This is to certify that the
dissertation entitled

ESSAYS ON CEO OVERCONFIDENCE

presented by

NESLIHAN YILMAZ

has been accepted towards fulfillment
of the requirements for the

PhD degree in FINANCE

Charles J. Hadlock
Major Professor's Signature

May 4, 2009
Date

ESSAYS ON CEO OVERCONFIDENCE

By

Neslihan Yılmaz

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILSOPHY

Finance

2009

ABSTRACT

ESSAYS ON CEO OVERCONFIDENCE

By

Neslihan Yılmaz

This study contains two chapters. In the first chapter, I examine the effect of CEO overconfidence on turnover abnormal returns. Previous research shows that overconfident CEOs follow pecking order behavior, engage in overinvestment and make value destroying acquisitions. I argue that CEO overconfidence can play an important role in explaining both a firm's and its immediate competitor's abnormal stock returns in the event of a CEO turnover. I analyze the abnormal returns of S&P 500 firms and their competitors when CEO turnover takes place within a firm, and find that overconfidence level of a newly appointed CEO has a significant negative impact on firm's stock price and a positive impact on competitor's stock price.

In the second chapter, I argue that CEO overconfidence can play an important role on firm product market performance and analyze whether overconfident CEOs are good or bad for the firm's product market performance. I study the relationship between CEO overconfidence and within-industry sales performance, and my findings show that higher overconfidence levels are associated with better product market performance.

ACKNOWLEDGEMENTS

I am grateful to my advisor Professor Charles J. Hadlock for his valuable guidance and support. I am indebted to Professor G. Geoffrey Booth for his continuous support and encouragement. I would also like to thank my committee members Professors Ted Fee and Mike Mazzeo for their help and insightful comments throughout my studies.

I am very fortunate to have received support from many other people before and during my doctoral studies. My primary debt is to Professor Celal Aksu for providing me an opportunity to study finance. I extend many thanks to Elizabeth Booth, Ümit Gürün, Merve Çebi and Ranadeb Chaudhuri for their help, support and encouragement.

There are no words with which I can express my deepest appreciation to my husband Çetin and to my family. I cannot thank him enough for his endless patience, help and support. My mother Gülser Özdem, my father Mehmet Özdem, my sister Figen Fırat, my brother in-law Ömer Fırat, my sister in-law Banu Özdem, and my brother Doğan Özdem have always supported and believed in me.

TABLE OF CONTENTS

LIST OF TABLES vi

INTRODUCTION

CHAPTER 1
THE EFFECT OF CEO OVERCONFIDENCE ON TURNOVER
ABNORMAL RETURNS 1
Introduction 1
Related Literature and Hypotheses Development 4
Existing Literature on Managerial Irrationality 4
Corporate Financial Policies 5
Investment 6
Mergers and Acquisitions 6
Firm Abnormal Returns 7
Existing Literature on CEO Turnover and Competition 7
Competitor Abnormal Returns 9
Appointment of Overconfident CEOs 10
Data 11
Sample Selection 11
Overconfidence Measure 14
Control Variables 16
Summary Statistics 19
Overconfidence and Turnover Abnormal Returns 21
Firm Abnormal Returns 22
Competitor Abnormal Returns 24
Robustness and Extensions 28
Successor Overconfidence 30
The Effect of Turnover 30
The Probability of Having an Overconfident Successor 31
Conclusion 33

APPENDIX 1 TABLES AND FIGURES FOR CHAPTER 1 35

CHAPTER 2
THE EFFECT OF CEO OVERCONFIDENCE ON PRODUCT MARKET
PERFORMANCE 51
Introduction 51
Related Literature and Hypotheses Development 53
Existing Literature on Product Market Performance 53
Existing Literature on Managerial Irrationality 54

Effect of Overconfidence on Competitive Performance..... 55
Effect of Board Independence on Competitive Performance..... 56
Data and Sample Selection..... 57
Sample Selection..... 57
Proxies for Overconfidence and Product Market Performance..... 58
Control Variables..... 60
Summary Statistics..... 61
Debt and Sales Growth..... 62
Overconfidence and Product Market Performance..... 63
Overconfidence and Sales Growth..... 64
Market Concentration..... 66
Robustness..... 68
Conclusion..... 69

APPENDIX 2 TABLES AND FIGURES FOR CHAPTER 2..... 71

BIBLIOGRAPHY REFERENCES FOR CHAPTER 1..... 83

BIBLIOGRAPHY REFERENCES FOR CHAPTER 2..... 88

LIST OF TABLES

TABLES FOR CHAPTER 1

Table 1.1 Summary Statistics..... 36

Table 1.2 Summary Statistics of Nonzero and Zero Overconfidence Index Samples..... 38

Table 1.3 Correlations..... 40

Table 1.4 Effect of CEO Overconfidence on Firm Abnormal Returns..... 44

Table 1.5 Effect of CEO Overconfidence on Competitor Abnormal Returns..... 46

Table 1.6 Incoming Overconfidence Before and After the Turnover..... 48

Table 1.7 Logit Estimation of Having Nonzero Successor Overconfidence Levels..... 49

TABLES FOR CHAPTER 2

Table 2.1 Summary Statistics..... 72

Table 2.2 Overconfidence Across Industries..... 73

Table 2.3 Summary Statistics for Industry Mean-Adjusted CEO Overconfidence Samples..... 74

Table 2.4 Correlations..... 75

Table 2.5 Debt and Sales Growth Performance..... 76

Table 2.6 Overconfidence and Sales Growth Performance..... 77

Table 2.7 Overconfidence and Sales Growth Performance for Mean-Adjusted CEO Overconfidence Samples..... 78

Table 2.8 Overconfidence and Sales Growth Performance across Industry Concentrations and Firm Sizes..... 80

Table 2.9 Overconfidence and Sales Growth Performance with Different Overconfidence Measures..... 82

Chapter 1

1 The Effect of CEO Overconfidence on Turnover Abnormal Returns

1.1. Introduction

Recent behavioral studies examine the relationship between managerial irrationality and firm's actions. This research examines how irrational managers affect firm's financial policies, investment, and mergers and acquisitions decisions. However, while we know that overconfident managers follow pecking order behavior, engage in overinvestment, and make value destroying acquisitions, we do not know much about how the market reacts to the appointment of overconfident CEOs. In particular, the link between CEO overconfidence and both firm and immediate competitor abnormal stock returns in the event of a CEO turnover in firm is not well understood. Since a CEO plays a crucial role in setting and implementing the strategy and actions of a firm, and most firms do not operate in monopolistic markets, understanding the effect of CEO overconfidence on stock prices would appear to be an important issue for investigation.

I study the turnover of a sample of CEOs employed by S&P 500 firms from 1996 to 2006. Following Malmendier and Tate (2005), I calculate managerial overconfidence of both the incoming and the outgoing CEO in terms of the moneyness of options granted to

the executive. The intuition is that a risk-averse CEO should exercise his options early if the stock price is sufficiently high as he is under-diversified due to the fact that he cannot trade his option grants or hedge the risk by short-selling firm stock. Using event study methodology to calculate turnover abnormal returns, I identify several interesting findings. First, I find that as the overconfidence of CEO appointed to a firm increases, the abnormal return on firm stock decreases while the abnormal return on immediate competitor stock increases at the time of the succession announcement. Second, I find that although the successor CEO's overconfidence level does not change following the turnover event for the overall sample, on average, it increases significantly as the successor stays more than five years in the CEO post. Finally, I examine the factors that may influence the probability of having an overconfident successor in the first place and find that as the outgoing CEO's overconfidence level increases or if he holds dual role, it is more likely for the firm to have an overconfident successor. In contrast, the probability of having an overconfident successor decreases as the number of outsiders on the firm's board of directors increases or if the outgoing CEO holds an MBA degree.

The findings of this paper contribute to the behavioral corporate finance literature. Beginning with Roll (1986), studies examine the role of managerial irrationality. In general findings suggest that overconfident managers may be detrimental to firm value (e.g., Ben-David et al. (2007), Malmendier and Tate (2008)) However, in their theoretical studies Gervais et al. (2007) and Englmaier (2006) argue that it might be desirable for a firm to hire an overconfident manager as he can increase firm value. This study complements the literature by measuring the biased managerial beliefs and their

implications for turnover abnormal returns. My proxy for overconfidence is similar to that of Malmendier and Tate (2005) who consider overconfidence of a CEO as the persistent failure of the manager to reduce his exposure to company-specific risk. I use CEO option holdings data to quantify overconfidence and build upon the Holder 67 variable in Malmendier and Tate (2005) in order to construct a continuous overconfidence index.

This paper also adds to the research on managerial turnover. A large literature examines the causes and consequences of CEO turnover and several findings emerge. Weisbach (1988) who looks at the effect of board composition on CEO resignations, and Bonnier and Bruner (1989) who examine distressed firms report significantly positive reactions to turnover announcements. In contrast, Beatty and Zajac (1987) who consider large corporations, and Khanna and Poulsen (1995) who examine financially distressed firms, find the opposite. Reinganum (1985), Warner et al. (1988), and Friedman and Singh (1989) observe no significant price changes at all. This paper complements the literature by examining the relationship between turnover abnormal returns and managerial irrationality as CEO overconfidence is public information (Malmendier and Tate (2005)).

The paper also contributes to the research on product market competition. While a few published studies mostly focus on the interplay between managerial turnover and

competition[1], I show that the CEO turnover in the firm has a significant impact on competitor's stock price.

1.2 Related Literature and Hypotheses Development

1.2.1 Existing Literature on Managerial Irrationality

Research in psychology shows that people are overconfident in their estimates[2] and the situation seems to be no different for professionals. Ben-David et al. (2007) show that actual market returns are within executives' 80% confidence intervals 38% of the time, and Russo and Shoemaker (1992) report that professional managers perceive their judgment to be too exact.

Recently, there have been a number of studies that look at the less than fully rational behavior of managers and their effects on corporate policies. The main focus is on overconfidence and optimism which are closely related. In behavioral corporate finance, a manager can be called optimistic if he overestimates the mean of his firm's cash flows, and overconfident if he either underestimates the volatility of his firm's future cash flows or overweighs his private signals relative to public information (Ben-David et al. (2007)).

---

[1] One of the main findings is that turnover is more likely in more competitive industries (e.g., Pfeffer and Salancik (1977); Parrino (1997); DeFond and Park (1999); Fee and Hadlock (2000))

[2] People have narrow confidence intervals, for example, their 98 % confidence intervals include the true quantity about 60% of the time (Alpert and Raiffa (1982)). They also estimate probabilities poorly; events they think that are certain, occur 80% of the time and impossible, occur 20% of the time (Fischhoff et al. (1977)).

I now discuss these studies and motivate the hypotheses in the context of existing theory and evidence.

1.2.1.1 Corporate Financial Policies

In a theory work, Hackbarth (2007) discusses that optimistic managers follow pecking order behavior since they overestimate the growth of future earnings of their firms and think external finance is too costly. On the other hand, the overconfident managers underestimate the riskiness of future earnings and think debt finance is undervalued by the market, therefore, follow a reverse pecking order behavior. However, empirical research on behavioral corporate finance usually supports the pecking order theory. Ben-David et al. (2007) calculate overconfidence of CFOs using the narrowness of the individual probability distributions for the stock market returns based on the Duke/CFO Business Outlook survey, and report that firms with overconfident CFOs use debt more aggressively, and pay out fewer dividends. Malmendier et al. (2007) consider overconfidence of a CEO as the persistent failure of the manager to reduce his exposure to firm-specific risk, and show that conditional on accessing public markets, overconfident CEOs raise external financing (debt or equity) less frequently, and when they do, they are more likely to issue debt than equity. Overall, findings suggest that overconfident CEOs follow a pecking order behavior.

1.2.1.2 Investment

Malmendier and Tate (2005) find that overconfident CEOs overinvest when they have internal funds and investments are significantly more responsive to cash flow, particularly in equity-dependent firms. Similarly, Ben-David et al. (2007) present evidence that firms with overconfident CFOs invest more. However, an alternative possibility is suggested by the work of Gervais et al. (2007), who argue that overconfident managers can increase firm value. The overconfident manager overestimates his ability to reduce risk, thus, may make capital budgeting decisions that are in better interest of shareholders. Similarly, Goel and Thakor (2008) argue that overconfident managers sometimes make value-destroying investments but a risk averse CEO's overconfidence has a nonmonotonic positive effect on firm value since it offsets some of the manager's risk aversion.

1.2.1.3 Mergers and Acquisitions

Roll (1986) is the first to link overbidding in mergers and tender offers to bidding firms infected by hubris. Recently, Malmendier and Tate (2008) find that overconfident CEOs make value destroying acquisitions, pay more for the targets, and are more likely to make acquisitions especially when they are diversifying and do not require external financing. Consequently, the market reacts more negatively to a merger announcement for an overconfident CEO. Doukas and Petmezas (2007) classify managers in the UK market as overconfident when they conduct five or more acquisitions within a 3-year period, and

show that when overconfident managers make acquisitions, they realize lower announcement returns than rational bidders and exhibit poor long-term performance.

1.2.2 Firm Abnormal Returns

Findings of the behavioral corporate finance literature are inconclusive about the possible direction of the reaction to overconfident successor announcements. Several studies show that overconfident CEOs are detrimental to firm value as they may engage in activities that deviate from maximizing shareholder value. I refer to this possibility as the *negative firm abnormal returns hypothesis*. Under this hypothesis, we expect a negative reaction for firm's stock when an overconfident successor is appointed to the CEO post. However, an alternative possibility is suggested by the works of Gervais et al. (2007) and Goel and Thakor (2008) who argue that overconfident managers can increase firm value. I label this possibility the *positive firm abnormal returns hypothesis*. Under this hypothesis, when an overconfident CEO is announced to take the helm, the market reacts positively to the news.

1.2.3 Existing Literature on CEO Turnover and Competition

Top executive turnover is one of the most important events a firm experiences as the CEO plays a crucial role in setting and implementing the strategy and actions of the firm (Bertrand and Schoar (2003)). Accordingly, a large literature on this topic has evolved. One of the main findings is that the likelihood of management turnover is negatively

related to firm performance.[3] Several studies examine the stock price reaction to turnover news. Weisbach (1988) looks at the effect of board composition on CEO resignations and observes significantly positive reactions for outsider dominated and mixed boards. Bonnier and Bruner (1989) examine distressed firms and find positive price reactions as well. Davidson et al. (1990) and Huson et al. (2004) report similar results. However, Beatty and Zajac (1987), who consider large corporations, and Khanna and Poulsen (1995), who examine financially distressed firms, find the opposite. Reinganum (1985), Warner et al. (1988), and Friedman and Singh (1989) observe no significant price changes at all.

The existing CEO turnover literature provides us a context in which to think about the consequences of overconfident CEO turnover on the firm itself. However, further analysis is yet to be done on the effect of succession on firm's rivals although there is a continuous interaction between firm and its rivals unless the firm is in a monopolistic market. In addition, the post-turnover actions of the successor may affect the rivals as well as the firm. Consequently, when we look at only the firm and do not take competition into consideration, we may not be able to capture the whole picture; after all, the firm itself is a competitor too.

Katz (1991) demonstrates that when contracts are unobservable, agents may act as pre-commitment devices. The rationale is that the contract distorts the agent's behavior - he

[3] A partial list of relevant studies include Warner et al. (1988), Weisbach (1988), Murphy and Zimmerman (1993), Denis and Denis (1995), Kim (1996), Fee and Hadlock (2004), and Huson et al. (2004)

acts as if the marginal costs were higher - and thus the contract has indirect strategic effects as other players in the market take the change in the agent's actions into account. Kockesen (2007) finds similar results. Miller and Pazgal (2002) contend that managers' types, attitudes toward relative performance, can also be used as a strategic commitment device that can change firm profits.

