

Internal and External Attributions by Managers in Earnings Conference Calls

by

Zhenhua Chen

Business Administration
Duke University

Date: _____

Approved:

William Mayew, Co-chair

Mohan Venkatachalam, Co-chair

Robert Ashton

Richard Larrick

Dissertation submitted in partial fulfillment of
the requirements for the degree of
Doctor of Philosophy in Business Administration
in the Graduate School of
Duke University

2012

ABSTRACT

Internal and External Attributions by Managers in Earnings Conference Calls

by

Zhenhua Chen

Business Administration
Duke University

Date: _____

Approved:

William Mayew, Co-chair

Mohan Venkatachalam, Co-chair

Robert Ashton

Richard Larrick

An abstract of a dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor of Philosophy
in Business Administration
in the Graduate School of
Duke University

2012

Copyright by
Zhenhua Chen
2012

Abstract

In this study, I examine whether managers make self-serving attributions by internally (externally) attributing favorable (unfavorable) performance or demonstrate leadership by accepting blame and deflecting praise when communicating with analysts and investors. After validating the attribution measure I use in this paper, I find that managers tend to attribute favorable performance to internal factors and unfavorable performance to external factors, consistent with self-serving attribution being the dominant force. I also find that investors react negatively to managers' internal attributions. Further analysis reveals that more internal attributions are associated with lower earnings persistence.

Dedication

I dedicate this work to my father (Ruizhen Chen) and mother (Guizhen Zhou).

Contents

Abstract	iv
List of Tables	viii
Acknowledgements	ix
1. Introduction	1
2. Related Research and Hypothesis Development	10
3. Research Design and Data Construction	15
4. CEO Attribution Measure	21
5. Construct Validity of the Attribution Measure	30
5.1 Manual Coding of Management Attributions during Earnings Conference Calls	32
5.2 Internal and External Attributions and Personal Pronouns	38
6. Firm Performance and Managers' Attributions during Earnings Conference Calls	41
7. Market Reaction and Analyst Forecast Revisions to Managers' Attributions	48
8. Managers' Attributions and Earnings Persistence	54
9. Managers' Attributions and Future Stock Returns	58
10. Managers' Attributions and CEO Compensation	61
11. Further Empirical Tests	64
12. Robustness Tests	70
12.1 Attributions in Causal Reasoning Statements	70
12.2 Alternative Method of Identifying Self-serving Attributions	72
12.3 Using IvsWE as an Alternative Attributions Measure	75

12.4 Additional Robustness Checks	78
13. Conclusions.....	79
Appendix A.....	80
Appendix B:	83
References	85
Biography	93

List of Tables

Table 1: Descriptive Statistics of Firm Characteristics	17
Table 2: Descriptive Statistics of Linguistics Variables.....	23
Table 3: Descriptive Statistics of Manual Coding Sample.....	34
Table 4: Personal Pronouns and CEO Attributions.....	40
Table 5: The Association between Firm Performance and Managers' Attributions.....	44
Table 6: The Association between Management Attributions and Contemporaneous Stock Returns	50
Table 7: The Association between Management Attributions and Analyst Forecast Revisions	53
Table 8: The Association between Managers' Attributions and Earnings Persistence	57
Table 9: Managers' Attributions and Future Stock Returns	60
Table 10: Managers' Attributions and CEO Compensation.....	63
Table 11: High Attenuation and Management Attributions.....	66
Table 12: Firm Performance and Managers' Attributions in Causal Reasoning Statements	71
Table 13: Descriptive Statistics of Self-serving Attribution Sentences	74
Table 14: <i>IvsWE</i> as an Alternative Attribution Measure	77

Acknowledgements

I am deeply indebted to Bill Mayew and Mohan Venkatachalam for their guidance and mentoring during my doctoral study at Duke University. I thank my dissertation committee members, Bob Ashton, Rick Larrick, Bill Mayew (co-chair), and Mohan Venkatachalam (co-chair) for their invaluable comments that have greatly improved this paper. I also appreciate support from other faculty members and fellow doctoral students at Duke University's Fuqua School of Business.

1. Introduction

Managers often provide explanations of operating outcomes at the time of financial reporting and disclosure. In this paper, I empirically investigate how managers attribute firms' operating results when communicating with financial analysts and investors. Prior literature in social psychology and leadership offers different predictions on how managers will provide attributions to outsiders. Using a novel approach to identify CEO attribution, I study CEO attributions in a large sample that includes 50,434 earnings conference calls. I also examine how investors and financial analysts react to management attribution and whether attributions are related to earnings persistence.

When discussing financial performance with investors, managers could either attribute outcomes to internal factors such as business strategies and personal efforts or to external factors such as the macroeconomic environment, customer demand, and competition. These attributions may provide valuable information to help investors evaluate firm and management performance. Prior research documents that management forecasts accompanied with explanations are associated with stronger price reaction (Baginski et al. 2004), suggesting that management attributions are relevant for investor decisions.

There is very little research on managerial attributions and hence how managers make attributions remains an open question (Koonce et al. 2011). There are competing

theories that predict different attribution behavior by managers. Social psychology research suggests that people exhibit self-serving biases in making attributions. In other words, human beings tend to internally attribute favorable outcomes and externally attribute unfavorable outcomes (Försterling 2001; Miller and Ross 1975). In contrast, organizational behavior and leadership literature argues that as business leaders, managers should behave precisely the opposite way by deflecting praise when outcomes are favorable and accepting blame when outcomes are unfavorable (Collins 2001; Lee and Tiedens 2001; Lee et al. 2004; Morris et al. 2005; Ou 2011). Collins (2001) argues that personal humility, evidenced by deflecting praise, helps CEOs to successfully lead firms. Morris et al. (2005) articulate that humility brings supportive relationship between managers and employees and thus leads to improved future performance. Recent empirical research by Ou (2011) finds that CEO humility is positively related to middle manager ambidexterity and job performance.

Lee et al. (2004) focus on attributions in the presence of negative events, and argue that when negative events occur, making external attributions leads investors to believe that these events are out of the control of managers. Thus it is optimal for managers to make internal attributions for unfavorable results in order to convince investors that the company is able to act to prevent those results in the future. Lee et al. (2004) find that firms that make “self-disserving” attributions in their annual reports have higher stock prices in the future, suggesting that CEOs, as business leaders, should

demonstrate leadership when they communicate with investors and analysts by internally attributing negative outcomes.

CEOs are both human beings and leaders. As human beings, it is likely that they suffer from the same self-serving attribution bias. As leaders of corporations, they are expected to demonstrate leadership by deflecting praise for good performance and taking blame for bad performance. As such, it is unclear which force is more descriptive in CEOs' communication with analysts and investors.

I study management attributions in a large sample by adopting a new approach to measuring attributions. I use the personal pronouns spoken by CEOs during earnings conference calls as a proxy for management attributions. This methodology enables me to examine management attribution in a large sample of earnings conference calls. Using Linguistic Inquiry and Word Count (*LIWC*) 2007, a text analysis software that analyzes written or spoken samples on a word-by-word basis, I construct a measure of management attributions. Before applying this measure in a large sample investigation, I first examine the construct validity of the *LIWC*-based attribution measure by comparing it with an attribution measure based on human coding. In particular, I select 80 earnings conference call transcripts from my sample and manually code the attribution sentences spoken by managers during these calls. I classify these attributions as internal or external based on human judgment and compare these judgments to the *LIWC*-based measure. I find that internal attributions are characterized by more

frequent use of first-person pronouns and external attributions by third-person pronouns. A simple model using the LIWC-based attribution measure discriminates among manually coded internal and external attributions with 74% accuracy. This offers some assurance that the LIWC-based measure has some construct validity when proxying for management attributions in conference calls.

The findings regarding my main hypothesis are as follows. I find evidence consistent with managers attributing good earnings performance to internal factors and bad earnings performance to external factors. This pattern is robust to controlling for firm characteristics. I also document that investors react negatively to managers' internal attributions, while financial analysts do not incorporate management attributions in their future earnings forecasts. Further analysis reveals that internal attributions are related to lower earnings persistence, suggesting that market reaction is rational.

Kim (2011) finds that self-serving CEOs are more likely to be fired. To investigate why CEOs make self-serving attributions even though the stock market and labor market punish them for doing so, I conduct further analysis to examine whether CEO attributions vary with CEO and firm characteristics. Empirical results show that CEOs make less self-serving attributions when CEOs have been with the firm for a shorter time, and when their firms experience higher revenue growth, suggesting that self-serving attribution bias is attenuated when CEOs are more concerned about labor market and stock market consequences.

This paper makes the following contributions. First, this is one of the first large sample studies to examine how managers explain firm performance when they communicate in real time with investors and analysts. Despite the prevalence of causal reasoning in financial statements, there has been very little research done to analyze the determinants and consequences of these explanations (Koonce et al. 2011). This paper documents evidence consistent with the idea that managers make self-serving attributions in earnings conference calls, suggesting that managers are subject to the same behavioral biases as the general population even though they are business leaders. Second, I document that more internal attributions are perceived by investors as a negative signal and show that internal attributions are related to lower earnings persistence. This provides evidence that management attributions help investors make resource allocation decisions. Third, this paper validates the use of personal pronouns to proxy for managerial attributions. This may provide a useful tool for future researchers to study managerial attributions in earnings conference calls and other disclosure outlets.

The large sample analysis reported here complements other recent studies examining managers' attribution behaviors, either in small samples or specialized settings. Most studies adopt the content analysis approach. For example, Baginski et al. (2004) study attributions accompanied with management earnings forecasts and find that these attributions are useful to investors as evidenced by stock market reaction.

However, their results are limited by data requirement and potential measurement error due to human coding (p. 27). This paper enhances our understanding of management attributions by examining a large sample of conference calls and improves the generalizability of the empirical results. (Keusch et al. 2012) examine how firms explain their performance during economic crisis by studying the letters to shareholders in annual reports in Europe. They find a crisis leads to more extensive self-serving bias and suggest that CEO attributions are not intended to provide truthful information but rather to mislead investors. (Marques and Tavares 2012) examine CEO attributions in response to the terrorist attacks of September 11 and the Iraq war. Their paper extends the experimental findings by (Barton and Mercer 2005) and suggests that attributing bad performance to external factors may backfire if investors do not believe the explanation is plausible.

The evidence presented here also complements the large sample analysis reported in contemporaneous work by Li (2010), who examines management attributions in a large sample of Management Discussions and Analysis (MD&A) of 10-K filings. Both Li (2010) and this paper find similar results that managers tend to attribute good performance to internal factors and poor performance to external factors, confirming that the self-serving attribution bias exists in both earnings conference calls and in annual reports. However, this paper differs from Li (2010) in the following ways. First, I focus on the implications of managerial attributions on earnings persistence and

investor reactions while Li (2010) focuses on the implications on corporate policies. Li (2010) views self-serving attribution biases as one managerial trait that leads to CEO overconfidence about firms' future performance and therefore optimistic corporate policies. My main research question is whether managerial attributions are self serving or not, and in turn whether they provide valuable information for investors to evaluate firm performance. Thus I study whether self-serving attributions are related to earnings persistence and how investors react to managerial attributions. Second, I focus on earnings conference calls while Li (2010) studies the MD&A parts of the 10-K filings. There are distinct advantages to using earnings conference calls relative to MD&A. First, during the calls managers have interactive conversations with analysts while MD&A are pre-scripted texts disclosed after considerable deliberations. Bloomfield (2008) argues that linguistic properties such as word choice and sentence structure represent unconscious behaviors and thought processes. Annual reports are pre-scripted texts which may not have linguistic patterns similar to spontaneous conversations. Conference calls contain conversations between managers and analysts which are largely spontaneous.¹ Second, it is not clear that CEOs actually author the MD&A section because corporate textual disclosure is usually the collaboration of managers, auditors, lawyers and investor relation staff. Another advantage of conference calls is

¹ There are scripted presentations at the beginning of each conference call. However the questions and answer section of the conference call is less likely to be scripted and more likely to represent spontaneous conversations.

that we can observe CEOs presenting the financial results and interacting with financial analysts, thereby providing a direct context in which to observe managerial behavior.

Finally, this paper builds on recent work in accounting that examines the qualitative information of management disclosure. Early studies in corporate disclosure relied on the level of disclosure to examine the effects of disclosures (for example, Lang and Lundholm (1996)). More recent studies examine the linguistic tone (Davis et al. 2008; Demers and Vega 2008; Engelberg 2008; Loughran and McDonald 2011) and other characteristics of corporate text like readability (Li 2008) and vividness (Hales et al. 2011). This study expands the set of qualitative information provided to market participants by investigating attributions.

The remainder of this study is organized as follows. Section 2 discusses prior research and develops the main hypothesis. Section 3 describes the research design and sample construction process. In section 4, I explain how I measure management attributions in the large sample. Section 5 conducts a series of tests to verify the construct validity of the attribution measure used in this study. Section 6 presents empirical evidence regarding how CEOs make attributions during conference calls. Section 7 examines how the stock market and financial analysts react to CEO attributions. Section 8 shows how managers' attributions are related to earnings persistence. Section 9 studies whether the stock market reaction is complete by examining the association between future stock returns and managers' attributions.

Section 10 provides evidence about whether boards react to CEO attributions. I conduct additional empirical analysis in section 11, robustness tests in section 12, and I conclude in Section 13.

2. Related Research and Hypothesis Development

Causal reasoning has been studied extensively in the psychology literature, and theory indicates that human beings search for causes of events in their everyday activities (Försterling 2001; Kelley 1992). For example, people frequently ask questions such as “Why did I do well in the midterm?” or “Why did we lose the basketball game?” Psychology research suggests that attributions to such questions help a person understand an event as well as to predict future outcomes. Moreover, understanding the causes of events enables a person to take action in order to control future events in some situations. For example, if a coach attributes the loss of a basketball game to internal factors such as game strategy or player ability, he/she may change strategy or spend time improving player ability. However, if he/she blames external factors such as an unfavorable referee or bad luck, he/she may not make any change in strategy or player development.

Understanding causal relations between performance drivers and corporate performance is important in business contexts. It is essential for managers and investors to correctly identify the underlying factors that affect firm performance. For managers, recognizing the correct performance driver helps them take corrective actions to improve future performance. Ittner and Larcker (2003) find that companies that establish a causal link between non-financial performance measures and financial outcomes experience higher *ROA* over a five-year period than other firms. Financial analysts and

investors are also interested in identifying the factors that affect firm performance. Understanding the nature of firm performance facilitates prediction of future earnings and improves investors' resource allocation decisions. Prior research finds that CEOs often discuss performance drivers through various disclosure channels and management forecasts are commonly accompanied by managerial attributions (Baginski et al. 2000; Baginski et al. 2004).

Psychologists, like economists, usually assume human beings are rational when making attributions because humans attempt to obtain an accurate understanding of the causal factors of an event (Försterling 2001; Kelley 1967, 1992)¹. However, a series of studies suggest that human attributions are sometimes biased and deviate from rational models (See Försterling 2001 and Koonce et al. 2011 for synopses of attribution biases). One bias pertinent to this paper is asymmetric attributions for success and failure: people tend to attribute good outcomes to internal factors, whereas bad outcomes are traced back to external factors (Beckman 1970; Johnson et al. 1964; Miller and Ross 1975). In experiments conducted by Johnson et al. (1964), participants are asked to evaluate their teaching based on their students' performance. The students' scores are determined by the experimenter who withholds this information from experiment participants. Results demonstrate that when student performance improves, the teachers are more

¹ Just as economists portray a perfect decision making person as an "economic person," psychologists have a similar metaphor -- "naïve scientist" -- regarding how people make attributions (Forsterling 2001).

likely to attribute performance to their effective teaching. When student performance deteriorates, teachers are more likely to blame the quality of the students as the reason for poor student performance. In business contexts, a CEO can attribute a firm's past performance to internal factors such as his/her own personal ability and the management team's efforts, or ascribe it to external factors such as the macroeconomic environment and intense competition. If CEOs suffer from self-serving attribution bias, they will tend to attribute good firm performance to internal factors and poor firm performance to external factors.

