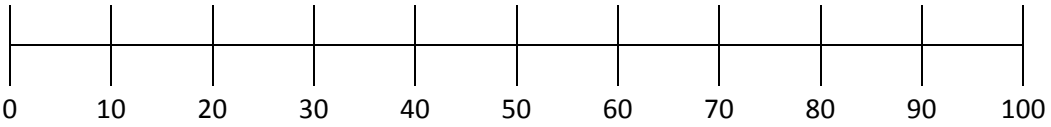
Now that you have read management's earnings forecast for the next year (2015), please make your own prediction of what you think EPS will be for Firm Y/Firm Z.

Recall that you will earn points for accurately predicting EPS so you want to make the best estimate you can. To calculate how many points you get for this, I will start you with 25 accuracy points, and then for each penny that your prediction differs from the actual EPS, you will lose two points from these 25 accuracy points. So you want to be as accurate as you can. *(Note: total accuracy points cannot go below zero).*

You may read the earning press release again if you wish.

I predict that the company will earn $ _____ next year (2015).

How confident are you in your EPS prediction?



Not at all Confident — Neutral — Completely Confident

Part D

[PRIOR MATERIALS INACCESSABLE]

ALMOST DONE!

The next section contains general questions about your investing experience.

All responses will remain confidential.

1) **How many times (total number of buy and sell transactions) have you invested <u>directly</u> in the common stock of a company (not through an ETF or mutual fund)?**

   Approximately [ ] total buy and sell transactions.

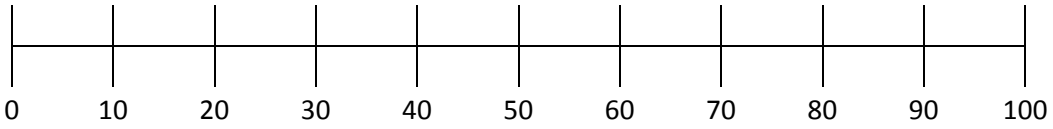
2) **Approximately how many years of experience do you have of investing directly in the common stock of a company?**

   Approximately [ ] years.

3) **Do you plan to invest directly in common stocks sometime in the future (circle one)?**
   1. Yes
   2. Maybe
   3. No
   4. Prefer not to say

4) **Have you ever invested in a mutual fund or exchange-traded fund (ETF) (circle one)?**
   1. Yes
   2. Uncertain
   3. No
   4. Prefer not to say

5) During this survey, you read two earnings releases, along with two earnings forecasts for the upcoming year. Both earnings forecasts were in a range format. Which earnings forecast had the <u>wider (larger)</u> range, the first forecast (for 2014), or the second forecast (for 2015)?

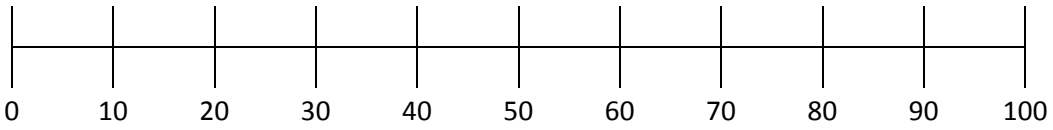


The first forecast (for 2014) was wider than the second forecast (for 2015)

No Change (had the same width)

The second forecast (for 2015) was wider than the first forecast (for 2014)

6) Now, please ignore the prior information in this survey. In general, do you think that average investors prefer earnings forecasts that are a relatively narrow range or a relatively wide range?



Prefer relatively narrow range

Don't prefer one over another

Prefer relatively wide range

7) Have you ever used a company's financial statements to evaluate its performance (circle one)?

1. Yes
2. Uncertain
3. No
4. Prefer not to say

8) Have you ever read (or heard) a company's earnings press release (circle one)?

1. Yes
2. Uncertain
3. No
4. Prefer not to say

9) How many total undergraduate and graduate <u>accounting</u> courses have you taken, including the courses in which you are currently enrolled?

Approximately [ ] total accounting courses

10) How many total undergraduate and graduate <u>finance</u> courses have you taken, including the courses in which you are currently enrolled?

Approximately [ ] total finance courses

11) How many years of total work experience do you have?

Approximately [ ] years

12) How many years of total <u>finance and accounting</u> work experience do you have?

Approximately [ ] years

13) Are you a Chartered Financial Analyst (CFA), and if so, for how many years?

Approximately [ ] years

14) Are you a Certified Public Accountant (CPA), and if so, for how many years?

Approximately [ ] years

15) What is your age (optional)?

[ ] years old

16) What is your gender (optional) (circle one)?

1. Female
2. Male
3. Prefer not to say