Essays on the Role of Firms' Competition Culture in Finance: A Textual Analysis Based Approach

TERRY HARRIS

Essays on the Role of Firms' Competition Culture in Finance: A Textual Analysis Based Approach

Terry Anderson M. Harris
Submitted for the Degree of Doctor of Philosophy in Finance
2018

Abstract

In this thesis, we introduce a measure of firms' competition culture based on a textual analysis of firms' 10-K filings. Using this measure, we study the relationship between competition culture and various phenomena in corporate finance for a large sample of US-based financial and nonfinancial firms. The thesis is comprised of three main studies as follows.

The first study develops a measure of firms' competition culture and based on theory and our own reasoning validate the measure by relating it to other well-known indicators of firms' competition culture. Further, in this study, we argue and provide evidence that transient institutional ownership intensifies firms' competition culture, while dedicated institutional ownership lessens it.

In the second study, we argue that firms with greater levels of competition culture are more prone to meet/ beat analysts forecast and experience idiosyncratic stock price crashes. In this vein, we provide direct evidence that those firms with higher competition culture are able to consistently beat analysts' forecasts. In addition, we present evidence that firms with more intensive competition culture are susceptible to firm-specific stock price crash risk. Furthermore, we investigate whether firms' competition culture is a channel through which institutional investors are able to affect crash risk. In doing so, we document a positive relationship between competition culture and crash risk only among those firms with a high proportion of transient and a low proportion of dedicated institutional ownership. What is more, we directly test and find evidence that supports the notion that firms' competition culture partially mediates the relationship between the composition of firm's dedicated and transient institutional ownership and firm-specific crash risk.

Finally, we examine the effect of competition culture on bank lending and loan loss provisioning. We find evidence that banks with greater levels of competition culture are generally more prone to engage in lending and loan loss provisioning activity. However, we find that during the recent financial crisis banks with higher pre-crisis competition culture reduce lending more and have a more pronounced increase in loan loss provisioning during the crisis.

The findings of this thesis have important policy implications since it signals that competition culture is able to affect a number of economic outcomes.

Essays on the Role of Firms' Competition Culture in Finance: A Textual Analysis Based Approach

By
Terry Anderson M. Harris
St. Mary's College

Completed under the Supervision of:
Prof. Dennis Philip
And
Prof. Panayiotis Andreou

A Thesis
Submitted for the Degree of Doctor of Philosophy in Finance
Durham University

Durham University Business School
2018

Table of Contents

List of Tables

List of Figures

Declaration

I declare that no part of this thesis has been submitted elsewhere for any other degree or qualification at this or any other institution. I confirm that it is all my own work except where acknowledgment has been made in the text.

Statement of Copyright

Acknowledgements

First, I would like to express my deepest and sincerest gratitude and thanks to my supervisors, Prof. Dennis Philip and Prof. Panayiotis Andreou for their patience, understanding, guidance, long-term commitment and continual support. They were always willing to provide useful insights, comments, and suggestions on my work, but more importantly, in my opinion, they were also able to communicate their enthusiasm for research in a manner that was irresistibly infectious. I have certainly learnt a great deal from them; without a doubt, their knowledge and sense of purpose shared with me throughout these past years have contributed immeasurably to my growth as an individual and to the completion of my course of study—this thesis certainly would not have been possible without them!

I would also like to thank Prof. Franco Fiordelisi, Prof. Bill Francis, Prof. Iftekhar Hasan, and Dr. Xunhua Su, among others for providing useful comments and suggestions for my research. I also acknowledge valuable comments that I have received when my research was presented at the meetings of the British Accounting and Finance Association, the International Rome Conference on Money, Banking and Finance, and the Financial Intermediation Network of European Studies.

I am also indebted to Durham University Business School and in particular to the Department of Economics and Finance and the Department of Accounting, for the provision of financial support during my course of study. I would like to especially extend my sincerest gratitude to Prof. David Oldroyd and Prof. Richard Slack, the two Heads of the Department of Accounting during my tenure, for their willingness to support my research work and activities.

Furthermore, I would like to thank my colleagues and friends at Durham University Business School; particularly, those in the Department of Economics and Finance and the Department of Accounting, for their friendship and collegiality during these past years. Specifically, I would like to express thanks to, Dr. Ahmed Elsayed and Dr. Riham Rizk for our many shared moments together during these past years.

I reserve special thanks for my family and friends back home. In particular, my dear mother Teresacita, father Timothy, and close friends Dion and John who provided constant and invaluable support and care. Although time and the distance of the Atlantic Ocean separated us, we were always united in love; we were always united in spirit. Thank you!

Last, but certainly not least, I would like to thank my love Virgil for her endless physical and emotional support and encouragement provided to me, not only during my studies but also throughout our life shared together. This thesis is dedicated to you!

Chapter 1 Introduction

1.1 Introduction

Traditionally, researchers in finance have tended to adopt a rather negative attitude towards the role played by culture in explaining firms' economic outcomes. According to Zingales (2015) this view has been historically taken because of the perception that culture was a "shoddy" way of dealing with economic problems, with many mainstream researchers in finance considering cultural explanations as a "cop-out" used by those unwilling to or incapable of unearthing the "real" economic reasons for the observations that they make (Guiso et al., 2006, 2015a, 2015b; Zingales, 2015). However, in recent years there has been increased acceptance of culture as a valid explanation for phenomena that are unexplained by traditional theories in finance and economics. This has led to an increasing body of work that has documented the significant role played by culture, and in particular corporate culture, in explaining a variety of firms' economic outcomes (see, for example, Guiso et al., 2006, 2015a, 2015b; Cronqvist et al., 2007; Popadak, 2013; Fiordelisi and Ricci, 2014; Callen and Fang, 2015; Thakor, 2015; Zingales, 2015; Barth, 2016; Erhard et al., 2016; Grieser et al., 2016; Graham et al., 2017; Bhandari et al., 2017; Song and Thakor, 2017; Nguyen et al., 2018). These studies suggest that firm attributes such as corporate culture detail the operating philosophy that guides the top management teams' decision-making and influences the economic and policy outcomes of firms. To be sure, these works identify firms' culture as an important corporate attribute that governs managerial decision-making and hence impacts firms' performance and shareholder value creation (Quinn and Cameron, 1983; Quinn and Rohrbaugh, 1983).

This thesis extends the recent literature on the role played by corporate culture by first introducing a measure of firms' competition culture that is based on a textual analysis of 10-K filings. To develop our measure we conceptualize firms' corporate culture by adopting the

competing values framework (CVF), which suggests that there are four main cultural orientations that firms take; namely, *competition*, *collaboration*, *control*, and *creation* oriented cultures (Cameron et al., 2014). Following this, we use our measure of firms' competition culture to explore its plausible antecedents. In particular, following recent studies aiming to contribute to our understanding of the influence of institutional investors' preferences and interventions on firms' corporate governance (e.g., Bebchuk et al., 2015; Giannetti and Yu, 2016; McCahery et al., 2016; Harford et al., 2017), we first use the measure to investigate whether the composition of the institutional investor base influences firms' competition culture. Following this, we explore how firms' competition culture relates to meeting/ beating analysts' expectations and their propensity to experience stock price crashes. Additionally, using the measure of competition culture developed in this thesis, we consider the nature of the relationship between banks' competition culture and bank lending and loan loss provisioning.

The competition culture of a firm can be described as the combination of those firm attributes that focus on assimilating external information and responding to market conditions (Quinn and Cameron, 1983; Quinn and Rohrbaugh, 1983; Hartnell et al., 2011). Hence, the competition culture of a firm involves those value-creating practices and activities that entail an aggressive pursuit of competitiveness and achievement. Consequently, increase profitability, the speed of action, driving through barriers to deliver results, and building competition-focused decision-making, all typify firms with a competition culture (Cameron et al., 2014). In that vein, such firms have a proclivity towards being aggressive and moving fast, while assessing success based on indicators such as increased profit margins. Conversely, it is conceivable that a firm with greater levels of competition culture, which also faces increased pressure to perform from investors, make suboptimal investment decisions that can harm long-term shareholder value creation.

In this thesis, we follow the growing literature that applies textual analysis in finance-related research (see, for instance, Tetlock, 2007; Loughran and McDonald, 2009; Hoberg and Phillips, 2010, 2016; Li et al., 2013a; Fiordelisi and Ricci, 2014; Hoberg et al., 2014; Kearney and Liu, 2014), to develop a measure of competition culture using the textual information in firms'10-K filings for the period 1994–2014. Based on the intuition that the words used by management in firms' 10-K reports are reflective of the stated and latent values that they hold, we adopt this measurement approach as it provides an efficient way of capturing firms' competition culture. What's more, by exploiting a large corpus of archival data describing current and future operations of US-listed firms we are able to circumvent severe data limitations associated with the measurement of latent corporate characteristics (e.g. culture) that has plagued past studies (Guiso et al., 2006, 2015a, 2015b; Zingales, 2015). We operationalize the measure by parsing 10-K filings to identify a set of lexical items relating to attributes that shape firms' competition culture.

We assess the validity of our measure by relating it to alternative indicators of firms' competition culture (see Appendix A). In doing so, we note that according to existing theory, firms with a competition culture should be more in tune with and responsive to the external market environment and be more aggressive in the pursuit of profitability (Quinn and Cameron, 1983; Quinn and Rohrbaugh, 1983; Hartnell et al., 2011). Hence, one important indicator of firms with elevated levels of competition culture is high-profit margins (Cameron and Quinn, 2011; Cameron et al., 2014; Tremblay, 2016). Furthermore, it is reasonable to expect that the level of a firm's competition culture will persist over time since it reflects the long-lived traits, practices, and attributes of the firm. Thus, we take advantage of these premises to assess the validity of our measure by exploring its relation to these alternative indicators of firms' competition culture (Cameron and Quinn, 2011; Cameron et al., 2014; Fiordelisi and Ricci, 2014). To consider these

ideas, we conduct univariate and multivariate analyses that control for industry and year effects, and annual transition matrices analyses and find strong evidence that our measure of competition culture is positively related to firms' profit margins and an alternative text-based indicator of competition culture. Further, we find that our measure of firms' competition culture reflects the slow-moving behavior that is consistent with our expectations.

Then, in the first study of this thesis, we use our measure of competition culture to consider the overarching question; "*what is the influence of firms' institutional investor base on competition culture?*" as this question is intriguing in many aspects. For instance, it can inform recent literature that documents strong links between institutional ownership and corporate outcomes such as earnings manipulation, R&D investments, M&As, and financing (see, for example, Gaspar et al., 2005; Chen et al., 2007; Elyasiani et al., 2010; Harford et al., 2017), as well as between institutional ownership and financial performance (see, for example, Gompers and Metric, 1998; Nofsinger and Sias, 1999; Cai and Zheng, 2004; Giannetti and Yu, 2016). However, unlike the prior literature that remains rather silent on exactly how institutional investors affect corporate outcomes and performance, in this thesis, we advance firms' competition culture as a channel through which institutional investors appear to influence corporate decision-making and outcomes. This proposition is consistent with recent evidence documenting that institutional investors regularly engage with management and the board of directors in behind-the-scenes interventions that can shape corporate environment and objectives (Edmans, 2014, Bebchuk et al., 2015; Brav et al., 2015; McCahery et al., 2016, among others), and that the composition of firms' institutional investor base can create (or mitigate) implicit incentives for managers to over-allocate effort towards improving current performance, potentially at the expense of long-term firm value (e.g., Bushee, 1998; Dikolli et al., 2009). Based on these arguments, institutional investors could,

therefore, influence firms' competition culture so as to create an operating environment that is more likely to fulfill their own goals at the expense of other investors. Thus, it is important to trace the effect of institutional investors on firms' competition culture since it details the context in which organizational members' prioritize activities that could deliver lucrative (or devastating) financial results to investors (O'Reilly et al., 1996; Hartnell et al., 2011).

Accordingly, in the first study, we provide robust causal evidence that transient institutional ownership has a strong positive relation to firms' one-year-ahead level of competition culture. As transient institutional investors invest based on the likelihood of reaping short-term trading profits (Bushee, 1998, 2001), this evidence supports the notion that they intervene and exert pressure on managers to intensify firms' competition culture, perhaps aiming for results-right-now and more immediate financial performance. As such, we argue that this behavior is explained in part by the management of a firm with more transient institutional investors being more likely to succumb to such pressures under the threat that if these institutional investors become unhappy, then they will forcefully exit by selling shares, thereby suppressing the firm's stock price (Bernardo and Welch, 2004; Fos and Kahn, 2015).

Conversely, we demonstrate that dedicated institutional ownership has a negative relation to firms' one-year-ahead level of competition culture. This evidence supports the notion that dedicated institutional investors also intervene and influence managers but instead to lessen firms' competition culture, perhaps following their incentives to monitor and offset managerial myopia, and to assess performance by relying on information beyond the current period (Gaspar et al., 2005; Chen et al., 2007; Harford et al., 2017). Correspondingly, this evidence suggests that the managers of firms with more dedicated institutional investors feel less pressure to consistently meet market expectations and therefore ease their aggressive pursuit of short-term performance

objectives as they are less concerned about large price drops that can be spurred by the exit-selling strategies of these investors. This is reasonable since a large proportion of dedicated investors are in fact passive investors who simply invest in firms (directly or indirectly) based on an index. These investors are therefore usually unable or unwilling to directly sell specific firms that comprise the index. As a result, managers at firms with more dedicated investors are increasingly less likely to be concerned about selling pressure initiated by initial signals of underperformance (Cella et al., 2013; Giannetti and Yu, 2016).

In the second study of this thesis, we use our measure of competition culture to investigate the relation between it and a firm's proclivity to meet and/or beat analysts' earnings expectations and engage in bad news hoarding that increases crash risk. In firms with more competition orientated corporate cultures, it is expected that managers face greater pressures, have financial incentives, among other career motives, to extend themselves to consistently meet and/or beat analysts' earnings forecasts. Furthermore, it is plausible that managers at such firms face pressures to intentionally conceal bad news and accelerate the disclosure of good news, hoping that poor current performance will be masked by stronger future performance (Kim and Zhang, 2011a, 2011b, 2016). However, such practices make firms vulnerable to adverse economic outcomes in the form of large idiosyncratic stock price declines, known as crash risk (Hutton et al., 2009; Callen and Fang, 2013, 2015; Andreou et al., 2016, 2017). For firms with an intense competition culture, managerial incentives to conceal negative information regarding poor operating performance would be naturally heightened, since such firms need to consistently deliver superior financial performance as they inherently have a proclivity to cater to market expectations. Thus, after controlling for known determinants of crash risk, we empirically test this proposition and show a strong positive relation between competition culture and one-year-ahead measures of crash risk.