Attribution bias is not the only factor that may influence CEO attributions. Theory on effective leadership predicts that CEOs will make attributions in a manner opposite that predicted by the psychology literature discussed earlier (Collins 2001; Lee and Tiedens 2001; Lee et al. 2004; Morris et al. 2005; Ou 2011). Leadership theory argues that as leaders of organizations, CEOs can demonstrate leadership during the attribution process by deflecting praise when performance is good and taking blame when performance is poor. The notion of "humble servant leader" is not new to the leadership literature (Greenleaf 1977; Greenleaf and Spears 1998). More recently, Collins (2001) identifies personal humility as one of the two attributes of level 5 leadership² in his best-

² "Level 5" refers to a five-level hierarchy of manager capabilities, with Level 5 at the top. According to Collins (2001), level 5 leadership is a mix of personal humility and professional will.

selling book, *From Good to Great: Why Some Companies Make the Leap ... and Others Don't*.³

The rationale behind this argument is that humility helps a CEO build a great team that will result in long term company success. Collins (2001) finds that “level 5 leaders” routinely credit others, external factors and good luck for good performance, and blame themselves when results are poor.⁴ Morris et al. (2005) argue that humility fosters a supportive relationship between managers and employees and socializes power, and therefore leads to organizational success. Ou (2011) suggests that humility helps CEOs empower leaders within the firms, promotes management team integration, and in turn improves job performance. From a survey of 63 CEOs, Ou (2011) finds that CEO humility is positively related to middle manager ambidexterity and job performance, suggesting that leadership-style attributions improve firms’ future performance.

Lee et al. (2004) make a similar assertion, although they only focus on the occurrences of negative events. They suggest that by claiming responsibility for bad news, managers convince investors that the firms are in control of the management. For example, Jeffery Immelt, the CEO of GE, attempted to convince investors that he can lead General Electric to continued growth following poor performance by telling the

³ Featured as *Best of Harvard Business Review 2001* and published in 35 languages, *Good to Great* has made a huge impact on leadership theory and practice (Caulkins 2008; Filbeck et al. 2010; Niendof and Beck 2008). Over three million copies of *Good to Great* have been sold. The book has been popular not only in the business world but also in not-for-profit sectors and business schools. Mike Useem, a Wharton professor, praises *Good to Great* as “the most significant book on leadership to appear in terms of moving how people think in the last decade.” (See “Good to Great, a B-School Staple”, *BusinessWeek* online, January 19 2006)

⁴ Humility may also be perceived as a form of personal weakness, indicating lack of confidence and low self-regard (Exline and Geyer 2004; Tangney 2000). However, empirical evidence suggests that humility is clearly associated with confidence and leadership (Exline and Geyer 2004).

public that “I should have done more to anticipate the radical changes that occurred.”(Glader 2009) Overall, leadership theory suggests that CEOs make self-disserving attributions relative to the self-serving attributions forwarded by psychology theory.

Given the fact that CEOs are both human beings and leaders, it is ultimately an empirical question as to which of the two contrasting theories of attributions is more descriptive of CEO behavior. Thus, my main research question is to examine which force dominates on average, yielding the following hypothesis:

H_a (Attribution Theory): Managers attribute firm performance more to internal (external) factors when firm performance is favorable (unfavorable).

H_b (Leadership Theory): Managers attribute firm performance less to internal (external) factors when firm performance is favorable (unfavorable).

3. Research Design and Data Construction

Prior studies (e.g.: Bettman and Weitz 1983; Staw et al. 1983) classify management attributions using human judges. The advantage of this approach is that humans are able to classify attributions with reasonable accuracy. For instance, Bettman and Weitz (1983) find that two independent judges agree on 94.6% of the attributions coded. A disadvantage of using human coding is that the analysis is not scalable, i.e., a large sample study is too costly. The small sample size potentially yields low powered tests of the determinants and consequences of management attributions, and hampers generalizability. To overcome these limitations, I adopt a new approach to measuring management attributions. Specifically, I measure the personal pronouns spoken by CEOs during earnings conference calls. I posit that more frequent usage of first-person pronouns represents more internal attributions and more frequent usage of third-person pronouns represents more external attributions. I discuss how I measure CEO usage of personal pronouns and test the validity of my measure in sections 4 and 5.

I consider the earnings conference call setting to measure attributions for several reasons. First, earnings conference calls are explicit avenues through which CEOs directly present and explain firm performance. In contrast, other corporate communications such as annual reports and SEC filings are often influenced by several parties including the firms' attorneys (Choudhary et al. 2012; Hopkins et al. 2012). Second, Bloomfield (2008) argues that many underlying theories in psychology rely on

the assumption that conversations are spontaneous, which is not true for most firm disclosures. Conference calls include both presentation sections during which managers read pre-scripted statements and Q&A sections during which managers answer questions from analysts. Examining both portions of the call allows me to directly examine the validity of Bloomfield's (2008) argument. Third, an earnings conference call is an important avenue for firms to provide voluntary disclosures, and prior research shows that such disclosures are informative to financial analysts and investors (Bowen et al. 2002; Frankel et al. 1999). By examining how managers make attributions, and how market participations react to management attributions, I am able to expand on prior research to more fully characterize what can be learned from earnings conference calls.

My sample selection starts with quarterly earnings conference call transcript data obtained from the Thomson Financial's *StreetEvents* database over the period 2002 to 2007. From this sample, I eliminate conference calls where a CEO is not present or where more than one CEO is present¹.

I obtain accounting information from *COMPUSTAT* and stock return data from *CRSP*. I also obtain CEO characteristics from *Execomp* and *BoardEx*, and analyst forecasts from *I/B/E/S* in additional empirical analysis. The final sample contains 50,434 quarterly

¹ Occasionally there is more than one CEO in a conference call, often during CEO turnover periods. I drop these firms from my analysis, but keeping these firms does not change the inferences.

earnings conference calls, for which firms' earnings and earnings forecasts are available.

The sample construction process is described in panel A of Table 1.

Table 1: Descriptive Statistics of Firm Characteristics

Panel A: Sample Construction

Number of quarterly conference call transcripts on <i>StreetEvents</i> database from 2002 to 2007	62,280
Less: Transcripts with no CEO participation in the calls	(10,277)
Less: Transcripts with no sufficient <i>COMPUSTAT</i> or <i>CRSP</i> data	(1,569)
Final sample of firm-quarter observations	50,434

Panel B: Descriptive Statistics

Variable	N	Mean	Std Dev	Min	P25	Median	P75	Max
<i>ROA</i>	50,434	0.01	0.04	-0.19	0.00	0.02	0.03	0.11
<i>ASSETS</i>	50,434	4775	13968	14	216	773	2777	110337
<i>LN MVE</i>	50,434	6.77	1.66	2.97	5.64	6.70	7.83	11.03
<i>BM</i>	50,434	0.48	0.35	-0.32	0.26	0.43	0.64	1.92
<i>SI</i>	50,434	0.00	0.01	-0.09	0.00	0.00	0.00	0.02
<i>DRND</i>	50,434	0.47	0.50	0.00	0.00	0.00	1.00	1.00
<i>REGULATED</i>	50,434	0.09	0.28	0.00	0.00	0.00	0.00	1.00
<i>POSWORDS</i>	50,434	1.85	0.65	0.57	1.39	1.78	2.23	3.87
<i>NEGWORDS</i>	50,434	0.84	0.39	0.14	0.57	0.78	1.04	2.17
<i>CAR(-1,1)</i>	42,780	0.00	0.08	-0.25	-0.04	0.00	0.04	0.22
<i>CAR1YR</i>	42,824	0.01	0.40	-1.26	-0.19	0.02	0.23	1.16
<i>CAR2YR</i>	42,840	0.00	0.58	-2.03	-0.26	0.05	0.34	1.43
<i>CAR3YR</i>	42,849	-0.01	0.70	-2.48	-0.32	0.07	0.40	1.62
<i>FREV</i>	36,711	0.00	0.01	-0.03	0.00	0.00	0.00	0.02
<i>MOM</i>	42,780	0.00	0.04	-0.11	-0.02	0.00	0.02	0.13
<i>ACCRUALS</i>	49,453	-0.01	0.04	-0.20	-0.03	-0.01	0.00	0.11
<i>BETA</i>	42,594	1.17	0.56	0.04	0.78	1.11	1.52	2.76
<i>SG</i>	49,980	0.18	0.43	-0.67	0.00	0.11	0.26	2.65
<i>TENURE</i>	42,585	6.07	6.28	0.00	2.00	4.00	8.00	33.00

Table 1 (continued)

Panel C: Industry Composition				
Industry	Sample Firms		All Compustat Firms	
	N	%	N	%
Chemicals	98	2.01	276	1.81
Computers	838	17.22	1,874	12.27
Extractive	197	4.05	781	5.11
Financial	495	10.17	1,900	12.44
Food	81	1.66	244	1.60
Insurance/RealEstate	228	4.68	2,258	14.78
Manf:ElectricalEqpt	196	4.03	487	3.19
Manf:Instruments	293	6.02	635	4.16
Manf:Machinery	140	2.88	319	2.09
Manf:Metal	100	2.05	273	1.79
Manf:Misc.	32	0.66	97	0.64
Manf:Rubber/glass/etc	69	1.42	189	1.24
Manf:TransportEqpt	88	1.81	214	1.40
Mining/Construction	108	2.22	740	4.84
Pharmaceuticals	338	6.94	787	5.15
Retail:Misc.	229	4.71	479	3.14
Retail:Restaurant	63	1.29	150	0.98
Retail:Wholesale	129	2.65	372	2.44
Services	430	8.84	1,101	7.21
Textiles/Print/Publish	177	3.64	445	2.91
Transportation	362	7.44	866	5.67
Utilities	142	2.92	473	3.10
Not assigned	34	0.70	314	2.06
Total	4,867	100.00	15,274	100.00

This table reports descriptive statistics of firm characteristics for a sample of 50,434 observations from quarterly earnings conference calls occurring between 2002 and 2007. Panel A describes sample selection process. Panel B reports descriptive statistics of firm characteristics. Panel C presents industry composition of the sample. Variables are defined in Appendix A. All continuous variables are winsorized at the 1st and 99th percentiles.

Descriptive statistics of firm characteristics are presented in Panel B of Table 1. The average firm has total assets of \$4.8 billion, an average quarterly return on assets (ROA) of 1%, and book-to-market ratio of 0.48. The sample contains relatively large firms, consistent with prior findings that larger firms are more likely to hold earnings conference calls (Frankel et al. 1999). Prior studies find that qualitative information is also related to firm performance (Davis et al. 2008; Demers and Vega 2008; Engelberg 2008; Loughran and McDonald 2011), so I also include the frequency of positive and negative words, as defined in Loughran and McDonald (2011). The means of *POSWORDS* and *NEGWORDS* are 1.85 and 0.84, respectively. Loughran and McDonald (2011) report that the means of *POSWORDS* and *NETWORDS* for the MD&A portions of 10-K documents are 0.83 and 1.51, respectively. This inconsistency suggests that managers use more optimistic language during conference calls than the MD&A, which may result from managers “pushing forward” more favorable language to a more salient disclosure outlet (Davis and Tama-Sweet 2012). The fact that managers use more positive words than negative words is also consistent with other research documenting that on average, linguistic tone is optimistic, on net (Frankel et al. 2010). Overall, there is substantial variation in firm characteristics measures, consistent with the sample representing a broad cross-section of firms.

Panel C presents industry composition of the sample firms, suggesting a relatively greater number of firms from the computer industry. The industry

concentrations documented here are consistent with prior studies on earnings conference calls (e.g.: Mayew 2008).

4. CEO Attribution Measure

I construct my attribution measure by counting how frequently a CEO uses first-person and third-person pronouns. I assume that a CEO's attribution of firm performance to internal (external) factors is characterized by more frequent use of first- (third-) person pronouns. Psychology theory suggests that personal pronouns reflect the attention allocation of the speaker (Davis and Brock 1975; Gunsch et al. 2000; Tausczik and Pennebaker 2010). For example, Gunsch et al. (2000) study the personal pronouns used in political ads and find that there are more first-person pronouns in positive ads and more third-person pronouns in negative ads, consistent with the intuition that positive ads focus on political candidates themselves and negative ads focus on their opponents.

In business contexts, how attributions are captured by personal pronouns is not as straightforward. Although I expect that a CEO's explanation of firm performance will be characterized by the personal pronouns he or she uses, it is likely that personal pronouns may not completely or sufficiently capture internal and external attributions. For example, Baginski et al. (2004) find that managers often mention general economic and environmental factors when making external attributions. Sometimes attributions are also characterized by words such as proper nouns (for instance, a CEO may attribute firm performance to the macroeconomic environment or specific companies.) Therefore, I conduct a construct validity test in section 5 to examine whether personal pronouns

provide a satisfactory classification of internal and external attributions in business contexts.

I use LIWC 2007 to analyze the transcripts of earnings conference calls¹. LIWC 2007 measures the percentage of words in categories defined by dictionaries in the software. This tool is widely used in the linguistics and psychology literature. I first isolate the words spoken by CEOs during the presentation and Q&A sessions of earnings conference calls using a *Perl* program. Then I obtain the percentage of personal pronouns from LIWC. The internal reference measure, *INT*, is the percentage of first-person pronouns (including both singular and plural forms)². Similarly, the external reference measure, *EXT*, is the percentage of third-person pronouns. Panel A of Table 2 lists the words included in the pronoun dictionaries in LIWC 2007.

My measure of management attribution, *IvsE*, is constructed as:

$$IvsE = \ln\left(\frac{1 + INT}{1 + EXT}\right)$$

I use the natural logarithm to account for skewness and add 1 to both nominator and denominator to avoid division by 0.

¹ LIWC 2007 is a text analysis tool developed by psychologists at the University of Texas at Austin and the University of Auckland. Li (2008) uses an earlier version of this software in his analysis of corporate annual reports. The software manual and more details can be found at www.liwc.net.

² LIWC 2007 specifies both the singular and plural forms of personal pronouns. *INT* is the sum of *I* and *WE*; *EXT* is the sum of *SHEHE* and *THEY*.