1.2.4 Competitor Abnormal Returns

Above findings suggest that when firm experiences a managerial change, there may be an impact on competitor's stock price. Several studies report a link between the returns of firms releasing information and those of their rivals. This relation is referred to as intra-industry information transfer. Most studies present evidence on a contagion effect, in other words, competitor stock price reaction is in the same direction as firm stock price reaction (Akhigbe et al. (1997), Tawatnuntachai and D'Mello (2002)). I label this possibility the *contagion effect hypothesis*. Under this hypothesis, we expect a positive price reaction to competitor stock price when there is a positive reaction to firm stock price in the case of an overconfident CEO appointed to the firm, or vice versa. One possible explanation for the contagion effect is that the appointment of an overconfident CEO to firm may convey information to the market about firm's rivals in the industry such that the rivals may as well appoint overconfident executives as their CEOs.

In contrast, some studies report a competitive effect as well as a contagion effect, in other words, competitor stock price reaction is in the opposite direction of firm stock price

reaction (Lang and Stulz (1992), Laux et al. (1998)). This suggests that we expect a negative price reaction to competitor stock price when there is a positive reaction to firm stock price in the case of an overconfident CEO appointed to the firm, or vice versa. I refer to this possibility the *competitive effect hypothesis*.

Behavioral corporate finance studies present evidence that overconfident CEOs may engage in value destroying actions. This implies that the competitor may benefit from an overconfident CEO in the firm. One possible explanation is that if the firm with overconfident CEO makes value destroying acquisitions and perform poorly in the long run, the competitors in the industry would benefit from the underperforming firm, for example, gain market share. Alternatively, the competitor itself may become a target for the firm in the future and enjoy possible overestimation of its value by firm's overconfident CEO.

1.2.5 Appointment of Overconfident CEOs

Baker et al. (2006) argue that irrational manager departs from rational expectations and expected utility maximization, but is not involved in rational moral hazard behavior; such as empire building and stealing. The manager believes that he is maximizing firm value but is in fact deviating from it. Besides, in order for him to have an impact, corporate governance is assumed to be limited in its ability to constrain him into making rational decisions. This could occur if boards are behaviorally biased or are not independent of management or the standard incentive contracts have little effect. This also suggests that

the board may choose to hire a manager even though he is overconfident. One implication of this is that as the independence of the board of directors decreases, the probability of having an overconfident CEO appointed to the office increases. I label this possibility the *appointment of overconfident CEOs*. By examining in detail the dynamics of overconfident CEO appointments, we may also shed some light on the other factors that may be in effect.

1.3 Data

1.3.1 Sample Selection

I select my initial sample from the set of CEOs listed in the Compustat ExecuComp database. I identify all the CEO changes that take place in S&P 500 firms during the time period between 1996 and 2006.[4] I collect the announcement dates of each succession through news searches. In order to be included in the sample, the change a firm experiences should appear in Dow Jones Factiva during the time period. The option information required to calculate the overconfidence indices of both the incoming and outgoing CEOs is obtained from Thomson Reuters' Insider Derivative Transactions. In addition, I supplement the data with personal information of the CEOs using Marquis Who's Who, Forbes annual compensation surveys, and firms' official websites. The information on the board of directors and institutional shareholders are from Riskmetrics

[4] The sample period is dictated by the availability of the option data from Thomson Reuter's Insider Derivative Transactions. I consider the CEO turnovers that take place in S&P 500 firms for practical reasons since I hand collect the data on announcement dates, CEO and succession characteristics.

and CDA/Spectrum, respectively, and the accounting and stock price data are from Compustat and CRSP.

The competitor information is from Hoover's. I use the Hoover's website, instead of the SIC codes, in order to identify the immediate competitors of the firms. The Hoover's website provides information on more than 20 million public and private firms in the United States and abroad. For each firm, detailed information including its strategies and background, sales and employment figures, top management as well as its competitors are listed. The competitors list consists of two parts; top competitors and all competitors. The top competitors are the three closest rivals in the industry while the full list includes all the available rivals. For example, for General Motors Corporation the top three competitors are Ford motor Company, Chrysler LLC, and Toyota Motor Corporation. The full list of competitors includes all the car manufacturers available such as BMW AG, Honda Motor Company, Volkswagen AG, and Kia Motors Corporation.

In order to identify the immediate competitor for each firm, first I search through the top competitors list of each firm and identify the single competitor that is publicly traded and also does not have any announcements on the succession day. If none are available from top competitors, I go to the full list and find the next closest competitor in terms of business description and size.

I start with 623 turnovers. I retain only those observations with valid information on both the incoming and the outgoing CEOs' option grants prior to the day of turnover

announcement in order to compute the overconfidence index of each CEO. Similarly, I eliminate observations without valid personal information for both incoming and outgoing CEOs. I eliminate any turnovers that are directly related to activities such as mergers, acquisitions or spin offs. In addition, observations that are concurrent with other announcements at the time of the succession announcement such as dividend payments, stock repurchases and earnings are excluded. Abnormal returns calculated in the presence of such conditions may contain information not related to the CEO characteristics alone; therefore, make it harder to isolate the effect of CEO overconfidence on the stock price. In a similar vein, I eliminate observations that have either or both of the CEOs as interims, acting or co-CEOs since interim CEOs usually holds the position temporarily during the search for permanent successors and co-CEOs are two people working together.

In examining the link between CEO overconfidence and turnover abnormal returns, I include only the observations with both the outgoing CEO's departure and the successor's appointment announcements concurrent: This allows us to control for both the incoming and the outgoing CEO characteristics while examining the abnormal returns. When the announcements are not made at the same time, in almost all of the cases, the departure of the outgoing CEO is announced first and no information is available on the incoming CEO. Therefore, when all of the observations, regardless of the timing of the announcements, are included in the analysis one cannot control for the successor overconfidence level. Consequently, the resulting sample consists solely of concurrent announcements. However, my results that CEO overconfidence matters still

hold when I include all observations available and control for outgoing CEO's overconfidence level only. The overconfidence of the outgoing CEO is statistically and economically significant for the

Finally, I retain only those observations with valid information on both the incoming and the outgoing CEOs' option grants prior to the day of turnover announcement in order to compute the overconfidence index of each CEO. The final sample consists of 134 observations.

1.3.2 Overconfidence Measure

Malmendier and Tate (2005) explain that a risk-averse CEO should exercise his options early if the stock price is sufficiently high as he is under-diversified due to the fact that he cannot trade his option grants or hedge the risk by short-selling firm stock. Besides, the value of his human capital is closely linked to the firm's performance. In order to construct the Holder 67 proxy for overconfidence, the authors examine the first year all options are at least partially exercisable, year 5. Then, they identify a benchmark of 67% for the minimum percentage in-the-money at which the CEO should exercise his vested options. The benchmark is from Hall and Murphy (2002) who estimate the value of non-tradable options to an undiversified and risk averse executive, and the 67% threshold level corresponds to a CEO with a relative risk aversion coefficient of 3 and a percentage of wealth in company equity equal to 66%. Malmendier and Tate (2005) classify a CEO as overconfident, or the dummy variable Holder 67 equals one, if the CEO persistently

(i.e., more than twice) exercises options later than suggested by the benchmark. The CEO is assumed to be overconfident in his ability to keep the firm's stock price rising and profit from expected price increases.

While the upward bias in manager's expectations is sometimes considered as optimism or overoptimism, the CEO here is referred to as overconfident. He overestimates his own abilities (e.g., his managerial skill) and its respective outcomes, and not the precision of his beliefs or exogenous outcomes (e.g., the economy). The miscalibration reduces the expected volatility of the stock and thus the value of holding options. Therefore, the argument that overconfident CEO does not exercise his in-the-money option grants may not hold for optimistic CEOs.

The overconfidence proxy in this paper, called the overconfidence index, builds upon the Holder 67 variable. However, the overconfidence index (OI) is different from Holder 67 in the sense that OI is both a continuous number that accounts for the total number of days the CEO fails to exercise his option grants and draws on all the available data over the exercisable lives of the options.[5] A continuous measure may provide more information about the level of the overconfidence of the CEO as it accounts for the total number of times the CEO deviates from rational behavior, and determine what effect, if any, overconfidence has on abnormal returns.

[5] The correlation between the overconfidence index and the Holder 67 measure in Malmendier and Tate (2005) is 0.58 and is significant at the 1% level. The results are virtually unchanged when Holder 67 is used as an alternative measure of overconfidence in the analyses.

I compute the overconfidence indices of both the incoming and outgoing CEOs prior to the turnover announcement. In order to construct the index, first I count the number of days the CEO fails to exercise his each exercisable option grant that is above the threshold percentage in-the-money level and add these up for each CEO. The threshold levels for the options are from Hall & Murphy (2002), and correspond to a CEO with a relative risk aversion coefficient of 3 and a percentage of wealth in company equity equal to 66. Then, I count the number of days each option is exercisable and add these days up for each CEO. The overconfidence index equals the days the CEO fails to exercise his in-the-money options divided by the days CEOs options are exercisable, therefore, the overconfidence index is between zero and one. If a CEO's has a nonzero overconfidence index, he is referred to as overconfident as the nonzero index reveals that he fails to exercise his in-the-money options that are above the threshold levels.[6]

1.3.3 Control Variables

Studies like Denis and Denis (1995) argue that forced turnovers may result in improved management of the firm and a subsequent increase in firm performance, thus, there should be a positive market reaction when a CEO is forced out of the office. In contrast, others like Khanna and Poulsen (1995) who focus on financially distressed firms, argue that there may not be any change in managerial quality as the bad performance can be a

---

[6] One may argue that having a zero overconfidence level does not necessarily measure the CEO's overconfidence since there may be some instances in which the stock price does not reach a sufficiently high level to exercise the options. However, this effect is negligible as there are few such cases and my results still hold when these observations are excluded.

result of bad luck but not bad management, which is referred to as the scapegoat hypothesis. Hence, when a CEO is fired there may not be any significant reaction to the news. Therefore, one must control for nature of the succession, whether it's forced or voluntary when analyzing turnover abnormal returns. I classify a succession as forced if it is reported that the CEO is forced or fired from the position, or the news implies that he was forced, or he is retiring but did not announce the departure at least six months in advance.

Graham et al. (2001) argue that CEOs with MBA degrees are more likely use sophisticated techniques such as net present value when doing capital budgeting or the CAPM when calculating the cost of equity capital. Moreover, Bertrand and Schoar (2003) find a positive relationship between MBA graduation and corporate performance; the return on assets is higher for MBA graduates. However, in their working paper, Gottesman and Morey (2006) demonstrate that firms managed by CEOs with MBA degrees do not perform better. In addition, Borokhovich et al. (1996) find that abnormal returns are positive and significant for outside successors around forced turnovers. Similarly, Huson et al. (2004) show that the performance improvements after a managerial turnover are positively related to the appointment of an outsider CEO. Accordingly, I include whether the CEO holds an MBA degree and whether incoming CEO is an outsider to the firm (i.e., with the firm for one year or less at the time of the appointment) as controls in my regression of turnover abnormal returns on CEO overconfidence. Furthermore, as in previous papers in the CEO turnover literature, both the incoming and outgoing CEO age and tenure in the firm, whether the CEO holds dual

role (i.e. holds both the chairman and CEO titles), and whether he is the founder of the firm or is a member of the founding family are also included.

In their empirical work, Agrawal and Knoeber (1996) examine the relationship between firm performance and several mechanisms to control agency problems like the use of outside directors, shareholdings of institutions and insiders. They find that only board composition has a significant effect. However, Huson et al. (2004) show that the performance improvements after a managerial turnover are positively related to both the level of institutional shareholdings and the presence of an outsider dominated board. Consequently, my baseline abnormal returns model also includes firm and competitor monitoring mechanisms. The monitoring mechanisms contain the percentage of outsiders on the board of directors, and the institutional ownership percentage of total shares.

Finally, I control for firm and competitor size, performances as wells as the competition in the industry. I use the natural logarithm of the book value of assets as the basic measure of firm size. Firm performance is measured by the industry-adjusted return for the fiscal year prior to the year during which the CEO change takes place minus the value-weighted 2-digit SIC code industry return for the same period. HHI (Herfindahl-Hirschman Index) proxies for the level of competition in the industry. HHI is the summation of the squared percentage market shares of all the firms in an industry, which is defined by the 2-digit SIC code. The market share of each firm is the sales of the firm divided by the total sales in the industry. As the HHI value gets lower, showing that the industry concentration is lower, the competition gets higher.

1.3.4 Summary Statistics

Table 1.1 contains the summary statistics (before industry-year adjustments) for the sample of CEO successions occurring from 1996 through 2006. The average successor overconfidence index equals 0.11 whereas it is 0.10 for the outgoing CEO, both indicating that the managers in the sample do not have high overconfidence levels. 13% of new CEOs are outsiders, and on average, the 117 insiders have been with the firm slightly over 17 years. The outgoing CEOs, on the other hand, have an average tenure of almost 23 years. A substantial number of outgoing CEOs, 83 % as opposed to 26% of the successors, holds dual roles. Also, the average incoming CEO is 51 while the outgoing CEO is 60 years old. Family member and founder CEOs are not very common, yet, there are no founder successors at all.

Most often the CEO seems to leave voluntarily; just 6% of the successions are classified as forced. Statistics that I omit for brevity show that when the outgoing CEO is fired, it is more likely that the incoming CEO is an outsider and/or holds dual role when compared to voluntary successions. The successor holds dual role, is and outsider, and both holds dual role and is an outsider 50%, 38% and 38% of the time, whereas, it is 25%, 11% and 4%, of the time in voluntary turnovers.

In the sample, on average, the firms have 69% of outsiders and 72% of institutional share ownership, whereas the competitors have 43% of outsiders and 53% of institutional share

ownership. Also, both the sample firms and their competitors are typically quite large with the median total assets of $10.3 billion and $11.6 billion, respectively. Besides, the low mean HHI of 0.06 implies a competitive environment.

Table 1.2 summarizes the sample split into two groups as zero and nonzero overconfidence index successors in order to identify the different characteristics of the firms that appoint these CEOs. On the left and right hand sides, statistics for nonzero and zero overconfidence levels are listed, respectively. On average, both the successor and outgoing tenure, and the number of successors who are also members of the founding family in the nonzero group are significantly less, whereas, Outgoing OI and HHI are significantly more than the zero Incoming OI group. This suggests that firms that appoint overconfident successors are in less competitive industries and have more overconfident outgoing CEOs; however, these managers have been with the firm less number of years. This also implies that firms that already have more overconfident CEOs in the office continue to pick such CEOs as successors.

Table 1.3 presents the pairwise correlation coefficients among CEO overconfidence indices and control variables. In Panel A, the results for overconfidence indices and personal characteristics are listed while in Panel B, the correlations among overconfidence indices and succession, firm, competitor and competition characteristics are listed. Panel A presents that the correlation coefficient between the Incoming and Outgoing OIs is quite large and statistically significant at 1% level. This and the rest of the correlation coefficients in Table 1.3 imply that both overconfidence indices are

capturing similar effects. For example, both indices are negatively correlated with successor tenure and outgoing CEO's age while successor tenure has slightly larger coefficients. Also, in Panel B, both indices are significantly and positively correlated with the firm's institutional ownership percentage and industry-adjusted return. Finally, there is a negative but slightly weaker correlation between the Outgoing OI and the percentage of outsider directors on firm's board which is significant at the 10% level.