Combining the result that transient institutional ownership intensifies firms' competition culture with the evidence that competition culture heightens the propensity for crash risk, we postulate that competition culture might be a channel through which transient institutional ownership exerts direct intervention within firms to influence corporate policies and economic outcomes. To investigate this, we conduct subsample analyses and mediation test using seemingly unrelated regressions and the results are consistent with our expectations. Specifically, with regards to the subsample analysis, we find that the strong positive relation between competition culture and future crash risk is present only within the subsample of firms that is dominated by high levels of transient institutional ownership and low levels of dedicated institutional ownership. Hence, consistent with the theoretical underpinnings in the CVF (see e.g. Cameron et al., 2014), the analysis shows that competition culture does not cause any adverse effects on shareholder value; rather, the striking result is that competition culture of a firm becomes harmful only when it is associated with a high proportion of transient and a low proportion of dedicated institutional ownership. Further, the seemingly unrelated regression analyses are consistent with competition culture mediating the relation between our measures of institutional ownership and stock price crash risk. By and large, these findings qualify institutional investors as key corporate governance agents which can (either curb or) exacerbate firms' competition culture as their preferences and interventions can lead management to become highly susceptible to making suboptimal decisions and to prioritize activities that harm long-term firm value.

Finally, in the third study, we use our measure to consider the role played by competition culture in explaining various corporate phenomena in US-based financial firms (from henceforth referred to as "banks"). While the prior studies of this thesis have explored the effect of competition culture on organizational outcomes in nonfinancial firms, the importance of banks' corporate culture in

explaining phenomena cannot be overstated given the importance of the banking industry to the overall economy. This makes banking and interesting industry to study in its own right. Without a doubt, banks play a central role in the sound functioning of the entire financial system, and of particular concern to bank regulators is whether and how excessive risk-taking by individual banks pose a threat to the financial system as a whole (see, e.g., Acharya et al., 2010; Hanson, et al., 2011). In this vein, important undecided issues related to the extent to which banks' competition culture mitigates or exacerbates incentives for bank lending and abnormal loan loss provisioning, particularly in crisis periods, and its effects on the overall stability of the financial system remain unaddressed. Furthermore, banks present a special case for understanding the relation between competition culture and organizational outcomes such as earnings manipulation since banks' specific accruals (e.g., loan loss provisions) can be more easily isolated and modeled. As a result, we are motivated to consider the following research questions; "*what is the relationship between banks' competition culture and bank lending and loan loss provisioning?*" and "*how does banks' pre-crisis competition culture relate to crisis period lending and loan loss provisioning?*".

The results suggest that banks with greater competition culture are likely to engage in more lending and abnormal loan loss provisioning activity. Additionally, we find that banks with high competition culture are likely to engage in more procyclical lending, as they exhibit a more pronounced reduction in lending activity during the recent crisis period, given their pre-crisis period levels of competition culture. Further, we find that during the recent financial crisis, those banks with higher pre-crisis period levels of competition culture engage in more discretionary loan loss provisioning during the crisis.

This thesis contributes to the literature as follows. Firstly, the finding that the composition of institutional ownership base impacts managers' operating philosophy and decision-making as

indicated by their firms' competition culture, adds direct knowledge to our understanding of how institutional investors engage with managers in behind the scenes interventions that leave an indelible mark on firms' culture. As such, our findings complement other recent studies (e.g., Edmans, 2014; Bebchuk et al., 2015; Brav et al., 2015; McCahary et al., 2016) that endeavor to provide direct evidence of institutional investors' preferences and actions on their portfolio firms. Second, it contributes to the settling of the on-going debate regarding the benefits and costs of institutional investors on corporate decision making (e.g., Massa et al., 2015; Giannetti and Yu, 2016; Harford et al., 2017) by investigating the impact of transient and dedicated investors on firms' competition culture, which inherently encapsulates the managers' decision-making environment instead of simply relying only on corporate outcomes like R&D, dividends, investments, financial fraud, etc. Finally, this thesis also contributes to the burgeoning literature that focuses on the impact of firms' organizational values, norms and principles to policies and economic outcomes (see, for example, Loughran et al., 2009; Popadak, 2013; Fiordelisi and Ricci, 2014; Guiso et al., 2006, 2015a, 2015b; Zingales, 2015; Callen and Fang, 2015; Erhard et al., 2016; Graham et al., 2017) by introducing competition culture as another organizational effectiveness factor that links to firms' economic outcomes. As it is frequently very hard to measure such intangible corporate characteristics, we show how to operationalize such an empirical construct using textual analysis of the 10-K reports for all firms with such reports in the SEC Edgar database.

The thesis is presented as follows: In Chapter 2, we provide an overview of the literature surrounding the role played by corporate culture in finance. In addition, we provide a synthesis of the relevant theoretical and empirical works that explore the relationship between corporate culture and various economic outcomes.

Chapter 3 presents a review of the literature that discusses the textual analysis approach and how this method has been adopted by researchers in finance. Also, we highlight the main findings from works that used this approach and discuss whether and how it can be applied to measure corporate culture.

Chapter 4 provides the first study of the thesis. In this study, we develop a text-based measure of firms' corporate culture based on the CVF. Also, we provide direct evidence that firms' institutional ownership structure influences the level of competition culture, thereby providing confirmation that firms' institutional ownership structure is an important antecedent of corporate culture. In particular, we show that transient institutional ownership intensifies competition culture, while dedicated institutional ownership reduces it.

In Chapter 5, we use the measure to show that firms with higher competition culture are more likely to meet and/or beat analysts' forecasts and engage in bad news hoarding that increases firms' stock price crash risk, a phenomenon particularly observed among firms with a high proportion of transient and a low proportion of dedicated institutional ownership, and that is consistent with competition culture playing a mediating role in the relationship between institutional ownership and firm specific stock price crash risk.

Chapter 6 presents the final study of the thesis where we examine the effect of competition culture on bank lending and loan loss provisioning. Consistent with expectations, we find evidence that banks with greater competition culture are generally more prone to engage in greater lending and loan loss provisioning activity. However, we find that during the recent financial crisis banks with higher pre-crisis competition culture reduce lending more and have a more pronounced increase in loan loss provisioning, thereby feeding into a procyclical dynamic.

Chapter 7 concludes the thesis by providing a summary of the findings, outlines the policy implications of the studies, and provides direction for future research.

Chapter 2 Literature Review: What is Culture?

2.1 Introduction

What is culture? Culture is a broad and inherently complex concept that can be defined as those values, norms, customs, and beliefs held by particular societal groups (See e.g. Schein, 1990, 1992; Guiso et al., 2006; Zingales, 2015; Graham et al., 2017). Put another way, culture can be said to represent the nexus of all implicit and explicit contracts that govern behavior and human interaction within societal groups (Benabou and Tirole, 2003, 2011). With regards to the firm, culture can be defined as an intangible asset that is designed to meet unforeseen contingencies (Kreps, 1990). Simply put, culture can be said to be "*the way things get done around here*" (Deal and Kennedy, 1982).

In recent years, there has been increased acceptance of culture as a valid explanation for economic behavior in finance (Zingales, 2015). This has been aided in part by the development of new tools, methods, and methodologies aimed at measuring and analyzing the effects of culture on various economic outcomes. To be sure, researchers in finance now have various seamless approaches for incorporating culture into empirical studies (Guiso et al., 2006). A central theme to all this is first the identification of a direct impact of culture or of a particular cultural orientation on the rational preferences and/or expectations of certain economic agents or groups. Following this, the researcher must show that those preferences and/or expectations, in turn, have a predictable and measurable impact on economic outcomes. Finally, the researcher must identify the cultural component of the said preference and expectation by instrumenting them with an appropriate measure of culture.

It is widely accepted that a particular group's culture reveals their preferences and expectations and that this is necessarily an important determinant of their behavior. Clearly, this realization

makes culture a seemingly important construct for explaining economic outcomes in finance. Nevertheless, despite this and other arguments that point to an economic impact of culture and social norms (e.g., Becker, 1957; Arrow, 1972; Akerlof, 1980; Hofstede et al., 1990), in past decades scholars in finance and economics have with very few exceptions (see for example Kreps, 1990), doggedly avoided investigations into the role played by culture when conducting research for mainstream consumption.

The negative attitude towards culture traditionally adopted by many researchers in finance was in part due to the perceived notion that it was a "sloppy" way of dealing with economic problems in finance. In fact, many have considered cultural explanations as a "cop-out" used by individuals unwilling or unable to discover the "true" economic reasons for the empirical results that they obtain (Zingales, 2015). However, in recent years there has been increased acceptance of culture as a valid explanation for observed phenomena that are unexplained by traditional theories in finance and economics. This has led to an increasing body of work that has documented the critical role of culture in explaining a wide array of economic outcomes and phenomena (see, for example, Hofstede, 1980, 2001; Gray, 1988; Hofstede et al., 1990; Schwartz, 1992, 1994; Guiso et al., 2006, 2008, 2009; 2015a, 2015b; Doupnik, 2008; Chui et al., 2010; Callen et al., 2011; Giannetti and Yafeh, 2012; Li et al., 2013b; Cameron et al. 2014; Fiordelisi and Ricci, 2014; Callen and Fang, 2015; Kanagaretnam et al., 2013; Popadak, 2013; Ahern et al., 2015; Eun et al., 2015; Zingales, 2015; Erhard et al., 2016; Dang et al., 2017; Graham et al., 2017).

In this chapter, we review the finance-related literature centered on the role played by corporate culture to answer economically meaningful research questions. In particular, we focus on the various theoretical frameworks and taxonomies that can be used to describe a firm's "culture" and the empirical studies that discuss the role of corporate culture in finance.

2.2 Corporate Culture

Previous finance and economics based works on corporate culture provide theoretical insights into the role that it plays within the organization. For instance, Kreps (1990) motivates corporate culture as an important economic concept and develops a model in which corporate culture can be used as a "coordination" mechanism that is designed to meet unforeseen contingencies. Furthermore, Cremer (1993) views corporate culture as the shared knowledge of organizational members that is unavailable to outsiders. Similarly, Hermalin (2001) models the choice of corporate culture as the decision between high fixed cost and low marginal cost (strong culture) and low fixed cost and high marginal cost (weak culture). Meanwhile, Van den Steen (2010a, 2010b) interprets corporate culture as being concerned with the shared values and beliefs that can reduce belief heterogeneity and disagreement among organizational members. More recently, Lo (2016) introduced the "Adaptive Market Hypothesis" view of corporate culture, which suggests that firm's culture represent the core traits of an organization that survive various evolutionary processes.

In recent times, the increased data available on firms, managers and those charged with governance has made it possible to quantify various aspects of corporate culture and to use these measures to answer questions motivated by past theoretical work (Popadak, 2013; Fiordelisi and Ricci, 2014; Guiso et al., 2015a, 2015b; Graham et al., 2017). In particular, these firm-level measures of culture have made it possible to address questions such as; "*does corporate culture affect firms' economic outcomes, and if so how?*". Further, the thrust to explore the role of corporate culture is also explained by the fact that in corporations rational agents have a greater

ability to shape the distinct norms and preferences of the organization (Guiso et al., 2015a, 2015b; Zingales, 2015). This makes corporate culture a fertile ground to explore such design choices in relation to existing finance and economic theories. What is more, at the corporate level there is greater data available with which to undertake large-scale studies and hence it should come as no surprise that researchers in finance are increasingly focusing on corporate culture.

2.2.1 Taxonomies of Corporate Culture

To study the role of corporate culture in finance, we first make use of the extensive body of work that has explored the broader concept that is organizational culture. This approach makes sense since past decades have seen a number of theoretical frameworks for organizational culture proposed and developed by esteemed researchers of organizational behavior (see for example, Handy, 1976; Deal and Kennedy, 1982; Reynolds, 1986; Johnson, 1988; Denison, 1990, O'Reilly et al., 1991; Schein, 1990, 1992; Hofstede, 1980, 2001, 2011; Cameron and Quinn, 2011; Cameron et al., 2014). Table 2.1 presents a summarized list of taxonomies and theoretical frameworks on organizational culture that have been developed in recent decades. Furthermore, in recent years these taxonomies for organizational culture have provided researchers in finance, interested in pursuing questions related to the role of corporate culture, with broad overviews of the many variations that exist between the different conceptualizations of organizational culture that can manifest within firms. Therefore, to get a better understanding of these notions of organizational culture and how they are reflected in the corporate form of business organization, we next consider some of the noted typologies of organizational culture that have emerged in the organizational behavior literature.

2.2.1.1 Handy (1976)

Early work by Handy (1976) provides a coherent framework for thinking about organizational culture. Based on a scheme originally introduced by Harrison (1972) he links organizational structure to firm culture and identifies four distinct types of organizational culture; namely the *power culture, role culture, task culture* and *person culture*. The *power culture* captures the degree to which tactical and strategic decision making authority within the organization is concentrated on a key central person or among a small group of individuals. The *role culture* seeks to delegate decision making authority to individuals with defined functions and specialties within a highly defined organizational structure. In the *task culture,* decision-making authority resides with a small collaborative team of individuals with varying expertise who collectively solve problems and execute tasks. Finally, Handy identifies the *person culture* where the individual is the central focal point and thus they believe themselves to be set apart from the organization as a whole.

2.2.1.2 Deal and Kennedy (1982)

Another popular taxonomy for organizational culture that can be used to explore corporate culture was introduced by Deal and Kennedy (1982), who defined organizational culture as simply "*the way things get done around here*". In their work, Deal and Kennedy identify six interlocking cultural elements that help to define the firms' culture. These cultural elements are institution's *history, values and beliefs, rituals and ceremonies, stories, heroic figures,* and *cultural network.* By examining these cultural elements across a variety of organizations they identify two factors that influence observed cultural patterns. These factors are i) the degree of risk that accompanies

the organization's activities, and ii) the speed at which organizations learn and provide feedback concerning whether particular actions and strategies are successful. These two dimensions combine to define four types of organizational culture; namely, *work-hard, play-hard culture*, *tough-guy, macho culture*, *process culture*, and *bet-the-company culture*. In the *work-hard, play-hard culture* speed of action and speed of recreation all typify this culture. Organizations with a *work-hard, play-hard culture* focus on swift learning and the delivery of rapid feedback to members as it relates to their performance; these members are encouraged to take low risk. The *tough-guy, macho culture* also emphasizes rapid learning and feedback but encourages members to take on high degrees of risk. In the *process culture* learning and feedback is slow and members take on low risk. The *bet-the-company culture* also provides slow learning and feedback but members within organizations that have this culture are encouraged to take on higher levels of risk.