Table 2: Descriptive Statistics of Linguistics Variables

Panel A: List of Personal Pronoun Words³

<i>INT = I + WE</i>	
<i>I</i> (12 words)	i, Id, I'd, i'll, Im, I'm, ive, I've, me, mine, my, myself
<i>WE</i> (12 words)	lets, let's, our, ours, ourselves, us, we, we'd, we'll, we're, weve, we've
<i>EXT = SHEHE + THEY</i>	
<i>SHEHE</i> (17 words)	he, hed, he'd, her, hers, herself, hes, he's, him, himself, his, oneself, she, she'd, she'll, shes, she's
<i>THEY</i> (10 words)	their*, them, themselves, they, theyd, they'd, theyll, they'll, theyve, they've

Panel B: Descriptive Statistics on Linguistics Variables

Variable	N	Mean	Std Dev	Min	P25	Median	P75	Max	Talking
<i>LENGTH</i>	50,434	3.05	1.66	0.28	1.82	2.80	4.01	8.54	0.60
<i>PPRON</i>	50,434	8.16	1.46	4.44	7.20	8.18	9.12	11.82	13.63
<i>I</i>	50,434	1.24	0.59	0.21	0.81	1.15	1.57	3.21	6.30
<i>WE</i>	50,434	5.42	1.19	2.52	4.62	5.40	6.21	8.47	1.09
<i>SHEHE</i>	50,434	0.06	0.09	0.00	0.00	0.00	0.07	0.52	1.46
<i>THEY</i>	50,434	0.50	0.34	0.00	0.26	0.44	0.68	1.62	0.84
<i>INT</i>	50,434	6.67	1.27	3.49	5.83	6.68	7.52	9.82	7.39
<i>EXT</i>	50,434	0.56	0.35	0.00	0.30	0.50	0.75	1.72	2.30
<i>IvsE</i>	50,434	1.60	0.28	0.84	1.42	1.62	1.80	2.21	

³ The LIWC dictionary contains many derivatives of personal pronouns. For example, “Id” and “I’d” are included in the singular first-person pronoun list to account for the different spelling habits. Similar examples also include “we’ve”, “they’ll” and “they’ve”.

Table 2 (continued)

Panel C: Linguistics Variables during Presentation and Q&A Sections

Variable	N	Mean	Std Dev	Min	P25	Median	P75	Max
<i>Presentation Section</i>								
<i>LENGTH</i>	50,434	1.43	0.90	0.00	0.81	1.26	1.85	4.85
<i>PPRON</i>	50,434	6.91	2.20	0.00	5.78	7.04	8.29	11.88
<i>I</i>	50,434	0.74	0.56	0.00	0.36	0.61	0.96	3.05
<i>WE</i>	50,434	5.33	1.79	0.00	4.36	5.43	6.48	9.26
<i>SHEHE</i>	50,434	0.06	0.12	0.00	0.00	0.00	0.06	0.71
<i>THEY</i>	50,434	0.27	0.28	0.00	0.07	0.20	0.40	1.32
<i>INT</i>	50,434	6.08	1.95	0.00	5.06	6.20	7.32	10.30
<i>EXT</i>	50,434	0.33	0.32	0.00	0.10	0.25	0.48	1.50
<i>IvsE</i>	50,434	1.63	0.43	0.00	1.46	1.70	1.90	2.34
<i>Question and Answer Section</i>								
<i>LENGTH</i>	50,434	1.61	1.23	0.00	0.66	1.40	2.32	5.66
<i>PPRON</i>	50,434	8.85	2.79	0.00	8.04	9.15	10.23	16.47
<i>I</i>	50,434	1.62	0.91	0.00	1.04	1.57	2.16	4.36
<i>WE</i>	50,434	5.12	1.89	0.00	4.30	5.26	6.24	9.58
<i>SHEHE</i>	50,434	0.05	0.11	0.00	0.00	0.00	0.05	0.63
<i>THEY</i>	50,434	0.64	0.52	0.00	0.27	0.56	0.92	2.42
<i>INT</i>	50,434	6.75	2.22	0.00	6.00	7.03	8.02	11.36
<i>EXT</i>	50,434	0.70	0.54	0.00	0.31	0.61	0.99	2.55
<i>IvsE</i>	50,434	1.48	0.52	0.00	1.27	1.56	1.81	2.45

Panel D: Linguistics Variables across Years

Variable	2002	2003	2004	2005	2006	2007
<i>LENGTH</i>	2.72	2.84	2.96	3.09	3.21	3.12
<i>PPRON</i>	8.23	8.13	8.21	8.08	8.12	8.22
<i>I</i>	1.27	1.24	1.25	1.23	1.23	1.25
<i>WE</i>	5.32	5.32	5.39	5.38	5.46	5.54
<i>SHEHE</i>	0.06	0.05	0.06	0.06	0.05	0.05
<i>THEY</i>	0.50	0.51	0.51	0.50	0.49	0.49
<i>INT</i>	6.59	6.57	6.66	6.62	6.69	6.80
<i>EXT</i>	0.57	0.57	0.57	0.56	0.55	0.54
<i>IvsE</i>	1.59	1.58	1.59	1.59	1.61	1.63

Table 2 (continued)

Panel E: Linguistics Variables across Different *LENGTH* Quintiles

Variable	Quintile1	Quintile2	Quintile3	Quintile4	Quintile5
<i>IvsE</i>	1.69 (0.32)	1.62 (0.27)	1.59 (0.27)	1.56 (0.26)	1.54 (0.25)
<i>IvsE (Pres)</i>	1.52 (0.74)	1.73 (0.31)	1.67 (0.31)	1.64 (0.29)	1.59 (0.28)
<i>IvsE (Q&A)</i>	1.23 (0.91)	1.60 (0.38)	1.55 (0.34)	1.52 (0.32)	1.49 (0.30)

Panel F: Pearson Correlations among Linguistics Variables

	<i>LENGTH</i>	<i>I</i>	<i>WE</i>	<i>SHEHE</i>	<i>THEY</i>	<i>INT</i>	<i>EXT</i>
<i>I</i>	0.12***						
<i>WE</i>	-0.12***	-0.12***					
<i>SHEHE</i>	-0.03***	0.13***	-0.03***				
<i>THEY</i>	0.20***	0.12***	-0.11***	0.02***			
<i>INT</i>	-0.07***	0.36***	0.88***	0.04***	-0.05***		
<i>EXT</i>	0.18***	0.16***	-0.12***	0.31***	0.95***	-0.04***	
<i>IvsE</i>	-0.18***	0.10***	0.63***	-0.22***	-0.75***	0.64***	-0.78***

This table reports descriptive statistics of the linguistics variables of CEO speech for a sample of 50,434 quarterly earnings conference calls observations occurring between 2002 and 2007. Panel A lists the personal pronouns in the LIWC dictionary. Panel B presents the descriptive statistics of the linguistic variables; the *Talking* column shows the average lexical properties of people’s daily conversation from Pennebaker et al. (2007). Panel C presents the descriptive statistics of linguistics variables during the presentation and the Q&A section, respectively. Panel D reports mean values of these linguistics variables in each calendar year. Panel E presents the mean values of *IvsE* in each *LENGTH* quintile. Panel F shows the correlations among the linguistic variables. ***/**/* indicates significance at 0.01, 0.05 and 0.10 level, respectively. Variables are described in Appendix A and are winsorized at the 1st and 99th percentiles.

Panel B of Table 2 presents the linguistic profiles of CEO spoken transcripts during earnings conference calls. To facilitate comparison with linguistic profiles of non-business conversations, I provide in the last column of Panel B labeled “Talking”, the

average lexical properties of people's daily conversation documented in prior research (Pennebaker et al. 2007). Panel B shows that, on average, a CEO speaks 3,050 words during an earnings conference call. In a recent large sample study of earnings conference calls, Li *et al.* (2009) report that the typical length of a conference call is 32,484 letters and a typical CEO speaks 48% of them. Assuming that a typical English word contains 4.5 letters (Pierce 1980), the results in Li *et al.* (2009) translate to 3,465 words spoken by a CEO during an earnings conference call, which is comparable to what I find for my sample.

Panel B also suggests that business conversations exhibit several distinguishing patterns. First, CEOs use fewer personal pronouns in conference calls than people use in daily conversations (8.16 vs. 13.63)⁴, suggesting that business conversations are less personal than daily conversations. Psychology research suggests that the usage of personal pronouns reveals attention allocation of speakers (Tausczik and Pennebaker 2010). Conference call participants focus mainly on business events, which are less personal as compared to daily conversation. Second, CEOs are less likely to use singular first-person pronouns (*I*) in conference calls (1.24 vs. 6.30) but are more likely to use plural first-person pronouns (*WE*) in conference calls (5.42 vs. 1.09). This is reasonable because managers are talking in an organizational context with actions representing the inputs of many individuals. For example, a CEO is less likely to say "I decided to

⁴ Lexical variables from *LIWC 2007* are in percentage form.

expand in Asia” but rather to describe it in a group context such as “We decided to expand in Asia.” Third, CEOs use relatively fewer third-person pronouns than people do in daily conversations (0.56 vs. 2.30).

Panel C shows descriptive statistics of linguistics variables for the presentation and Q&A separately. Prior studies suggest that pronoun usage varies in different contexts. Pennebaker et al. (2007) analyze 168 million words used in different types of writing and speaking and find that the average number of personal pronouns used in “control writing” is 10.78% and the average personal pronouns used in talking is 13.63%.⁵ The lexical properties of managerial speech differ between the presentation and the Q&A sections. During a conference call the CEO usually reads a prepared statement regarding firm performance. Hence, it is reasonable that the transcript of a presentation is characterized by lower use of personal pronouns than that of a Q&A section where a CEO responds spontaneously to analyst questions. Consistent with this prediction, I find that the CEOs use more personal pronouns in the Q&A than the presentation (8.85 vs. 6.91). This is consistent with Pennebaker et al. (2007), who find that fewer personal pronouns are used in “control writing” than during conversations.

Panel D of Table 2 presents the mean values of the linguistics variables across my sample period. Although most linguistic variables show no time trends, conference calls

⁵ Control writing refers to writing about non-emotional topics such as descriptions of ordinary events. Talking refers to transcripts collected from individual talking in real world settings. These are analogous to presentation and Q&A sections of earnings conference calls.

have become longer over time. This is likely due to firms providing more concurrent and expanded disclosures surrounding earnings announcements (Francis et al. 2002), thereby requiring CEOs to discuss more during earnings conference calls. CEOs also tend to use more plural first-person pronouns over time (from 5.32 in 2002 to 5.54 in 2007), leading to an increasing trend of *IvsE*. Because of the time-series differences in linguistic variables, I control for time effects in my regression analysis by adding calendar quarter indicator variables.

Panel E shows the means and standard deviations (in parentheses) of the main attribution variable, *IvsE*, for different quintiles of *LENGTH*. The results suggest that different length of conference calls may affect the means and standard deviations of the attribution measure. *IvsE* decreases with the length of a conference call increases from quintile 2 to quintile 5. *IvsE* in the first quintile have much larger standard deviations than in other quintiles, because variation in personal-pronouns is amplified when the length of a conference call is short. Therefore, I include *LENGTH* as a control variable in my regression analysis.

The Pearson correlation matrix of the linguistic variables is presented in Panel F. *INT* and *EXT* are negatively correlated with each other, reflecting the mechanical substitution effect between the internal and external attributions. The correlation between *INT* and *LENGTH* is negative, while the correlation between *EXT* and *LENGTH*

is positive. This perhaps suggests that as conference calls get longer, a CEO speaks more of issues external to the firm than internal to the firm.

5. Construct Validity of the Attribution Measure

Before proceeding to utilize the *IvsE* variable for hypothesis testing, I first attempt to provide construct validity. Providing construct validity is important for several reasons. First, *IvsE* is not a direct measure of internal and external attributions but assumes that internal attributions are characterized by more frequent usage of first-person pronouns, and external attributions are characterized by third-person pronouns. Second, it is possible that a measure based on pronouns is too noisy because internal and external attributions in business contexts may not be sufficiently captured by the use of personal pronouns. First-person pronouns may not include firm references and thus may not capture an internal attribution when a CEO refers his or her company as “the company” rather than using first-person pronouns. Third-person pronouns likely exclude external factors such as economic or environmental issues. If a manager refers to macroeconomic factors (e.g.: strength of the currencies, interest rates, and environment), these external attributions may not be captured by third-person pronouns. While these examples suggest the presence of measurement error, the degree of measurement error is not clear. Further, although theory and empirical evidence supports the use of personal pronouns to proxy for internal and external attributions, there is little prior evidence to support the use of personal pronouns to study attributions in business contexts.

Another reason to conduct a construct validity test is that personal pronouns may be correlated with some variables that are omitted in this paper. For example, Chatterjee and Hambrick (2007) use first-person singular pronouns to proxy for CEO narcissism. A narcissistic CEO may overestimate his or her role in the organization. Newman et al. (2003) find that truth tellers use more singular first-person and third-person pronouns than liars. Libby and Rennekamp (2010) find that self-serving attribution bias is related to manager overconfidence. If my attribution measure, *IvsE*, captures some other construct instead of attribution, it may lack power in predicting internal or external attributions.

Finally, pronoun usage may mistakenly indicate internal or external attributions for benign reasons. For instance, speakers may use fillers such as “I think” and “you know” that have no attribution qualities but would be nonetheless be included as part of the *IvsE* attribution measure. This may be true in a conference call setting where managers use fillers to “buy time” to react to analysts’ questions. Another example is that a manager may refer to company employees as “they”, which is an internal attribution, but my classification scheme will misclassify it as an external attribution. Managers, in deflecting praise to others in the organization may refer to “our team,” which would be classified as an internal attribution with the *IvsE* metric. Such misclassifications and improper identification of internal and external attribution introduce noise into the attribution measure.

5.1 Manual Coding of Management Attributions during Earnings Conference Calls

As the first step in the validation process, I manually classify attributions for a subsample of conference call transcripts and then correlate the self-constructed attribution measure with the automated attribution measure, *IvsE*. I choose 80 earnings conference call transcripts (from 67 unique firms), 40 of which are chosen from the two extreme tails of the *ROA* distributions, with the remaining 40 observations chosen randomly from the rest of the sample. I choose 40 firms with extreme *ROA* because I anticipate that managers of firms with extreme positive and negative performance face higher demand for explanations and hence are more likely to provide attributions. I also include 40 random observations in order to observe attributions for a broad cross-section of firms.

For each conference call transcript, I first identify attributions made during the call. To be identified as an attribution, it must be the case that a manager points to specific factors to explain some performance outcome, such as earnings, revenue, or other operational performance. There must also be causal reasoning between the factor and firm performance. I read the entire transcript to search for attributions, and follow framework of Baginski et al. (2004)¹ to classify an attribution as internal or external. Internal attributions refer to factors inside the organization, such as changes in business

¹ See Section 3.2 of Baginski et al. (2004).

strategies and management efforts. External attributions refer to events outside the organization, such as increasing competition and regulatory changes. There are many forms of attributions and sometimes an attribution points to both internal and external factors. It is also possible that it is difficult to distinguish whether an attribution is internal or external.

Miscalculation introduces noise and reduces the power of the construct validity test. To mitigate this concern, a graduate student coder and the author independently read the earnings conference call transcripts based on the coding guideline specified above. Coding conflicts were identified, discussed and resolved before conducting the validity test.

Table 3 presents the descriptive statistics for the subsample of earnings conference calls used for construct validity testing. Panel A shows that firms in this sample are smaller and less profitable than the whole population of conference call firms. The mean of *ROA* is -0.06, compared to 0.01 in table 1. The average firm size is much smaller. The mean of assets is \$1.16 billion, compared to \$4.9 billion reported in table 1. The mean of the book-to-market ratio is 0.16 compared to 0.48 in table 1, suggesting that there are more growth firms in the two tails of *ROA* distribution. The table also shows that 33% of the firms report special items not equal to zero, and 58% of them report R&D expenses.