1.4 Overconfidence and Turnover Abnormal Returns

To examine the effect of CEO overconfidence on turnover abnormal stock returns, I use the following regression specification:

$$CAR_i = \beta_1 + OI_i' B_2 + X_i' B_3 + \varepsilon_i$$

The cumulative abnormal return CAR for each firm *i* is calculated over a two-day period including the day of and the day prior to the turnover announcement (-1,0) [7] where the market is the CRSP market index. The event day is the day the firm announces the incoming CEO. In most cases, the firm also announces the planned departure date of the incumbent. OI is the set of overconfidence indices; the overconfidence index of both the incoming and the outgoing CEO, and X is the set of additional controls used in the

[7] When the turnover is announced after the market is closed, I consider the next business day as day zero.

regression; CEO, succession, firm and competition characteristics. In the estimations performed, I correct the regression error structure for arbitrary heteroskedasticity.

1.4.1 Firm Abnormal Returns

Table 1.4 reports the results of the analysis of the relationship between CEO overconfidence levels and abnormal returns of the firm for different specifications. The estimates of the univariate regression of the abnormal returns on the Incoming OI are reported in column 1. I extend the regression model to include variables related to successor and firm characteristics in columns 2 and 3, respectively. In all cases, the coefficients on the Incoming OI variable are significant and equal to -0.04, suggesting that the market reacts negatively when an overconfident CEO is appointed. Besides, previous studies show that overconfidence is public information (Malmendier and Tate (2005)). Therefore, the negative coefficient on the Incoming OI indicates that when an overconfident manager is announced to be the next CEO of the firm, the investors anticipate his possible future actions deviating from shareholder value maximization and react negatively.

Column 4 displays the results for the same specification as in Column 3 with controls for the incoming CEO replaced with those for the outgoing CEO. The outgoing CEO's overconfidence level seems to significantly affect the abnormal returns, as well, with a coefficient of -0.049. This negative coefficient is surprising, though, as one would expect it to be positive if it is negative for the incoming CEO. That is, if the overconfident CEO

is detrimental to firm value, it should be good news when he leaves the firm. The magnitude of the effect is also very close to that of the Incoming OI. This and the positive correlation between the two overconfidence indices in Table 1.3 may indicate that only one of the indices has an effect on the abnormal returns and the other one substitutes for the effective one whenever it is not present. The results of the regression specification including all the explanatory variables are reported in column 5. The coefficients reveal that the Outgoing OI has no significant effect and it is the Incoming OI that matters. One possible explanation for having only the successor but not the outgoing CEO's overconfidence index significantly reducing the returns, is the age of the outgoing CEOs. On average, an Outgoing CEO is 60 years old, and in most firms CEOs tend to retire after this age. Thus, even prior to the succession announcement, the market may anticipate that the outgoing CEO is going to leave the office soon. Consequently, when the succession news is released, Outgoing OI may not have as significant impact on the abnormal returns as the Incoming OI.[8]

In column 5, the coefficient of Incoming OI equals -0.06 which indicates that when the overconfidence of the successor increases by 1 standard deviation, the abnormal return decreases by about 1%. This is an important effect as the average daily return on the S&P 500 index and individual firms in the index between 1996 and 2006 are around -2 and 10

[8] One can use the same argument to show that it may be less useful to include the difference of the two overconfidence indices in the regressions rather than the levels. Besides, substituting the levels with the differences makes it harder to differentiate the effect of the high and low levels of overconfidence as long as the differences are the same. Still, the results for a specification with the difference of the two indices (Incoming OI minus the Outgoing OI) as a control for overconfidence show that there is, again, a negative but less significant effect.

basis points, respectively.[9] Overall, these findings provide evidence for the *negative firm abnormal returns hypothesis.*

Turning to the controls other than those for the overconfidence levels, the outgoing CEO being forced from firm is statistically significant and has a positive sign in columns 4 and 5. This evidence supports the findings of the improved management literature; when a CEO is forced out of the office, he is replaced with a person with better management quality and the firm performance improves accordingly, which implies that market reacts positively at the time of the announcement.[10]

1.4.2 Competitor Abnormal Returns

Table 1.5 reports the results of the analysis of the relationship between CEO overconfidence levels and abnormal returns of the immediate competitor for different specifications. The estimates of the univariate regression of the abnormal returns on the Incoming OI are displayed in column 1. In column 2, I extend the model to include variables related to successor characteristics. Results resemble those of the firm; the only significant variable among the personal characteristics is the successor overconfidence index that is significant at the 10% level. Compared to the results of the firm, having a smaller estimate and lower significance level for the Incoming OI is expected as the

---

[9] From CRSP between 1996 and 2006.

[10] My inferences are unchanged if include the four-digit SIC industry codes or replace the age of the outgoing CEO with a dummy variable that equals one if the departing CEO is above the age of 60.

effect of the CEO may be more pronounced for the firm itself. The positive sign as opposed to the negative one in Table 1.4 implies that in terms of the intra-industry information transfers, the competitive effect exists for the immediate competitor. While the arrival of an overconfident CEO is bad news for the firm, it is good news for the competitor.

Turning to the coefficients on the outgoing CEO characteristics in column 3, unlike the estimate of the successor overconfidence level in columns 1 and 2, Outgoing OI does not significantly affect the outcome. This evidence is in line with the argument for the firm; Incoming OI is the one that matters. Interestingly, no variable but the Outgoing Founder has a significant coefficient. Outgoing Founder significantly reduces the competitor abnormal returns at the 5% level. This is surprising, though, since Outgoing Founder is not significant in Table 1.4.

One possible explanation is the large sizes of my sample firms (Jayaraman et al. (2000)).[11] Still, the negative coefficient in Table 1.4 suggests that founders can be good for the firm, hence when one leaves the firm, the stock price drops (Fahlenbrach (2006), Adams et al. (2007), Palia et al. (2008)). On the other hand, the results of an unreported analysis reveal that the negative impact of the founder CEO on competitor abnormal returns is not monotonic although it is monotonic for the firm. When I reestimate the regression specified in column 4 for competitors that are both smaller than the median competitor in Table 1.1 ($11.6 billion) and the firm experiencing the turnover, Outgoing

[11] Jayaraman et al. (2000) find that founder management does not have a main effect on firm stock returns but has more positive effect for smaller firms than larger firms.

Founder has a significant negative effect at the 1% level. However, this negative effect disappears when I conduct the analysis for the below-the-median but greater-than-the-firm or above-the-median competitors. This evidence suggests that the negative effect of the founder CEO on competitor abnormal returns is driven by the smaller competitors. Besides, the coefficient has the same sign as the ones in columns 4 and 5 of Table 1.4. In a nutshell, the negative coefficients of the founder CEO in Tables1.4 and 1.5 indicate that he may be good for the firm and the small competitor, although, it's the small competitor that is adversely affected by his departure. This could reflect a small competitor strategy to operate in line with the firm and not have a fierce competition with it. If the founder acts accordingly but the successor CEO does not follow the founder's footsteps, for example, chooses to compete with the rivals or even engage in predatory pricing, this may hurt the small competitor.

Finally, I include the controls for the competitor and competition characteristics in column 4. Outgoing Founder still significantly predicts a lower abnormal return. Moreover, both the magnitude and the significance of the coefficient on the Incoming OI increase considerably to 0.08 and 5% level, respectively. As opposed to the findings of the firm, Outgoing Forced or any other succession or firm characteristics do not significantly affect the abnormal returns.

The most important reason for the increase in the magnitude and the significance of the coefficient on the Incoming OI is the inclusion of the industry-adjusted competitor stock return, without this term the estimates are similar to the ones reported in previous

columns. By the construction of the data, the competitor does not have any other announcements on the event day. Hence, once controlled for stock performance, Incoming OI is one of the most important factors explaining the change in the competitor's stock price on the announcement day. Furthermore, Incoming OI has a substantial impact; one standard deviation increase in the successor's overconfidence index results in more than 1% increase in the abnormal returns. This provides evidence for the *competitive effect hypothesis*.

Industry-adjusted 1-year stock return of the competitor also helps predict abnormal returns; the better the competitor's performance, the higher the abnormal returns. This implies that the competitor with a higher performance during the year prior to the CEO change in the firm benefits from the succession event. It is possible that during the uncertainties that may follow the turnover process, the competitor might gain market share.

Compared to the estimates of the firm, Incoming CEO's overconfidence level is the only common factor that has a statistically and economically significant influence on both the firm and competitor abnormal returns. Besides, the outgoing CEO being fired from the CEO post has a positive impact on firm stock price which implies that if the CEO is forced from the firm, it is good news to the market, which is in line with the improved management literature. On the other hand, a different set of controls are in effect for the competitor. When the founder of the firm leaves, there is a significant reduction in the

competitor's stock price. Moreover, the better the performance of the competitor in terms of the industry-adjusted stock return, the higher its abnormal returns.

Overall, my findings show that the overconfidence of the successor CEO is important for not only the firm itself but also its immediate competitor. Furthermore, the market is aware of the less than optimal behavior of overconfident CEOs and this is reflected in the stock prices during CEO successions.

1.4.3 Robustness and Extensions

To check the robustness of the regressions presented in Tables 1.4 and 1.5, in unreported results I experiment with some alternative subsamples. In particular, I estimate the regression models in the last columns in Tables 1.4 and 1.5 using alternative measures of governance mechanisms; such as boards classified as outsider dominated if the percentage of outsiders is greater than or equal to 60%, or institutional share ownership grouped as greater or less than the sample median level (Huson et al. (2004)). The main findings of the analyses are virtually unchanged when I use these alternative measures.

The threshold values I use to compute the overconfidence levels of the CEOs are for an executive with a relative risk aversion coefficient of 3 and a percentage of wealth in company equity equal to 66. I investigate the sensitivity of my main results for the firm and the immediate competitor to changes in these assumptions. In results that I omit for brevity, I reestimate the regression models using different combinations of executive

relative risk aversion coefficient of 2 and 3, and a percentage of wealth in company equity equal to 50 and 66 (see also Hall and Murphy (2002)). The coefficients on the incoming CEO's overconfidence level become even more significant when the coefficient of relative risk aversion and the percentage of wealth invested in company stock decrease, in other words, the thresholds for the CEO to exercise his in-the-money options increase. This implies that with higher threshold values, even more biased CEOs are considered as overconfident and their impacts on abnormal returns are higher. In addition, the coefficients on the remaining of the variables remain almost unchanged.

To further examine the robustness of my results in Tables 1.4 and 1.5, I estimate the regression models using cumulative abnormal returns over different event windows as the dependent variable. In unreported results, I also use event windows (-3,+3), (-3, 0), (-2,+2), (-2,0), and (-1,+1) to compute the cumulative abnormal returns. The significance of the estimates for the overconfidence variables decrease sharply as we move from day -1 backwards and from day zero onwards, while the qualitative nature of all reported results is unchanged. This suggests that the announcement news is rapidly absorbed into prices and there are almost no information spillovers. One of the main reasons for the estimates with CAR (-1, +1) being less significant is the definition of event day. The event day (day zero) is the day the turnover news is announced. However, when the announcement is made after the market is closed, I refer to the next business day as day zero. Thus, it is not surprising to see less significant results with event windows that include day +1.

1.5 Successor Overconfidence

1.5.1 The Effect of Turnover

In a theory work, Gervais and Odean (2001) argue that attribution bias; attributing successful outcomes to own skill and unsuccessful ones to bad luck, may lead successful traders to become overconfident even if they were not originally. Similarly, Hilary and Menzly (2006) find that analysts who predict earnings more accurately than the median for the past four quarters become overconfident and less accurate subsequently. A natural question to ask is whether this argument holds for the CEOs. In this section, I examine whether the overconfidence level of an incoming CEO changes after he is appointed to the office, in other words, becoming a CEO has any effect on his overconfidence.

Table 1.6 presents the Incoming CEO overconfidence levels prior to and after the turnover event (Before and After). The figures for All OIs suggest that there is no significant difference between the Before and After overconfidence indices. Next, I split the sample into two; overconfidence indices of successors with higher and lower than 5 years of tenure in the office, in order to ascertain whether there is no significant change in the overconfidence levels regardless of the number of years the successor spends in the office. Interestingly, although there is no such change in the lower tenure sample, there is a significant increase in the higher tenure sample. On average, the overconfidence indices in the After group are significantly larger than those in the Before group at the 5% level

(0.04 vs. 0.10). This increase implies that the attribution bias may be in effect as on average, the overconfidence of a manager who is appointed to the CEO post increases significantly after he spent at least five years in the office. One may argue that being promoted to the CEO post and keeping the position for a couple of years resembles the successful traders and analysts in Gervais and Odean (2001) and Hilary and Menzly (2006).

1.5.2 The Probability of Having an Overconfident Successor

Research shows that overconfident CEOs may deviate from shareholder value maximization and my evidence suggest that there is a negative reaction to firm and positive reaction to competitor stock price in the market when an overconfident manager is announced to be the next CEO of the firm. Based on these findings, one may ask why an overconfident CEO is appointed to the office in the first place. In this section, I examine the driving forces that may lead to an overconfident successor. I estimate a logit model for a binary dependant variable that takes a value of 1 if the incoming CEO has a nonzero overconfidence index and 0 otherwise. The control variables are the outgoing CEO, firm, competitor and competition characteristics.

Table 1.7 reports the logit estimates. The results of the univariate analysis in column 1 indicate that Outgoing OI has a significant positive effect on the probability of having a nonzero Incoming OI. This is consistent with the figures in Table 1.2 and 1.3, which illustrate that Incoming and Outgoing OI are highly correlated, and firms that appoint

overconfident successors have more overconfident outgoing CEOs. Thus, the possibility of having an incoming CEO with nonzero overconfidence index is more pronounced when the firm already has an overconfident incumbent. This might either be a firm characteristic or the result of the actions of a powerful incumbent who may want to ensure an overconfident successor.

I extend the model to include variables related to outgoing CEO and firm characteristics in columns 2 and 3, respectively. After I add the remaining outgoing CEO characteristics, a higher Outgoing OI still significantly predicts a higher probability of having an overconfident successor. In addition, the coefficients of Outgoing Tenure, Dual Role and MBA are also significant. As the outgoing CEOs tenure increases or if he holds an MBA degree, the likelihood of having an overconfident successor decreases whereas the likelihood increases if the outgoing CEO has dual role. One possible explanation for the significant Outgoing MBA coefficient is that an MBA degree may correspond to a better knowledge and understanding of the value maximizing actions a CEO should take. In particular, the outgoing CEO with an MBA degree may even try to avoid an overconfident successor. On the other hand, when the outgoing CEO has both the chairman and CEO posts (i.e., has more control of the firm), he may also be powerful enough to enforce an overconfident successor.

I include the controls for the firm and competitor characteristics as well as the competition in industry in columns 3 and 4, respectively. No variable, but the competition index HHI, has a significant effect. HHI has a positive impact at the 10% level which

suggests that as the industry becomes less competitive, it is more likely to have an overconfident successor appointed to the CEO post. However, when I include all the explanatory variables in column 5, the coefficient of HHI is no longer significant. The significant variables in column 2, except for the Outgoing Tenure, still help predict the probability of having an overconfident successor. Moreover, a greater percentage of outside directors on firm board indicates a lower likelihood of having an overconfident successor, which suggests a potential method to abstain from overconfident successors. This provides evidence for the *appointment of overconfident CEOs hypothesis*. Overall, if the Outgoing OI or Firm Outsider Percentage increase by 10% then the probability of having an incoming CEO with a nonzero overconfidence index increases by 6% and decreases by 14%, respectively.