2.2.1.3 Reynolds (1986)

Reynolds (1986) argues that the various dimensions of culture introduced by previous researchers (for example, Handy, 1976; Deal and Kennedy, 1982) overlap. Synthesising the past literature, he presents 14 independent dimensions of organizational culture. These are *external versus internal, task versus social, risk versus safety, conformity versus individuality, individual versus group rewards, individual versus collective decision making, centralized versus decentralized decision making, ad hockery versus planning, stability versus innovation, cooperation versus competition, simple versus complex organization, informal versus formalise procedures, high versus low loyalty,* and *ignorance versus knowledge of organizational expectations.*

In the *external versus internal* emphasis domain, organizations with greater external emphasis are said to focus on satisfying customers and other external stakeholders, while those organizations with an internal emphasis concentrate on enhancing the efficiency and effectiveness of internal activities. The *task versus social* dimension measures the degree to which organizations view either task completion or meeting the social needs and desires of members/employees is more important. In the *risk versus safety* dimension, how willing individuals in the organization are to accept and adapt to changing environments and ways of doing work is measured. The *conformity versus individuality* domain measures the degree to which the members are forced to kowtow their distinctive behavior to the group. The *individual versus group rewards* domain captures how the organization rewards all members whether as a group and/or individually based on their contribution. The *individual versus collective decision-making* dimension measures the degree to which decisions are made by individuals or as a group. The *centralized versus decentralized decision-making* dimension captures whether decisions are made by those in senior positions in the organization or by those with the day to day responsibility for the implementation of the decided course of action. The *ad hockery versus planning* domain reveals the degree to which the organization develops in an unplanned manner or whether detailed plans are made. The *stability versus innovation* dimension captures whether the organization is open to adopting new and unique goods, services, and processes. The *cooperation versus competition* domain reflects the attitude of individuals in the institution towards internal competition with other members of the organization for rewards and status versus their attitude towards teamwork and collaboration to enhance the effectiveness of external competition with outsiders. The *simple versus complex organization* dimension measures the degree of complexity of the internal political processes of the firm as well as the formal and informal structures of the organization. The *informal versus*

formalize procedures domain reflects the tendency within the firm to have detailed rules and procedures for making decisions. In the *high versus low loyalty* dimension, the degree of loyalty individuals have to the organization compared to other relevant groups is captured. Finally, the *ignorance versus knowledge of organizational expectations* domain reveals the degree to which organizations communicate performance expectations to members and the level to which members are aware of these expectations and how they, in turn, contribute to the achievement of organizational goals.

2.2.1.4 The Cultural Web

The cultural web proposed by Johnson (1988) is another noteworthy organizational cultural framework that is useful for understanding corporate culture. Their framework identifies a number of elements that describe and influence organizational culture. According to them, these elements may overlap to form the culture of the organization; and they point out that a greater level of cultural coherence among these elements is a likely source of competitive advantage. The first element of culture that they identify is the organization's *paradigm*; this cultural element describes what the institution is all about, what it does, its values, its mission, and its objectives. Next, they describe the *control systems* of the organization as the processes that are put in place to monitor internal activities. They also identify the *organizational structures* of the entity, which defines the internal reporting lines that describe the way that work flows through the organization. Further, they identify the *power structures* of the entity as the degree to which individuals or groups of individuals make the decisions in the organization. *Symbols* include the organizational logos and designs as well as those internal symbols of power. The *rituals and routines* of the firm are those habitual organizational practices that occur as a matter of habit rather than necessity. Finally, they

categorize the institution's *stories and myths* as those narratives accumulated about people and events that communicate what is valued within the organization.

2.2.1.5 Denison (1990)

Similarly, Denison (1990) proposes a model of organizational culture that is useful for understanding how corporate culture manifests within businesses. In particular, this model allows the culture of organizations to be defined broadly as being either externally or internally focused as well as being flexible or stable. Further, this model suggests that organizational culture and organizational effectiveness can be described by four dimensions; namely, *involvement*, *consistency*, *adaptability*, and *mission*. The *involvement* domain refers to the degree to which the organization is able to create a sense of ownership and responsibility. This sense of ownership engenders greater levels of commitment to the institution. The *consistency* dimension involves the relationship between aspects of organizational culture and organizational effectiveness. In particular, this perspective emphasizes the positive impact that culture can have on effectiveness by reinforcing core values, engendering agreement, and promoting greater inter-functional coordination. The *adaptability* domain refers to the system of norms and beliefs which support the capacity of an organization to receive, interpret, and translate signals from the environment to internal behaviors. Finally, the *mission* dimension captures the degree to which there is a shared purpose and direction for the organization and its members.

2.2.1.6 O'Reilly et al. (1991, 1996, 2012)

O'Reilly et al. (1991, 1996, 2012) advance a model of organizational culture that has proved popular in the finance-related literature (See e.g., Popadak, 2013; Guiso et al., 2015; Grieser et al., 2016). First, based on the idea that an organization's culture is distinguished by the values held and reinforced from inside, they propose the Organizational Cultural Profile (OCP). Hence, this model of culture gauges organizational climate and measures the degree of compatibility between individuals and the organization i.e. the person-organizational fit. They argue that this model can be used to identify the most efficient persons suited to join the institution.

Then, consistent with the OCP, O'Reilly et al. (1991;1996, 2012) identify seven main components of organizational culture; namely, *adaptability*, defined as the willingness to experiment, take risk and innovate; *collaboration*, which denotes the attitude individuals within the organization have towards working with others; *customer-orientation*, this indicates the degree to which customers are listened to; *detail-orientation*, which refers to the attention paid to detail; *integrity*, this signifies the regard held for honesty and high ethical standards; *results-orientation*, denotes emphasis placed on performance; and *transparency*, refers to the degree to which the information concerning the organization's goals and practices are shared freely with interested parties.

2.2.1.7 Schein (1990, 1992)

Yet another important framework for organizational culture was proposed by Schein (1990, 1992), who identifies *external adaptation* and *internal integration* as the two main reasons why cultures develop within organizations. In his work, he posits that *external adaptation* suggests that

cultures develop and are maintained because they help organizations to survive and do well. Thus, if the organization's culture is valuable and presents the potential for engendering sustained competitive advantages, then it is retained. The other main explanation for the development of organizational culture, *internal integration*, is identified as a function since cohesive social structures are important for the existence of organizations. According to Schein (1992), organizational practices are learned through socialization at work. Further, the work environment serves to support the prevailing culture by encouraging members to adopt the pre-existing cultural values and norm. In addition, he develops the dimensions of organizational culture and introduces three levels of the organizational culture; namely, *artifacts*, *espoused values*, and *assumptions*.

At the *artifact* level, aspects of the organization's culture are visible to those external to the institution. These cultural factors may include the organization's formal and informal infrastructures and the language used in the organization's messages. An organization may claim certain values, however, its infrastructure may serve to undermine those espoused values. In this case, the *artifacts* show that the values held by organizational leaders have not been effectively shared or transmitted such that they affect the organization's activities. Furthermore, once the external environment changes the organization's *artifacts* are the first level of culture to be affected. In turn, changes to this outer level of organizational culture may gradually affect the deeper cultural levels—*espoused values* and *assumptions*.

The *espoused values* of organizations represent the middle layer of the three levels of organizational culture posited by Schein (1992). This level denotes the philosophies, goals, objectives, and strategies of the organization. Also, the *espoused values* represent those unwritten norms and customs that members understand and follow self-consciously. Those individuals not adhering to the *espoused values* of the group are made to feel ostracised. The *espoused values*

themselves are comprised of the *working environment* and the *leadership style*. The *working environment* reflects the nature of relationships in the organization. In particular, it entails how supervisors relate to their subordinates, the relations between members, and how conflicts are managed, etc. In contrast, the *leadership style* reflects the approach of the leader in the execution of the organization's strategies in the achievement of organizational goals and objectives.

Assumptions are the core values that are shared by members of the group but that are often imperceptible even to these members. The core values take a long time to develop and are hard to remove once established. The essence of the core values is conveyed by communicating their key facets into the espoused values and artifacts of the organization. Hence, to determine the *assumptions* of an organization, it is important to identify the values that are comprehended and followed by members of the institution. Further, these core values should not just be slogans or even the speech/ writings of the directors, but they are reflected in the other cultural levels of the organization. Put another way, the core values manifest themselves as automatic reactions and unconscious perceptions and/or opinions of organizational members.

2.2.1.8 Hofstede (2011)

In yet another important work that presents a taxonomy of organizational culture, Hofstede (2011) introduces a framework that identifies six dimensions to describe organizational culture; namely, *process-oriented* versus *results-oriented*, *job-oriented* versus *employee-oriented*, *professional* versus *parochial*, *open system* versus *closed system*, *tight* versus *loose control*, and *pragmatic* versus *normative* dimensions. A further discussion of these six dimensions follows;

The *process-oriented* versus *results-oriented* dimension is closely linked to the operational success of the organization. Organizations with a *process-oriented* culture focus on the technical and bureaucratic aspects of *how* the work is done. On the other hand, organizations that are results-oriented are concerned with outcomes, where members are focused on what is to be done. *Process-oriented* and *results-oriented* organizations also differ with respect to the level of risk-taking. In particular, *process-oriented* organizational cultures seek to avoid risk, while *results-oriented* cultures tend to take-on more risk in order to achieve the organization's goals and objectives.

In Hofstede's (2011) organizational culture framework, the *job-oriented* versus *employee-oriented* dimension relates to the operating philosophy of management. In *job-oriented* organizational cultures, members are held responsible for their performance without much regard for their individual wellbeing. In contrast, organizations with an *employee-oriented* culture take both performance and the welfare of individual members into consideration.

The *professional* versus *parochial* domain relates to how members are perceived by others within the organization and how they view themselves. In the *professional* culture, members are identified with their profession or job category/type. Conversely, in institutions that adopt a *parochial* culture, members are identified with their various organizational subunits/ groups (i.e. departments, teams, and/or work units).

The *open system* versus *closed system* dimension reveals the ease of access to information about the organization. In particular, it reflects the internal and external communication style of the institution and how easily insiders and outsiders have access to information of particular interest. In an *open system*, information is accessible to both insiders and outsiders, while in a *closed system* this information is not as accessible to outsiders.

The *tight control* versus *loose control* cultural domain refers to the level of discipline exercised within the organization. Specifically, this dimension is concerned with the amount of control exercised over organizational members in terms of the level of formality and punctuality expected of them. In a *tight control* culture, organizational members are exposed more control and discipline, while in a *loose control* culture members are expected to be less formal.

Hofstede's (2011) *pragmatic* versus *normative* dimension is concerned with the external-internal drive of the organization. In a *pragmatic* culture, the organization is focused on satisfying the needs, wants and demands of end users (i.e. customers) without much regard for other organizational norms. Thus, such institutions are said to be externally driven. Conversely, in a *normative culture,* the organization is said to be more internally driven since they place greater emphasis on their internal processes, ethical and compliance issues.

2.2.1.9 The Competing Values Framework

The final taxonomy for organizational culture that we will discuss is the competing values framework (CVF). Modeled by Quinn and Rohrbaugh (1981, 1983), Cameron and Quinn (2011), and Cameron et al. (2014), this organizational culture framework has been widely cited in the literature and has been used in a number of recent finance related studies to conceptualize firms' organizational culture (see e.g., Fiordelisi and Ricci, 2014; Thakor, 2015; Barth, 2016; Tremblay, 2016; Bhandari, et al., 2017; Nguyen et al., 2018).

Like previous taxonomies (see for example Denison, 1990) this framework for organizational culture differentiates between those competing values and attitudes within the firm that focus on the external environment from those that focus on internal effectiveness—the *external-internal*

domain. Further, it distinguishes between those organizational attributes that emphasize effectiveness criteria that focus on flexibility and discretion from those that are centered on stability and internal control—i.e. the *flexibility-stability* domain. These two dimensions intersect to define four distinct types of orientations that comprise the CVF, namely the *competition culture*, *creation culture, collaboration culture,* and *control culture*.

Organizations with the *competition culture* value the accomplishment of measurable and stretch goals. These types of organizations place particular emphasis on finance-based and market-based goals and objectives such as enhanced financial performance and increased market share. In such institutions, the relationship between members and the organization is contractual and members are individually held accountable for achieving a pre-agreed level of performance. Furthermore, a spirit of competitiveness permeates throughout the organization. The entity focuses on the external environment and the formal control orientation reflects stability.

A *creation culture* is a cultural form that is characterized by high levels of creativity and risk-taking behavior. The members of such organizations are committed to being innovative and on being on the leading edge of whatever endeavor the group is pursuing. This type of organization reacts rapidly to change and in fact, creates it via individual initiative and flexibility that promotes growth that is reinforced by rewards. This type of organization focuses on providing new and unique products and/or services. Thus, the organization focuses on the external environment and the formal control orientation is flexible.

In organizations defined by the *collaboration culture*, traits such as loyalty, cooperation, and teamwork are all valued. Organizations with this type of culture place greater emphasis on internal effectiveness, while allowing for a flexible form of control. Members of such institutions exhibit

a commitment to others in the group and to the organization as a whole that is beyond their mere job descriptions. In response to the long-term levels of commitment (i.e. loyalty) by members, the organization reciprocates with a long-term commitment to the members. In organizations with the collaboration culture, there is a strong peer pressure to abide by the norms that are valued by the group. Thus, normative pressures within the institution generate enhanced levels of the valued traits. Further, in such organization success is assumed to depend on cooperation and teamwork, as well as concern for other people.

Finally, organizations with the *control culture* value rules, hierarchy, ordered coordination, and standardized operating procedures that are clearly defined. These types of organizations are concerned with long-term efficiency, predictability, and stability. Thus, managers within a bureaucratic institution are organizers and are required to police the rules and procedures to ensure that they are enforced. The tasks, responsibilities, and authority of all members are also clearly defined. However, this type of culture can impede the effectiveness and efficiency of the organization as it is likely to dampen flexibility. The emphasis of attention of this organization is internal, and the formal control is stable.

2.2.2 Implications of Corporate Culture for Finance

Recent empirical works have documented the importance of corporate culture for the behavior of so-called "economic man" in organizations (see e.g. Cronqvist et al., 2007; Popadak, 2013; Fiordelisi and Ricci, 2014; Guiso et al., 2006, 2015a, 2015b; Zingales, 2015; Callen and Fang, 2015; Erhard et al., 2016; Grieser et al., 2016; Bhandari et al., 2017). In much of this strand of literature, corporate culture is conceptualized as a type of intangible asset of the firm that is

designed to meet unforeseen contingencies (Kreps, 1990). In this way, corporate culture is said to reflect those intrinsic and informal institutions of the firm that help to shape employee behaviors (Popadak, 2013; Graham et al., 2017). Thus, using this and other related definitions of corporate culture, hitherto unaddressed questions such as; "*does corporate culture matter?*", and "*what is the role of corporate culture?*" are increasingly being answered by mainstream researchers in finance despite these relationships being largely unaccounted for in traditional finance and economic theories.

For instance, in an extensive and influential work, Graham et al. (2017) conduct a survey and interview-based analysis of 1,348 North American firms and use this information to investigate whether differences in firms' corporate culture help to explain why otherwise similar firms experience divergence in terms of success and failure. They find that half of the senior executives believe that corporate culture is a top-three driver of firm value and 92% believe that improving their culture would increase firm value. Somewhat surprisingly, they find that a mere 16% of senior executives believe that their firm's culture is where it should be. Furthermore, they find that senior executives link firms' corporate culture to ethical choices (e.g. compliance and short-termism), innovation (e.g. creativity and taking the appropriate risk), and value creation (e.g. productivity and acquisition premia). They assess these links within a framework that implies that cultural effectiveness depends on interactions between the corporate culture, which is theorized as an informal attribute of firms, and those formal institutions. In doing so, they find evidence that firms' corporate culture is as important as their stated values in achieving success.