Table 3: Descriptive Statistics of Manual Coding Sample

Panel A: Descriptive Statistics of Firm Characteristics								
Variable	N	Mean	Std Dev	Min	P25	Median	P75	Max
<i>ROA</i>	80	-0.06	0.29	-0.50	-0.50	0.02	0.17	0.34
<i>UE</i>	80	-0.03	0.23	-0.50	-0.01	0.00	0.01	0.48
<i>NEG_UE</i>	80	0.30	0.46	0.00	0.00	0.00	1.00	1.00
<i>ASSETS</i>	80	1,161	2,554	1	9	190	675	10,163
<i>LN MVE</i>	79	5.66	2.06	1.82	4.19	5.91	7.38	9.45
<i>BM</i>	79	0.16	0.41	-0.83	0.01	0.20	0.39	0.83
<i>DSI</i>	80	0.33	0.47	0.00	0.00	0.00	1.00	1.00
<i>DRND</i>	80	0.58	0.50	0.00	0.00	1.00	1.00	1.00
<i>REGULATED</i>	80	0.06	0.24	0.00	0.00	0.00	0.00	1.00

Panel B: Attribution Characteristics		
Firm Level (n=80)	Observation	(%)
<i>ATTRIBUTION</i>		
At least one type of attribution provided	64	80.0%
Neither type of attribution provided	16	20.0%
<i>INTERNAL ATTRIBUTIONS</i>		
Internal attribution present	48	60.0%
No internal attribution	32	40.0%
<i>EXTERNAL ATTRIBUTIONS</i>		
External attribution present	26	32.5%
No external attribution	54	67.5%

Attribution Level (n=110)		
<i>INTERNAL vs. EXTERNAL</i>		
Attribution factor is internal	67	60.9%
Attribution factor is external	33	30.0%
Attribution contains both internal and external factors	5	4.5%
Attribution factor is not internal or external	5	4.5%
<i>PRESENTATION vs. Q&A</i>		
Attribution provided in presentation	105	95.5%
Attribution provided in Q&A	5	4.5%
<i>FAVORABLENESS</i>		
Attribution factor is income increasing	57	51.8%
Attribution factor is income decreasing	40	36.4%
Undetermined	13	11.8%

This table reports descriptive statistics of my manual coding sample of 80 quarterly earnings conference calls. Panel A shows firm characteristics. Panel B presents the characteristics of attributions. All continuous variables are winsorized at the 5th and 95th percentiles; *ROA* is winsorized to the range between -0.5 and 0.5.

Panel B shows that managers provide attributions in 64 of the 80 earnings conference calls analyzed. That is, 80% of my sample firms offer attributions, which is close to the percentage observed in prior research (Baginski et al. 2004). Specifically, Baginski et al. (2004) find that 72.4% of their sample firms provide attributions. In my sample, 28 firms provide attributions in the 40 observations drawn from the extreme tails of *ROA* distribution, while 36 firms provide attributions in the randomly chosen 40 firms. This differential proportion of attributions between the extreme tails subsample and the random subsample is contrary to expectations. I expect that firms facing extreme profits or losses will face higher demand for explanations and therefore, have more attributions. I examine the 12 firms that do not have attributions in the extreme *ROA* sample and find that 4 of them are in the positive *ROA* group and 8 of them are in the negative *ROA* group. Further investigation suggests that firms with large losses spend a considerable amount of time during earnings conference calls discussing survival and restructuring plans instead of explaining prior quarter performance. I also find that firms are more likely to make internal attributions: 48 observations have internal attributions while only 26 observations have external attributions.

The second table in Panel B provides information at the attribution level. Of the 110 attributions identified, 67 are internal, 33 are external, 5 are both internal and external, and the remaining 5 I am unable to unambiguously label as internal or external. In addition, I document that 95% of the attributions are offered during the

presentation sections. This is consistent with the notion that managers understand the demand for attributions from investors and provide explanations in the presentation session in anticipation to satisfy the information demand. I also find that firms are more likely to offer favorable attributions than unfavorable attributions (57 vs. 40), which is consistent with prior theory and empirical evidence that firms tend to disclose favorable news (Dye 2001; Wasley and Wu 2006).

There is variation in managers' attribution behavior, consistent with both self-serving attribution and leadership theories. For example, Herve Caen, CEO of Interplay Entertainment, makes the following internal attribution for good performance during the firm's Q4 2003 conference call: *"Our operating income for fiscal year 2003 was 1.4 million compared to an operating loss of 12.4 million in 2002. The results show a dramatic improvement in operations, resulting from a successful turnaround, which I led since taking over destiny of Interplay almost three years ago."* In contrast, the following example finds a manager attributing good performance to external factors: *"We had a favorable tax rate decrease in the quarter from 36.50 a year ago to 33.7. If you remember we had given an outlook expecting our average effective rate to be about 35.5 but because of favorable state legislation that was enacted at the end of, June 30, really, and some other settlements we actually had a benefit of about \$0.025 per share as a result of that reduced tax rate."* (Healthcare Realty Trust Q4 2006 earnings conference call)

Managers also exhibit different patterns for attributing poor performance. The following example reveals a CEO blaming external factors for poor performance: *“Revenues (are) slightly down because of the decline in the U.S. dollar.”*² (Technip Q1 2005 earnings conference call), while the following quote from Ambassadors Groups shows a manager attributing internal factors for bad performance: *“We also believe that part of the decline (of revenue) is driven by an unexpected decline in the performance of one of our named databases or sources of names.”* (Ambassadors Group Inc. Q3 2007 earnings conference call)

² Content in the parenthesis is added by the author.

5.2 Internal and External Attributions and Personal Pronouns

To further examine the relation between personal pronouns and attribution characteristics, I calculate *IvsE* for each attribution that I can identify as internal or external (100 out of the total 110 attributions). I then examine the association between the automated pronoun based attribution measure, *IvsE*, and the attributions manually coded internal or external.

Panel A of Table 4 presents the univariate analysis results. The mean of *IvsE* for internal attributions is 1.70, and the mean of *IvsE* for external attributions is 0.89. The two groups are significantly different with a t-statistic of 4.70. To assess explanatory power, estimate a simple logistic model with *IvsE* as the only independent variable. The dependent variable equals 1 if an attribution was manually coded as internal and 0 if an attribution was manually coded as external. The results are presented in Panel B. The sensitivity of the model is 88.06%, as evidenced by the correct classification of 59 out of the 67 internal attributions. The specificity of the model is 45.45%, as evidenced by the model classifying 15 attributions correctly out of the 33 external attributions.³ Collectively, the model correctly classifies 74% of the attributions. The area under the Receiver Operating Characteristic (ROC) curve for my model is 0.740, which suggests

³ This suggests that the pronoun based measure does a poor job capturing external attributions. It is likely due to the fact that managers refer to specific firms and economic factors for external attributions. A possible way to sharpen the measure is to append a dictionary that includes certain economic and environmental words.

that the automated *IvsE* measure provides acceptable discrimination of internal and external attributions.⁴

The results show that the pronoun based measure is better at capturing internal attributions than external attributions (i.e., the measurement error is greater for external attributions than for internal attributions). This is likely due to the fact that managers refer to specific firm and macroeconomic factors for external attributions and these attributions are not likely characterized by third-person pronouns.⁵ Nonetheless, I conclude from this section that the *IvsE* variable reasonably captures internal and external attributions.

⁴ Hosmer and Lemeshow (2000) indicate that areas under ROC curves equal to 0.50 suggest the model is no better than chance, models with areas between 0.70 and 0.80 provide acceptable discrimination and models with areas between 0.80 and 0.90 provide excellent discrimination.

⁵ An alternative method is to incorporate these macroeconomic factors (for example: exchange or interest rates, tax policies, regulatory actions, etc.) into the attribution measure. In this paper, my objective is to construct a parsimonious measure without subjective modification.

Table 4: Personal Pronouns and CEO Attributions

Panel A: Univariate Analysis	
<i>Average IvsE for internal attributions</i>	1.70
<i>Average IvsE for external attributions</i>	0.89
<i>T-stat</i>	4.70

Panel B: Logistic Regression	
<i>Intercept</i>	-0.624 (0.391)
<i>IvsE</i>	1.028*** (0.258)
<i>N</i>	100
<i>Pseudo R²</i>	0.148
<i>Wald chi-square</i>	18.83
<i>P-value</i>	0.000
<i>True Positive</i>	59
<i>False Positive</i>	18
<i>False Negative</i>	15
<i>True Negative</i>	8
<i>Sensitivity</i>	88.06%
<i>Specificity</i>	45.45%
<i>Correctly Classified</i>	74.00%
<i>Area under the ROC Curve</i>	0.740

This table presents the prediction of attribution types using personal pronouns. Panel A shows results from the univariate analysis; Panel B shows results from a logistic model with *IvsE* as the independent variable.

6. Firm Performance and Managers' Attributions during Earnings Conference Calls

In this section I use my measure to investigate how CEOs attribute firm performance. The main research question is to examine whether self-serving bias or leadership is more descriptive of managers' attributions. I regress *IvsE* on firm performance and control for other variables that affect managers' attributions by estimating the following ordinary least squares model:

$$IvsE = \lambda_0 + \lambda_1 ROA + \lambda_2 DRND + \lambda_3 DSI + \lambda_4 LNMVE + \lambda_5 LENGTH + \varphi \quad (1)$$

Both the measurement of each independent variable and the expected association with *IvsE* are discussed below.

1. *Firm performance.* I use *ROA* as the measure of firm performance. Prior research on earnings conference calls also uses performance measures such as stock returns (Matsumoto et al. 2011) and unexpected earnings (Frankel et al. 2010). Stock returns also incorporate information that is not conveyed by earnings, and prior research finds that only a small portion of stock returns can be explained by earnings (Lev 1989). Unexpected earnings are affected by market expectations, and managers may conduct expectation management to walk down market expectations in order to beat the earnings target (Bartov and Cohen 2009; Richardson et al. 2004). *ROA* is not impacted by market movements or earnings expectations. Moreover, I find in my manual coding of attributions in section 4 that most explanations provided by managers are about earnings or earnings components rather than stock returns or

earnings surprises. Therefore, I use ROA to proxy for firm performance in this paper. Under attribution theory, I expect λ_1 to be positive (i.e., better performance leads to more internal attributions relative to external attributions). If the leadership effect dominates in the sample, I expect λ_1 to be negative.

2. *Proprietary cost.* Verrecchia (1983) argues that a manager may not disclose valuable information to investors because this information may be used by other parties to reduce the firm's competitive advantage. That is, if a firm has higher proprietary cost, the manager is less likely to talk about internal factors that affect firm performance. Hence, in equation (1) I include an indicator variable, *DRND*, which is equal to 1 if a firm has R&D expenses during the past three years. Proprietary cost theory predicts the coefficient on *DRND* to be negative.
3. *Special items.* Baginski et al. (2004) find that firms mentioning one-time charges in their management forecasts are more likely to provide internal attributions and less likely to provide external attributions. Therefore, I include an indicator variable, *DSI*, which takes the value of one if a firm reports a non-zero value for special items during the fiscal quarter, and zero otherwise. I expect the coefficient of *DSI* to be positive.
4. *Firm size.* Baginski et al. (2004) document that larger firms are more likely to provide external attributions with management earnings forecasts. I include the natural logarithm of market value (*LNMVE*) as a control variable and expect its coefficient to

be negative.

5. *Length of conference calls.* As shown in Table 2 Panel F, the statistical distribution of *IvsE* is affected by the length (*LENGTH*) of conference calls. I therefore include *LENGTH* in the regression analysis and expect a negative coefficient.

Panel A of Table 5 shows the Pearson correlation matrix of CEO attributions and firm characteristics. The correlation between *IvsE* and *ROA* is positive and statistically significant, indicating that better performance leads to more internal attributions relative to external attributions. This suggests that self-serving bias seems to be the more dominant force in management attributions.¹ *IvsE* is also positively correlated with assets and the logarithm of market value of equity, which is not in line with the result in Baginski et al. (2004) that larger firms tend to make external attributions. The correlation between *IvsE* and *DRND* is -0.15 and significant, consistent with the notion that firms with higher proprietary costs are less likely to make internal attributions. *IvsE* is positively correlated with *DSI*, suggesting that firms that have special items are more likely to make internal attributions, consistent with the results in Baginski et al. (2004). *IvsE* is weakly related to contemporaneous market reaction and not correlated with future stock returns.

¹ It is not clear whether the correlation is economically significant. In the later part of the paper I examine the incrementally explanatory power of firm performance relative to the control variables to see if the association between performance and managers' attributions is economically significant.

Table 5: The Association between Firm Performance and Managers' Attributions

Panel A: Pearson Correlation Matrix between *IvsE* and Firm Characteristics

	<i>IvsE</i>
<i>ROA</i>	0.09***
<i>ASSETS</i>	0.10***
<i>LN MVE</i>	0.11***
<i>ROA_{t+1}</i>	0.09***
<i>ROA_{t+2}</i>	0.09***
<i>DRND</i>	-0.15***
<i>DSI</i>	0.04***
<i>CAR(-1,1)</i>	0.01**
<i>CAR1yr</i>	0.00
<i>CAR2yr</i>	-0.00
<i>CAR3yr</i>	-0.00

Table 5 (continued)

Panel B: The Association between Firm Performance and Managers' Attributions

		<i>IvsE</i> (Whole Call)	<i>IvsE</i> (Presentation Section)	<i>IvsE</i> (Q & A Section)
	<i>Predicted Sign</i>	(1)	(2)	(3)
<i>Intercept</i>	?	1.854*** (156.698)	1.894*** (86.754)	1.622*** (45.695)
<i>ROA</i>	+/-	0.233*** (3.897)	0.247** (2.532)	0.458*** (4.629)
<i>DRND</i>	-	-0.056*** (-6.497)	-0.082*** (-5.244)	-0.054*** (-4.121)
<i>DSI</i>	+	0.037*** (9.781)	0.035*** (5.629)	0.042*** (6.448)
<i>LN MVE</i>	-	0.010*** (5.491)	-0.019*** (-5.278)	0.002 (0.601)
<i>LENGTH</i>	-	-0.033*** (-18.079)	0.011*** (3.369)	-0.003 (-1.028)
<i>Industry Fixed Effect</i>		Yes	Yes	Yes
<i>Time Fixed Effects</i>		Yes	Yes	Yes
<i>Two-way Clustered Standard Errors</i>		Yes	Yes	Yes
<i>N</i>		50434	50434	50434
<i>Adjusted R²</i>		0.105	0.032	0.026

Panel A presents the Pearson correlation matrix of *IvsE* and firm characteristics. Panel B reports ordinary least squares regression estimation of equation (1). T-statistics are shown in parentheses with standard errors clustered at both firm and quarter level. ***/**/* means significance at 0.01, 0.05 and 0.10 level, respectively.

Panel B of Table 5 presents the results of the OLS regression analysis. As can be seen in column 1, the coefficient on *ROA* is 0.233 ($t = 3.897$). This indicates that managers' attributions are positively associated with firm performance, suggesting that self-serving attribution bias dominates leadership in earnings conference calls.

The coefficient on *DRND* is negative (coefficient = -0.056) and statistically significant, consistent with the notion that firms with higher proprietary costs are less likely to provide internal attributions since it may reduce the firms' competitive advantage. The coefficient on *DSI* is positive, consistent with Baginski et al. (2004) that firms with special items are more likely to make internal attributions. The coefficient on *LN MVE* is positive, which is inconsistent with Baginski et al. (2004).

The model has reasonable explanatory power with an R^2 of 10.5%. Untabulated results show that when I stepwise introduce the dependent variable, the explanatory power of *ROA* is trivial (0.8%). The majority of the explanatory power comes from industry fixed effects (5.6%). Combined with the finding reported in Panel A of the correlation between *IvsE* and *ROA* (9.0%), these results suggest that earnings are not the first order determinant of internal and external attributions.