1.6 Conclusion

Studies on the interaction between overconfident CEOs and firm policies often conclude that overconfident CEOs may engage in activities that may be detrimental to firm value. In this paper, I empirically examine whether overconfidence has any impact on abnormal returns of both the firm and its close competitor when a CEO turnover takes place. First, I investigate the relationship between overconfidence and firm returns, and find strong evidence that successor overconfidence has a significant negative effect. In addition to incoming CEO's overconfidence level, forced successions have a positive effect on stock prices. Next, I conduct a similar analysis for the immediate competitor of the firm and provide evidence that a higher overconfidence level of the incoming CEO indicates a

higher stock price for the competitor. Moreover, when the outgoing CEO is the founder of the firm, there is a negative price reaction for the competitor's stock whereas the reaction is positive for better performing competitors. I further show that, on average, successor's overconfidence level increases as he stays more than five years in the CEO post. Finally, I examine the factors that may lead to an overconfident successor CEO appointed to the office in the first place. I find that the possibility of having an overconfident incoming CEO is more pronounced when the firm already has an overconfident incumbent or the incumbent holds dual role. On the contrary, the likelihood decreases as the number of outsiders on the board of directors of the firm increases or if the outgoing CEO holds an MBA degree.

Taken as a whole, my findings suggest that when a firm has an overconfident CEO, it is more likely to have another one succeeding him, however, the market anticipates the possible future irrational behavior of the successor and reacts accordingly on the day of the turnover announcement. Consequently, overconfidence should be accounted for in the CEO succession and contracting practices to mitigate its possible harmful effects. Moreover, having more outside members on firm boards or CEOs with MBA education may prove to be useful in order to decrease the likelihood of having overconfident successors.

APPENDIX 1

TABLES FOR CHAPTER 1

Table 1.1

Summary Statistics

Incoming and Outgoing OI are the overconfidence indices of the successor and outgoing CEO, respectively. Outsider is a binary variable and is equal to 1 if the successor is from another firm or with the firm for one year or less. Tenure is the total number of years the CEO is with the firm. Dual Role is equal to 1 if the CEO holds both the chairman and CEO post. Family Member equals 1 if the CEO is a member of the founding family, whereas Founder equals 1 if he is the founder of the firm. MBA is equal to 1 if the CEO holds an MBA degree. Forced takes the value 1 it is reported that the CEO is forced or fired from the position, or the news imply that he was forced, or he is retiring but did not announce the departure at least six months in advance. Outsider is the percentage of outside directors on the board of directors and Institutional Ownership is the percentage of total amount of shares owned by institutions. Size is the total amount of assets in million dollars. Industry-Adjusted Return is the stock return for the fiscal year prior to the year during which the CEO change takes place minus the value-weighted 2-digit SIC code industry return for the same period. HHI is the Herfindahl-Hirschman Index for each 2-digit SIC code.

	Mean	Median	Std. Dev.	Min.	Max.	Obs.
Successor CEO						
Incoming OI	0.11	0	0.21	0	1	134
Outsider	0.13		0.33	0	1	134
Tenure	17.21	17	10.03	1	38	117
Dual Role	0.26		0.44	0	1	134
Age	51.16	51.5	5.48	37	67	134
Family Member	0.04		0.19	0	1	134
Founder	0		0	0	0	134
MBA	0.36		0.48	0	1	134
Outgoing CEO						
Outgoing OI	0.10	0	0.18	0	0.79	107
Tenure	22.79	23	12.90	1	49	133
Dual Role	0.83		0.37	0	1	133
Age	60.29	62	6.00	39	74	133
Family Member	0.01		0.09	0	1	134
Founder	0.08		0.28	0	1	134
MBA	0.34		0.48	0	1	133
Succession						
Forced	0.06		0.24	0	1	134

Table 1.1 (cont'd)

	Mean	Median	Std. Dev.	Min.	Max.	Obs.
Firm						
Outsider	68.79%	72.73%	20.45%	0.00%	92.31%	134
Institutional Ownership	71.63%	72.08%	15.25%	32.48%	100.00%	129
Assets ($M)	35,483	10,312	123,123	916	1,264,032	133
Industry-Adjusted Return	0.02	0.00	0.23	-0.73	0.93	125
Competitor						
Outsider	43.34%	53.85%	36.97%	0.00%	100.00%	134
Institutional Ownership	53.11%	61.03%	31.42%	0.00%	100.00%	124
Assets ($M)	88,614	11,603	270,102	44	1,494,037	127
Industry-Adjusted Return	0.02	0.00	0.18	-0.67	0.67	105
HHI	0.06	0.04	0.07	0.01	0.47	134

Table 1.2

Summary Statistics of Nonzero and Zero Overconfidence Index Samples

Incoming OI is the overconfidence index for the successor CEO. Outsider is a binary variable and is equal to 1 if the successor is from another firm or with the firm for one year or less. Tenure is the total number of years the CEO is with the firm. Dual Role is equal to 1 if the CEO holds both the chairman and CEO post. Age is the age of the CEO as of the announcement year. Family Member equals 1 if the CEO is a member of the founding family, whereas Founder equals 1 if he is the founder of the firm. MBA is equal to 1 if the CEO holds an MBA degree. Outgoing OI is the overconfidence index for the outgoing CEO. Forced takes the value 1 it is reported that the CEO is forced or fired from the position, or the news imply that he was forced, or he is retiring but did not announce the departure at least six months in advance. Outsider is the percentage of outside directors on the board of directors and Institutional Ownership is the percentage of total amount of shares owned by institutions. Size is the total amount of assets in million dollars. Industry-Adjusted Return is the stock return for the fiscal year prior to the year during which the CEO change takes place minus the value-weighted 2-digit SIC code industry return for the same period. HHI is the Herfindahl-Hirschman Index for each 2-digit SIC code.

	Incoming OI > 0 Sample				Incoming OI=0 Sample			
	Mean	Median	Std. Dev.	Obs.	Mean	Median	Std. Dev.	Obs.
Successor CEO								
Outsider	0.13		0.34	53	0.12		0.33	81
Tenure	14.50***	11.00	9.38	46	18.97	20.00	10.12	71
Dual Role	0.21		0.41	53	0.30		0.46	81
Age	51.42	51.00	5.19	53	51.00	52.00	5.68	81
Family Member	0**		0	53	0.06		0.24	81
Founder	0		0	53	0		0	81
MBA	0.34		0.48	53	0.37		0.49	81
Outgoing CEO								
Outgoing OI	0.18***	0.08	0.22	47	0.04	0.00	0.12	60
Tenure	19.24***	20.00	12.52	53	25.14	26.00	12.69	80
Dual Role	0.89		0.32	53	0.80		0.40	80

Table 1.2 (cont'd)

	Incoming OI > 0 Sample				Incoming OI=0 Sample			
	Mean	Median	Std. Dev.	Obs.	Mean	Median	Std. Dev.	Obs.
Age	59.51	60	6.42	53	60.81	62.5	5.70	80
Family Member	0		0	53	0.01		0.11	81
Founder	0.11		0.32	53	0.06		0.24	81
MBA	0.23		0.42	53	0.41		0.50	80
Succession								
Forced	0.08		0.27	53	0.05		0.22	81
Firm								
Outsider	66.19%	72.73%	24.39%	53	70.48%	75.00%	17.36%	81
Institutional Ownership	74.17%	75.08%	14.65%	50	70.02%	69.29%	15.49%	79
Assets ($M)	19,236	11,557	29,758	52	45,913	10,312	155,456	81
Industry-Adjusted Return	0.06	0.00	0.21	48	0.00	0.00	0.27	77
Competitor								
Outsider	44.74%	60.00%	38.18%	53	42.42%	50.00%	36.37%	81
Institutional Ownership	54.26%	63.40%	32.28%	47	52.40%	60.45%	31.07%	77
Assets ($M)	58,957	13,814	212,654	49	107,245	11,436	300,466	78
Industry-Adjusted Return	0.01	0.00	0.14	42	0.02	0.00	0.20	63
HHI	0.08**	0.04	0.10	53	0.05	0.04	0.03	81

*, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 1.3

Correlations

Panel A shows the correlation coefficients between the CEO OIs and personal characteristics. Panel B shows the correlation coefficients between CEO OIs and turnover, firm, competitor and competition characteristics. Incoming OI and Outgoing OI are the overconfidence indices for the incoming and outgoing CEO, respectively. Incoming Family Member and Outgoing Family Member are binary variables that are equal to 1 if the CEO is member of the founding family. Incoming Tenure and Outgoing Tenure are the total number of years the CEO is with the firm. Incoming Dual Role and Outgoing Dual Role are equal to 1 if the CEO holds both the chairman and CEO post. Incoming Age and Outgoing Age are the ages of the CEOs as of the announcement year. Incoming MBA and Outgoing MBA are equal to 1 if the CEO holds an MBA degree. Incoming Outsider equals 1 if the successor is from another firm or with the firm for one year or less. Outgoing Forced takes the value 1 if it is reported that the CEO is forced or fired from the position, or the news imply that he was forced, or he is retiring but did not announce the departure at least six months in advance. Firm Outsider and Competitor Outsider are the respective percentages of outside directors on the boards of the firm and the competitor. Firm Institutional Ownership and Competitor Institutional Ownership are the percentages of the total amount of shares of the firm and competitor shares owned by institutions. Firm Size and Competitor Size are the total assets in million dollars. Industry-Adjusted Firm and Competitor Returns are the stock returns for the fiscal year prior to the year during which the CEO change takes place minus the value-weighted 2-digit SIC code industry return for the same period. HHI is the Herfindahl-Hirschman Index for each 2-digit SIC code.

Panel A: CEO Overconfidence & Personal Characteristics

N=107	Inc. OI	Out. OI	Inc. Family Mem.	Inc. Ten.	Inc. Dual Role	Inc. Age	Inc. MBA	Out. Family Mem.	Out. Foun.	Out. Ten.	Out. Dual Role	Out. Age	Out. MBA
Incoming OI	1.00												
Outgoing OI	0.63***	1.00											
Incoming Family Member	-0.07	-0.08	1.00										
Incoming Tenure	-0.26***	-0.31***	0.10	1.00									

Table 1.3 (cont'd)

N=107	Inc. OI	Out. OI	Inc. Family Mem.	Inc. Ten.	Inc. Dual Role	Inc. Age	Inc. MBA	Out. Family Mem.	Out. Foun.	Out. Ten.	Out. Dual Role	Out. Age	Out. MBA
Incoming Dual Role	-0.10	-0.09	0.07	0.18	1.00								
Incoming Age	-0.11	-0.10	-0.18	0.25	0.30	1.00							
Incoming MBA	-0.10	-0.06	0.04	0.08	0.05	0.02	1.00						
Outgoing Family Member	-0.05	-0.06	-0.01	0.20	-0.06	0.16	0.13	1.00					
Outgoing Founder	0.04	-0.10	-0.03	0.01	-0.14	0.02	-0.08	-0.02	1.00				
Outgoing Tenure	-0.16	-0.12	0.11	0.28	0.29	0.06	0.09	0.08	0.06	1.00			
Outgoing Dual Role	-0.02	-0.13	-0.33	-0.02	0.14	0.11	0.00	0.04	-0.03	0.05	1.00		
Outgoing Age	-0.22**	-0.29***	-0.07	0.15	-0.02	0.14	-0.16	-0.11	-0.07	0.26	0.12	1.00	
Outgoing MBA	-0.11	-0.12	0.04	-0.06	-0.01	0.03	0.15	-0.07	-0.16	-0.07	0.04	-0.07	1.00

Table 1.3 (cont'd)

	Panel B: CEO Overconfidence & Turnover, Firm, Competitor and Competition Characteristics												
N=83	Inc. OI	Out. OI	Inc. Out.	Out. Forc.	Com. Outs. (%)	Com. Inst. Owsh. (%)	Com. Size	Ind. Adj. Com. Return	Com. Outs. (%)	Com. Inst. Owsh. (%)	Com. Size	Ind. Adj. Com. Return	HHI
Incoming Outsider	-0.11	-0.15	1.00										
Outgoing Forced	0.11	0.10	0.25	1.00									
Firm Outsider	-0.10	-0.19*	0.10	-0.22	1.00								
Firm Institutional Ownership	0.30***	0.31***	-0.15	-0.04	0.04	1.00							
Firm Size	-0.10	-0.10	-0.05	-0.03	0.08	-0.18	1.00						
Industry-Adjusted Firm Return	0.27**	0.23**	-0.16	-0.00	0.02	0.15	-0.01	1.00					
Competitor Outsider	-0.11	-0.14	-0.02	-0.10	0.31	-0.04	-0.11	0.01	1.00				
Competitor Institutional Ownership	-0.05	-0.06	-0.01	-0.03	0.18	0.24	-0.17	-0.01	0.64	1.00			
Competitor Size	-0.12	-0.14	-0.06	-0.06	0.08	-0.18	0.47	0.02	0.01	-0.05	1.00		

Table 1.3 (cont'd)

N=83	Inc. OI	Out. OI	Inc. Out.	Out. Forc.	Com. Outs. (%)	Com. Inst. Owsh. (%)	Com. Size	Ind. Adj. Com. Return	Com. Outs. (%)	Com. Inst. Owsh. (%)	Com. Size	Ind. Adj. Com. Return	HHI
Industry-Adjusted Competitor Return	0.01	0.04	-0.28	-0.14	-0.02	-0.03	-0.01	0.23	-0.04	-0.01	-0.04	1.00	
HHI	-0.05	0.00	-0.10	-0.10	0.14	0.17	-0.04	-0.02	0.18	0.08	0.06	0.16	1.00

*, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 1.4

Effect of CEO Overconfidence on Firm Abnormal Returns

The analysis is for Firm CAR (-1, 0), the cumulative abnormal return for the firm over the two day period between the day before the announcement of the CEO turnover and the announcement day. Incoming OI and Outgoing OI are the overconfidence indices for the incoming and outgoing CEO, respectively. Incoming Outsider is a binary variable and is equal to 1 if the successor is from another firm or with the firm for one year or less. Outgoing Forced takes the value 1 it is reported that the CEO is forced or fired from the position, or the news imply that he was forced, or he is retiring but did not announce the departure at least six months in advance. Incoming Tenure and Outgoing Tenure are the total number of years the CEO is with the firm. Incoming Dual Role and Outgoing Dual Role are equal to 1 if the CEO holds both the chairman and CEO post. Incoming Family Member and Outgoing Family Member are equal to 1 if the CEO is member of the founding family. Outgoing Founder equals 1 if the outgoing CEO is the founder of the firm. Incoming MBA and Outgoing MBA are equal 1 if the CEO holds an MBA degree. Outsider is the percentage of outside directors on firm's board. Institutional Ownership is the percentage of the total amount of shares owned by institutions. Size is the natural logarithm of the total assets. Industry-Adjusted Return is the stock return for the fiscal year prior to the year during which the CEO change takes place minus the value-weighted 2-digit SIC code industry return for the same period. HHI is the Herfindahl-Hirschman Index for each 2-digit SIC code.