The drive to investigate culture in the corporate setting is explained in part because the corporation provides a unique environment within which to examine the role played by culture. This is so since corporations are in fact micro-societies that have the ability to actively shape

distinct norms, values, and preferences (Guiso et al., 2015a, 2015b; Zingales, 2015). Thus, in this vein researchers in finance who study corporate culture often embed it within the broader literature that surrounds corporate institutions and theorise corporate culture as a type of informal institution that helps to shape employee behaviors and hence firm outcomes (e.g. Guiso et al., 2015a, 2015b; Graham et al., 2017). In this way, corporate culture is thought to be a fruitful area for research into the role of culture broadly since it is more likely to reflect the specific design choices of those economic agents who first instilled these informal arrangements. Also, in the corporate setting, there is greater data availability, and this fact coupled with the increased precision of variables measured at firm level make corporate culture and important and rich area for research into the impact of culture. In fact, recent results suggest that management and those charged with governance help to shape the corporate culture of the firm (Benmelech and Frydman, 2015; Biggerstaff et al., 2015; Bushman et al., 2017); further, prior results reveal the corporate culture has implications for firm performance (Sørensen, 2002; Fiordelisi and Ricci, 2014; Guiso et al., 2015b; Mironov, 2015), firm value (Popadak, 2013; Benmelech and Frydman, 2015; Au et al., 2018) earnings manipulation activity (Benmelech and Frydman, 2015; Biggerstaff et al., 2015; Braguinsky and Mityakov, 2015; Davidson et al., 2015; Grieser et al., 2016; DeBacker et al., 2015; Liu, 2016; Bhandari et al., 2017), bank behavior (Bushman et al., 2017; Barth, 2017; Nguyen et al.,2018), and merger and acquisition activity (Tremblay, 2016; Bereskin et al., 2017).

2.2.2.1 Performance

Prior literature suggests that strong types of corporate cultures can improve firms' performance since they can help to enhance internal consistency of management and staff behaviors (see e.g. (Deal and Kennedy, 1982; Kotter and Heskett, 1992; O'Reilly and Chatman, 1996). Given this,

Sørensen (2002) explore the impact of having a strong corporate culture on the variability of firms' performance. Using a sample of firms from a broad variety of US industries, he hypothesizes and finds that firms with a strong corporate culture do indeed perform well during times of incremental change. However, he finds that the relationship between corporate culture and firms' performance is weaker in more volatile environments.

Fiordelisi and Ricci (2014) also consider the implications of corporate culture to firms' performance by examining the role it plays in the relationship between firm performance and CEO turnover. In particular, they examine the question; "*what role does corporate culture play in the decision to fire a CEO after [a] poor performance?*". To answer this question, they adopt the competing values framework of culture proposed by Quinn and Rohrbaugh (1981, 1983), Cameron and Quinn, (2011), and Cameron et al., (2014). They find that the probability of a CEO change is increased when firms exhibit greater levels of compete- and create- oriented corporate cultures. Further, their results suggest that the negative relationship between firm-specific performance and CEO turnover is strengthened by the control culture and diminished by the create culture. Finally, they observe that firms with a create culture are less likely to replace the CEO with an outsider as opposed to an internal promotion.

Guiso et al. (2015b) consider whether and why certain dimensions of corporate culture are related to firms' performance. They find that firms' declared values are irrelevant for predicting corporate outcomes; however, they note that when employees identify top managers as being more ethical and trustworthy (i.e. managers have more "integrity") firms' performance is indeed stronger. In addition, they find that when employees perceive managers as having more integrity the attractiveness of job offerings is increased and the degree of unionization among employees is decreased. Further, they explore how differences in firms' corporate governance structures affect

the ability to sustain integrity as a corporate value. They find that while traditional measures of corporate governance do not seem to have an effect, privately held firms are better able to sustain integrity compare to publicly listed companies.

Also examining the role that corporate culture plays in relation to firms' performance, Mironov (2015) explores the relationship between a culture of managerial corruption, as indicated by managements' propensity to corrupt (PTC), and firm performance. Using data on Moscow traffic violations, he constructs the PTC of every licensed driver in Moscow. Assuming that some traffic violations were not recorded due to bribe-taking activity, Mironov constructs individual PTC by taking the difference between the expected and actual number of recorded traffic violations, given observed driver characteristics. Following this, they determine the PTC for the top management of over 58,000 privately held firms and find that a one standard deviation increase in managements' PTC corresponds to a 3.6% increase in income diversion among firms. Interestingly, given the previous results of Guiso et al. (2015b), he finds that firms with more corrupt managers in fact significantly outperform their less corrupt counterparts.

2.2.2.2 Firm Value

Popadak (2013), using the O'Reilly et al., (1991, 1996, 2012) model of corporate culture, shows that corporate culture is an important channel through which shareholder governance is able to affect firm value. In particular, she finds that greater shareholder governance significantly increases results-orientation but lessens customer-orientation, integrity, and collaboration. Furthermore, consistent with a positive link between shareholder governance and firm value, she finds that stronger shareholder governance increases tangible financial results in the short-term.

However, she finds that by focusing on the tangible aspects of firm's performance, the firm's intangible assets associated with customer satisfaction and employee integrity declines, and this partially reverses the gains from greater results-orientation. She argues that these results are consistent with a model of multitasking where stronger governance encourages managers to focus on easy-to-observe short-term targets at the expense of the harder-to-measure intangibles, even though to do so is not in the long-run interest of the firm.

More recently, Au et al. (2018) identify employee flexibility as an important dimension of corporate culture that leads to higher firm value. Further, they note that this is particularly true for those firms that are exposed to high exogenous risk. In particular, they estimate firms' employee flexibility scores using a textual analysis of job reviews published by a career intelligence website for a sample of S&P1500 listed firms. They find that firms with a strong employee flexibility score earn abnormally high stock returns. Moreover, consistent with their hypothesis that firms with proactive and resilient employees respond best to unexpected situations, they find that the benefits of greater employee flexibility are concentrated on those firms with an elevated exposure to systematic risk and in periods of policy uncertainty. Also, they find that firms with a culture of flexibility have higher gross profitability. All told, their results suggest that a culture of employee flexibility is valuable but market participants do not fully value this intangible asset.

2.2.2.3 Earnings Manipulation

Considering the impact of firm's culture on earnings manipulation, Benmelech and Frydman (2015) explore how the personal traits of CEOs can help to shape the corporate culture and the effect that this can have on firms' propensity to commit financial fraud. To achieve this, they take

advantage of exogenous variation in the propensity to serve in the military (see, for example, Angrist et al., 1990, 1991, 1998) and find that military service is associated with conservative corporate policies and ethical behavior. In particular, they find that CEOs with military service pursue lower levels of corporate R&D investment and are less likely to be involved in fraudulent corporate activity. Further, they find that firms which have Military CEOs have superior performance during industry downturns. Taken together, their finding suggests that CEOs with military service are able to shape the corporate environment and firm outcomes.

Furthermore, Biggerstaff et al. (2015) explore the ability of management to shape corporate culture and the implications that this can have on fraudulent activity by examining the culture of firms' top executives and whether this affects corporate malfeasance. To do this, they explore the relationship between those firm CEOs who personally benefit from options backdating (i.e. "suspect CEOs") and various forms of corporate misbehavior and find that such CEOs are more likely to engage in financial fraud and to overstate earnings. Thus, they argue that whether CEOs personally benefit from options backdating is suggestive of an unethical corporate culture. Further, they find that private companies are more likely to be acquired by suspect CEOs and that this is possible in an effort to hide the frauds that such CEOs commit. Also, they note that when suspect CEOs make acquisitions the market response is more muted. They also find that the relation between suspect CEOs and corporate misbehavior is acuter for externally hired CEOs and this is consistent with outside CEOs having a greater ability to help shape firms' corporate culture (Hambrick and Mason, 1984). Importantly, they point out that the cost of such corporate misbehaviors is reflected in larger stock price declines/crashes during market corrections and increased CEO turnover rates.

Focusing on the implications of corporate culture to financial fraud, Braguinsky and Mityakov (2015) consider differences in corporate culture between multinational corporations and privately held domestic firms in Russia. They note that firms from developed countries usually have a culture of transparency and that this is in contrast with firms from transition economies, such as Russia, where a culture of hiding and insider dealing persist. To examine whether firms' corporate culture of transparency affects firms' proclivity to commit fraud, they make use of Russian administrative data on reported earnings and the market values of cars. Based on the intuition that reported earnings can be more easily falsified relative to car values in Moscow, they measure transparency as the difference in employees reported earnings and car values. Using this measure of transparency, they find that the employees' earnings reported by foreign-owned firms are, on average, four times higher than those reported by domestic firms for employees with the same car values. Further, they show that closer ties with multinational firms lead to increased wage reporting transparency by privately held Russian companies. Also, they find a positive relationship between a corporate culture of transparency and increased hiring from multinational firms.

Likewise, Davidson et al. (2015) examine the influence of corporate culture on financial reporting by considering how executives' behavior external to the workplace is related to financial reporting risk. In particular, they explore whether executives' ownership of luxury goods, including expensive cars, boats, and real estate etc. (their "frugality") and whether they have prior legal infractions predicts fraudulent activity and material mistakes in corporate reporting. They find that CEOs and CFOs who have a legal record are more likely to engage in fraudulent reporting. However, they find no relation between executives' frugality and their likelihood to engage in fraudulent corporate reporting. Instead, they note that less frugal CEOs generally administer over a relatively weak internal control environment that is characterized by a comparatively high

likelihood of fraud being committed by others. They also find that unintentional material reporting mistakes are also more likely when CEOs are less frugal. Further, they find that cultural changes that are consistent with an increased risk of fraud are associated with less frugal CEOs.

Moreover, DeBacker et al. (2015) explore how corporate cultural norms affect illicit corporate activities. Using confidential U.S. data obtained from the Internal Revenue Service (IRS) audits and Corruption Perception Index (CPI) published by Transparency International, they find that foreign-owned/controlled U.S based firms are more likely to evade taxes when the owners are from countries that have higher levels of corruption norms. They also note that this effect is more pronounced among smaller firms and is decreasing in firm size. Furthermore, they find that enforcement efforts aimed at reducing tax evasion are less effective in corporations whose owners are from corrupt countries.

What's more, Liu (2016) considers the role played by corporate culture in influencing corporate misconduct. Using a large sample of U.S. publicly listed firm-year observations, she examines whether a firm's corruption culture influences corporate misbehavior. To measure corruption culture, she adopts the epidemiological approach as described in Fernández (2011), where it is assumed that when individuals emigrate to a new country, their prior cultural values, norms, and beliefs travel with them and are passed down to their descendants (Guiso et al., 2015b). Thus, corruption culture is proxied as the average corruption values for all insiders, where individuals' corruption values are based on the corruption index in the insiders' country of ancestry identified using their surnames (Lauderdale and Kestenbaum, 2000). Using this measure, she finds that firms with high corruption culture are more likely to engage in earnings management, accounting fraud, option backdating, and opportunistic insider trading. Further, she finds evidence that corruption

culture operates both as a selection mechanism and by having a direct effect on individual behavior.

In a recent and thought-provoking paper, Grieser et al. (2016) explore the effects of firms' culture on earnings manipulation by moving beyond the self-reported measures of integrity used in previous studies (see e.g., Guiso et al., 2015b), to a measure based on individual employee action. Specifically, they use the frequency of employees' decision to register for, and use, AshleyMadison.com, a website that facilitates extramarital affairs, as a measure of integrity. They find that in those firms that score low on integrity, as their employees have a high number of active accounts with AshleyMadison.com, are associated with a greater probability of SEC enforcement actions for accounting misstatements, lower corporate ethics ratings by external analysts, and a greater propensity for tax-avoidance. However, they also report that such firms also have higher research and development output, more patents and patent citations, and greater patent diversity, thereby suggesting a link between a lack of integrity and higher levels of creativity.

Bhandari et al. (2017) examine the effect of firms' corporate culture on earnings management practices. To quantify culture they follow past studies (e.g., Fiordelisi and Ricci, 2014) by adopting the competing values framework and implementing a textual analysis of firms' 10-K filings for a large sample of US firms. They measure firms' earnings management practices using an accruals-based model of earnings management, real activities based model of earnings management, and the presence of a GAAP violation. They find that firms with collaboration (competition) oriented corporate cultures are more (less) likely to manage earnings, while firms with the control culture are more prone to engage in real activities based earnings manipulation only. Further, they find that auditors price the risk of culture-driven earnings manipulation since

firms with collaboration and control culture face on average higher audit fees, while firms with the competition culture face on average lower audit fees.

2.2.2.4 Bank Behavior

In a recent examination of the relevance of corporate culture to bank behavior, Barth (2016) utilize the competing values framework of corporate culture proposed by Quinn and Rohrbaugh (1981, 1983), Cameron and Quinn, (2011), and Cameron et al. (2014). In particular, following the theoretical literature which suggests that corporate culture plays an important role in the sorting process of workers into firms (see e.g. Friebel and Giannetti, 2009; Van den Steen, 2010a, 2010b), he examines whether banks that differ in terms of their corporate culture also differ in terms of the compensation schemes that they deploy, plausibly in an effort to attract a particular type of staff. Consistent with this, he finds that at banks with a stronger competition culture CEOs' total compensation have a larger proportion of variable elements. Furthermore, investigating the impact of corporate culture on banks' risk-taking and performance, he finds that banks with more competition culture are associated with higher levels of credit risk and higher buy-and-hold stock market return.

Moreover, Bushman et al. (2017) explore the role of corporate culture in banking by considering whether and how bank CEO materialism influences bank culture. In particular, they measure CEO materialism using a revealed preference approach similar to that previously adopted by Davidson et al., (2015) for non-financial firms which suggest that executives' personal ownership of luxury goods can be viewed as a manifestation of relatively high materialism. Consistent with the Upper Echelons Theory" (see Hambrick and Mason 1984), they expect these manifestations of CEO

materialism to have implications for the behavior of non-CEO executives. Specifically, they examine the extent to which bank CEOs exert influence on the corporate cultures of banks by exploring how bank CEO materialism has evolved over time. Further, they explore how bank CEO materialism is associated with observed risk management policies, the behavior of non-CEO executives and bank tail risk. They find that the percentage of banks run by materialistic CEOs has increased during the 1994 to 2004 period and that this has coincided with a significant amount of deregulation in the banking industry. Moreover, using an index that reflects the strength of Bank's risk management functions (RMI), they find that RMI is significantly lower for banks with materialistic CEOs. Additional, they provide evidence consistent with non-CEO executives in such banks being more aggressive in exploiting insider trading opportunities around government interventions during the financial crisis. Finally, they find that banks with materialistic CEOs have considerably more downside tail risk compared to those banks with more frugal (i.e. less materialistic) CEOs and that the difference between downside tail risk for these two groups of banks increased significantly during the recent crisis.