Bloomfield (2008) suggests that spontaneous conversations (such as Q&A sessions of conference calls) are more suitable in testing psychology theory than pre-scripted texts (such as the presentation sections of conference calls). If this claim is valid, I expect to see stronger results using the attribution measure based on CEO responses in the Q&A sessions. However, Larcker and Zakolyukina (2011) do not find significant differences in predicting financial misreporting when they compare the presentation sessions and Q&A sessions. To test whether CEO attributions differ from presentation to Q&A sessions, I measure *IvsE* separately for the presentation and Q&A sections of the

conference calls, and re-estimate equation (1) using *IvsE* from presentation and Q&A sections separately.

Column 2 presents the regression results based on management attributions during presentation section of the conference call. The results are largely in line with using *IvsE* based on the entire conference calls, suggesting that CEOs tend to refer to internal factors for good performance and external factors for poor performance even in the presentation section. Column 3 shows the regression results based on Q&A sections of the conference calls. The coefficient on *ROA* is larger for results for the Q&A sections. However, untabulated results show that the difference is not statistically significant, consistent with the recent finding in Larker and Zakolyukina (2012) that managers do not have different speaking patterns during the presentation and Q&A sections.

7. Market Reaction and Analyst Forecast Revisions to Managers' Attributions

In this section I examine how investors and financial analysts respond to management attributions by examining the contemporaneous stock market returns and analyst forecast revisions. Investors' and analysts' future earnings forecasts are affected by their diagnosis of performance drivers in the previous periods (Koonce et al. 2011). If managers' attributions help investors evaluate the performance drivers, investors may adjust their future earnings forecasts and react accordingly.

To test for market reactions, I regress the three-day cumulative abnormal returns measured around the conference call date $CAR(-1,1)$ on the unexpected component of $IvsE^1$. To measure the expected component of $IvsE$, I use seasonal prior quarter value of $IvsE$. I control for quantitative accounting news contained in the earnings conference call by including earnings surprises (UE_t). I also control for news in linguistic tone documented in prior research (Davis et al. 2008; Demers and Vega 2008; Engelberg 2008; Loughran and McDonald 2011). Kinney et al. (2002) find that market reaction to earnings surprise is not linear but S-shaped, and thus I include $LargePosUE$ and $LargeNegUE$ as explanatory variables to control for the non-linearity of the return-earnings relation. In addition, I control for other firm characteristics that may affect market reaction during

¹ Using unadjusted $IvsE$ as the dependent variable yields similar empirical implications.

the conference call window: firm size (*LN MVE*), growth option (*BM*), and momentum (*MOM*). I use the following model to test market reaction:

$$CAR(-1,1) = \gamma_0 + \gamma_1 \Delta vs E + \gamma_2 UE + \gamma_3 LargePosUE + \gamma_4 LargeNegUE + \gamma_5 POSWORDS + \gamma_6 NEGWORDS + \gamma_7 LN MVE + \gamma_8 MOM + \gamma_9 BM + \varphi \quad (2)$$

Table 6 shows that the market reacts negatively to more internal attributions provided by managers. This is consistent with the results in a recent study that finds a negative market reaction to CEO's self-reference words during CNBC interviews (Kim 2011). This negative reaction suggests investors interpret managers' self-serving attributions as a negative signal. Whether this stock market inference is rational is investigated in more detail in section 8. The market also react to news in earnings (*UE*) and news in linguistic tone (*POSWORDS* and *NEGWORDS*), consistent with prior studies.

Table 6: The Association between Management Attributions and Contemporaneous Stock Returns

	<i>Predicted Sign</i>	
<i>Intercept</i>	?	-0.030*** (-2.878)
<i>ΔIvsE</i>	?	-0.003* (-1.795)
<i>UE</i>	+	10.995*** (27.184)
<i>LargePosUE</i>	-	-8.791*** (-22.853)
<i>LargeNegUE</i>	-	-10.064*** (-26.955)
<i>POSWORDS</i>	+	0.005*** (8.137)
<i>NEGWORDS</i>	-	-0.013*** (-8.036)
<i>LMVE</i>	?	0.002*** (4.326)
<i>MOM</i>	?	0.214*** (12.246)
<i>BM</i>	?	0.005*** (4.555)
<i>Industry Fixed Effect</i>		Yes
<i>Time Fixed Effects</i>		Yes
<i>Two-way Clustered Standard Errors</i>		Yes
<i>N</i>		33504
<i>Adjusted R²</i>		0.103

This table reports ordinary least squares regression estimation of the association between attributions and contemporaneous stock market reaction $CAR(-1,1)$. All the variables are defined in Appendix A. T-statistics are shown in parentheses with standard errors clustered at both firm and quarter level. ***/**/* means significance at 0.01, 0.05 and 0.10 level, respectively.

To examine analyst reactions, I use analyst forecast revisions ($FREV$) as the dependent variable instead of $CAR(-1,1)$ in equation (2). I also modify equation (2) to include the contemporaneous market reaction $CAR(-1,1)$ as an additional independent variable to control for other contemporaneous news that is not captured by other explanatory variables. I expect the coefficient on $CAR(-1,1)$ to be positive.

I measure $FREV$ as the one-quarter-ahead forecast revision, which is calculated as the difference between the median one-quarter-ahead forecast issued after and before the current quarter earnings announcement, scaled by stock price two days before the earnings conference call. I calculate the median of analyst forecasts before (after) the earnings announcement using the last (first) forecast of all individual analysts who issue forecasts during the 90-day period before (after) the current quarter earnings announcement.

Table 7 shows that the coefficient on $\Delta IvsE$ is not significant, suggesting that analysts do not incorporate the information in managers' attributions in their future earnings forecasts. Consistent with prior studies, I find that the coefficients on earnings surprises (UE) and the contemporaneous returns ($CAR(-1,1)$) are positive and significant.

The insignificant coefficient on $IvsE$ is possibly explained by the following three possibilities. First, analysts do not incorporate managers' attributions when forecasting earnings. Second, analysts do incorporate CEO attributions into their long term

earnings forecasts, but not into their short term earnings forecasts. To disentangle these possibilities requires an examination of how CEO attributions associate with firms' future performance, which I examine in section 8. Third, the information contained in CEO attributes is fully captured by the contemporaneous stock returns and hence the effect is controlled away. However, this explanation is unlikely because when contemporaneous stock returns are removed from the model, I still do not observe a significant coefficient on the CEO attribution signal.

Table 7: The Association between Management Attributions and Analyst Forecast Revisions

	<i>Predicted Sign</i>	
<i>Intercept</i>	?	-0.005*** (-6.605)
<i>ΔIvsE</i>	?	0.000 (0.842)
<i>UE</i>	+	0.244*** (11.221)
<i>CAR(-1,1)</i>	+	0.013*** (15.979)
<i>LargePosUE</i>	-	-0.128*** (-5.385)
<i>LargeNegUE</i>	-	0.019 (0.723)
<i>POSWORDS</i>	+	0.000*** (2.780)
<i>NEGWORDS</i>	-	-0.001*** (-7.422)
<i>LMVE</i>	?	0.000*** (11.223)
<i>MOM</i>	?	0.004*** (2.637)
<i>BM</i>	?	-0.002*** (-7.013)
<i>Industry Fixed Effect</i>		Yes
<i>Time Fixed Effects</i>		Yes
<i>Two-way Clustered Standard Errors</i>		Yes
<i>N</i>		28389
<i>Adjusted R²</i>		0.228

This table reports ordinary least squares regression estimation of the association between attributions and one-quarter-ahead analyst forecast revisions (*FREV*). All the variables are defined in Appendix A. T-statistics are shown in parentheses with standard errors clustered at both firm and quarter level. ***/**/* means significance at 0.01, 0.05 and 0.10 level, respectively.

8. Managers' Attributions and Earnings Persistence

Results in section 7 show that investors react negatively to managers' internal attributions. In this section I examine whether this negative reaction is consistent with deteriorating future performance accompanied with managers' attributions. Motivated by theory and prior research, I investigate whether deteriorating earnings persistence is a plausible explanation for the negative market response to unexpected internal attributions.

I examine earnings persistence because it is related to whether managers' claims about performance drivers are truthful information or reflect their conscious or unconscious biases.¹ If managers' attributions are truthful, we would expect to observe a positive association between internal attributions and earnings persistence. On the other hand, if managers' attributions represent conscious bias for impression management purpose², we would expect to observe a negative association between internal attributions and earnings persistence. If the attribution bias is due to cognitive

¹ Attribution theory suggests that an event is likely to reoccur or change according to whether the cause is going to remain or change (Weiner et al. 1971). Weiner et al. (1971) suggest that if an event is caused by a stable factor (for example, managerial ability) rather than an unstable factor (for example, efforts or luck), then the event is more likely to be persistent. In an annual report setting, Bettman and Weitz (1983) find that the locus of causality (i.e., internal vs. external attributions) and stability are closely related. They find that most internal attributions provided by managers are stable. In this paper, I assume that earnings innovations from internal and external factors have different persistence: internal innovations are more persistent and external shocks are more transitory.

² CEOs have incentive to portray firm performance as better than it is. Prior research suggests that CEOs use corporate narratives to manipulate the impression of analysts and investors so as to be perceived favorably (Staw et al. 1983; Westphal and Graebner 2010).

factor such as overconfidence, then we may not observe an association between attributions and earnings persistence.

If a manager makes self-serving attributions to portray favorable firm performance as more persistent than it truly is, a rational market will unravel this and react negatively. Furthermore, one should observe less persistent earnings in the future. To examine the relation between managers' attributions and earnings persistence, I regress ROA in future periods (ROA_{t+1} and ROA_{t+4}) on the interactive term of current period ROA and $IvsE$. The interaction term captures the relation between CEO attributions and earnings persistence. I also include other variables in equation (1) as additional explanatory variables. To control for the accrual effect documented by Sloan (1996), I include the absolute value of accruals ($ABSACC$) and its interactive term with ROA in the earnings persistence tests. The final empirical specification is as follows:

$$ROA_{t+1(t+4)} = \beta_0 + \beta_1 IvsE + \beta_2 ROA_t + \beta_3 ROA * IvsE + \beta_4 DRND + \beta_5 DSI + \beta_6 LNMVE + \beta_7 LENGTH + \beta_8 ABSACC + \beta_9 ROA * ABSACC + \varepsilon \quad (3)$$

Table 8 presents the results of OLS regression of equation (3). The coefficients on $ROA * IvsE$ are mostly negative and statistically significant, in line with ROA being less persistent in the presence of internal attributions. The negative association between managerial attributions and earnings persistence suggests that CEO attributions are for impression management purpose rather than providing incremental information about managerial ability. The results also suggest that the negative market reaction reported earlier is rational.

To gauge the economic magnitude, I examine how changes of attributions affect changes of earnings persistence. A one standard deviation change in *IvsE* yields a change in one-quarter-ahead *ROA* of 0.029 ($-0.102 * 0.28$), which is comparable to the standard deviation of *ROA* (0.04). This suggests that the negative relation between managers' attributions and earnings persistence is also economically significant.

Column 3 to 6 present the regression results based on attributions from the presentation and Q&A sections separately. The results indicate that attributions from both the presentation and Q&A sessions are negatively related to earnings persistence. Untabulated results show that the coefficients are not statistically different between the presentation and Q&A sections.³

³ To be consistent with prior literature, I also re-estimate the first column of Table 8 using only observations with positive *ROA*. The empirical implications remain unchanged.

Table 8: The Association between Managers' Attributions and Earnings Persistence

	<i>Predicted Sign</i>	Whole Call		Presentation Section		Q & A Section	
		(1)	(2)	(3)	(4)	(5)	(6)
		ROA_{t+1}	ROA_{t+4}	ROA_{t+1}	ROA_{t+4}	ROA_{t+1}	ROA_{t+4}
<i>Intercept</i>	?	-0.002 (-0.950)	-0.000 (-0.269)	-0.001 (-0.336)	0.000 (0.112)	-0.002** (-2.321)	-0.002** (-2.398)
<i>IvsE</i>	?	0.001** (2.060)	0.001 (1.253)	0.000 (0.345)	-0.001 (-1.228)	0.000 (1.247)	-0.000 (-0.220)
<i>ROA</i>	+	0.908*** (17.335)	0.852*** (20.795)	0.810*** (33.795)	0.710*** (16.182)	0.772*** (27.159)	0.721*** (32.810)
<i>ROA * IvsE</i>	?	-0.061** (-2.052)	-0.026 (-1.208)	0.002 (0.147)	0.010 (0.388)	-0.030* (-1.905)	0.004 (0.378)
<i>DRND</i>	?	0.000 (0.050)	0.000 (0.053)	0.000 (0.034)	0.000 (0.174)	0.000 (0.176)	0.000 (0.220)
<i>DSI</i>	?	-0.001*** (-7.946)	-0.001*** (-7.730)	-0.001*** (-7.853)	-0.000** (-2.098)	-0.000** (-2.032)	-0.000** (-2.243)
<i>LN MVE</i>	?	0.001*** (10.438)	0.001*** (10.401)	0.001*** (10.315)	0.001*** (6.153)	0.001*** (5.907)	0.001*** (5.802)
<i>LENGTH</i>	?	-0.000*** (-2.744)	-0.000*** (-3.345)	-0.000 (-0.816)	-0.000** (-2.074)	-0.000*** (-2.722)	-0.000 (-0.270)
<i>ABSACC</i>	?	0.098*** (8.455)	0.098*** (8.358)	0.098*** (8.438)	0.035*** (6.234)	0.034*** (6.018)	0.035*** (6.217)
<i>ROA * ABSACC</i>	-	-3.067*** (-7.526)	-3.070*** (-7.457)	-3.101*** (-7.507)	-0.079 (-0.488)	-0.042 (-0.257)	-0.081 (-0.501)
<i>Industry Fixed Effect</i>		Yes	Yes	Yes	Yes	Yes	Yes
<i>Time Fixed Effects</i>		Yes	Yes	Yes	Yes	Yes	Yes
<i>Two-way Clustered Standard Errors</i>		Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>		36395	36395	36395	34874	34874	34874
<i>Adjusted R²</i>		0.610	0.610	0.610	0.637	0.637	0.636

This table reports ordinary least squares regression estimation of the association between attributions and future *ROA*. All the variables are defined as Appendix A. T-statistics are shown in parentheses with standard errors clustered at both firm and quarter level. ***/**/* means significance at 0.01, 0.05 and 0.10 level, respectively.

9. Managers' Attributions and Future Stock Returns

Based on the evidence in prior sections, we can conclude that investors react negatively to managers' attributions, and managerial attributions are negatively related to earnings persistence. It is unclear, however, whether the negative market reaction is complete. Indeed, given that analysts may not fully incorporate the information contained in CEO attributions, it is plausible that capital markets are not completely efficient. Moreover, prior literature documents price drift with respect to quantitative earnings information (Bernard and Thomas 1989) and with respect to qualitative information contained in the linguistic tone of management (Demers and Vega 2008; Engelberg 2008). In this section I test whether the stock market fully reflects the information in CEO attributions. If the stock market is fully rational and efficient with respect to managers' attributions, I expect that future returns will not be associated with information contained in managers' attributions.