	(1)	(2)	(3)	(4)	(5)
Incoming OI	-0.0370	-0.0434	-0.0440		-0.0612
	(-2.26)**	(-2.56)***	(-2.39)***		(-1.98)**
Outgoing OI				-0.0493	-0.0093
				(-2.06)**	(-0.29)
Incoming Outsider		0.0145	0.0166		0.0141
		(1.15)	(1.22)		(0.75)
Outgoing Forced				0.03650	0.0319
				(2.14)**	(1.75)*
Incoming Tenure		-0.0004	-0.0005		-0.0003
		(-1.01)	(-1.15)		(-0.65)
Incoming Dual Role		0.0055	0.0077		0.0055
		(0.68)	(0.86)		(0.53)
Outgoing Dual Role				0.0099	0.0166
				(0.86)	(1.31)

Table 1.4 (cont'd)

	(1)	(2)	(3)	4)	(5)
Incoming Age		0.0008	0.0010		0.0002
		(1.16)	(1.36)		(0.26)
Outgoing Age				-0.0009	-0.0008
				(-0.98)	(-0.85)
Incoming Family Member		0.0014	0.0010		0.0316
		(0.08)	(0.05)		(0.99)
Outgoing Family Member				-0.0479	-0.0416
				(-1.18)	(-0.95)
Outgoing Founder				-0.0194	-0.0167
				(-0.80)	(-0.68)
Incoming MBA		-0.0007	0.0011		0.0009
		(-0.11)	(0.15)		(0.10)
Outgoing MBA				-0.0055	-0.0087
				(-0.66)	(-1.01)
Outsider			0.0030	0.0138	0.0116
			(0.17)	(0.67)	(0.54)
Institutional Ownership			-0.0012	-0.0202	-0.0116
			(-0.05)	(-0.59)	(-0.32)
Size			-0.0027	-0.0046	-0.0049
			(-0.87)	(-1.39)	(-1.41)
Industry-Adjusted Return			-0.0134	-0.0070	0.0008
			(-0.85)	(-0.40)	(0.04)
HHI			-0.0321	-0.0593	-0.0750
			(-0.60)	(-0.87)	(-1.07)
Number of Obs.	132	132	123	100	100
Adjusted R-squared	0.0304	0.0460	0.0296	0.0125	0.0131

t-statistics are reported in parenthesis.
*, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively

Table 1.5

Effect of CEO Overconfidence on Competitor Abnormal Returns

The analysis is for Competitor CAR (-1, 0), the cumulative abnormal return for the immediate competitor over the two day period between the day before the announcement of the CEO turnover and the announcement day. Incoming OI and Outgoing OI are the overconfidence indices for the incoming and outgoing CEO, respectively. Incoming Outsider is a binary variable and is equal to 1 if the successor is from another firm or with the firm for one year or less. Outgoing Forced takes the value 1 it is reported that the CEO is forced or fired from the position, or the news imply that he was forced, or he is retiring but did not announce the departure at least six months in advance. Incoming Tenure and Outgoing Tenure are the total number of years the CEO is with the firm. Incoming Dual Role and Outgoing Dual Role are equal to 1 if the CEO holds both the chairman and CEO post. Outgoing Founder equals 1 if the outgoing CEO is the founder of the firm. Incoming MBA and Outgoing MBA are equal to 1 if the CEO holds an MBA degree. Outsider is the percentage of outside directors on competitor's board. Institutional Ownership is the percentage of the total amount of shares owned by institutions. Size is the natural logarithm of the total assets of the competitor. Industry-Adjusted Return is the stock return for the fiscal year prior to the year during which the CEO change takes place minus the value-weighted 2-digit SIC code industry return for the same period. HHI is the Herfindahl-Hirschman Index for each 2-digit SIC code.

	(1)	(2)	(3)	(4)
Incoming OI	0.0286	0.0352	0.0571	0.0788
	(1.59)	(1.84)*	(1.81)*	(2.50)**
Outgoing OI			-0.0230	-0.0412
			(-0.75)	(-1.34)
Incoming Outsider		-0.0089		0.0052
		(-0.67)		(0.28)
Outgoing Forced			-0.0088	-0.0095
			(-0.54)	(-0.57)
Incoming Tenure		0.0001		
		(0.14)		
Outgoing Tenure			0.0001	
			(0.23)	
Incoming Dual Role		0.0068		
		(0.78)		
Outgoing Dual Role			-0.0034	
			(-0.28)	
Outgoing Founder			-0.0440	-0.0450
			(-2.25)**	(-2.38)**
Incoming MBA		0.0093		0.0006
		(1.24)		(0.07)
Outgoing MBA			0.0008	0.0082
			(0.09)	(0.87)

Table 1.5 (cont'd)

	(1)	(2)	(3)	(4)
Outsider				-0.0017
				(-0.10)
Institutional Ownership				-0.0089
				(-0.42)
Size				0.0003
				(0.12)
Industry-Adjusted Return				0.0438
				(1.82)*
HHI				-0.0215
				(-0.31)
Number of Obs.	114	114	93	86
Adjusted R-squared	0.0133	0.0039	0.0118	0.0451

t-statistics are reported in parenthesis.
*,**,*** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 1.6

Incoming Overconfidence Before and After the Turnover

All OIs are all of the available incoming overconfidence indices. OIs for CEO Tenure < 5 and > 5 Years are the overconfidence indices for the successors who spend less than or more than 5 years in the office, respectively. Before and After are the incoming overconfidence indices calculated before and after the announcement of the turnover.

	Mean	Median	Std. Dev.	Min.	Max.	Obs.
All OIs						
Before	0.11	0	0.21	0	1	134
After	0.15	0.08	0.20	0	1	133
OIs for CEO Tenure < 5 Years						
Before	0.13	0	0.23	0	1	95
After	0.17	0.05	0.22	0	1	94
OIs for CEO Tenure > 5 Years						
Before	0.04	0	0.12	0	0.60	39
After	0.10**	0.09	0.12	0	0.42	39

*,**,*** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 1.7

Logit Estimation of Having Nonzero Successor Overconfidence Levels

Outgoing OI is the overconfidence index for the outgoing CEO. Outgoing Tenure is the total number of years the CEO is with the firm. Outgoing Dual Role equals 1 if the CEO holds both the chairman and CEO post. Outgoing Founder equals 1 if the outgoing CEO is the founder of the firm. Outgoing MBA equals 1 if the outgoing CEO holds an MBA degree. Firm Outsider and Competitor Outsider are the percentages of outside directors on companies' boards. Firm Institutional Ownership and Competitor Institutional Ownership are the percentages of the total amount of shares owned by institutions. Firm Size and Competitor Size are the natural logarithms of the total assets. Industry-Adjusted Return is the stock return for the fiscal year prior to the year during which the CEO change takes place minus the value-weighted 2-digit SIC code industry return for the same period. HHI is the Herfindahl-Hirschman Index for each 2-digit SIC code.

	(1)	(2)	(3)	(4)	(5)
Outgoing OI	5.6830	5.3707			5.4428
	(3.37)***	(3.07)***			(2.53)**
Outgoing Tenure		-0.0422			-0.0441
		(-2.26)**			(-1.60)
Outgoing Dual Role		1.4782			2.4383
		(1.81)*			(1.74)*
Outgoing Age		-0.0470			-0.0436
		(-1.00)			(-0.70)
Outgoing Founder		1.1309			-0.4983
		(1.06)			(-0.30)
Outgoing MBA		-0.8445			-1.3885
		(-1.67)*			(-1.99)**
Firm Outsider			-0.9460		-2.5104
			(-1.03)		(-1.67)*
Firm Institutional Ownership			1.8103		2.8600
			(1.27)		(0.90)
Firm Size			-0.0660		-0.3533
			(-0.41)		(-1.09)
Industry-Adjusted Firm Return			0.9142		1.8317
			(1.10)		(1.06)
Competitor Outsider				0.1350	0.6800
				(0.18)	(0.51)
Competitor Institutional Ownership				-0.4499	0.6967
				(-0.47)	(0.39)

Table 1.7 (cont'd)

	(1)	(2)	(3)	(4)	(5)
Competitor Size				-0.1412	0.2188
				(-1.30)	(1.07)
Industry-Adjusted Competitor Return				-0.3411	-1.1510
				(-0.29)	(-0.56)
HHI				6.1991	5.2928
				(1.75)*	(0.94)
Number of Obs.	107	107	123	104	83
Pseudo R-squared	0.1216	0.2195	0.0352	0.0388	0.3590

t-statistics are reported in parenthesis.
*, **, *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Chapter 2

2 The Effect of CEO Overconfidence on Product Market Performance

2.1 Introduction

A large literature examines the factors that influence firm product market decisions. Several studies look at the interaction between firm capital structure and competitive performance. However, while we know a great deal about the effect of financial policies, we know very little about the impact of CEO characteristics - overconfidence in particular - on firm product market performance. Recent studies on behavioral corporate finance find that irrational CEOs may follow pecking order behavior, engage in overinvestment, and make value destroying acquisitions. Since the CEO plays a crucial role in setting and implementing the strategy and actions of the firm, understanding the consequences of managerial irrationality on competitive performance would appear to be an important issue for investigation.

I study the link between CEO overconfidence and firm competitive performance using firm-level data from 1996 to 2006. Following Malmendier and Tate (2005), I calculate managerial overconfidence in terms of the moneyness of options granted to the executive. The intuition is that a risk-averse CEO should exercise his options early if the stock price

is sufficiently high as he is under-diversified due to the fact that he cannot trade his option grants or hedge the risk by short-selling firm stock. Focusing on the relative-to-industry firm sales growth as a measure of product market performance, I identify several interesting findings. First, I find that CEO overconfidence does have a significant positive effect on performance. My estimates imply that a one standard deviation increase in CEO's relative-to-industry overconfidence level results in sales growth of 3.4% above the industry average growth. This finding, which is perhaps surprising, suggests that overconfident CEOs help improve firm's stance in the competitive environment. Second, I find that firm performance is sensitive to the percentage of outsiders on the board of directors. An increase in the relative percentage of outsiders corresponds to product market underperformance.

The testing strategy I use deals with the unobservable, time-varying industry effects through the adjustment of the variables by removing their mean industry effects in each year. Therefore, a firm's performance and the overconfidence level of its CEO are measured relative to that of its industry-year rivals.

The findings of this paper add to the research on competitive performance. While studies mostly focus on the interplay between firm capital structure and product market performance, I show that CEO overconfidence has a significant effect. My approach here is closely related to Campello (2006) who uses relative-to-industry firm sales growth to proxy for product market performance.

The paper also contributes to the behavioral corporate finance literature. Beginning with Roll (1986), studies examine the role of managerial irrationality. In general findings suggest that overconfident managers may be detrimental to firm value (e.g., Ben-David et al. (2007), Malmendier and Tate (2008)). However, theoretical studies like Gervais et al. (2007) and Goel and Thakor (2008) argue that it might be desirable for a firm to hire an overconfident manager as he can increase firm value. This study complements the literature by measuring the biased managerial beliefs and their implications for product market decisions. My proxy for overconfidence is similar to that of Malmendier and Tate (2005) who consider overconfidence of a CEO as the persistent failure of the manager to reduce his exposure to company-specific risk. I use CEO option holdings data to quantify overconfidence and build upon the Holder 67 variable in Malmendier and Tate (2005).

The rest of the paper is organized as follows. Section 2 summarizes the related literature and develops the hypotheses. Data and overconfidence measure are described in Section 3. In Section 4, I present the empirical evidence and Section 5 concludes.

2.2 Related Literature and Hypotheses Development

2.2.1 Existing Literature on Product Market Performance

Beginning with Brander and Lewis (1986) several studies have focused on debt financing and its consequences on product market performance. These papers report that debt financing leads to aggressive firm behavior in output markets (e.g., Maksimovic (1988)).

On the other hand, studies like Chevalier (1995), Opler and Titman (1994) show that debt usage results in firms competing less aggressively. In a similar vein, Phillips (1995) and Kovenock and Phillips (1997) find that highly-leveraged firms tend to invest less aggressively. These studies also suggest that highly-leveraged firms will charge higher prices if they can. Recently, Campello (2006) argues that debt financing can both boost and hurt firm performance since there is a nonmonotonic relationship between debt financing and competitive behavior.

2.2.2 Existing Literature on Managerial Irrationality

Research in psychology shows that people are overconfident in their estimates[1] and the situation seems to be no different for professionals. Ben-David et al. (2007) show that actual market returns are within executives' 80% confidence intervals 38% of the time, and Russo and Shoemaker (1992) report that professional managers perceive their judgment to be too exact.

Beginning with Roll (1986), there have been a number of studies that look at the less than fully rational behavior of managers and their effects on corporate policies, and several findings emerge. Some empirical finding suggest that overconfident managers may be

[1] People have narrow confidence intervals, for example, their 98 % confidence intervals include the true quantity about 60% of the time (Alpert and Raiffa (1982)). They also estimate probabilities poorly; events they think that are certain, occur 80% of the time and impossible, occur 20% of the time (Fischhoff et al. (1977)).

detrimental to firm value (e.g., Ben-David et al. (2007), Malmendier and Tate (2008)) However, theoretical studies like Gervais et al. (2007) and Goel and Thakor (2008) argue that it might be desirable for a firm to hire an overconfident manager as he can increase firm value. Gervais et al. (2007) discuss that overconfident managers can increase firm value as the overconfident manager overestimates his ability to reduce risk and may make capital budgeting decisions that are in better interest of shareholders. Similarly, Goel and Thakor (2008) find that overconfident managers sometimes make value-destroying investments but a risk averse CEO's overconfidence has a nonmonotonic positive effect on firm value since it offsets some of the manager's risk aversion.

2.2.3 Effect of Overconfidence on Competitive Performance

There are few studies that consider overconfidence in the competitive context. In his theory paper, Englmaier (2006) analyzes whether it might be desirable for a firm to hire an overconfident manager for strategic reasons. He argues that under both a tournament type version of Bertrand competition and a linear demand Cournot model where the firms have the opportunity to carry out cost reducing R&D before they enter into product market competition, firms may want to delegate to overconfident managers. Ando (2004) examines two different sources of overconfidence, overestimation of one's own ability and underestimation of the rival's ability, and compare the behavioral consequences of each situation. He finds that the former always induces the participants' aggressive behavior, whereas the latter sometimes brings about less aggressive behavior of one or both participants.

These findings and results of studies like Gervais et al. (2007) and Goel and Thakor (2008) suggest that overconfident managers can increase firm value. This also implies that overconfident CEOs improve product market performance. I label this possibility the *positive competitive performance hypothesis*. Under this hypothesis, higher overconfidence levels are associated with better within-industry sales performance. In contrast, several empirical studies show that overconfident CEOs are detrimental to firm value as they may engage in activities that deviate from maximizing shareholder value. These findings suggest that overconfident CEOs hurt firm competitive performance, a possibility I label as the *negative competitive performance hypothesis*. Under this hypothesis, I expect higher CEO overconfidence levels to lead to product market underperformance.

2.2.4 Effect of Board Independence on Competitive Performance

Several studies examine the link between board independence and firm performance, though the empirical findings are inconclusive. Cotter et al. (1997) find that high level of board independence is associated with higher firm performance during takeover contests while Subrahmanyam et al. (1997) report a negative relation in bank acquisitions. Hermalin and Weisbach (1991) find no relation at all. On the other hand, there are very few studies that analyze the relation in the competitive context. Using Swedish data, Randoy and Jenssen (2004) look at the effect of number of outsider board members on firm's q and ROE. The authors report that board independence reduces (increases) firm

performance in highly competitive (less competitive) industries. They argue that since the competition in the market provides a monitoring effect, monitoring by an independent board can be redundant and alienate top management in highly competitive product markets.

To directly test for the presence of board effects on competitive performance measured as within-industry sales for US firms, I consider in the analysis the number of outsiders on the board of directors. The findings of Randoy and Jenssen (2004) suggest the possibility that more independent boards are associated with lower within-industry sales performance in more competitive industries. I will refer to this possibility as the *effect of board independence on competitive performance hypothesis*.

2.3 Data and Sample Selection

2.3.1 Sample Selection

I select my initial sample from the set of CEOs listed in Standard and Poor's Execucomp database over the 1996-2006 period. The option data required to compute CEO overconfidence levels is from Thomson Reuters' Insider Derivative Transactions.[2] Following standard practice, I exclude regulated utilities and financial firms (SIC codes 4900-4949, 6000-6999). I also eliminate firms with sales (COMPUSTAT's item#12) or asset (item #6) growth of more than 200% a year, and total assets less than long term debt

[2] I start with 1996 since this is the first year that option information is available on Thomson Reuters' Insider Derivative Transactions.