In a related study, Nguyen et al. (2018) explore the effect of banks' corporate culture on bank lending decisions. Using the CVF, they find that compete culture banks are associated with riskier lending behavior. That is, these banks have higher approval rates, lower borrower quality, and fewer covenant requirements. Further, these banks exhibit higher loan growth but incur larger loan losses. As a result, they find that such banks make greater contributions to overall systemic risk. However, they find the opposite result among banks with the control culture.

2.2.2.5 Mergers and Acquisitions

Recent papers in finance have also studied the impact of corporate culture on the likelihood and success of M&A activity. For instance, Tremblay (2016) uses a textual analysis of firms' annual reports to develop an estimate of the cultural similarity of combining firms. In particular, she quantifies the dimensions of corporate culture by counting the frequency of words in a firm's 10-K filing that correspond to the competing values framework (Cameron et al., 2014). Tremblay (2016) then measures the cultural similarity between two merging firms using the correspondence of these word counts. Based on this measure, she finds that when the cultural distance between the firms is greater, this leads to higher synergistic gains post-merger, but only when the acquiring firm has a stronger culture than that of its target. Further, she finds that the synergy gains are concentrated among deals where the acquirer's values are not antagonistic to those of the target firm.

Similarly, Bereskin et al. (2017) examine the effects of corporate cultural similarity on M&A decisions and outcomes. They hypothesize that the similarity between two firms in terms of corporate social responsibility (CSR) practices reflects cultural similarity between them and that this is positively related to the probability that such firms will form merger pairs, and that post-merger performance will be superior. They note that an essential feature of this hypothesis is that firms with analogous CSR behavior have similar corporate cultures and will experience less post-merger integration challenges. To measure CSR similarity they adopt a textual analysis based approach where they apply Jaffie's (1986) distance measure for a given pair of firms' CSR policies obtained from the KLD database. Using this measure of firms' CSR similarity, they find that firms with similar corporate culture are indeed more likely to merge. Furthermore, consistent with the notion that cultural similarity eases post-deal integration, they find that these mergers are

associated with greater synergies, superior long-run operating performance, and fewer of write-offs.

2.3 Summary

In this chapter, we define the term culture as a broad, inherently complex and intangible concept that reflects group values and decision-making environment. In so doing, we introduce it as an important, economically valid and significant empirical construct, particularly at the corporate level, that is of increasing relevance and interest to researchers in finance and economics. We then review a wide array of taxonomies for corporate (i.e. organizational) culture, where we focus on those better documented theoretical frameworks that have emerged in the rich organization behavior literature on the theme (see for example, Handy, 1976; Deal and Kennedy, 1982; Reynolds, 1986; Johnson, 1988; Denison, 1990, O'Reilly et al., 1991; Schein, 1990, 1992; Hofstede, 1980, 2001, 2011; Cameron and Quinn, 2011; Cameron et al., 2014).

Following this, we supplement our understanding of the implication of firms' corporate culture by perusing and highlighting the key findings from the empirical finance related literature that documents the role of firms' corporate culture as an important explanatory variable for explaining firms' economic policies and outcomes. And, as we have seen, this past literature suggests that corporate culture impacts firms' level of performance (Fiordelisi and Ricci, 2014; Guiso et al., 2015a; Mironov 2015), firm value (Popadak, 2013; Benmelech and Frydman, 2015; Au et al., 2018), earnings manipulation activity (Benmelech and Frydman, 2015; Biggerstaff et al., 2015; Braguinsky and Mityakov, 2015; Davidson et al., 2015; DeBacker et al. 2015; Liu, 2016; Bhandari et al., 2017; Grieser et al., 2016), bank behavior (Bushman et al., 2017; Barth, 2017; Nguyen et

al.,2018), and merger and acquisition activity (Tremblay, 2016; Bereskin et al., 2017), among many other outcomes.

Table 2.1: Taxonomies of Corporate Culture

This table presents a list of taxonomies and theoretical frameworks on organizational culture and hence corporate culture that have been developed in recent decades.

Handy (1976)	*Power culture*: This captures degree to which tactical and strategic decision making authority is held by a key central person or among a small group. *Role culture*: Organisations with this type of culture seek to delegate decision making authority to individuals with defined functions and specialties. *Task culture*: This indicated the degree to which decision-making authority resides with small collaborative teams with varying expertise who collectively solve problems and execute tasks. *Person culture*: In this cultural type, the individual is the central focal point and thus they believe themselves to be set apart from the organization.
Deal and Kennedy (1982)	*Work-hard/ play-hard culture*: Organizations with this culture focus on swift learning and rapid feedback to members as it relates to their performance; these members are encouraged to take low risk. *Tough-guy/ macho culture*: This type of culture emphasizes rapid learning and feedback but encourages members to take on high degrees of risk. *Process culture*: In this culture, learning and feedback is slow and members take on low risk. *Bet-the-company culture*: In this type of culture, members are encouraged to take on higher levels of risk but provides slow learning and feedback.
Reynolds (1986)	*External versus internal domain*: Organizations with greater external emphasis focus on satisfying customers and other external stakeholders, while those organizations with an internal emphasis concentrate on enhancing the efficiency and effectiveness of internal activities. *Task versus social domain*: This dimension measures the degree to which organizations view either task completion or meeting the social needs and desires of members as more important. *Risk versus safety domain*: This domain captures how willing organizational members are to accept and adapt to changing environments and processes. *Conformity versus individuality domain*: This domain measures the degree to which the members or the organization are forced to conform to the group. *Individual versus group rewards domain*: This dimension captures whether the organization rewards members as a group and/or individually. *Individual versus collective decision-making domain*: This dimension measures the degree to which decisions are made by individuals or as a group. *Centralized versus decentralized decision-making domain*: This domain denotes whether decisions are made by those in senior positions in the organization or by those with the day to day responsibility. *Ad hockery versus planning domain*: This domain reveals the degree to which the organization develops in a highly planned or unplanned manner. *Stability versus innovation domain*: This captures whether the organization is open to adopting new and unique goods, services, and processes. *Cooperation versus competition domain*: This domain reflects the attitude of individuals towards internal competition with other members of the organization for rewards and status versus their attitude towards teamwork and collaboration. *Simple versus complex organization domain*: This dimension measures the degree of complexity of the internal political processes as well as the formal and informal structures of the organization. *Informal versus formalize procedures domain*: This reflects the tendency within the firm to have detailed rules and procedures for making decisions. *High versus low loyalty domain*: This captures the degree of loyalty individuals have to the organization compared to other relevant groups. *Ignorance versus knowledge domain*: This reveals the degree to which organizations communicate their performance expectations to members.
Johnson (1988)	*Paradigm*: This cultural element describes what the institution is all about, what it does, its values, its mission, and its objectives. *Control systems*: This element of organization culture captures the degree to which processes are put in place to monitor internal activities. *Organizational structures*: This defines the internal reporting lines that describe the way that work flows through the organization. *Power structures*: This is the degree to which individuals or groups of individuals make the decisions in the organization. *Symbols*: This includes the organizational logos and designs as well as those internal symbols of power. *Rituals and routines*: These are those habitual organizational practices that occur as a matter of habit rather than necessity. *Stories and myths*: This cultural element refers to those narratives accumulated about people and events that communicate what is valued.

(continued on the next page)

Table 2.1 cont'd.

Denison (1990)	*Involvement domain*: This cultural domain refers to the degree to which the organization is able to create a sense of ownership and responsibility. *Consistency domain*: This dimension captures the relationship between aspects of organizational culture and organizational effectiveness. *Adaptability domain*: This domain refers to the capacity of an organization to respond to the external environment. *Mission domain*: This dimension captures the degree to which there is a shared purpose and direction for the organization and its members.
O'Reilly et al. (1991, 1996, 2012)	*Adaptability*: This type of organization culture defines the willingness to experiment, take risk and innovate. *Collaboration*: This culture denotes the attitude individuals within the organisation have towards working with others. *Customer-orientation*: this indicates the degree to which customers are listened to. *Detail-orientation*: This type of organizational culture refers to the attention paid to detail within the organization. *Integrity*: This organizational culture signifies the regard held for honesty and high ethical standards. *Results-orientation*: This culture denotes the emphasis placed on performance within the organization. *Transparency*: This culture refers to the degree to which the information about the organisation's goals and practices are shared with interested parties.
Schein (1990, 1992)	*Artifacts*: These are those cultural elements that are visible to those external to the institution. *Espoused values*: These represent those unwritten norms and customs that members understand and follow self-consciously. *Assumptions*: These are those core values that are shared by members of the group but that are often imperceptible even to these members.
Hofstede (2011)	*Process-oriented versus results-oriented*: Organisations with a process-oriented culture seek to avoid risk and focus on the technical and bureaucratic aspects of how the work is done. On the other hand, organizations that are results-oriented take on more risk and focus on what is to be done. *Job-oriented versus employee-oriented*: In job-oriented organizational cultures, members are held responsible for their performance without much regard for their individual wellbeing. In contrast, organizations with an employee-oriented culture take both performance and the welfare of members. *Professional versus parochial*: In organizations with a professional culture, members are identified with their job category/type. Conversely, in institutions that adopt a parochial culture, members are identified with their various organizational subunits/ groups. *Open system versus closed system*: In an open system, information is accessible to both insiders and outsiders, while in a closed system this information is not as accessible to outsiders. *Tight control versus loose control*: In a tight control culture, organizational members are exposed more control and discipline, while in a loose control culture members are expected to be less formal. *Pragmatic versus normative*: In a pragmatic culture, the organization is externally driven and focuses on satisfying end users without much regard for norms. Conversely, in a normative culture, the organization is internally driven with emphasis on their internal processes, ethical and compliance issues.
The Competing Values Framework	*Competition culture*: Organisations with this type of culture value the accomplishment of measurable and stretch goals. Such entities focus on the external environment and the formal control orientation reflects stability. *Creation culture*: This type of cultural form is characterized by high levels of creativity, innovation and risk-taking behavior. Organization with this culture focus on the external environment and the formal control orientation is one of flexibility. *Collaboration culture*: Organisations with this type of culture place emphasis on internal effectiveness, while allowing for a flexible form of control. Members exhibit a commitment to the organization and other members of the group. The organization also has a long-term commitment to the members. *Control culture*: Organizations with this type of culture are concerned with long-term efficiency, predictability, and stability. The emphasis of attention of this organization is internal, and the formal control is stable.

Chapter 3 Literature Review: What is Textual Analysis, and can we use it to Measure Corporate Culture?

3.1 Introduction

The textual analysis approach also sometimes referred to as content analysis, computational linguistics, information retrieval, natural language processing etc., refers to the systematic and objective quantification of the semantic content contained in a body of text. This notion of parsing text to discover patterns allows for the unearthing of valuable information in text and has a long history as it has been applied in many different contexts and disciplines. For instance, in a recent comprehensive review on the topic, Loughan and McDonald (2016) note that in the 1300s Catholic priest used a form of textual analysis to provide indexes of common biblical phrases. However, Loughan and McDonald (2016) point out that it wasn't until the 1960s that textual analysis achieved wider popularity with Mosteller and Wallace's (1964) reliance on it to determine the disputed authorship of the Federalist Papers.

In the years since, the publication of a large corpus of unstructured textual information that is available online in news articles, conference calls, Security and Exchange Commission (SEC) filings, and text generated by social media outlets like Twitter and Facebook, coupled with significant increases in computational power and the accuracy of statistical parsing techniques has led to researchers in finance and related fields exploring whether textual analysis can be used to extract valuable information from these sources (see for example, Antweiler and Frank, 2004; Das and Chen, 2007; Tetlock, 2007; Li, 2008, 2010a, 2010b, 2010c; Loughran and McDonald, 2009, 2011, 2016; Hoberg and Phillips, 2010, 2016, Li et al., 2013a; Fiordelisi and Ricci, 2014; Hoberg et al., 2014; Kearney and Liu, 2014; Audi et al., 2016; Bushman et al., 2016).

Of particular importance to researchers in finance is whether the corporate disclosures provide economically meaningful information. A relationship between the textual content of firms'

corporate disclosures and firms' economic outcomes is plausible since it is likely that information contained in such documents provide insights into managements' operating philosophies, societal norms, design and characteristics, incentives, and private information sets, which in turn guide the data generation process which creates the financial numbers. Thus, it is reasonable to expect that the textual information provided in corporate disclosures offers an important context for interpreting the financial data produced, and can be used to answer important research questions, and test economically interesting hypotheses.

To be sure, the transmission of firm-specific qualitative information to the public is of paramount importance for the efficiency of stock markets (Li and Ramesh, 2009; Li, 2010a; Feldman et al., 2010), firm's information environment (Kothari et al., 2009) and the behavior of investors and financial analysts (Miller, 2010; Lehavy et al., 2011). Textual disclosures do not only affect how investors react to and trade on the obtained information, but also reveal particular managerial characteristics (Li, 2010a, 2011), various management incentives (Simon, 1997) and firm's behavior in a potentially litigious environment (Nelson and Pritchard, 2007). Hence, understanding the short- and long-run value of the firm through the prism of corporate disclosures among other pieces of firm-related text is of broad interest both to academics and practitioners and has become possible due to the technological breakthrough of textual analysis techniques. However, to date, the application of textual analysis to analyze firm's corporate disclosures remains an emerging area in the finance literature. In the subsequent sections, we discuss the main techniques used and how these have been applied in finance-related research.

3.2 Textual Analysis Techniques and Applications

In this section, we discuss the techniques that are designed to extract relevant information content from a body of text and explore how these tools have been applied. Generally, textual analysis can be thought of as a three-step process that involves i) collecting text data, ii) preparing and cleaning text data, and analyzing text data. During the collecting phase, the researcher collates the necessary text data on firms from one or more of a varied range of sources (e.g. corporate disclosures, Twitter, web forms etc.). After collecting the text data, which is unstructured in nature, the researcher pre-processes the text. This may involve converting words into lower case so that capitalisation is ignored, removing (or replacing) any URLs embedded in the document to ensure that the analysis is not biased due to web addresses, removing (or replacing) all non–words and punctuations, and trimming to a single space all white spaces (e.g. tabs and newlines). Finally, during the analysis phase, the researcher further processes the data using a variety of techniques to derive information from the body of text. Broadly speaking, such techniques can be divided into two approaches; namely, lexicon-based approaches and statistical learning approaches. Table 3.1 presents a summary of the textual analysis techniques discussed in this chapter.

3.2.1 Lexicon Based Approaches

3.2.1.1 Readability

Lexicon-based approaches rely on the direct use of the words contained in a body of text. One such methodology makes use of the quantity and complexity of these words to examine the ease with which an investor can read and understand the corporate disclosures. In so doing, these methods seek to quantify the readability of firms' corporate disclosures using an algorithm that

produces a score based on the quantity and complexity of the words in each sentence in the text (see e.g. Li, 2008; Loughran and McDonald, 2014; Bonsall IV et al., 2017). Researchers document that firms with reports that are difficult to read tend to exhibit higher stock volatility, analyst dispersion, and earnings surprises. These implications are more likely to reflect the complexity of a firm's business.