Initial examination of this issue is reported in Table 5 Panel A, which reveals that future returns are not significantly correlated with managerial attributions during earnings conference calls. To test this in a multivariate framework, I estimate the following determinant model of future stock returns that controls for factors shown in prior literature to affect future stock returns:

$$\begin{aligned} CAR_{1yr} (2yr \text{ or } 3yr) = & \gamma_0 + \gamma_1 \Delta IvsE + \gamma_2 UE + \gamma_3 POSWORDS + \gamma_4 NEGWORDS \\ & + \gamma_5 LNMVE + \gamma_6 MOM + \gamma_7 BM + \gamma_8 ACCRUALS + \varphi \end{aligned} \quad (4)$$

The results of estimating equation (4) are presented in Table 9. The coefficients on $\Delta IvsE$ are not statistically significant in all three columns. This suggests that the stock market appears to be fully efficient with respect to information in managers' attributions.

The other coefficients are consistent with prior literature. The coefficients on UE are positive and statistically significant, consistent with Doyle et al. (2006), who find that earnings surprises are positively associated with future stock returns in the next three years. I find weak statistical association between $POSWORDS$ and future returns, and no statistical association between $NEGWORDS$ and future returns¹. The coefficients on MOM are positive and statistically significant at the 0.10 level, consistent with Chan et al. (1996) who document the association between momentum and future returns. The negative coefficients on $ACCRUALS$ are consistent with the accrual anomaly (Sloan 1996).

¹ Prior literature finds mixed evidence about the associations between management tones and future returns. Engelberg (2008) and Demers and Vega (2008) document associations between future returns and linguistic tones, but Loughran and McDonald (2011) find no association between negative tone and future returns.

Table 9: Managers' Attributions and Future Stock Returns

	<i>Predicted Sign</i>	<i>CAR1YR</i>	<i>CAR2YR</i>	<i>CAR3YR</i>
<i>Intercept</i>	?	0.093 (0.000)	0.101 (0.000)	-0.023 (0.000)
<i>ΔIvsE</i>	?	0.009 (1.101)	0.007 (0.717)	0.011 (1.134)
<i>UE</i>	+	2.496*** (3.902)	3.684*** (4.083)	4.390*** (4.271)
<i>POSWORDS</i>	+	0.015*** (2.734)	0.017* (1.811)	0.021 (1.583)
<i>NEGWORDS</i>	-	-0.016 (-1.217)	0.004 (0.232)	0.013 (0.569)
<i>LMVE</i>	?	0.004 (0.673)	0.015* (1.955)	0.025*** (2.762)
<i>MOM</i>	+	0.120* (1.705)	0.154* (1.810)	0.197* (1.715)
<i>BM</i>	?	0.027 (1.048)	-0.020 (-0.544)	-0.036 (-0.715)
<i>ACCRUALS</i>	-	-0.447*** (-6.007)	-0.302** (-2.558)	-0.376** (-2.249)
<i>Industry Fixed Effect</i>		Yes	Yes	Yes
<i>Time Fixed Effects</i>		Yes	Yes	Yes
<i>Two-way Clustered Standard Errors</i>		Yes	Yes	Yes
<i>N</i>		33120	33120	33120
<i>Adjusted R²</i>		0.076	0.080	0.090

This table reports ordinary least squares regression estimation of the association between managers' attributions and firms' future stock returns. All the variables are defined in Appendix A. T-stats are shown in parentheses with standard errors clustered at both firm and quarter level. ***/**/* means significance at 0.01, 0.05 and 0.10 level, respectively.

10. Managers' Attributions and CEO Compensation

Given the prior sections suggest that the capital markets recognize and appropriately “punish” self-serving attributions by managers, in this section, I examine whether boards also recognize the negative implications of CEO attributions and react accordingly. Kim (2011) shows that CEOs with self-serving attribution bias are more likely to be fired. In this paper I examine a different punishment mechanism: CEO compensation. Koonce et al. (2011) suggest that boards should adjust compensation depending on the factors managers ascribe to performance. To assess whether boards make any adjustments to compensation in response to self-serving attribution, I regress CEO compensation on the attribution measure, while controlling for other economic factors that may affect CEO compensation I estimate the following specification:

$$\begin{aligned} LNCOMP = & \gamma_0 + \gamma_1 \Delta IvsE + \gamma_2 LNSALE_{t-1} + \gamma_3 BM_{t-1} + \gamma_4 ROA + \gamma_5 RET \\ & + \gamma_6 STDRET \quad (5) \end{aligned}$$

The dependent variable is the natural logarithm of total compensation obtained from *EXECUCOMP*. Because the compensation data is only available on an annual basis, I use the mean value of *IvsE* during the fiscal year and conduct analysis on a firm-year basis. Prior literature on CEO compensation suggests that larger firms with more growth opportunities and more complex operations need higher-ability managers who demand higher compensation (Smith and Watts 1992), therefore I include prior year sales ($LNSALE_{t-1}$) to proxy for firm size and operating complexity, and prior year book-to-market ratio (BM_{t-1}) to proxy for growth opportunities. Classic agency theory and prior

empirical results suggest that firm performance is also a determinant of CEO compensation, so I also include current year *ROA* and stock returns (*RET*) as additional independent variables. I also control firm risk using standard deviations of returns in the past five years (*STDRET*). However, because prior literature suggests that firm risks may increase or decrease CEO compensation (Banker and Datar 1989), I do not have a predicted sign for *STDRET*.

Table 10 presents the regression results of equation (5). The coefficient on $\Delta IvsE$ is negative but not statistically significant, suggesting that boards do not adjust CEO compensation in response to managers' attributions during conference calls. There are two plausible explanations for this finding. One explanation is that boards are irrational with respect to managers' attributions. However, Kim (2011) suggests that boards are rational in that CEOs with self-serving attribution bias are more likely to be fired. The other possible explanation is that CEOs may communicate with board members through other channels rather than earnings conference calls. A conference call is for managers to communicate with financial analysts and investors, and managers may disclose different information about attributions when they communicate with board members through other avenues such as board meetings.

The coefficients on $LNSALE_{t-1}$ and BM_{t-1} are consistent with prior literature that finds larger firms with more growth opportunities pay their CEOs more. The coefficient on *ROA* is positive but not statistically significant, while the coefficient on *RET* is

positive and statistically significant, consistent with results in Core et al. (1999). The coefficient on *STDRET* is negative but not statistically significant.

Table 10: Managers' Attributions and CEO Compensation

	<i>Predicted Sign</i>	
<i>Intercept</i>	?	4.686*** (78.056)
<i>ΔIvsE</i>	?	-0.038 (-0.910)
<i>LNSALE_{t-1}</i>	+	0.400*** (13.864)
<i>BM_{t-1}</i>	-	-0.093*** (-4.186)
<i>ROA</i>	+	0.203 (1.524)
<i>RET</i>	+	0.165*** (4.298)
<i>STDRET</i>	?	-0.205 (-1.382)
<i>Industry Fixed Effect</i>		Yes
<i>Time Fixed Effects</i>		Yes
<i>Two-way Clustered Standard Errors</i>		Yes
<i>N</i>		6692
<i>Adjusted R²</i>		0.594

This table reports ordinary least squares regression estimation of the association between managers' attributions and CEO compensation. All the variables are defined in Appendix A. T-statistics are shown in parentheses with standard errors clustered at both firm and quarter level. ***/**/* means significance at 0.01, 0.05 and 0.10 level, respectively.

11. Further Empirical Tests

Thus far the results suggest that CEOs exhibit self-serving attribution bias, and that the market rationally incorporates its ramifications. However, it is not clear why CEOs still make self-serving attributions even though the market reacts unfavorably. To provide some exploratory insight, I examine whether the CEO's attribution behavior varies in a systematic manner. More specifically, I test whether CEOs attribution behavior differs in four different settings: when CEOs are less established as proxied by tenure, when CEOs attach less weight in attributions as proxied by high growth, when the earnings conference calls are in the financial crisis period of 2007, and when CEOs are overconfident.

In a model relating managers' career concerns to disclosures, Hermalin and Weisbach (2011) suggest that owners of a firm seek to assess a CEO's ability based on the information available to them, and to replace him or her if the assessment is too low. Kim (2011) finds that self-serving CEOs are more likely to be fired, suggesting that the labor market does evaluate CEOs based on their attribution styles.

If CEOs' abilities have not been revealed to the market, the labor market reaction to their self-serving attributions may be stronger. For a CEO who has been with the firm for a shorter time (lower tenure), his or her ability is less likely to have been revealed to the labor market, and hence he or she is more subject to the negative consequences of

self-serving attributions. As a result I predict newer CEOs will be less likely to make self-serving attributions.

To test this prediction, I include *LOWTENURE* and its interaction term with *ROA* as additional independent variables in model (1). *LOWTENURE* is an indicator variable that equals 1 if a CEO's tenure is below the median of the sample. In column (1) of Table 11, the coefficient on the interactive term *ROA*HIGHTENURE* is negative and statistically significant, suggesting newer CEOs are less likely to make self-serving attributions.

The second type of attenuation that I consider is how sensitive a firm's stock price is to information. Given the capital market reacts negatively to attributions, the cost of supplying a self-serving attribution should be higher in settings where the stock market reacts more strongly to signals. Extant literature suggests that stock markets react more strongly and asymmetrically negatively to unfavorable earnings signals (Skinner and Sloan 2002). I posit that CEOs at high growth firms will be less likely to engage in self-serving attributions in order to avoid the relatively severe stock market response to signals. To test this assertion, I include *HIGHGROWTH* and its interaction term with *ROA* in equation (1), where *HIGHGROWTH* equals 1 if a firm's sales growth rate is above the median. Column (2) of table 11 shows that the coefficient on *ROA*HIGHGROWTH* is negative and statistically significant, consistent with my prediction.

Table 11: High Attenuation and Management Attributions

		(1)	(2)	(3)	(4)	(5)
	<i>Predicted Sign</i>	LOWTENURE	HIGHGROWTH	NOCRISIS	NEG_LONGHOLDER	NEG HOLDER67
<i>Intercept</i>	?	1.520*** (75.404)	1.926*** (151.766)	1.916*** (101.499)	0.830*** (11.984)	0.827*** (11.993)
<i>ROA</i>	?	0.434*** (4.414)	0.312*** (4.472)	0.188*** (2.891)	-0.122 (-0.807)	-0.014 (-0.084)
<i>HIGHATTENUATION</i>	?	0.042*** (7.704)	-0.011*** (-3.215)	-0.062*** (-7.113)	-0.005 (-0.285)	-0.000 (-0.023)
<i>ROA*HIGHATTENUATION</i>	-	-0.189* (-1.737)	-0.137** (-2.044)	0.057 (0.896)	0.359 (0.787)	0.631 (1.595)
<i>DRND</i>	-	-0.052*** (-5.409)	-0.055*** (-6.424)	-0.056*** (-6.493)	-0.037** (-2.170)	-0.037** (-2.232)
<i>DSI</i>	+	0.036*** (8.436)	0.036*** (9.545)	0.037*** (9.773)	0.034*** (5.084)	0.033*** (4.913)
<i>LN MVE</i>	-	0.012*** (5.540)	0.011*** (5.575)	0.010*** (5.511)	0.015*** (4.345)	0.015*** (4.359)
<i>LENGTH</i>	-	-0.033*** (-17.191)	-0.033*** (-17.951)	-0.033*** (-18.195)	-0.028*** (-8.984)	-0.028*** (-8.962)
<i>Industry Fixed Effect</i>		Yes	Yes	Yes	Yes	Yes
<i>Time Fixed Effects</i>		Yes	Yes	Yes	Yes	Yes
<i>Two-way Clustered Standard Errors</i>		Yes	Yes	Yes	Yes	Yes
<i>N</i>		42585	49980	50434	9143	9143
<i>Adjusted R²</i>		0.115	0.105	0.105	0.106	0.107

This table presents the ordinary least squares regression between management attributions and firm performance in different tenure groups. All the variables are defined in Appendix A. T-statistics are shown in parentheses with standard errors clustered at both firm and quarter level. ***/**/* means significance at 0.01, 0.05 and 0.10 level, respectively.

The third type of attenuation that I consider is financial crisis. My sample period includes 2007, which is during the U.S. financial crisis. External economic conditions give managers more extensive and credible leeway to blame financial crisis as the performance driver. Keusch et al. (2012) find that CEOs of large European companies are more self-serving in their letters to shareholders during the financial crisis. Therefore, I examine whether CEOs are more self-serving during the 2007 financial crisis.

To be consistent with the predicted sign, I include an indicator variable, *NOCRISIS*, and its interactive term with *ROA* as additional independent variables in equation 1. *NOCRISIS* equals 1 if the calendar year of a quarter is between 2002 and 2006 and 0 otherwise. The regression results are presented in column (3). I find no association between financial crisis and managers' self-serving bias, as the coefficient on *ROA*CRISIS* is not statistically significant.

One plausible explanation for my finding is that some managers behave in the opposite way during crisis. Indeed, managers during a financial crisis may find it to be an opportunity to demonstrate leadership (Halverson et al. 2004). Lee et al. (2004) argue that managers take more responsibility for unfavorable outcomes in order to show that they are capable of influencing the company. For instance, Jeff Immelt, the CEO of GE, offered a "Mea Culpa" attribution during the 2008 financial crisis. The two effects may work against each other during the financial crisis and result in a muted association. The other possible explanation is that CEO attributions during the financial crisis are not

captured by third-person pronouns, as I recognized in the validity test section of this paper.

The fourth type of attenuation that I examine is the effect of CEO overconfidence. Libby and Rennekamp (2010) suggest that self-serving attribution bias is closely related to managerial overconfidence. Li (2010) uses self-attribution bias to capture CEO overconfidence and finds that overconfidence is related to corporate financial policies. Overconfident CEOs may make more self-serving attributions than others. Therefore I include overconfidence and its interactive term with *ROA* to examine the effects of overconfidence on CEO attributions.

Following Malmendier and Tate (2005, 2008), I measure CEO overconfidence based on the CEOs' beliefs about future stock returns. To be consistent with the predicted sign, I use the negative value of the overconfidence indicators. I use two measures: *NEG_LONGHOLDER*, which equals -1 if a CEO holds an option until the year of expiration even though the option is at least 40% in the money, and *NEG_HOLDER67*, which equals to -1 once a CEO fails to exercise options with 5 years remaining duration despite a stock price increase of at least 67% since grant date.¹

¹ Because the overconfidence measures require outstanding options data from *EXECCOMP*, observations before 2006 were dropped in this analysis.

Results presented in column (4) and (5) do not support the hypothesis that overconfident CEOs are more self-serving than other managers. The coefficients on the interactive terms of overconfidence and ROA are not statistically significant.

12. Robustness Tests

12.1 *Attributions in Causal Reasoning Statements*

One disadvantage of measuring *IvsE* using the whole call transcript is that the entire conference call is not dedicated to explaining firm performance. I rely on the assumption that pronoun usage during managers' attributions is correlated with pronoun usage during the whole conference call. However, pronoun usage in sentences that are not related to attributions adds noise to the measure. One possible way to test the effect of this measurement error is to extract the sentences in which a manager clearly makes attributions and only analyze these attributions statements. This adds to the power to my tests by mitigating measurement error in the attribution measure.

I extract causal reasoning statements (CRS) from earnings conference calls and re-measure the attribution variable *IvsE* using only these statements. I define causal reasoning statements as all the sentences that contain at least one causal word (e.g., due to, because, lead to, etc.) and at least one word related to performance (e.g., earnings, cash flow, growth, etc.). I delete filler words such as "I believe" that are not related to attributions but may add noise to the attribution measure. The list of causal, performance related and filler words are presented in Appendix B.