(item #34) (close to bankruptcy firms). All firm-level data are from Compustat. All financial data are CPI-deflated. The information on the board of directors is from Riskmetrics. CEO age and tenure information is from Execucomp database.

2.3.2 Proxies for Overconfidence and Product Market Performance

Malmendier and Tate (2005) argue that a risk-averse CEO should exercise his options early if the stock price is sufficiently high. The CEO is under-diversified since he cannot trade his option grants or hedge the risk by short-selling company stock. Besides, the value of his human capital is closely linked to the firm's performance. In order to construct the Holder 67 proxy for overconfidence, the authors examine the first year all options are at least partially exercisable, year 5. Then, they identify a benchmark of 67% for the minimum percentage in-the-money at which the CEO should exercise his vested options. The benchmark is from Hall and Murphy (2002) who estimate the value of non-tradable options to an undiversified and risk averse executive, and the 67% threshold level corresponds to a CEO with a relative risk aversion coefficient of 3 and a percentage of wealth in company equity equal to 66%. Malmendier and Tate (2005) classify a CEO as overconfident, or the dummy variable Holder 67 equals one, if the CEO persistently (i.e., more than twice) exercises options later than suggested by the benchmark. The CEO is assumed to be overconfident in his ability to keep the firm's stock price rising and profit from expected price increases.

While the upward bias in manager's expectations is sometimes considered as optimism or overoptimism, the CEO here is referred to as overconfident. He overestimates his own

abilities (e.g., his managerial skill) and its respective outcomes, and not the precision of his beliefs or exogenous outcomes (e.g., the economy). The miscalibration reduces the expected volatility of the stock and thus the value of holding options. Therefore, the argument that overconfident CEO does not exercise his in-the-money option grants may not hold for optimistic CEOs.

To calculate my overconfidence measure, I build upon the Holder 67 variable. My overconfidence measure is different from Holder 67 in the sense that it is the arithmetic mean of the times CEO's options' percentage in-the-money levels are above the threshold levels[3]. A continuous measure may provide more information about the CEO's overconfidence level as it accounts for the amount CEO deviates from rational behavior and help determine what effect, if any, overconfidence has on competitive performance.

In order to construct the overconfidence measure, I calculate a daily ratio for each exercisable option the CEO holds. The daily ratio is the option percentage in-the-money level divided by the threshold level minus one. The threshold levels for the options are from Hall & Murphy (2002), who estimate the value of non-tradable options to an undiversified and risk averse executive[4]. When CEO does not exercise an option until the expiration date, I keep the maximum nonnegative ratio available over the exercisable life

[3] The correlation between the overconfidence measure and Holder 67 in Malmendier and Tate (2005) is 0.08 and is significant at the 1% level.

[4] The threshold levels I use for my main analyses are for executives with coefficient of relative risk aversion of three and percentage of wealth in company equity equal to 66. In section 2.4.3, I test the robustness of my results to different coefficients of relative risk aversion and percentages of wealth in company equity.

of that option since all ratios less than zero implies that the option price is never sufficiently high enough. When the CEO exercises an option, I keep the ratio at the exercise day. The overconfidence level of the CEO is the overall arithmetic mean of the ratios obtained for his individual option packages.

The product market performance proxy I use is the change in firm's share of industry sales which enables us to consistently estimate firm performance across many industries and periods (see also Campello (2006)).

2.3.3 Control Variables

In examining the link between product market performance and managerial irrationality, I control for CEO age and his tenure as a CEO in the firm. I also control for board independence proxied by the percentage of outsiders on the board of directors. Natural logarithm of the book value of assets is the basic measure of firm size.

Following Campello (2006), I use the following remaining controls. I use leverage to proxy for capital structure. Leverage the long-term debt to assets ratio. In addition, I also control for firm profitability proxied by operating earnings over assets (item #18 plus item #14, divided by item #6) since sales growth is likely to be associated with profitability. Similarly, I include net income divided by total assets as control for firm investment (item #172 divided by item #6) as capital spending in one period can lead to sales growth in the next period. My model also includes the selling expense as the sum of

advertising and selling expenses scaled by total assets (item #45 plus item #189, divided by item #6) because competitive performance may be influenced by past sales efforts. As in Campello (2006), I adjust all variables by removing their mean-industry effects in each year.

2.3.4 Summary Statistics

Table 2.1 contains the summary statistics. The mean CEO overconfidence equals 1.65 indicating that on average, managers hold options that are more than two and a half times the threshold in-the-money level. On average, firms have 65% of outsiders on their boards. My sample firms are typically large with the median total assets of $1.08 billion. Mean profitability is about 8% whereas investments and selling expenses account for 6% and 29 % of total assets.

In an effort to understand CEO overconfidence in different industries, I examine the number of times an industry is in the top or bottom deciles of the overall sample overconfidence levels. Panel A and B in Table 2.2 summarize the results. Panel A shows that the computer peripheral equipment industry has the most number of firms. Following two industries are also computer services and products related. On the contrary, Panel B shows that the most common industry in the bottom decile of sample overconfidence levels is from chemicals and allied products. Similarly, the second most common is the lubricating oils and greases industry. These figures imply that many high overconfidence

CEOs in my sample are with computer and office equipment firms whereas many of the lower overconfidence CEOs are with the chemicals products firms.

To further identify the different characteristics of firms with overconfident CEOs, I split my sample into two; CEOs who are more or less overconfident than their peers in the industry. Table 2.3 presents the summary statistics for Mean-Adjusted Overconfidence levels greater than or less than zero. On average, CEOs whose overconfidence levels are greater than the industry mean are slightly older, have longer tenures as CEOs and they control larger firms. In addition, firms with more overconfident CEOs have higher profitability levels and have significantly lower selling expenditures.

Table 2.4 presents the pairwise correlation coefficients among controls. CEO overconfidence is significantly and positively correlated with tenure and firm size whereas it is negatively correlated with percentage of outside directors. Similarly, there is a negative correlation between firm leverage and CEO overconfidence level.

2.3.5 Debt and Sales Growth

Before conducting my tests, I examine the link between firm leverage and competitive performance in order to verify whether my sample can be used to replicate results from comparable studies. Leverage is the long-term debt to assets ratio. The results are reported in Table 2.5. Columns 1 and 2 display the estimated 2-year and 3-year lagged leverage estimates for the overall sample. In columns 3 and 4, estimates for different

industry concentrations are listed. In line with the findings in Campello and Fluck (2004), relatively high leverage has a significant negative impact on firm sales growth.

2.4 Overconfidence and Product Market Performance

To examine the effect of CEO overconfidence on firm product market performance, I use the following regression specification:

$$\begin{aligned} SalesGrowth_{i,t} = \beta_1 &+ \sum_{k=1}^{2} \beta_{2,k} \Pr of_{i,t-k} \\ &+ \sum_{k=1}^{2} \beta_{3,k} Inv_{i,t-k} + \sum_{k=1}^{2} \beta_{4,k} SellExp_{i,t-k} \\ &+ \beta_5 Lev_{i,t-2(or,t-3)} \\ &+ \beta_6 Overconf_{i,t} + X'_{i,t} \mathrm{B}_7 + \varepsilon_{i,t} \end{aligned}$$

Prof is firm profitability, Inv is investment, Sell Exp is selling expenses, Lev is leverage and Overconf is CEO overconfidence. X is the set of additional controls used in the regression; CEO and firm characteristics. In the estimation, standard errors are robust to within-firm clustering and heteroskedasticity. In order to remove idiosyncratic effects from the estimates, I also adjust all the variables in the regression by removing their mean industry effects each year (see Campello (2006)). Leverage is the long-term debt to assets ratio.

2.4.1 Overconfidence and Sales Growth

Table 2.6 reports the results from the analysis of the relationship between CEO overconfidence levels and firm competitive performance for different specifications. The estimates of the univariate regression of the annual gross sales growth on overconfidence are reported in column 1. I extend the regression model to include variables related to CEO and firm characteristics in columns 2 and 3, respectively. In all cases, the coefficients on overconfidence are significant suggesting that firm performance increases with relatively high CEO overconfidence. The results of the regression specification including all the explanatory variables are reported in column 4. Column 5 displays results with $leverage_{t-2}$ in column 4 replaced with $leverage_{t-3}$. The estimates suggest strongly positive sales-overconfidence sensitivity, a one-standard deviation increase in CEO overconfidence leads to sales growth of 3.4% above the industry average growth. The coefficients on overconfidence in all models are statistically significant at the 1% level.

Turning to the coefficients on other CEO characteristics, both age and tenure estimates in columns 1 to 4 are statistically significant. Higher age corresponds to product market underperformance whereas higher tenure as a CEO leads to market share gains. However, once I control for firm characteristics, both coefficients are less significant and smaller in magnitude. The significantly negative coefficient on the percentage of outsiders on the

board of directors indicates that sales performance of firms with relatively more outside directors on their boards is lower. On the contrary, relatively larger firm size relates to relative-to-rival sales gains while higher indebtedness corresponds to product market underperformance. One possible explanation to the negative effect of relatively more independent boards is that having more outside board members than the mean level in the industry may result in firm suffering from having less number of directors with firm specific expertise compared to its rivals in the competitive environment, thus, lose market share.

Next, I examine whether my previous results change when I allow the estimation to capture differences in sales-overconfidence sensitivities across CEO overconfidence levels that are below or above-the-mean industry overconfidence levels (Mean-Adjusted Overconfidence$\leq$0 and Mean-Adjusted Overconfidence>0, respectively). Mean-Adjusted Overconfidence is CEO overconfidence minus the mean industry overconfidence level in each year. Table 2.7 reports the results from estimations that resemble column 4 in Table 2.6 which are replicated in column 1 to facilitate comparisons. Results in column 2 and 3 are for the firm-years with CEO overconfidence below and above the mean industry, respectively. As it turns out, results are significantly different in the two columns at the 1% level.

The estimates in columns 2 and 3 reveal that the positive impact of overconfidence on firm performance is due to CEOs who are less overconfident than their peers in the industry. When the CEO overconfidence is greater than the sample mean, there is no such

significant impact. The argument is similar for firm size. However, the negative coefficient on profitability implies that in the presence of a more overconfident CEO, firm's relative-to-rival sales go down. At the same time, CEO tenure, the composition of the board of directors and leverage have strongly significant effects in both columns 2 and 3. One possible explanation to the negative effect of relatively higher profitability is that higher revenue generation efforts by the firm like higher pricing may lead to lower profits compared to industry peers through reduced demand.

2.4.2 Market Concentration

I examine the interplay between sales performance and CEO overconfidence across concentrated and competitive markets, and firms that are larger or smaller than the mean firm. According to the guidelines of Department of Justice, an industry is concentrated if the Herfindahl-Hirschman Index (HHI) is greater than 0.18 and competitive if HHI is less than 0.1. HHI is the summation of the squared percentage market shares of all the firms in an industry, which is defined by the 4-digit SIC code. The market share of each firm is the sales of the firm divided by the total sales in the industry. As the HHI value gets lower, showing that the industry concentration is lower, the competition gets higher. Mean firm size in my sample is the natural logarithm of mean total assets worth of 3.86 million dollars.

Table 2.8 presents the results. In column 1, I replicate the results from column 4 in Table 2.6 for comparative purposes. The coefficients in column 2 and 3 are for concentrated

and competitive industries, respectively. All estimates but that on CEO age and firm profitability in columns 2 and 3 are significantly different from each other. These figures reveal evidence regarding the significant effect of CEO overconfidence on sales growth in competitive industries. The estimates also show that tenure as CEO is important for firm performance in both industry types while independence and leverage are in effect in competitive industries. While relatively longer tenure CEOs are associated with improved sales performance, the same is not true for board composition and firm leverage. Indeed, firms with higher percentage of outsiders on their boards in competitive markets lose market share. This suggests that monitoring by an independent board can be redundant and alienate top management in competitive markets as the competition in the market provides a monitoring effect (Randoy and Jenssen (2004)). This finding provides evidence for the *effect of board independence on competitive performance hypothesis.*

Columns 4 and 5 report results for different firm sizes. Overconfidence is in effect for relatively smaller firms in the industry. In smaller firms, higher CEO overconfidence leads to higher performance, while higher indebtedness corresponds to lower sales growth. At the same time, the estimate on board independence indicates a significant negative effect while longer tenure as CEO is associated with improved sales performance regardless of firm size.

Overall, the results I find suggest that relatively higher overconfidence levels yield market share gains. This positive effect is more pronounced if the CEO is less overconfident than his peers in the industry or the firm is smaller than the industry mean

firm size or is in a competitive industry. While CEO age has a negative effect on competitive performance particularly in competitive industries, tenure as CEO is associated with improved performance. Interestingly, higher relative-to-rival board independence relates to lower share in industry sales in competitive industries. In addition, profitability hurts sales performance if the CEO is more overconfident relative to his rivals. Relatively higher indebtedness also leads to sales underperformance particularly for smaller firms and firms in competitive industries.

2.4.3 Robustness

As a final robustness check, I reestimate my model using different overconfidence measures. The results from the estimations are reported in Table 2.9. For comparative purposes, column 1 replicates the results in column 4 in Table 2.6 which correspond to CEO coefficient of relative risk aversion of three and percentage of wealth in company equity equal to 67 (ρ=3, 67%). In columns 2 to 4, the estimates on overconfidence measures are computed for CEOs with different combinations of the coefficient of relative risk aversion of three and two, and the percentage of wealth in company equity equal to 50 and 67. In column 5, I use the Holder 67 variable in Malmendier and Tate (2005) as proxy for overconfidence. Based on the figures, it is clear that CEO overconfidence has a significantly positive effect on firm competitive performance.

2.5 Conclusion

This paper proposes that CEO overconfidence can be an important factor for firm competitive performance. I empirically examine the relationship between firm relative-to-rival CEO overconfidence and sales performance using firm-level data from 1996 to 2006. The results I find suggest that overconfidence has a significant positive impact on firm performance. In addition to CEO overconfidence, bigger firm size relates to higher performance. However, firm's percentage of outsiders on the board of directors and leverage are associated with underperformance. I further investigate the overconfidence-performance relationship by reestimating my model for CEOs who are more or less overconfident than their peers in the industry. My findings suggest that the positive effect of overconfidence is driven by the CEOs who are less overconfident. Moreover, the effect of overconfidence is more pronounced in concentrated industries and smaller firms in the industry. While CEO age hurts performance particularly in concentrated industries, tenure as CEO is generally associated with relative-to-rival sales gains. In addition, higher relative-to-rival board independence relates to lower share in industry sales. Profitability has a negative effect on sales performance if the CEO is more overconfident relative to his rivals. Relatively higher indebtedness also leads to sales underperformance particularly for smaller firms, and relatively higher level of investment is linked to lower sales performance mainly in concentrated industries.

Overall, my findings suggest that CEO overconfidence is an important factor for firm's product market performance. While several findings in the behavioral corporate finance

literature suggest that overconfident CEOs may be detrimental to firm value, my results indicate that overconfidence can be of use in the competitive environment. My findings also provide empirical evidence for the behavioral theory work on competition.