Li (2008) introduces to finance the first well-known measure of readability for 10-K reports; namely, the "Fog Index". This index is based on the average sentence length and the percentage of complex words (i.e. words with more than two syllables). They show that firms with difficult-to-read reports exhibit lower documented earnings. Following Li (2008), a large number of studies exploit the Fog Index and link it with capital investment efficiency (Biddle et al., 2009), small investors' trading behavior (Miller, 2010), retail investors' ownership (Lawrence, 2013), analyst coverage and dispersion (Lehavy et al., 2011).

However, the recent study of Loughran and McDonald (2014) identify a number of weaknesses of the Fog Index and propose a new easy to construct and intuitive measure of readability. In particular, they point out that the number of complex words and sentence length are negatively related to each other; hence, the Fog Index is likely to be misspecified. Furthermore, the definition of complex words used by Li (2008) is more likely to reflect the industry-specific component rather than the complexity of 10-K reports. For example, such words as "financial, company, operations, and management" can be easily digested by investors and do not reflect difficult-to-interpret information in business documents. Hence, as an easy to replicate and straightforward proxy for readability, Loughran and McDonald (2014) introduce the natural logarithm of gross 10-K file size and show that it can serve as a good proxy.

Another measure of readability for financial reports was recently proposed by Bonsall IV et al. (2017). Particularly, they posit the "Bog Index", which consists of three multifaceted components i) average sentence length scaled by standard long sentence limit of 35 words, ii) plain English style problems (frequent use of passive and hidden verbs, overwriting, legal terms, clichés) along with word difficulty (heavy words, specialist terms), and iii) good writing attribute (frequent usage of names and interesting words). The important finding of the paper is that among all readability measures, the Bog Index has the strongest effect on post-10-K filing stock volatility.

3.2.1.2 Dictionary Methods

Dictionary methods seek to reduce the dimensionality of a body of text by assuming that the order and sequence of words, as well as the context of sentences, carry no meaningful information. Such methods are typically termed "bag-of-words" approaches and consist of parsing the texts into vectors of words and word counts and the construction of a "term-document matrix".

Using the "term-document matrix", a "mapping" algorithm is applied which allocates the words into different categories based on specifically-developed word lists. Finally, following the literature on information retrieval, a term weighting scheme is routinely used to scale the raw word counts since these are likely to be strongly related to document length. Further, such term weighting schemes also account for the word frequency by putting less weight on commonly occurring words.

3.2.1.2.1 Target Words

The collection and processing of certain words in the text constitute one of the most parsimonious and powerful approaches to textual analysis. The advantage of this approach is its simplicity and lower likelihood of extracting a misspecified proxy for a certain firm characteristic. For instance, Li et al., (2013a) derive a measure of firms' product market competition from 10-K reports by counting the number of occurrences of "competition", "competitor", "competitive", "compete", "competing" and then scaling this count by the total number of words in the 10-K filings.

3.2.1.2.2 Dictionaries and Word Lists

A collection of words with similar sentiment, tone and/or meaning is typically called a "dictionary", "word lists" or "lexicons". Put another way, a dictionary is an array of words with common characteristics and interpretations that are intentionally created to determine a certain attribute of the report. The lexicon methodology is applied to the "term-document" matrix when counting the number of words pertaining to a certain lexicon category (e.g. words with positive, negative or neutral meaning) relative to the total number of words in the document. This approach allows the researcher to gauge the tone and sentiment of a financial document, with, for example, higher proportion of positive words in the filing associated with a more optimistic tone of the report. The dictionary approach has several advantageous properties including the applicability to large samples, easy replicability by other researchers; however, it is clear that the success of any dictionary-based procedure in extracting the meaning from the text critically depends on the selected dictionary (Li, 2010a; Loughran and McDonald, 2011).

The most frequently used dictionaries in finance for textual analysis are the Henry (2008) word list, the Harvard General Inquirer dictionaries, the Diction word list, and the Loughran and McDonald (2011) word list. These dictionaries contain subcategories of words that share common thematic sentiments such as optimism, pessimism, uncertainty, constraints, pleasure, emotion or pain. In the following sections, we will discuss each of these dictionaries, which are frequently used in finance to analyze the tone and sentiment of a body of text.

3.2.1.2.2.1 The Harvard General Inquirer

The most popular set of dictionaries that have been widely used by researchers in finance due to their rich thematic vocabulary in multiple subcategories and availability are the Harvard General Inquirer line of dictionaries. Tetlock (2007), in arguably one of the more innovative papers in this area, use the Harvard IV-4's (Harvard Psychological Dictionary) positive and negative lexicon categories to examine the prospective impact on the stock market of negative and positive words found in the "Abreast of the Market" Wall Street Journal (WSJ) column. Specifically, in this study, Tetlock finds that when journalistic pessimism is high, this relates to both lower subsequent stock price returns and higher stock market volatility in later periods. What is more, he observes that the pressure on stock prices is not as a result of the "Abreast of the Market" WSJ column revealing new value relevant information; however, he suggests that the "Abreast of the Market" WSJ column is nevertheless a good proxy for investor sentiment. Following Tetlock's (2007) seminal work, a number of papers use the Harvard IV-4 dictionary among other word lists to measure the sentiment and tone of corporate disclosures, news articles, and other pieces of communication (see for example, Tetlock et al., 2008; Kothari et al., 2009; Loughran and McDonald, 2009, 2011, 2016; Hanley and Hoberg, 2010; Hoberg and Phillips, 2010, 2016;

Fiordelisi and Ricci, 2014; Hoberg et al., 2014; Kearney and Liu, 2014; Da et al., 2015; Heston and Sinha, 2015).

For instance, using the Harvard IV-4 dictionary's word categories, Tetlock et al. (2008) conduct a textual analysis on news stories for several listed S&P 500 firms that appear in WSJ and Dow Jones News Service. In this work, they find that a greater frequency of negative words in firm-specific news is associated with lower earnings in subsequent periods even after controlling for other well-known determinants of earnings such as prior period financial data and analyst forecasts. Likewise, Kothari et al. (2009) rely on the Harvard IV-4 dictionary's negative and positive word lists to analyze the information content of disclosures made by firms, analysts, and various media outlets. They find that the tone of such content is related to both the volatility of stock returns and analyst forecast error dispersion. In particular, they find that a more positive tone in such disclosures is associated with lower stock return volatility and analyst forecast error dispersion. Conversely, they find that when the tone of news content in such disclosures is negative, then this is associated with significantly higher stock return volatility and analyst forecast error dispersion.

Furthermore, Hanley and Hoberg (2010) use the Harvard IV-4 dictionary's negative and positive word categories to explore the impact on future stock price returns of the tone of the initial prospectus form (Form S-1) for a large sample of initial public offerings (IPOs). They find that the tone of this form impacts stock price returns on the first day of trading. Specifically, they locate in the "Risk Factors" section of the initial prospectus form, a link between firms with an increasingly positive score on their net tone measure, computed as the percentage of positive tone words minus the percentage of negative tone words, and lower stock price returns on the first day. Furthermore, they find a positive relationship between this measure of net tone and smaller

changes in the offer price revision. Their finding suggests that investors, likely reassured that managers and underwriters face strict legal penalties for material misstatements when making IPOs, take a favorable view of the content contained in the initial prospectus form, and in particular the Risk Factors section, when the tone of such disclosure is positive.

Da et al. (2015) use the Harvard IV-4 dictionary (and the Lasswell Value Dictionary) to construct their Financial and Economic Attitudes Revealed by Search (FEARS) index. They argue that the FEARS index is able to capture investor sentiment. They operationalize the FEARS index by collating the volume of queries documented by Google Trends that relate to the Harvard IV-4 dictionary words that are indicative of economic sentiment. They find the FEARS index is able to predict short-term return reversal, temporary increases in stock price volatility, and mutual fund outflows from mutual funds to bonds and other safe havens.

Similarly, Heston and Sinha (2015) adopt the Harvard IV-4 dictionary's negative and positive word classifications to examine the effect of the sentiment of news articles published by Thomson-Reuters and stock price returns. Using a sample of more than 900,000 articles, they find that a higher score on their net tone measure, calculated as positive tone words frequencies minus negative tone words frequencies, relates to high stock price returns for the specific firms mentioned in such articles for up to one to two days after the article has been published. On the other hand, they find that firms with greater negative sentiment news articles experience lower short-term stock price returns.

The use of the Harvard IV-4 dictionary's negative and positive word classification to detect sentiment and tone in finance-related research is not without its critics. Some researchers suggest that more accurate general word lists are appropriate when seeking to capture the tone of a

document (see for example Rogers et al., 2011; Davis et al., 2012). Further, some (see for example Li, 2010a; Loughran and McDonald, 2011) suggest that the Harvard IV-4 dictionary word list is not appropriate in the context of textual analysis applied to documents related to financial information since this word list was not designed to deal with this specialized subject area. In particular, Loughran and McDonald (2011) argue that the Harvard IV-4 word list misclassifies as negative words such as "cost", "depreciation", and "liability". Furthermore, researchers find that about 75% of negative words according to the Harvard dictionary classification are typically not negative in the case of financial disclosures. For example, words such as "mine, cancer, tire or capital" tend to describe industry-specific characteristics of the firm rather than indicate a negative tone, as suggested by the Harvard list, whereas such words as "felony, litigation, misstatement or unanticipated", which are clearly associated with negative sentiment, are missing in the Harvard IV-4 lexicon. Testing whether the proposed word classification categories indeed capture the tone of 10-K reports, Loughran and McDonald (2011) document strong relations between the constructed word lists and next-day stock returns, trading volume, return volatility, and earnings surprises. For instance, portfolio sorts based on the frequency of Harvard IV-4 negative words in 10-K filings do not generate a significant predictability for 10-K filing returns, whereas using the suggested financial negative word list to rank firms produces a strong return pattern.

As a result, word list other than the Harvard IV-4 dictionary have been developed and used in finance research to assess the sentiment or tone of news releases, corporate disclosures, and other pieces of communication pertaining to the firm (Rogers et al., 2011; Loughran and McDonald, 2011; 2016; Davis et al., 2012; Price et al., 2012).

3.2.1.2.2.2 The Diction Word List

In a critique of the Harvard IV-4 word list based approach to measuring the sentiment of financial documents, Rogers et al. (2011) suggest that the Diction Optimism and Pessimism ("the Diction") word list, although not created with financial text in mind, nevertheless allows for a more suitable measure of tone in firms' corporate releases. In their paper, Rogers et al. (2011) rely on this word list to study the relationship between net tone and the likelihood of shareholder litigation. They find that firms with higher positive net tone (i.e. more optimism), measured as the percentage of Diction optimism words minus the percentage of Diction pessimism words, in their earnings announcements experience an increased likelihood of subsequent shareholders litigation action.

Similarly, Davis et al. (2012) use the Diction Optimism and Pessimism word list to explore the relationship between firms' earnings announcements and performance as measured by return on assets (ROA) in subsequent quarters. They find that firms with a more positive net tone in earnings releases achieve significantly higher subsequent ROA.

What is more, Davis and Tama-Sweet (2012) complement the prior studies of Rogers et al. (2011) and Davis et al. (2012) and find an association between the net tone (using the Diction word list) of the management discussion and analysis (MD&A) section of firm's 10-K and ROA in subsequent periods. In particular, they find that the more negative (i.e. more pessimistic) this section of a firm's 10-K is, the poorer ROA results are for the firm.

As with the use of the Harvard IV-4 dictionary word list, several authors in finance criticize the practice of using the Diction Optimism and Pessimism word list to measure tone since this list has not been developed to specifically deal with financial information (Li, 2010a; Loughran and McDonald, 2011; Loughran and McDonald, 2015). Loughran and McDonald (2011) suggest that

in fact some Diction word list positive (optimism) words, for example “necessary”, “power”, and “trust” do not usually have a positive connotation in financial disclosures, while words that are classified as negative (pessimism), such as “gross”, “no”, and “not”, do not typically have negative meanings in financial releases. These authors (among others) call for the use of finance specific word lists when undertaking a textual analysis of finance-related disclosures.

3.2.1.2.2.3 The Henry (2008) Word List

Perhaps the earliest example of a word list specifically developed to detect tone in financial disclosures is the Henry (2008) word list. In particular, Henry (2008) develops her financial dictionary for words classification in earnings press releases for high-tech industries. Since its introduction, this word list has been shown to provide valuable insight into managerial sentiment particularly during conference calls. For instance, Price et al. (2012) find that when presenters adopt a more positive tone in the question-and-answer segments of the conference calls, then such firms exhibit significantly higher stock price returns during both three-day and two-month windows. On the other hand, Price et al. (2012) find that when presenters adopt a more negative tone during this segment, such firms suffer negative abnormal stock price returns. Similarly, Doran et al. (2012) utilize the Henry (2008) word lists to study the effect of the tone of earnings conference calls for Real Estate Investment Trusts on stock price returns. Like Price et al. (2012), they find that the tone of earnings conference calls is related to stock price returns and that this is so even during the conference call when they control for earnings surprises.

However, despite being more appropriate for finance related studies, Loughran and McDonald (2011) note several limitations of the use of the Henry (2008) word lists to detect sentiment and

tone. For instance, this word list consists of 85 words compared to the over 4,100 words that make up the Harvard IV-4 dictionary and Loughran and McDonald raise this limited number of words as a potential shortcoming. They further point out that Henry's (2008) word list ignores commonly occurring negative words in financial disclosures, such as "adverse", "impairment", and "loss".

3.2.1.2.2.4 The Loughran and McDonald (2011) Word List

As an alternative to both the Harvard VI-4, Diction and Henry (2008) word lists, Loughran and McDonald (2011) develop what they argue is a more comprehensive taxonomy of words to capture the sentiment in financial disclosures and other pieces of corporate communication. In the Loughran and McDonald (LM) word list, in addition to the main "positive" and "negative" word classifications, Loughran and McDonald also create additional word classes, namely, "uncertainty", "litigious", "strong modal" and "weak modal" words. To produce these tonal classes, Loughran and McDonald (2011) develop a dictionary of words from all 10-Ks filed during 1994 to 2008. After carefully examining all words occurring in at least 5% of the documents they classify each word according to its most likely usage and sentiment in a financial context. As such, those words classified as "negative" are indicative of some adverse financial implication. Conversely, "positive" words are those that carry a favorable connotation in business. Those words classified as "uncertainty" are indicative of imprecision and/or risk, while those that reflect the potential for legal contestation are denoted as "litigious". Those words that express either strong or weak levels of confidence are classified as strong modal and weak modal words.[1] The LM word list was then used by them to evidence a relationship between managerial sentiments

[1] In later work, Bodnaruk et al. (2015) adopt a similar methodology to that used in Loughran and McDonald (2011) and propose "constraining" words, which are those words that suggest some financial constraint, for inclusion in the Loughran and McDonald word list.

detected in firms' 10-K reports and market reaction around the 10-K filing date, trading volume, unexpected returns, and subsequent stock price volatility.