After extracting CRS from the earnings conference calls, I repeat the empirical analysis discussed in prior sections using attributions from causal reasoning statements. Table 12 presents the results of testing the main hypothesis. I find that the results are

similar to prior results reported in table 5. The coefficient on *ROA* is positive and statistically significant, suggesting that managers are more likely to refer to internal factors for better performance. The sign of coefficients all control variables are consistent with prediction except for *LENGTH*.

Table 12: Firm Performance and Managers' Attributions in Causal Reasoning Statements

		<i>IvsE</i> (Presentation Section)	<i>IvsE</i> (Q & A Section)
	<i>Predicted Sign</i>	<i>IvsE</i> (Whole Call) (1)	(2)
<i>Intercept</i>	?	1.406*** (21.850)	0.959*** (14.810)
<i>ROA</i>	+/-	0.430*** (4.646)	0.257* (1.754)
<i>DRND</i>	-	0.009 (0.839)	-0.001 (-0.027)
<i>DSI</i>	+	0.004 (0.504)	0.030*** (3.224)
<i>LMVE</i>	-	-0.001 (-0.376)	-0.022*** (-5.376)
<i>LENGTH</i>	-	0.000*** (5.481)	0.001*** (11.959)
<i>Industry Fixed Effect</i>		Yes	Yes
<i>Time Fixed Effects</i>		Yes	Yes
<i>Two-way Clustered Standard Errors</i>		Yes	Yes
<i>N</i>		45888	45888
<i>Adjusted R²</i>		0.021	0.055

This table presents the ordinary least squares regression between management attributions in CRS and firm performance. All the variables are defined in Appendix A. T-statistics are shown in parentheses with standard errors clustered at both firm and quarter level. ***/**/* means significance at 0.01, 0.05 and 0.10 level, respectively.

12.2 Alternative Method of Identifying Self-serving Attributions

The current attribution measure, *IvsE*, relies on a frequency count of different types of personal pronouns. One disadvantage of frequency count is that it does not consider the context of the sentence. For example, “The operating success was because of my leadership” conveys a different leadership style from “The poor performance reflected our marketing strategy.” This kind of difference will not be captured by a frequency count of personal pronouns resulting in weak statistical power of my tests.

To mitigate this concern, I adopt a different method of identifying managers’ self-serving attributions. For each sentence with a causation word, I define the sentence as a “self-serving” sentence if the sentence has a first-person pronoun and a positive word, or a third-person pronoun and a negative word. Similarly, I define a “leadership” sentence as a sentence with a first-person pronoun and a negative word, or a third-person pronoun and a positive word. If a sentence has both first-person and third-person pronouns (or both positive and negative words), I use the one with higher frequency.

After classifying each sentence as leadership or self-serving, I construct two measures of self-serving attributions at the conference call level. The first measure, *NET_SELFSERVING*, is the number of self-serving sentences minus the number of leadership sentences. The second measure, *PCT_SELFSERVING*, is the percentage of the

number of self-serving attribution sentences to the number of all sentences with at least one causation word and a personal pronoun.

To test the main hypothesis of whether self-serving attributions or leadership notions are more descriptive of managerial behavior, I compare the amount of self-serving sentences to the leadership sentences. The descriptive statistics of the two attribution measures are presented in Table 13. The mean and median of *NET_SELFSERVING* are 1.17 and 1.00, respectively. Untabulated results show that both the mean and the median are significantly different from zero ($p < 0.001$). This suggests that CEOs are self-serving in attribution, consistent with the results in prior sections. The mean and median of *PCT_SELFSERVING* are 0.62 and 0.67, respectively, indicating that on average 62% of CEOs' causal sentences are self-serving. Untabulated results show that both the mean and the median are significantly different from 0.5 ($p < 0.001$). The results based on presentation and Q&A sections are also presented in Table 13, and the empirical inferences remain the same.

Table 13: Descriptive Statistics of Self-serving Attribution Sentences

Variable	N	Mean	Std Dev	Min	P25	Median	P75	Max
<i>Entire call</i>								
<i>NET_SELFSERVING</i>	30,707	1.17	3.05	-43.00	-1.00	1.00	3.00	52.00
<i>PCT_SELFSERVING</i>	30,333	0.62	0.31	0.00	0.43	0.67	0.88	1.00
<i>Presentation Section</i>								
<i>NET_SELFSERVING</i>	41,080	0.71	1.96	-24.00	0.00	1.00	2.00	32.00
<i>PCT_SELFSERVING</i>	36,121	0.65	0.39	0.00	0.33	0.78	1.00	1.00
<i>Questions and Answers Section</i>								
<i>NET_SELFSERVING</i>	37,596	0.41	1.96	-19.00	-1.00	0.00	1.00	25.00
<i>PCT_SELFSERVING</i>	34,052	0.58	0.39	0.00	0.25	0.63	1.00	1.00

This table presents the descriptive statistics of self-serving attribution sentences, as defined in section 12.2. All the variables are defined in Appendix A.

12.3 Using *IvsWE* as an Alternative Attributions Measure

A manager may take the credit when performance is good. However, when performance is poor, a manager may talk more about the company as a group setting, hiding his or her personal factor in the crowd. Therefore, another form of self-serving attributions is to use singular first-person pronouns (i.e., words like I, me, my, etc.) for positive outcomes and plural first-person pronouns (i.e., words like we, us, our, etc.) for negative outcomes. To investigate this issue empirically, I define a new variable, *IvsWE*, is defined as $\ln((1+I)/(1+WE))$, which measures the ratio of singular first-person pronouns to plural first-person pronouns.

Results of re-estimating equation (1) with *IvsWE* are presented in Table 14 Panel A. The coefficients on *ROA* are negative and statistically significant, suggesting that better (worse) performance results in more frequent reference to plural (singular) first-person pronouns. This is opposite of the predictions of self-serving attribution bias theory conditional on *IvsWE* being an alternative proxy for self-serving attribution. However, empirically, *IvsE* and *IvsWE* are negatively correlated (-0.29). This negative association between *IvsE* and *IvsWE* is likely due to the fact that CEOs tend to use plural first-person pronouns as shown in Table 2. Thus variation in *IvsE* is driven heavily by first-person plural pronouns in the numerator of the ratio. When first person plural pronouns are removed from the numerator of *IvsE* and placed in the denominator of *IvsWE*, a negative association results.

As an alternative examination, similar to section 12.2, I define a sentence with at least one causation word as “self-serving” if it contains a singular first-person pronoun and a positive word, or a plural first-person pronoun and a negative word. I also define a sentence with at least one causation word as “leadership” if it contains a singular first-person pronoun and a negative word, or a plural first-person pronoun and a positive word. I aggregate these sentences into conference call level measure.

Results presented in Panel B of Table 14 reveal a mean and the median of *NET_SELFSERVING* are -1.28 and -1.00, respectively. The mean and the median of *PCT_SELFSERVING* are 0.37 and 0.33, respectively. These results are consistent with Panel A, suggesting that managers use more plural first-person pronouns as firm performance improves.

Table 14: *IvsWE* as an Alternative Attribution Measure

Panel A: OLS Regression Results				
		<i>IvsWE</i> (Whole Call)	<i>IvsWE</i> (Presentation Section)	<i>IvsWE</i> (Q & A Section)
	<i>Predicted Sign</i>	(1)	(2)	(3)
<i>Intercept</i>	?	-1.164*** (-45.954)	-1.088*** (-59.151)	-0.869*** (-36.193)
<i>ROA</i>	+/-	-0.134* (-1.751)	-0.292*** (-2.898)	-0.336*** (-3.605)
<i>DRND</i>	-	0.000 (0.027)	0.022 (1.418)	0.010 (0.774)
<i>DSI</i>	+	-0.017*** (-3.969)	-0.018*** (-2.592)	-0.016*** (-2.618)
<i>LNMVE</i>	-	0.020*** (8.295)	0.024*** (6.687)	0.024*** (8.408)
<i>LENGTH</i>	-	0.033*** (14.583)	-0.027*** (-9.590)	0.013*** (5.041)
<i>Industry Fixed Effect</i>		Yes	Yes	Yes
<i>Time Fixed Effects</i>		Yes	Yes	Yes
<i>Two-way Clustered Standard Errors</i>		Yes	Yes	Yes
<i>N</i>		50434	50434	50434
<i>Adjusted R²</i>		0.068	0.046	0.029

Panel B: Descriptive Statistics of Self-Serving Attribution Sentences									
Variable	N	Mean	Std Dev	Min	P25	Median	P75	Max	
<i>Entire call</i>									
<i>NET_SELFSERVING</i>	30,707	-1.28	2.93	-44.00	-3.00	-1.00	0.00	24.00	
<i>PCT_SELFSERVING</i>	30,215	0.37	0.31	0.00	0.00	0.33	0.54	1.00	
<i>Presentation Section</i>									
<i>NET_SELFSERVING</i>	41,080	-0.70	1.92	-32.00	-2.00	-1.00	0.00	24.00	
<i>PCT_SELFSERVING</i>	35,577	0.34	0.39	0.00	0.00	0.20	0.67	1.00	
<i>Questions and Answers Section</i>									
<i>NET_SELFSERVING</i>	37,596	-0.53	1.85	-17.00	-1.00	0.00	1.00	19.00	
<i>PCT_SELFSERVING</i>	33,229	0.39	0.39	0.00	0.00	0.33	0.67	1.00	

Panel A presents the ordinary least squares regression between *IvsWE* and firm performance. Panel B presents the descriptive statistics of managers' self-serving attribution sentences. All the variables are defined in Appendix A. T-statistics are shown in parentheses with standard errors clustered at both firm and quarter level. ***/**/* means significance at 0.01, 0.05 and 0.10 level, respectively.

12.4 Additional Robustness Checks

In this section I conduct additional robustness checks. I include different *ROA* definition (use net income instead of operating earnings) in equation (1) and find similar results (not tabulated).

To observe the attribution behavior for a specific CEO, I examine the attribution pattern across positive and negative *ROA* within a CEO's tenure in the firm. I require a CEO to appear in at least 16 earnings conference calls from 2002-2007. I have the required time series data for 360 CEOs. On average, CEOs use more first-person pronouns when firms generate profits and more third-person pronouns when firms suffer losses. The mean value of *IvsE* difference between profits and losses is 0.017, and paired t-statistics suggests that the difference is statistically different from 0 ($p=0.04$). Of these CEOs, 189 CEOs are more likely to refer to internal factors for profits and external factors for losses. 171 CEOs are more likely to refer to internal factors for losses and external factors for profits.

13. Conclusions

Using a large sample of earnings conference calls, I document that managers' attributions tend to be self-serving when they communicate with investors and financial analysts. I also find that the market reacts negatively to managers' internal attribution. I argue that the negative market reaction is rational because I am able to document a negative relation between internal attributions and subsequent earnings performance. My results are robust to alternative methods of identifying CEO attributions.

The paper improves the power and generalizability of prior studies that rely on content analysis. My paper adopts a pronoun-based attribution measure that reduces the cost and bias induced by human coding. However, pronoun-based attribution measure may suffer from its own set of measurement error, especially with respect to external attributions. More refined attribution measures may decrease the classification errors in external attributions and provide additional insights on the determinants and consequences of external attributions.

Although I find that self serving attributions are punished by investors through a negative market reaction, I do not find evidence that CEOs gain other types of economic benefits (e.g. greater compensation) from self-serving attributions. Therefore this paper does not support the motivational explanation for self-serving attributions. Rather, it appears that CEOs on average suffer from self-serving attribution bias.

Appendix A: Variable Description

Variable Name	Definition
<i>ROA</i>	Return on assets measured as operating earnings (<i>OIADPQ</i>) scaled by book value of assets (<i>ATQ</i>)
<i>ASSETS</i>	Total assets at fiscal quarter end (<i>ATQ</i>)
<i>LN MVE</i>	Natural logarithm of the market value of equity at the fiscal quarter end (<i>CSHOQ</i> * <i>PRCCQ</i>)
<i>BM</i>	Ratio of the book value of equity (<i>SEQQ</i>) to market value of equity (<i>CSHOQ</i> * <i>PRCCQ</i>) at the fiscal quarter end
<i>SI</i>	Special items (<i>SPIQ</i>) scaled by total assets (<i>ATQ</i>)
<i>DRND</i>	Indicator variable that equals to 1 if a firm incurs R&D expense in the past three years
<i>REGULATED</i>	Indicator variable that equals to 1 if a firm is in one of the following industries: telephone, TV, cable, water, and financial
<i>POSWORDS</i>	Percentage of positive words, as defined by the Positive Words dictionary of Loughran and McDonald (2011)
<i>NEGWORDS</i>	Percentage of negative words, as defined by the Negative Words dictionary of Loughran and McDonald (2011)
<i>CAR(-1,1)</i>	Market adjusted cumulative abnormal returns over the earnings announcement window (-1,1)
<i>CAR1YR</i>	Market adjusted cumulative abnormal returns, beginning two days after the earnings announcement and extending one year into the future
<i>CAR2YR</i>	Market adjusted cumulative abnormal returns, beginning two days after the earnings announcement and extending two years into the future
<i>CAR3YR</i>	Market adjusted cumulative abnormal returns, beginning two days after the earnings announcement and extending three years into the future
<i>TENURE</i>	Number of years the the CEO is in that position within the firm
<i>BETA</i>	Market model beta estimated using daily returns over the prior year
<i>SG</i>	Growth rate of sales (<i>SALE</i>)
<i>ACCRUALS</i>	Accruals component of earnings, computed as GAAP earnings per share minus cash from operating per share, scaled by market price per share at the fiscal quarter end
<i>ABSACC</i>	Absolute value of <i>ACCRUALS</i>
<i>FREV</i>	Analyst one-quarter-ahead forecast revisions, measured as difference between the median forecast for quarter t+1 earnings issued after and before the quarter t earnings announcement

<i>MOM</i>	Momentum calculated as $CAR(-127, -2)$
<i>LENGTH</i>	Number of words spoken by a CEO during an earnings conference call (in thousands)
<i>PPRON</i>	Percentage of personal pronouns, as defined by Pennebaker et al. (2007)
<i>I</i>	Percentage of first-person singular pronouns, as defined by Pennebaker et al. (2007)
<i>WE</i>	Percentage of first-person plural pronouns, as defined by Pennebaker et al. (2007)
<i>SHEHE</i>	Percentage of third-person singular pronouns, as defined by Pennebaker et al. (2007)
<i>THEY</i>	Percentage of third-person plural pronouns, as defined by Pennebaker et al. (2007)
<i>INT</i>	Percentage of first-person pronouns (i.e., $I + WE$)
<i>EXT</i>	Percentage of third-person pronouns (i.e., $SHEHE + THEY$)
<i>IvsE</i>	First-person pronouns relative to third-person pronouns calculated as $\ln((1+INT)/(1+EXT))$
$\Delta IvsE$	The unexpected component of <i>IvsE</i> , where the expectation is <i>IvsE</i> of the same quarter in the last fiscal year
<i>LargePosUE</i>	Equals <i>UE</i> if $UE > 0.005$, 0 otherwise
<i>LargeNegUE</i>	Equals <i>UE</i> if $UE < -0.005$, 0 otherwise
<i>LNSALE</i>	Natural logarithm of annual sales (<i>SALE</i>)
<i>RET</i>	Annual returns over the current fiscal year
<i>STDRET</i>	Standard deviation of stock returns in the past five years
<i>LOWTENURE</i>	Indicator variable that equals 1 if a CEO's tenure is below the median, 0 otherwise
<i>HIGHGROWTH</i>	Indicator variable that equals 1 if a firm's sales growth is above the median, 0 otherwise
<i>NOCRISIS</i>	Indicator variable that equals 1 if the fiscal period is between 2002 and 2006, 0 otherwise
<i>NEG_LONGHOLDER</i>	Indicator variable that equals -1 if a CEO holds an option until the year of expiration even though the option is at least 40% in the money
<i>NEG HOLDER67</i>	Indicator variable that equals -1 if a CEO fails to exercise options with 5 years remaining duration despite a stock price increase of at least 67% since grant date
<i>NET_SELFSERVING</i>	The number of self-serving sentences minus the number of leadership sentences
<i>PCT_SELFSERVING</i>	The ratio of number of self-serving sentences to the total number of self-serving and leadership sentences

I_{vsWE}	Singular first-person pronouns relative to plural first-person pronouns calculated as $\ln((1+I)/(1+WE))$
------------	---

Appendix B: Managers' Attributions from Causal Reasoning Statements

I extract causal reasoning statements (CRS) from earnings conference calls from CEO talks in earnings conference calls. To make sure the sentence is about a CEO explain firm performance, I require that a sentence has to include at least one causal word and at least one performance related words to be classified as a CRS.