APPENDIX 2

TABLES FOR CHAPTER 2

Table 2.1

Summary Statistics

This table reports the summary statistics for the variables used in the regression estimations (before industry-year adjustments). Overconfidence is the arithmetic mean of CEO option ratios. Age is CEO age and Tenure is the total number of years the CEO holds the CEO post. Outsider is the percentage of outsiders on the board of directors. Size is the total amount of firm's assets in million dollars. Sales growth is firm annual sales growth at time t, given by $(Sales_t/Sales_{t-1})-1$, where Sales is item #12. Leverage is the ratio of book value of long-term debt to book value of total assets (item#9/item#6). Profitability is the operating earnings plus depreciation over assets (=(item #18+ item #14)/ item #6). Investment is capital expenditures over total assets (item #172/item #6), and Selling Expense is the sum of advertising expenses plus selling expenses scaled by total sales (=(item #45+ item #189)/item #6).

	Mean	Median	Std. Dev.	Pct. 25	Pct. 75	Obs.
Overconfidence	1.65	0.77	2.67	0.34	1.68	2606
Age	57.37	58	7.63	53	62	2598
Tenure	10.46	8.24	7.55	5.65	13.09	2598
Outsider	65.29%	66.67%	17.26%	55.55%	77.77%	2199
Size ($M)	3,861	1,083	7,343	346	3,458	2606
Sales Growth	0.10	0.06	0.27	-0.02	0.17	2606
Leverage	0.18	0.16	0.15	0.03	0.28	2606
Profitability	0.08	0.10	0.16	0.05	0.14	2606
Investment	0.06	0.05	0.06	0.03	0.08	2606
Selling Expense	0.29	0.24	0.23	0.13	0.40	2606

Table 2.2

Overconfidence Across Industries

This table provides information about the number of times an industry is in the top or bottom decile of the overall sample overconfidence levels.

Panel A: Top Decile

SIC	Number of Firms	Industry Description
3577	11	Computer Peripheral Equipment, Not Elsewhere Classified
7374	7	Computer Processing and Data Preparation and Processing Services
3572	5	Computer Storage Devices
3312	5	Steel Works, Blast Furnaces (Including Coke Ovens), and Rolling Mills
3845	4	Electromedical and Electrotherapeutic Apparatus
3651	3	Household Audio and Video Equipment
3661	3	Telephone and Telegraph Apparatus
7371	3	Computer Programming Services
2836	2	Biological Products, Except Diagnostic Substances
1381	2	Drilling Oil and Gas Wells
5065	2	Electronic Parts and Equipment, Not Elsewhere Classified
7011	2	Hotels and Motels
5651	2	Family Clothing Stores

Panel B: Bottom Decile

SIC	Number of Firms	Industry Description
2821	5	Plastics Materials, Synthetic Resins, and Nonvulcanizable Elastomers
2992	3	Lubricating Oils and Greases
2032	2	Canned Specialties
5211	2	Lumber and Other Building Materials Dealers
3061	2	Molded, Extruded, and Lathe-Cut Mechanical Rubber Goods
2621	2	Paper Mills
2761	2	Manifold Business Forms
3321	2	Gray and Ductile Iron Foundries

Table 2.3

Summary Statistics for Industry Mean-Adjusted CEO Overconfidence Samples
This table reports summary statistics for the main variables for the CEOs who are more (Mean-Adjusted Overconfidence>0) or less overconfident (Mean-Adjusted Overconfidence≤0) than their peers in their industries (before industry-year adjustments). Mean-Adjusted Overconfidence is CEO overconfidence minus the mean industry overconfidence level in each year. Age is CEO age and Tenure is the total number of years the CEO holds the CEO post. Outsider is the percentage of outsiders on the board of directors. Size is the total amount of firm's assets in million dollars. Leverage is the ratio of book value of long-term debt to book value of total assets (item#9/item#6). Profitability is the operating earnings plus depreciation over assets (=(item #18+ item #14)/ item #6). Investment is capital expenditures over total assets (item #172/item #6), and Selling Expense is the sum of advertising expenses plus selling expenses scaled by total sales (=(item #45+ item #189)/item #6).

	Mean-Adjusted Overconfidence>0			**Mean-Adjusted Overconfidence≤0**		
	Mean	**Std. Dev.**	**Obs.**	**Mean**	**Std. Dev.**	**Obs.**
Age	58.27[c]	7.29	729	57.02	7.73	1869
Tenure	11.09[b]	8.09	729	10.22	7.32	1869
Outsider	65.03%	17.65%	620	65.40%	17.11%	1579
Size ($M)	4,638[c]	8,545	731	3,558	6,795	1875
Leverage	0.18	0.15	731	0.18	0.16	1875
Profitability	0.09[c]	0.13	731	0.07	0.17	1875
Investment	0.06	0.06	731	0.06	0.06	1875
Selling Expense	0.27[b]	0.21	731	0.30	0.24	1875

Superscripts a, b, and c denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 2.4

Correlations

This table presents the pairwise correlations between the main variables (before industry-year adjustments). Overconfidence is the arithmetic mean of CEO option ratios. Age is CEO age and Tenure is the total number of years the CEO holds the CEO post. Outsider is the percentage of outsiders on the board of directors. Size is the total amount of firm's assets in million dollars. Leverage is the ratio of book value of long-term debt to book value of total assets (item#9/item#6). Profitability is the operating earnings plus depreciation over assets (=(item #18+ item #14)/ item #6). Investment is capital expenditures over total assets (item #172/item #6), and Selling Expense is the sum of advertising expenses plus selling expenses scaled by total sales (=(item #45+ item #189)/item #6).

	Overconfidence	Age	Tenure	Outsider	Size	Leverage	Profitability	Investment	Selling Expenses
Overconfidence	1.00								
Age	0.01	1.00							
Tenure	0.07[c]	0.33[c]	1.00						
Outsider	-0.04[b]	0.07[c]	-0.20[c]	1.00					
Size ($M)	0.08[c]	0.08[c]	0.00	0.10[c]	1.00				
Leverage	-0.18[c]	0.04[a]	-0.06[c]	-0.04[b]	0.06[c]	1.00			
Profitability	0.01	0.06[c]	0.01	0.02	0.06[c]	-0.06[c]	1.00		
Investment	0.01	-0.06[c]	0.06[c]	-0.11[c]	0.00	0.02	0.18[c]	1.00	
Selling Expense	0.02	-0.19[c]	-0.09[c]	0.01	-0.14[c]	-0.23[c]	0.00	-0.08[c]	1.00

Superscripts a, b, and c denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 2.5

Debt and Sales Growth Performance

The dependent variable is firm annual sales growth at time t, given by $(Sales_t/Sales_{t-1})-1$. Size is the natural logarithm of total assets. Profitability is the operating earnings over assets. Investment is capital expenditures over total assets, and Selling Expense is the sum of advertising expenses plus selling expenses scaled by total sales. Leverage is ratio of long-term debt to assets. HHI is the Herfindahl-Hirschman Index for each 4-digit SIC code. Concentrated industries are those with HHI greater than 0.18 and competitive industries are those with HHI less than 0.1. All variables are adjusted by removing their mean-industry effects in each year. Leverage is also standardized by dividing it by its industry-year standard deviation. Standard errors are robust to heteroskedasticity and within-firm clustering.

	All Industries (1)	All Industries (2)	Concentrated Industries (HHI≥0.18) (3)	Competitive Industries (HHI≤0.10) (4)
Size	0.0130	0.0168	0.0069	0.0527
	(1.51)	(1.84)[a]	(0.90)	(1.67)[a]
$\sum_{k=1}^{2}$ Profitability$_{t-k}$	-0.1120	-0.1058	0.1216	-0.2222
	(-1.32)	(-1.19)	(0.52)	(-1.25)
$\sum_{k=1}^{2}$ Investment$_{t-k}$	-0.0212	0.0218	-0.1594	-0.2616
	(-0.20)	(0.18)	(-1.58)	(-0.99)
$\sum_{k=1}^{2}$ Selling Expenses$_{t-k}$	-0.0354	-0.0114	-0.0506	-0.0913
	(-0.78)	(-0.27)	(-1.40)	(-0.91)
Leverage$_{t-2}$	-0.0249		-0.0193	
	(-3.28)[c]		(-2.84)[c]	
Leverage$_{t-3}$		-0.0151		-0.0402
		(-1.96)[b]		(-1.26)
Number of Obs.	2002	1656	1268	293
Adjusted R^2	0.0101	0.0034	0.0074	0.0336

t-statistics are reported in parenthesis.
Superscripts a, b, and c denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 2.6

Overconfidence and Sales Growth Performance

The dependent variable is firm annual sales growth at time t, given by $(Sales_t/Sales_{t-1})-1$. Overconfidence is the arithmetic mean of CEO option ratios. Age is CEO age and Tenure is the total number of years the CEO holds the CEO post. Outsider is the percentage of outsiders on the board of directors. Size is the natural logarithm of total assets. Profitability is the operating earnings over assets. Investment is capital expenditures over total assets, and Selling Expense is the sum of advertising expenses plus selling expenses scaled by total sales. Leverage is the ratio of book value of long-term debt to book value of total assets. Leverage is the ratio of long-term debt to assets. All variables are adjusted by removing their mean-industry effects in each year. Standard errors are robust to heteroskedasticity and within-firm clustering.

	(1)	(2)	(3)	(4)	(5)
Overconfidence	0.0137	0.0128	0.0130	0.0132	0.0128
	(4.47)[c]	(4.21)[c]	(3.62)[c]	(3.50)[c]	(3.07)[c]
Age		-0.0051	-0.0031	-0.0030	-0.0012
		(-3.54)[c]	(-2.17)[b]	(-2.00)[b]	(-0.78)
Tenure		0.0055	0.0046	0.0042	0.0026
		(3.83)[c]	(3.44)[c]	(2.74)[c]	(1.49)
Outsider			-0.2216	-0.1870	-0.1909
			(-5.57)[c]	(-4.41)[c]	(-4.29)[c]
Size			0.0077	0.0154	0.0152
			(1.11)	(2.01)[b]	(1.94)[a]
$\sum_{k=1}^{2}$ Profitability$_{t-k}$				-0.1295	-0.1364
				(-1.35)	(-1.23)
$\sum_{k=1}^{2}$ Investment$_{t-k}$				-0.0077	0.0696
				(-0.07)	(0.53)
$\sum_{k=1}^{2}$ Selling Expenses$_{t-k}$				-0.0163	0.0255
				(-0.50)	(0.78)
Leverage$_{t-2}$				-0.0207	
				(-3.07)[c]	
Leverage$_{t-3}$					-0.0133
					(-1.77)[a]
Number of Obs.	2606	2598	2194	1724	1456
Adjusted R^2	0.0025	0.0149	0.0194	0.0301	0.0235

t-statistics are reported in parenthesis.
Superscripts a, b, and c denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 2.7

Overconfidence and Sales Growth Performance for Mean-Adjusted CEO Overconfidence Samples

The dependent variable is firm annual sales growth at time t, given by $(Sales_t/Sales_{t-1})-1$. Overconfidence is the arithmetic mean of CEO option ratios. Age is CEO age and Tenure is the total number of years the CEO holds the CEO post. Outsider is the percentage of outsiders on the board of directors. Size is the natural logarithm of total assets. Profitability is the operating earnings over assets. Investment is capital expenditures over total assets, and Selling Expense is the sum of advertising expenses plus selling expenses scaled by total sales. Leverage is the ratio of long-term debt to assets. Mean-Adjusted Overconfidence is CEO overconfidence minus the mean industry overconfidence level in each year. All variables are adjusted by removing their mean-industry effects in each year. Standard errors are robust to heteroskedasticity and within-firm clustering.

	All	Mean-Adjusted Overconfidence ≤0	Mean-Adjusted Overconfidence>0
	(1)	(2)	(3)
Overconfidence	0.0132	**0.0230**	0.0029
	(3.50)[c]	(3.85)[c]	(0.44)
Age	-0.0030	**-0.0028**	-0.0016
	(-2.00)[b]	(-1.41)	(-0.79)
Tenure	0.0042	**0.0046**	0.0043
	(2.74)[c]	(2.33)[b]	(1.80)[a]
Outsider	-0.1870	**-0.1717**	-0.1794
	(-4.41)[c]	(-3.23)[c]	(-2.38)[b]
Size	0.0154	**0.0255**	0.0165
	(2.01)[b]	(2.57)[b]	(1.42)
$\sum_{k=1}^{2}$ Profitability$_{t-k}$	-0.1295	**-0.1121**	-0.3037
	(-1.35)	(-1.15)	(-2.76)[c]
$\sum_{k=1}^{2}$ Investment$_{t-k}$	-0.0077	**-0.0117**	0.1815
	(-0.07)	(-0.09)	(1.09)
$\sum_{k=1}^{2}$ Selling Expenses$_{t-k}$	-0.0163	**-0.0406**	0.0449
	(-0.50)	(-0.98)	(0.86)

Table 2.7 (cont'd)

	All (1)	Mean-Adjusted Overconfidence ≤0 (2)	Mean-Adjusted Overconfidence>0 (3)
$Leverage_{t-2}$	-0.0207	**-0.0200**	-0.0246
	(-3.07)[c]	(-2.50)[b]	(-2.01)[b]
Number of Obs.	1724	1188	536
Adjusted R^2	0.0301	0.0368	0.0850

t-statistics are reported in parenthesis.
Superscripts a, b, and c denote statistical significance at the 10%, 5%, and 1% levels, respectively.
Coefficients in bold in column 2 are significantly different from the respective values in column 3 at the 1% level.

Table 2.8

Overconfidence and Sales Growth Performance across Industry Concentrations and Firm Sizes

The dependent variable is firm annual sales growth at time t, given by $(Sales_t/Sales_{t-1})-1$. Overconfidence is the arithmetic mean of CEO option ratios. Age is CEO age and Tenure is the total number of years the CEO holds the CEO post. Outsider is the percentage of outsiders on the board of directors. Size is the natural logarithm of total assets. Profitability is the operating earnings over assets. Investment is capital expenditures over total assets, and Selling Expense is the sum of advertising expenses plus selling expenses scaled by total sales. Leverage is the ratio of long-term debt to assets. Mean Firm Size is the natural logarithm of mean total assets worth of $3.86 million. HHI is the Herfindahl-Hirschman Index for each 4-digit SIC code. Concentrated industries are those with HHI greater than 0.18 and competitive industries are those with HHI less than 0.1. All variables are adjusted by removing their mean-industry effects in each year. Standard errors are robust to heteroskedasticity and within-firm clustering.

	All (1)	Concentrated Industries (HHI≥0.18) (2)	Competitive Industries (HHI≤0.10) (3)	Firm Size< Mean Firm Size (4)	Firm Size≥ Mean Firm Size (5)
Overconfidence	0.0132	**0.0058**	0.0162	**0.0162**	0.0022
	(3.50)[c]	(0.76)	(3.50)[c]	(3.47)[c]	(0.47)
Age	-0.0030	-0.0031	-0.0035	-0.0024	-0.0028
	(-2.00)[b]	(-0.68)	(-1.74)[a]	(-1.35)	(-1.31)
Tenure	0.0042	**0.0066**	0.0038	**0.0037**	0.0048
	(2.74)[c]	(2.24)[b]	(1.89)[a]	(1.96)[b]	(1.99)[b]
Outsider	-0.1870	**-0.0606**	-0.2292	**-0.1868**	-0.2232
	(-4.41)[c]	(-0.93)	(-3.84)[c]	(-3.82)[c]	(-2.86)[c]
Size	0.0154	**0.0402**	0.0168		
	(2.01)[b]	(2.62)[b]	(1.63)		
$\sum_{k=1}^{2}$ Profitability$_{t-k}$	-0.1295	-0.1476	-0.1425	**-0.1273**	-0.0083
	(-1.35)	(-0.63)	(-1.33)	(-1.27)	(-0.06)
$\sum_{k=1}^{2}$ Investment$_{t-k}$	-0.0077	**0.1345**	0.0177	**-0.0478**	0.0612
	(-0.07)	(0.61)	(0.12)	(-0.38)	(0.31)

Table 2.8 (cont'd)

	All (1)	Concentrated Industries (HHI≥0.18) (2)	Competitive Industries (HHI≤0.10) (3)	Firm Size< Mean Firm Size (4)	Firm Size≥ Mean Firm Size (5)
$\sum_{k=1}^{2} SellExp_{t-k}$	-0.0163	**-0.0341**	-0.0018	**-0.0325**	0.0072
	(-0.50)	(-0.51)	(-0.05)	(-0.88)	(0.12)
$Leverage_{t-2}$	-0.0207	**-0.0088**	-0.0195	**-0.0209**	-0.0076
	(-3.07)[c]	(-0.89)	(-1.87)[a]	(-2.75)[c]	(-0.64)
Number of Obs.	1724	316	989	1274	450
Adjusted R-squared	0.0301	0.0134	0.0412	0.0344	0.0059

t-statistics are reported in parenthesis.
Superscripts a, b, and c denote statistical significance at the 10%, 5%, and 1% levels, respectively.
Coefficients in bold in column 2(4) are significantly different from the respective values in column 3(5) at the 1% level.