Since its release, the LM word list has seen widespread acceptance and application in a range of finance and accounting related research (Feldman et al., 2010; Dougal et al., 2012; Garcia 2013; Solomon et al., 2014; Kearney and Liu 2014; Chen et al., 2017). For example, Feldman et al. (2010) use the LM word list to explore market reaction to changes in the sentiment and tone of the Management, Discussion, and Analysis (the "MD&A") section of firm's 10-K/Q filings. They find that even after controlling for known determinants of stock price changes, when the tone of the MD&A section of 10-K/Qs is more positive a firm's stock price return is higher immediately after the 10-K/Q release.

Similarly, Dougal et al. (2012), expanding on the work of Tetlock (2007), use the LM word list to consider the relationship between the authorship of the WSJ's "Abreast of the Market" column and stock market reaction. They find that individual journalists who are associated with more pessimistic column tone are related directly to more negative stock market returns on the day following the column's publication.

The LM word list has also been applied to uncover the tone of news releases beyond the WSJ's "Abreast of the Market" column. For instance, Garcia (2013) use it to measure the sentiment of two columns in the New York Times (NYT) for the period 1905–2005. He finds that the tone of these columns predict future stock price returns and that this is especially true during recessionary periods. Similarly, Chen et al. (2017) use the LM word list to explore the link between stock price returns and the tone of the commentary section of the Seeking Alpha (SA) website. They find that

the tone of opinions contained in the SA commentary is related to future stock price returns and subsequent earnings surprises.

In works reminiscent of Hanley and Hoberg (2010), Ferris et al. (2013) and Loughran and McDonald (2013) both use the LM word list to explore the impact of the tone in IPO prospectus releases. Ferris et al. (2013) investigate the impact of IPO prospectus "conservatism" on IPO pricing and subsequent operating performance and stock price returns, where they define conservatism as the proportion of negative LM words to the total words contained in the documents. In this work, they find that IPO prospectus conservatism is positively related to IPO under-pricing and that this is more pronounced for technology firms. Further, they find that when nontechnology IPO prospectuses are more conservative, this has a negative impact on firm's post-IPO operating performance. In addition, they find evidence that for nontechnology firms' IPOs conservatism is negatively related to abnormal stock price returns in the post-IPO period.

In this same direction, Loughran and McDonald (2013) used the LM word list to investigate the relation between IPO prospectus "uncertainty" and firms' first-day returns, offer price revisions, and aftermarket volatility. They proxy uncertainty as the document frequencies of weak modal and negative words and using this measure find that when firms' IPOs prospectuses have high levels of uncertainty in the text, such firms tend to experience greater first-day returns. They also find a positive relationship between text uncertainty and absolute offer price revisions and subsequent volatility.

Further consideration of investors' reaction to news tone is provided by Solomon et al. (2014), who use the LM word list to explore the relation between newspaper sentiment and investors' proclivity to invest in particular funds. They find that when funds receive newspaper coverage

that is more positive in tone this results in them receiving higher capital inflows. In a similar fashion, Hillert et al. (2014) use the LM word lists to measure the tone of mutual fund letters to shareholders and find that they are responsive to the tone of these letters.

What is more, Ahern and Sosyura (2014) use the LM word list to explore whether the tone of firm press releases can affect stock prices of acquiring firms during merger negotiations. They find that some bidders try to increase the value of their stock prices during the private negotiation phase by making press releases. In particular, they note that press releases by bidders can result in increased media coverage that is, in fact, more positive in tone and this in turn slightly increases the bidder's stock price. These findings have motivated additional research activity into whether and how managers' tone can inform or mislead investors by the tone of the language used in press releases (see, for example, Mayew and Venkatachalam, 2012; Huang et al., 2014b).

3.2.1.2.3 Term Weighting Schemes

The development of tailored dictionaries, that become suitable for financial documents, makes the word classification process easier, faster and more transparent. However, once the words are classified into different thematic subcategories, it is crucial to impose a proper normalization on the word counts. Loughran and McDonald (2011) demonstrate that the attenuation bias caused by misclassifications can be considerably reduced by applying a term weighting scheme to word occurrences. More specifically, as shown by Loughran and McDonald (2011), some negative words appear very frequently in 10-K reports (e.g. "loss" appears 179,000 times), while the word "aggravates" appears only 10 times. Term weighting helps to dampen the effect of high-frequency words on sentiment measurement and put more weight on rare but important words in 10-K filings.

Researchers exploit a log transformation of the word count and adjust the document for its length. This weighting scheme takes into account the relevance of a term in a document, the document length and significance of a term in the entire corpus. In this case, the log transformation of raw word count and average word count in the document mitigate the effect of high-frequency words, whereas the log difference between the total number of 10-Ks in the sample and the number of documents with at least one occurrence of a term changes the effect of a word based on its commonality.

In summary, the dictionary-based approach has proved a very popular technique for textual analysis in finance; however, one noted limitation is that such approaches tend to ignore the context of the document. Furthermore, such word-lists have been criticized for frequently misclassifying words due to the limited availability of thematic dictionaries for corporate statements (Li, 2010a).

3.2.2 Statistical Learning Approaches

In this section, we discuss alternative techniques for textual analysis by focusing on statistical and machine learning approaches such as Naïve Bayes (Antweiler and Frank, 2004) and semantic analysis (Boukus and Rosenberg, 2006; Blei et al., 2003) that classify a message based on the grammatical structure of the language. Compared to lexicon approaches, these statistical methodologies extract the relevant information content from a document by learning the latent structure in the text data. For instance, when applied to sentiment analysis, algorithms undertake in-sample training to "learn" grammar dependent classification rules and then define the positive, negative or neutral tone of the out-of-sample message by examining the distance between word/phrase and grammar vectors that capture these tones, or a discriminant function based on

word counts (Das and Chen, 2007). In the following subsections, we will provide a brief description of various statistical methods for analyzing text.

3.2.2.1 Naïve Bayes

According to Huang et al. (2014a), Naïve Bayes classification is a statistical learning method that can be used to categorize text documents into their most likely class based on a statistical relation (i.e. model), that is based on words and category relations that is learned from a training sample of text documents. The algorithm is called naïve since it ignores the word sequence and treats each word independently. Hence, like the dictionary-based approaches this method disregards the grammatical structure of the document; however, it enables the researcher to process huge volumes of qualitative data, accurately measure the context of documents through training the Naïve Bayes learning algorithms, and classify the entire document and or sentences into positive, negative or neutral categories. In particular, this procedure can be considered as a prediction algorithm since it maximizes the probability that a message belongs to a certain category or type conditional on the stream of words in the document.

The input parameters in this algorithm, the likelihood of word occurrences conditional on the particular category, are obtained through training on an initial dataset, which usually represents a limited number of randomly selected sentences from financial reports. As a result of this in-sample learning, the Naïve Bayes model is developed and is then used to classify out-of-sample sentences in reports as either negative, positive or neutral.

In an early and important study that asks the question "does message tone matter?", Antweiler and Frank (2004) apply Naïve Bayes to explore the influence of "Yahoo Finance" message boards

postings for companies listed on the Dow Jones Industrial Average (Dow). In particular, they use this approach to classify tone of the posted messages. They find that these financial messages do indeed matter and they can predict the volatility of the index as a small degree of negative return predictability is generated by bullishness, while disagreement among messages generates higher trading activity.

Another important study in this area by Huang et al. (2014a) exploit the Naïve Bayes learning approach to measure the sentiment from more than 350,000 analyst reports. In fact, their training procedure processed about 27 million sentences from analyst reports. The findings from this large-scale study illustrate that even a few positive sentences make a significant impact on the earnings growth rate of a company.

3.2.2.2 Semantic Analysis

Another method for classifying the content of documents into certain thematic groups, which is free of using any lexicon is semantic analysis. This approach is specifically designed to define the themes within a corpus of reports by reducing the dimensionality of the term-document matrix through the assignment of each word to latent factors. The most frequently used techniques for semantic analysis are latent semantic indexing, which reduces the dimension of the term-document matrix using singular value decomposition (SVD), and latent Dirichlet allocation (LDA), that utilizes a Bayesian model with a variety of latent topics.

In particular, latent semantic analysis reduces the dimension of the "term-document" matrix using singular value decomposition. Applying a latent semantic analysis, Boukus and Rosenberg (2006) investigate market reaction to Federal Reserve policy as reflected in the Federal Open

Market Committee (FOMC) meeting minutes. They show that themes, derived from the minutes, are correlated with current and future macroeconomic and financial indicators, with, for instance, FOMC minutes strongly affecting Treasury yields.

Similarly, latent Dirichlet allocation aims to discern the latent structure from the array of documents by applying the Bayesian model to shrink the dimensionality of the "term-document" matrix. This procedure helps to analyze a large corpus of lengthy documents in a clear and replicable manner and infer the content of documents with multiple topics. The recent study by Dyer et al. (2017) examine the changing content of 10-K filings and demonstrates that these reports become more lengthy, redundant, sticky, less readable and specific. Bellstam et al. (2017) propose a new measure of text-based innovation by applying a topic modeling tool such as latent Dirichlet allocation to the large corpus of financial reports and capture innovation by the intensity with which analysts mention innovation topics in the reports. The paper finds that this proxy for innovation is strongly related to R&D expenditures and forecasts future R&D spending.

3.2.2.3 Similarity Analysis

There also exist tools that aim to measure the semantic similarity across documents. For example, Hoberg and Phillips (2016) establish new time-varying measures of product similarity based on firms' 10-K product descriptions. In particular, Hoberg and Phillips (2016) construct proxies of product similarity across firms using 10-K product descriptions and cosine similarity measure. To explore the relatedness between firms, researchers collect unique words in 10-K business descriptions that specify the characteristics of firm's products and estimate pair-wise word similarity scores for each pair of companies within a year. These researchers document that

a higher firm's expenditure on R&D is associated with a significant decrease in measures of product similarity and a substantial increase in future profitability.

Similarly, Cohen et al., (2016) propose the use of various measures of document similarity to capture the effect of active changes in firm's reports on asset prices. Specifically, Cohen et al. (2016), using the history of 10-K and 10-Q reports over the period from 1995-2014, examine the changes in the language structure of corporate reports across time by applying four commonly used similarity measures; namely, cosine similarity, Jaccard similarity, minimum edit distance and simple similarity. The essence of these measures lies in converting two documents into vectors of word counts (or a number of occurrences of a certain term) and exploiting various geometrical formulas for measuring the closeness of two vectors. This paper finds a strong return predictability pattern stemming from firms that change significantly their reporting style. Particularly, a portfolio that buys "non-changers" and short "changers" generate a monthly abnormal return of 30-60 basis points.

3.3 Can Textual Analysis be used to Measure Corporate Culture?

As we have discussed in Chapter 2, corporate culture remains a difficult to observe and measure force within firms that explains variations in firms' performance and other corporate behavior. In fact, one reason often given for the limited empirical research that concerns the role of corporate culture has been the absence of large-scale samples with high-quality data about this construct (Fiordelisi and Ricci, 2014; Guiso et al., 2015a, 2015b; Graham et al., 2017). Traditionally, corporate culture has been measured using various survey instruments that seek to capture managements' and /or employees' perceptions and opinions about the firm (Guiso et al., 2015a,

Graham et al., 2017). This approach for detecting corporate culture is a commonly used research strategy as it allows for easy comparisons and the appearance of authoritativeness (Saunders et al., 2016).

For instance, Graham et al. (2017) conduct a survey and interview-based analysis of 1,348 North American firms to investigate the question, "*does corporate culture matter?*", and use this information to consider whether differences in corporate culture explains why similar firms experience divergence in terms of success and failure. However, although the survey designs adopted by Graham et al. (2017) allows researchers to capture corporate culture from a relatively large cross-section of respondents, in practice this approach is limited due to the response availability of survey participants and the costs of administering questionnaires on a large scale. Further, sampling and non-sampling errors pose a challenge to the accuracy of the results. What is more, disadvantages stemming from the social interaction of the researcher and the respondents and the potential inaccuracy of responses all remain potential sources of errors for survey research designs.

In addition to survey-based methods, the textual analysis of firms' corporate disclosures and other documents has emerged as an increasingly popular approach to quantify various aspects of corporate culture (Popadak, 2013; Fiordelisi and Ricci, 2014; Barth, 2016; Bhandari et al., 2017; Nguyen et al., 2018). This is because, unlike the survey approach, this method to quantifying firms' corporate culture is more practical for large-scale research studies as it allows for the measurement of the key dimensions of the construct in a manageable and objective way using firms' archival documents. Furthermore, given the large increase in the number of corporate disclosures and other related documents in recent years, it should come as no surprise that this has led to researchers in finance leveraging tools developed in computer science and linguistics to

parse the words contained in these documents to unearth firm features and traits. In doing so, researchers actively adopt the assumption that the expressions and words chosen by management in producing firms' disclosures are representative of firms' culture that has been developed. Thus, the finance-related literature on corporate culture has begun to make increasing use of various textual analysis techniques in order to understand how a firm's culture relates to various economic phenomena.

For instance, Popadak (2013) applies a textual analysis approach to an original dataset consisting of over 1.8 million employee reviews to quantify corporate culture based on the O'Reilly et al. (1991, 1996, 2012) model. Similarly, Fiordelisi and Ricci (2014) utilize the textual analysis method to measure corporate culture from firms' readily available corporate reports (i.e. the 10-K filings). In doing this, Fiordelisi and Ricci (2014) adopt the competing values framework of culture.

In fact, the ease and extendibility of the approach taken by Fiordelisi and Ricci (2014) have seen their textual analysis based approach to quantifying culture become increasingly popular with researchers in finance. For example, Barth (2016) and Nguyen et al. (2018) utilize this method to explore the role played by corporate culture in banks, while Bhandari et al. (2017) adopt a similar textual analysis approach to examine the impact of firms' corporate culture on earnings management practices.

Hence, given the previous studies (Popadak, 2013; Fiordelisi and Ricci, 2014; Barth, 2016; Bhandari et al., 2017; Nguyen et al., 2018), it seems reasonable to suggest that a textual analysis of certain firm related documents represents a suitable approach to measuring corporate culture; however, it should also be mentioned that this approach to capturing corporate culture has also

been criticized. For example, Guiso et al (2015b) shed some doubt on whether firms stated values, such as those contained in firms' disclosures, should be used to measure firms' corporate culture as they find that firms' stated values are in fact not indicative of corporate culture.

Furthermore, the finding that firms' proclaimed values should be viewed with suspicion is also supported by the prior work of Loughran et al. (2009) who investigate the occurrence of ethics-related terms in firms' 10-K reports and find that firms that use more ethics-related terms in these reports are more likely to have an unethical corporate culture. That is, these firms are more prone to be the subject of class action lawsuits, and are expected to have inadequate corporate governance policies (e.g. entrenched managers). Their results suggest that managers who portray their firm as being more "ethical" in 10-K reports are in fact more likely to be systematically misleading the public.