The causal words and performance related words are presented at the end of this appendix. The causal words and performance related words are from human reading of earnings conference calls. Although the author attempts to be thorough, the lists may not include all the causal and performance words. I do not include "so" in the causal words because "so" may be used in many circumstances but do not necessarily have causal inferences (for example, "or so" and "and so on".)

Using this algorithm to search for CRS lead to both type I and type II errors. It is possible some causal reasoning sentences are not captured by this searching. It is also likely some flagged CRS are not causal explanation of company performance. However, I expect this algorithm to improve the sharpness of the attribution measures.

To calculate the attribution measure (IvsE) in CRS, I also delete filler words that have first-person pronouns (such as "I think") in the CRS. This reduces the noise in pronoun based attribution. Fillers words like "you know" do not affect the measure and thus are not treated.

Causal Words

due to, due in part to, due mainly to, due primarily to, reason, reasons, cuz, because, because of, thus, therefore, as a result, a result of, resulting from, resulted in, function of, driven by, driven primarily by, drove, driver, drivers, contributed to, contribute to, contributes to, contributor to, contributors to, contributions to, contributing to, affect, affects, affected, affecting, attribute, attributes, attributed, attributable to, cause, causes, caused, causing, impacted, impacting, factors, factor, reflected, reflect, reflects, reflecting, reflective of, reflection of, aided by, lead to, led to, leads to

Performance Related Words

income, incomes, loss, losses, earning, earnings, earnings per share, EPS, revenue, revenues, sale, sales, expense, expenses, cost, costs, profit, profits, SG&A, general and administrative, G&A, R&D, research and development, EBITDA, EBIT, gross margin, margin, deferred tax, tax rate, inventories, inventory, cash flow, cash flows, accounts payable, backlog, result, results, improvement, improvements, improving, increase, increased, decrease, decreased, decline, declined, performance, performed, success, successful, momentum, accomplishments, growth, grow, grows, grew

Filler Words

I believe, I also believe, we believe, we also believe, I think, I also think, we think, we also think, I guess, I also guess, We guess, We also guess, I mean, we see, I see, we expect, I expect, let me

References

Baginski, S. P., J. M. Hassell, and W. A. Hillison. 2000. Voluntary causal disclosure: tendencies and capital market reaction. *Review of Quantitative Finance and Accounting* 15:371-389.

Baginski, S. P., J. M. Hassell, and M. D. Kimbrough. 2004. Why do managers explain their earnings forecasts? *Journal of Accounting Research* 42 (1):1-29.

Banker, R. D., and S. M. Datar. 1989. Sensitivity, precision, and linear aggregation of signals for performance evaluation. *Journal of Accounting Research* 27 (1):21-39.

Barton, J., and M. Mercer. 2005. To blame or not to blame: Analysts' reactions to external explanations for poor financial performance. *Journal of Accounting and Economics* 39:509-533.

Bartov, E., and D. A. Cohen. 2009. The "Numbers Game" in the pre-and post-Sarbanes-Oxley eras. *Journal of Accounting, Auditing & Finance* 24 (4):505-534.

Beckman, L. 1970. Effects of students' performance on teachers' and observers' attributions of causality. *Journal of Educational Psychology* 61 (1):76-82.

Bernard, V. L., and J. K. Thomas. 1989. Post-earnings-announcement drift: delayed price response or risk premium? *Journal of Accounting Research* 27:1-36.

Bloomfield, R. 2008. Discussion of "annual report readability, current earnings, and earnings persistence". *Journal of Accounting and Economics* 45:248-252.

Bowen, R. M., A. K. Davis, and D. A. Matsumoto. 2002. Do conference calls affect analysts' forecasts. *The Accounting Review* 77 (2):285-316.

Chan, L. K. C., N. Jegadeesh, and J. Lakonishok. 1996. Momentum Strategies. *The Journal of Finance* 51 (5):1681-1713.

Chatterjee, A., and D. C. Hambrick. 2007. It's all about me: Narcissistic chief executive officers and their effects on company strategy and performance. *Administrative Science Quarterly* 52:351-386.

Choudhary, P., J. D. Schloetzer, and J. Sturgess. 2012. Do corporate attorneys influence financial disclosure? Working Paper, Georgetown University.

Collins, J. 2001. *Good to great: Why some companies make the leap and others don't*. New York: Harper Business.

Davis, A. K., J. M. Piger, and L. M. Sedor. 2008. Beyond the numbers: Managers' use of optimistic and pessimistic tone in earnings press releases. Working paper, University of Oregon.

Davis, A. K., and I. Tama-Sweet. 2012. Managers' Use of Language Across Alternative Disclosure Outlets: Earnings Press Releases versus MD&A*. *Contemporary Accounting Research*:no-no.

Davis, D., and T. C. Brock. 1975. Use of first person pronouns as a function of increased objective self-awareness and performance feedback. *Journal of Experimental Social Psychology* 11:381-388.

Demers, E., and C. Vega. 2008. Soft information in earnings announcements: news or noise? Working paper, INSEAD.

Doyle, J. T., R. J. Lundholm, and M. T. Soliman. 2006. The extreme future stock returns following I/B/E/S earnings surprises. *Journal of Accounting Research* 44 (5):849-887.

Dye, R. A. 2001. An evaluation of "essays on disclosure" and the disclosure literature in accounting. *Journal of Accounting and Economics* 32 (1-3):181-235.

Engelberg, J. 2008. Costly information processing: Evidence from earnings announcements. Working Paper, University of North Carolina at Chapel Hill.

Exline, J. J., and A. L. Geyer. 2004. Perceptions of Humility: A Preliminary Study. *Self & Identity* 3 (2):95-114.

Försterling, F. 2001. *Attribution: An introduction to theories, research and applications*. Philadelphia, PA: Taylor & Francis Group.

Francis, J., K. Schipper, and L. Vincent. 2002. Expanded disclosures and the increased usefulness of earnings announcements. *The Accounting Review* 77 (3):515-546.

Frankel, R., M. Johnson, and D. J. Skinner. 1999. An empirical examination of earnings conference calls as a voluntary disclosure medium. *Journal of Accounting Research* 37 (1):133-150.

Frankel, R., W. J. Mayew, and Y. Sun. 2010. Do pennies matter? Investor relations consequences of small negative earnings surprises. *Review of Accounting Studies* 15 (1):220-242.

Glader, P. 2009. Immelt offers mea culpa: GE chief seeks to persuade investors he's ready to tackle new era. *Wall Street Journal*, December 19.

Greenleaf, R. K. 1977. *Servant leadership : a journey into the nature of legitimate power and greatness*. New York: Paulist Press.

Greenleaf, R. K., and L. C. Spears. 1998. *The power of servant-leadership : essays*. San Francisco, Calif.: Berrett-Koehler Publishers.

Gunsch, M. A., S. Brownlow, S. E. Haynes, and Z. Mabe. 2000. Differential linguistic content of various forms of political advertising. *Journal of Broadcasting & Electronic Media* 44 (1):27-42.

Hales, J., X. J. Kuang, and S. Venkataraman. 2011. Who Believes the Hype? An Experimental Examination of How Language Affects Investor Judgments. *Journal of Accounting Research* 49 (1):223-255.

Halverson, S. K., S. E. Murphy, and R. E. Riggio. 2004. Charismatic Leadership in Crisis Situations A Laboratory Investigation of Stress and Crisis. *Small Group Research* 35 (5):495-514.

Hopkins, J., E. Maydew, and M. Venkatachalam. 2012. Corporate general counsel and financial reporting quality. *Darden Business School Working Paper No. 2060437*.

Hosmer, D. W., and S. Lemeshow. 2000. *Applied logistic regression*. 2nd ed. New York: Wiley.

Ittner, C. D., and D. F. Larcker. 2003. Coming up short on nonfinancial performance measurement. *Harvard Business Review* (November):88-95.

Johnson, T. J., R. Feigenbaum, and M. Weiby. 1964. Some determinants and consequences of the teacher's perception of causation. *Journal of Educational Psychology* 55 (5):237-246.

Kelley, H. H. 1967. *Attribution theory in social psychology*. D. Levine ed. Vol. 15. Lincoln, NE: University of Nebraska Press.

— — —. 1992. Common sense psychology and scientific psychology. *Annual Review of Psychology* 43 (1-23).

Keusch, T., L. H. H. Bollen, and H. F. D. Hassink. 2012. Self-serving Bias in Annual Report Narratives: An Empirical Analysis of the Impact of Economic Crises. *European Accounting Review* 21 (3):623-648.

Kim, Y. H. 2011. Self-Serving Attribution Bias and CEO Turnover: Evidence from CEO Interviews on CNBC. Working paper.

Koonce, L., N. Seybert, and J. Smith. 2011. Causal reasoning in financial reporting and voluntary disclosure. *Accounting, Organizations and Society* Forthcoming.

Lang, M. H., and R. J. Lundholm. 1996. Corporate disclosure policy and analyst behavior. *The Accounting Review* 71 (4):467-492.

Larcker, D. F., and A. A. Zakolyukina. 2011. Detecting deceptive discussions in conference calls. *Journal of Accounting Research* 50.

Lee, F., C. Peterson, and L. Z. Tiedens. 2004. Mea culpa: Predicting stock prices from organizational attributions. *Personality and Social Psychology Bulletin* 30 (12):1636-1649.

Lee, F., and L. Z. Tiedens. 2001. Who's being served? "Self-Serving" attributions in social hierarchies. *Organizational Behavior and Human Decision Processes* 84 (2):254-287.

Lev, B. 1989. On the usefulness of earnings and earnings research: Lessons and directions from two decades of empirical research. *Journal of Accounting Research* 27:153-192.

Li, F. 2008. Annual report readability, current earnings, and earnings persistence. *Journal of Accounting and Economics* 45 (2-3):221-247.

— — —. 2010. Managers' self-serving attribution bias and corporate financial policies. Working paper, University of Michigan.

Li, F., M. Minnis, V. Nagar, and M. V. Rajan. 2009. Formal and real authority in organizations: an empirical assessment. Working paper, University of Michigan.

Libby, R., and K. Rennekamp. 2010. Self-Serving Attribution Bias, Overconfidence, and the Issuance of Management Forecasts. *Journal of Accounting Research*.

Loughran, T., and B. McDonald. 2011. When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. *Journal of Finance* 66 (1):35-65.

- Malmendier, U., and G. Tate. 2005. CEO overconfidence and corporate investment. *The Journal of Finance* 60 (6):2661-2700.
- — —. 2008. Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of Financial Economics* 89 (1):20-43.
- Marques, A., and J. Tavares. 2012. Lying on Iraq, Telling the Truth on 9-11: Market Reactions to Corporate Earnings Announcements. Working paper.
- Matsumoto, D., M. Pronk, and E. Roelofsen. 2011. What Makes Conference Calls Useful? The Information Content of Managers' Presentations and Analysts' Discussion Sessions. *The Accounting Review* 86:1383.
- Mayew, W. J. 2008. Evidence of management discrimination among analysts during earnings conference calls. *Journal of Accounting Research* 46 (3):627-659.
- Miller, D. T., and M. Ross. 1975. Self-serving biases in the attribution of causality: Fact or fiction? *Psychological Bulletin* 82 (2):213-225.
- Morris, J. A., C. M. Brotheridge, and J. C. Urbanski. 2005. Bringing humility to leadership: Antecedents and consequences of leader humility. *Human Relations* 58 (10):1323-1350.
- Newman, M. L., J. W. Pennebaker, D. S. Berry, and J. M. Richards. 2003. Lying words: predicting deception from linguistic styles. *Personality and Social Psychology Bulletin* 29 (5):665-675.
- Ou, Y. 2011. CEO humility and its relationship with middle manager behaviors and performance: examining the CEO-middle manager interface. *Dissertation at Arizona State University*.
- Pennebaker, J. W., C. K. Chung, M. Ireland, A. Gonzales, and R. J. Booth. 2007. *The development and psychometric properties of LIWC 2007*. Austin, TX: liwc.net.

Pierce, J. R. 1980. *An introduction to information theory: symbols, signals & noise*. 2nd ed. New York: Dover Publications.

Richardson, S., S. H. Teoh, and P. D. Wysocki. 2004. The Walk-down to Beatable Analyst Forecasts: The Role of Equity Issuance and Insider Trading Incentives*. *Contemporary Accounting Research* 21 (4):885-924.

Skinner, D. J., and R. G. Sloan. 2002. Earnings surprises, growth expectations, and stock returns or don't let an earnings torpedo sink your portfolio. *Review of Accounting Studies* 7:289-312.

Sloan, R. G. 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? *Accounting Review*:289-315.

Smith, C. W., and R. L. Watts. 1992. The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics* 32 (3):263-292.

Staw, B. M., P. I. McKechnie, and S. M. Puffer. 1983. The justification of organizational performance. *Administrative Science Quarterly*:582-600.

Tangney, J. P. 2000. Humility: Theoretical perspectives, empirical findings and directions for future research. *Journal of Social and Clinical Psychology* 19 (1):70-82.

Tausczik, Y. R., and J. W. Pennebaker. 2010. The Psychological Meaning of Words: LIWC and Computerized Text Analysis Methods. *Journal of Language and Social Psychology* 29 (1):24-54.

Wasley, C. E., and J. S. Wu. 2006. Why do managers voluntarily issue cash flow forecasts? *Journal of Accounting Research* 44 (2):389-429.

Weiner, B., I. Frieze, A. Kukla, L. Reed, S. Rest, and R. M. Rosenbaum. 1971. *Perceiving the causes of success and failure*. New York: General Learning Press.

Westphal, J. D., and M. E. Graebner. 2010. A matter of appearances: How corporate leaders manage the impressions of financial analysts about the conduct of their boards. *The Academy of Management Journal (AMJ)* 53 (1):15-44.

Biography

Zhenhua Chen was born in Henan, China on February 2, 1982. He received his B.A. in Economics from Fudan University in 2004 in Shanghai, China. He then obtained an M.A. in Economics from State University of New York at Buffalo, and an M.S. in Accounting from Suffolk University. He was admitted to the Ph.D. program in Business Administration (Accounting) at the Fuqua School of Business, Duke University in 2007.