Table 2.9

Overconfidence and Sales Growth Performance with Different Overconfidence Measures

The dependent variable is firm annual sales growth at time t, given by $(Sales_t/Sales_{t-1})-1$. Overconfidence is the arithmetic mean of CEO option ratios. Holder 67 equals 1 if the CEO persistently exercises options later than suggested by the benchmark. Age is CEO age and Tenure is the total number of years the CEO holds the CEO post. Outsider is the percentage of outsiders on the board of directors. Size is the natural logarithm of total assets. Profitability is the operating earnings over assets. Investment is capital expenditures over total assets, and Selling Expense is the sum of advertising expenses plus selling expenses scaled by total sales. Leverage is the ratio of long-term debt to assets. ρ is the coefficient of relative risk aversion. 67% and 50% refer to the percentage of CEO wealth in company equity. All variables are adjusted by removing their mean-industry effects in each year. Standard errors are robust to heteroskedasticity and within-firm clustering.

	ρ=3, 67% (1)	ρ=3, 50% (2)	ρ=2, 67% (3)	ρ=2, 50% (4)	Holder67 (5)
Overconfidence	0.0132	0.0150	0.0154	0.0151	0.1564
	(3.50)^c	(3.33)^c	(3.29)^c	(2.74)^c	(2.02)^b
Age	-0.0030	-0.0029	-0.0031	-0.0036	-0.0009
	(-2.00)^b	(-1.95)^a	(-2.00)^b	(-2.33)^b	(-0.42)
Tenure	0.0042	0.0039	0.0038	0.0043	0.0058
	(2.74)^c	(2.36)^b	(2.28)^b	(2.46)^b	(2.58)^c
Outsider	-0.1870	-0.1984	-0.1944	-0.1894	-0.2178
	(-4.41)^c	(-4.36)^c	(-4.09)^c	(-3.75)^c	(-3.49)^c
Size	0.0154	0.0166	0.0167	0.0160	0.0096
	(2.01)^b	(2.17)^b	(2.17)^b	(2.02)^b	(0.72)
$\sum_{k=1}^{2}$ Profitability$_{t-k}$	-0.1295	-0.1115	-0.1140	-0.0852	-0.2611
	(-1.35)	(-1.23)	(-1.23)	(-0.99)	(-2.81)^c
$\sum_{k=1}^{2}$ Investment$_{t-k}$	-0.0077	0.0008	-0.0059	-0.0332	0.0560
	(-0.07)	(0.01)	(-0.05)	(-0.26)	(0.35)
$\sum_{k=1}^{2}$ SellExp$_{t-k}$	-0.0163	-0.0144	-0.0112	-0.0341	-0.0845
	(-0.50)	(-0.43)	(-0.33)	(-1.03)	(-1.60)
Leverage$_{t-2}$	-0.0207	-0.0210	-0.0208	-0.0217	-0.0298
	(-3.07)^c	(-3.07)^c	(-2.96)^c	(-3.02)^c	(-3.57)^c
Number of Obs.	1724	1613	1573	1427	748
Adjusted R-squared	0.0301	0.0313	0.0292	0.0284	0.0637

t-statistics are reported in parenthesis.
Superscripts a, b, and c denote statistical significance at the 10%, 5%, and 1% levels.

BIBLIOGRAPHY

REFERENCES FOR CHAPTER 1

BIBLIOGRAPHY

Adams, R. B., H. Almeida, and D. Ferreira, 2007, Understanding the relationship between founder CEOs and firm performance, Working paper, University of Queensland, New York University and London School of Economics.

Agrawal, A. and C. R. Knoeber, 1996, Firm performance and mechanisms to control agency problems between managers and shareholders, *Journal of Financial and Quantitative Analysis* 31, 377-397.

Akhigbe, A., J. Madura, and A. Whyte, 1997, Intra-industry effects of bond rating adjustments, *Journal of Financial Research* 20, 545-61.

Alpert, M. and H. Raiffa, 1982, A progress report on the training of probability assessors, in D. Kahneman, P. Slovic, and A. Tversky, eds.: *Judgement Under Uncertainty: Heuristics and Biases* (Cambridge University Press, Cambridge), 294-305.

Baker, M., R. S. Ruback, and J. Wurgler, 2006, Behavioral corporate finance: A survey, In Espen Eckbo, ed.: *The Handbook of Corporate Finance: Empirical Corporate Finance* (Elsevier/North Holland, New York).

Beatty, R. and E. J. Zajac, 1987, CEO change and firm performance in large corporations: Succession effects and manager shifts, *Strategic Management Journal* 8, 305-317.

Ben-David, I., J. R. Graham, and C. R. Harvey, 2007, Managerial overconfidence and corporate policies, AFA 2007 Chicago Meetings Paper.

Bertrand, M. and A. Schoar, 2003, Managing with style: The effect of managers on firm policies, *Quarterly Journal of Economics* 118, 1169-1208.

Bonnier, K. and R. F. Bruner, 1989, An analysis of stock price reaction to management change in distressed firms, *Journal of Accounting and Economics* 11, 95-106.

Borokhovich, K. A., R. Parrino, and T. Trapani, 1996, Outside Directors and CEO Selection, Journal of Financial and Quantitative Analysis 31, 337-355.

Davidson, W. N., D. L. Worrell, and L. Cheng, 1990, Key executive succession and stockholder wealth: The influence of successor's origin, position and age, *Journal of Management* 16, 647-664.

DeFond, M. L. and C. W. Park, 1999, The Effect of competition on CEO turnover, *Journal of Accounting and Economics* 27, 35-56.

Denis, D. J. and D. K. Denis, 1995, Performance changes following top management dismissals, *Journal of Finance* 50, 1029-1057.

Doukas J. A. and D. Petmezas, 2007, Acquisitions, overconfident managers and self-attribution bias, *European Financial Management* 13, 531-577.

Englmaier, F., 2006, A strategic rationale for having overconfident managers, Working Paper, Harvard University.

Fahlenbrach, R., 2006, Founder-CEOs, Investment decisions, and stock market performance, Working Paper, Ohio State University.

Fee, C. E. and C. J. Hadlock, 2000, Management turnover and product market competition: Empirical evidence from the U.S. newspaper industry, *Journal of Business* 73, 205-243.

Fee, C. E. and C. J. Hadlock, 2004, Management turnover across the corporate hierarchy, *Journal of Accounting and Economics* 37, 3-38.

Fischhoff, B., P. Slovic, and S. Lichtenstein, 1977, Knowing with certainty: The appropriateness of extreme confidence, *Journal of Experimental Psychology: Human Perception and Performance* 3, 552-564.

Friedman, S. D. and H. Singh, 1989, CEO succession and stockholder reaction: The influence of organizational context and event content, *Academy of Management Journal* 32, 718-744.

Gervais, S. and T. Odean, 2001, Learning to be overconfident, *The Review of Financial* Studies 14, 1-27.

Gervais, S., J. B. Heaton, and T. Odean, 2007, Overconfidence, investment policy, and manager welfare, Working paper, Duke University, Bartlit Beck Herman Palenchar & Scott LLP and University of California at Berkeley, Berkeley.

Goel, A. M., and A. V. Thakor, 2008, Overconfidence, CEO selection, and corporate governance, *Journal of Finance* 63: 6, 2737-2784

Graham, J. R. and C. R. Harvey, 2001, The theory and practice of corporate finance: Evidence from the field, *Journal of Financial Economics* 60, 187-243.

Hackbarth, D., 2007, Managerial traits and capital structure decisions, EFA 2004 Maastricht Meetings Paper.

Hall, B. J. and K. J. Murphy, 2002, Stock options for undiversified executives, *Journal of Accounting and Economics* 33, 3-42.

Hilary, G. and L. Menzly, 2006, Does past success lead analysts to become overconfident?, *Management Science* 52, 489-500.

Huson, M. R., P. H. Malatesta, and R. Parrino, 2004, Managerial succession and firm performance, *Journal of Financial Economics* 74, 237-275.

Jayaraman, N., A. Khorana, E. Nelling, and J. Covin, 2000, CEO founder status and firm financial performance, *Strategic Management Journal* 21, 1215-1224.

Katz, M. L., 1991, Game-playing agents: Unobservable contracts as precommitments, *RAND Journal of Economics* 22, 307-328.

Khanna, N. and A. B. Poulsen, 1995, Managers of financially distressed firms: Villains or scapegoats?, *Journal of Finance* 50, 919-940.

Kockesen, L., 2007, Unobservable contracts as precommitments, *Economic Theory* 31, 539-552.

Kim, Y., 1996, Long-term firm performance and chief executive turnover: An empirical study of the dynamics, *Journal of Law, Economics, and Organization* 12, 480-496.

Lang, L. H. P. and R. M. Stulz, 1992, Contagion and competitive intra-industry effects of bankruptcy announcements: An empirical analysis, *Journal of Financial Economics* 32, 45-60.

Laux, P., J. R. L. T. Starks, and P. S. Yoon, 1998, The relative importance of competition and contagion in intra-industry information transfers: An investigation of dividend announcements, *Financial Management* 27, 5-16.

Malmendier, U. and G. Tate, 2005, CEO overconfidence and corporate investment, *Journal of Finance* 60, 2661-2700.

Malmendier, U. and G. Tate, 2008, Who makes acquisitions? CEO overconfidence and the market's reaction, *Journal of Financial Economics* 89, 20-43.

Malmendier, U., G. Tate, and J. Yan, 2007, Corporate financial policies with overconfident managers, Working Paper, UC Berkeley and UC Los Angeles.

Miller, N. and A. Pazgal, 2002, Relative performance as a strategic commitment mechanism, *Managerial and Decision Economics* 23, 51-68.

Murphy, K. J. and J. L. Zimmerman, 1993, Financial performance surrounding CEO turnover, *Journal of Accounting and Economics* 16, 273-316.

Palia, D., S. A. Ravid, and C. Wang, 2008, Founders versus non-founders in large companies: Financial incentives and the call for regulation, *Journal of Regulatory Economics* 33, 55-86.

Parrino, R., 1997, CEO turnover and outside succession a cross-sectional analysis, *Journal of Financial Economics* 46, 165-197.

Pfeffer, J. and G. R. Salancik, 1977, Organization context and the characteristics and tenure of hospital administrators, *Academy of Management Journal* 20, 74-88.

Reinganum, M. R., 1985, The effect of executive succession on stockholder wealth, *Administrative Science Quarterly* 30, 46-60.

Russo, J. E. and P. J. H. Shchoemaker, 1992, Managing overconfidence, *Sloan Management Review* 33, 7-17.

Tawatnuntachai, O and R, D'Mello, 2002, Intra-industry reactions to stock split announcements, *Journal of Financial Research* 25:1, 39-57.

Warner, J. B., R. L. Watts, and K. H. Wruck, 1988, Stock prices and top management changes, *Journal of Financial Economics* 20, 461-492.

Weisbach, M. S., 1988, Outside directors and CEO turnover, *Journal of Financial Economics* 29, 431-460.

BIBLIOGRAPHY

REFERENCES FOR CHAPTER 2

BIBLIOGRAPHY

Ando, M., 2004, Overconfidence in economic contests, Working Paper, National Graduate Institute For Policy Studies, Tokyo.

Ben-David, I., J. R. Graham, and C. R. Harvey, 2007, Managerial overconfidence and corporate policies, AFA 2007 Chicago Meetings Paper.

Hermalin, B. E., and M. S. Weisbach, 1991, The effects of board composition and direct incentives on firm performance, *Financial Management* 20, 101-112.

Berger, P. G., E. Ofek, and I. Swary, 1996, Investor valuation and abandonment option, *Journal of Financial Economics* 42, 257-287.

Brander, J. A., and T. R. Lewis, 1986, Oligopoly and financial structure: The limited liability effect, *American Economic Review* 76: 5, 956-970.

Campello, M., 2006, Debt financing: Does it boost or hurt firm performance?, *Journal of Financial Economics* 82, 135-172.

Campello, M., and Z. Fluck, 2004, Product market performance, switching costs, and liquidation values: The real effects of financial leverage, Working Paper, University of Illinois.

Chevalier, J. A., 1995, Do LBO supermarkets charge more? An empirical analysis of the effects of LBOs on supermarket pricing, *Journal of Finance* 50, 1095-1112.

Cotter, J. F., A. Shivdasani, and M. Zenner, 1997, Do independent directors enhance target shareholders wealth during tender offers? *Journal of Financial Economics* 43, 195-218.

Englmaier, F., 2006, A strategic rationale for having overconfident managers, Working Paper, Harvard University.

Gervais, S., J. B. Heaton, and T. Odean, 2007, Overconfidence, investment policy, and manager welfare, Working Paper, Duke University, Bartlit Beck Herman Palenchar & Scott LLP and University of California at Berkeley.

Goel, A. M., and A. V. Thakor, 2008, Overconfidence, CEO selection, and corporate governance, *Journal of Finance* 63: 6, 2737-2784

Hall, B. J. and K. J. Murphy, 2002, Stock options for undiversified executives, *Journal of Accounting and Economics* 33, 3-42.

Kovenock, D., and G. M. Phillips, 1997, Capital structure and product market behavior, *Review of Financial Studies* 10, 767-803.

Maksimovic, V., 1988, Capital structure in repeated oligopolies, *Rand Journal of Economics* 19: 3, 389-407.

Malmendier, U. and G. Tate, 2005, CEO overconfidence and corporate investment, *Journal of Finance* 60, 2661-2700.

Malmendier, U. and G. Tate, 2008, Who makes acquisitions? CEO overconfidence and the market's reaction, *Journal of Financial Economics* 89, 20-43.

Malmendier, U., G. Tate, and J. Yan, 2007, Corporate financial policies with overconfident managers, Working Paper, UC Berkeley and UC Los Angeles.

Opler, T., and S. Titman, 1994, Financial distress and corporate performance, *Journal of Finance* 49, 1015-1040.

Phillips, G. M., 1995, Increased debt and industry product markets: An empirical analysis, *Journal of Financial Economics* 37, 189-238.

Randoy, T., and J. I. Jenssen, 2004, Board independence and product market competition in Swedish firms, *Corporate Governance* 12: 3, 281-289.

Roll, R., 1986, The hubris hypothesis of corporate takeovers, *Journal of Business* 59, 197-216.

Subrahmanyam, V., N. Rangan, and S. Rosenstein, 1997, The role of outside directors in bank acquisitions, *Financial Management* 26, 23-36.