Nevertheless, despite these limitations in this thesis we adopt a textual analysis based approach to quantify firm's competition culture as we maintain, consistent with past literature (see e.g. Fiordelisi and Ricci, 2014; Barth, 2016; Bhandari et al., 2017; Nguyen et al., 2018) that the textual analysis of firm's 10-K filings represents an efficient way of capturing the latent (and proclaimed) values of management. Furthermore, this method allows us to exploit a large corpus of archival data that are available for firms and thereby overcome the severe data limitation problem that would otherwise be associated with the intended study had we adopt an alternative research design (e.g. surveys).

3.4 Summary

In summary, textual analysis has recently been proven to be a valuable tool in finance to measure relevant information from various texts (see e.g. Antweiler and Murray, 2004; Tetlock, 2007; Tetlock et al., 2008; Hoberg and Hanley, 2010; Hoberg and Phillips, 2010; Li, 2008; Loughran and McDonald, 2011; Kearney and Liu, 2014; Audi et al., 2016). Further, we have discussed the relevance of this approach for quantifying corporate culture and although it remains questionable as to whether corporate culture is best measured using this approach, it seems reasonable since the words used by the management of a firm and the meanings that they carry should reflect the values that these individuals have developed over time. Therefore, by analyzing the corporate disclosures produced by the firm, we argue that we are able to detect the elusive but distinctive features of firms' corporate culture that are reflected in such documents.

Table 3.1: Textual Analysis Techniques

This table presents a summary of selected textual analysis techniques that are designed to extract the relevant information content from a body of text and explore.

Lexicon Based Approaches: These approaches rely on the direct use of the words contained in a body of text.

- **Readability:** When measuring readability the quantity and complexity of the words used are to examine to gauge the ease with which a reader (i.e. investor) can read and understand the corporate disclosures.
  - Li (2008) introduces the first well-known measure of readability for 10-K reports; namely, the "Fog Index".
  - Loughran and McDonald (2014) propose the use of the natural logarithm of gross 10-K file size and show that it can serve as a good proxy of readability.
  - Bonsall IV et al. (2017) posit the "Bog Index" as a new more accurate measure on readability.
- **Dictionary Methods:** These approaches seek to reduce the dimensionality of a body of text by assuming that the order and sequence of words, as well as the context of sentences, carry no meaningful information. These methods are typically termed "bag-of-words" approaches
  - **Target Words:** The collection and processing of certain words in the text constitute one of the most parsimonious and powerful approaches to textual analysis.
  - **Dictionaries and Word Lists:** A collection of words with similar sentiment, tone and/or meaning is typically called a "dictionary", "word lists" or "lexicons". Hence, this approach entails the use of an array of words with common characteristics and interpretations that are intentionally created to determine a certain attribute of the report.
  - The most frequently used dictionaries in finance for textual analysis are the Henry's (2008) word list, the Harvard's General Inquirer dictionaries, the Diction word list, and the Loughran and McDonald's (2011) word list. These dictionaries contain subcategories of words that share common thematic sentiments such as optimism, pessimism, uncertainty, constraints, pleasure, emotion or pain. In the following sections, we will discuss each of these dictionaries, which are frequently used in finance to analyze the tone and sentiment of a body of text.

Statistical Learning Approaches: Compared to lexicon approaches, statistical methodologies extract the relevant information content from a document by learning the latent structure in the text data.

- **Naïve Bayes:** According to Huang et al. (2014a), Naïve Bayes classification is a statistical learning method that can be used to categorize text documents into their most likely class based on a statistical relation, i.e. model, that is based on words and category relations that is learned from a training sample of text documents. The algorithm is called naïve since it ignores the word sequence and treats each word independently. Hence, like the dictionary-based approaches this method disregards the grammatical structure of the document; however, it enables the researcher to process huge volumes of qualitative data, accurately measure the context of documents through training the Naïve Bayes learning algorithms and classifying the entire document and or sentences into positive, negative or neutral categories. In particular, this procedure can be considered as a prediction algorithm since it maximizes the probability that a message belongs to a certain category or type conditional on the stream of words in the document
- **Semantic Analysis:** This approach is specifically designed to define the themes within a corpus of reports by reducing the dimensionality of the term-document matrix through the assignment of each word to latent factors. The most frequently used techniques for semantic analysis are latent semantic indexing, which reduces the dimension of the term-document matrix using singular value decomposition (SVD), and latent Dirichlet allocation (LDA), that utilizes a Bayesian model.
- **Similarity Analysis:** This approach measures the semantic similarity across documents. For example, Hoberg and Phillips (2016) establish new time-varying measures of product similarity based on firms' 10-K product descriptions. In particular, Hoberg and Phillips (2016) construct proxies of product similarity across firms using 10-K product descriptions and cosine similarity measure. Similarly, Cohen et al., (2016) propose the use of various measures of document similarity to capture the effect of active changes in firm's reports on asset prices. Specifically, Cohen et al. (2016), using the history of 10-K and 10-Q reports over the period from 1995-2014, examining the changes in the language structure of corporate reports across time by applying four commonly used similarity measures; namely, cosine similarity, Jaccard similarity, minimum edit distance and simple similarity.

Chapter 4 The Effect of Institutional Investors on Firms' Competition Culture

4.1 Introduction

In recent decades, a growing literature has emphasized the importance of corporate culture for influencing a firms economic outcomes (see, for example, Cronqvist et al., 2007; Popadak, 2013; Fiordelisi and Ricci, 2014; Guiso et al., 2006, 2015a, 2015b; Zingales, 2015; Callen and Fang, 2015; Erhard et al., 2016; Grieser et al., 2016; Bhandari et al., 2017). However, very little work has explored the antecedence of firms' corporate culture and in this chapter, we extend the existing literature in this direction by investigating whether the composition of the institutional investor base influences corporate competition culture. To do this, we utilize textual analysis of 10-K filings to develop a measure of corporate competition culture using the competing values framework of corporate culture (e.g., Quinn and Cameron, 1983; Quinn and Rohrbaugh, 1983). In so doing, we also follow recent studies that aim to contribute to the understanding of institutional investors' preferences and interventions on firms' governance (e.g., Bebchuk et al., 2015; Giannetti and Yu, 2016; McCahery et al., 2016; Harford et al., 2017).

The competing values framework emerged from studies of the factors that account for highly effective organizational performance and has been named as one of the 40 most important frameworks in the history of business (Ten Have et al., 2003). This framework (Quinn and Cameron, 1983; Quinn and Rohrbaugh, 1983; Hartnell et al., 2011; Cameron and Quinn, 2011; Cameron et al., 2014) theorizes the competition culture of a firm to be a concatenation of attributes that focus on achieving superior financial performance by assimilating external information and catering to capital market expectations. The competition culture of a firm indicates its aggressive and the forceful pursuit of profitability. Hence, speed of action to achieve results characterize firms with a competition culture (Cameron et al., 2014). In that vein, such firms have a proclivity

towards being aggressive and moving fast, while assessing success based on indicators such as increased profitability.

Following the growing literature that applies textual analysis in finance research (see, for instance, Tetlock, 2007; Loughran and McDonald, 2009; Hoberg and Phillips, 2010, 2016; Li et al., 2013a; Hoberg et al., 2014; Kearney and Liu, 2014), we develop a measure for corporate competition culture using information in the 10-K filings for the period 1994–2014. We adopt this measurement approach as it provides an efficient way of measuring firms' competition culture by exploiting a large corpus of archival data that describe the current and future operations of US-listed firms. Further, by relying on the information environment portrayed in the 10-K filings creates a leeway to circumvent severe data limitation problems that are associated with the measurement of latent corporate characteristics, like the competition culture considered in this chapter. We operationalize our measure by parsing 10-K filings to identify a set of lexical items relating to attributes that shape firms' competition culture. In particular, we focus on attributes that feature firms' external effectiveness to pursue enhanced competitiveness, emphasized organizational achievements, setting of goals and being aggressive, growth in profitability, superior financial performance, etc. For instance, it is sensible to expect firms using in their 10-K filings a relatively high frequency of words pertaining to "achievement", "aggressive", "compete", "goal", "profits", and "performance", among others, to be highly driven by corporate attributes geared towards the competition culture.

Having developed our text-based measure, we consider the overarching question; "*what is the influence of a firm's institutional investor base on its competition culture?*", as this question is intriguing in many aspects. For instance, it can inform recent literature that documents strong links between institutional ownership and organizational outcomes such as earnings manipulation, R&D

investments, M&As, and financing (see, for example, Gaspar et al., 2005; Chen et al., 2007; Elyasiani et al., 2010; Harford et al., 2017), as well as between institutional ownership and financial performance (see, for example, Gompers and Metric, 1998; Nofsinger and Sias, 1999; Cai and Zheng, 2004; Giannetti and Yu, 2016). However, unlike the prior literature that remains rather silent on exactly how institutional investors affect corporate outcomes and performance, we advance firms' competition culture as a channel through which institutional investors appear to influence corporate philosophy, decision-making, and outcomes. This proposition is consistent with recent evidence documenting that institutional investors regularly engage with management and the board of directors in behind-the-scene interventions that can shape corporate objectives (Edmans, 2014, Bebchuk et al., 2015; Brav et al., 2015; McCahery et al., 2016, among others), and that the composition of firms' institutional investor base can create (or mitigate) implicit incentives for managers to over-allocate effort towards improving current performance, potentially at the expense of shareholder value creation (e.g., Bushee, 1998; Dikolli et al., 2009). Further, it is well known that corporate goals and decision-making processes can be altered so as to reflect certain (desired) sets of management behaviors, priorities, shared norms and beliefs (Guiso et al., 2015b; Giannetti and Yu, 2016), and if institutional investors engage with management to change their decision-making environment via their "voice" and "exit" then it is conceivable that these investors affect firms' outcomes via alteration to firms' decision-making environment. Based on these arguments, institutional investors could, therefore, influence firms' competition culture so as to fulfil their own objectives and thereby leave an indelible mark on firms' values and norms. Hence, it is important to trace the effects of institutional investors' interventions on firms' culture since this details the context in which organizational members (particularly managers) prioritize

activities that could deliver lucrative (or devastating) financial results to investors (O'Reilly et al., 1996; Hartnell et al., 2011).

Our investigation provides robust causal evidence that transient institutional ownership has a strong positive relation to the one-year-ahead level of corporate competition culture. As transient institutional investors invest based on the likelihood of reaping short-term trading profits (Bushee, 1998, 2001) this evidence supports that they intervene and exert pressure on managers to intensify their firms' competition culture, perhaps aiming for results-right-now and more immediate financial performance. As such, the management of a firm with more transient institutional investors would succumb to such pressures under the threat that if these institutional investors become unhappy they will forcefully exit by selling shares, thereby suppressing the firm's stock price (Bernardo and Welch, 2004, Fos and Kahn, 2015). Indeed, Graham et al. (2005) report that the majority of managers would avoid commencing projects with positive NPVs and sacrifice long-term shareholder value creation for short-term profits in exchange for being able to cater to investors' expectations.

Conversely, we demonstrate that dedicated institutional ownership has a negative relation to the firm's one-year-ahead level of firm's competition culture. This evidence supports that dedicated institutional investors also intervene and influence managers but instead to lessen firms' competition culture, perhaps following their incentives to monitor and offset managerial myopia and to assess financial performance by relying on information beyond that provided in the current earnings period to assess managers' performance (Gaspar et al., 2005; Chen et al., 2007, Harford et al., 2017). Complementary, this evidence might reveal that the managers of firms with more dedicated institutional investors feel less pressure to consistently cater to investors and ease their thrust of being aggressive and forceful in the pursuit of performance as they are less concerned

about the possibility of large price drops spurred by the exit-selling strategies of these investors.[2] Overall, this evidence lends further credence to the view that institutional investors are far from homogeneous, whereby their investment horizon and performance-related objectives and preferences incentivize them to exert much different governance on firms' operating philosophy, priorities and decision-making processes.

In terms of econometric methods, our regression approaches are carefully implemented to tackle identification issues that may cloud the interpretation of the results. For instance, since firms' competition culture and the level of institutional ownership are rather persistent over time, following prior studies that derive their key variables using textual analysis (e.g., Hoberg and Phillips, 2010; Li, 2010c; Li et al., 2013a; Hoberg et al., 2014), we utilize pooled cross-sectional models for our primary analyses including time and industry fixed effects.[3] At the same time, in the spirit of the competing values framework, we adopt a scaling scheme designed to account for other corporate cultures that may co-exist with the competition culture, to mitigate omitted variable issues. In addition, to safeguard against simultaneous causality issues, our main baseline regression models rely on a one-year time-lag between the independent and dependent variables. Additionally, we conduct further analysis to confirm the causal relationship by ranking firms into deciles based on their competition culture at time *t* and test whether institutional ownership

[2] This is reasonable since a large proportion of dedicated investors are in fact passive investors who simply invest in firms (directly or indirectly) based on an index. These investors are therefore usually unable or unwilling to directly sell specific firms that comprise the index. As a result, managers at firms with more dedicated investors are increasingly less likely to be concerned by selling pressure brought about by initial signals of underperformance (Cella et al., 2013; Giannetti and Yu, 2016).

[3] We also conduct random effects estimates for the main relations, as this approach allows us to capture the effects of slow-moving variables and permits an efficient estimation of model parameters. For our analysis, we refrain from relying on firm fixed-effect estimations, which depend solely on within-firm variations and are thus inapplicable in our case due to the slow-changing behavior of some of our main variables. Such behaviors resemble, for example, the well-known stickiness nature of the corporate governance attributes, in which, following the intuition in Wintoki et al. (2012), the firm fixed-effects approach is also not the optimal choice. However, for the sake of completeness, we report firm fixed-effects in Appendix A which show similar conclusions, lending in this way more credence to the overall conclusions of this chapter.

structure can explain the *t* to *t+1* changes in a firm's decile rank of competition culture. We also adopt an instrumental variables approach by using a firm's inclusion or exclusion in the Russell 1000/2000 indexes as a source of exogenous variation in institutional ownership (Crane et al., 2015; Appel et al., 2016). In addition, we estimate additional instrumental variable models, dynamic panel generalized methods of moments (GMM) estimation, as well as firm random- and fixed-effects estimation. Irrespective of the approach, all econometric estimates confirm the robustness of our main findings and lend credence to the idea that the composition of the institutional investor base influences the firms' competition culture.

Our study contributes to the literature as follows. First, our main finding that the composition of institutional ownership base impacts firms competition culture and hence managers' operating philosophy and decision-making, adds direct knowledge to our understanding of how institutional investors engage with managers and reveal their interactions in behind the scenes interventions that leave an indelible mark on firms' corporate culture. As such, our findings complement other recent studies (e.g., Edmans, 2014; Bebchuk et al., 2015; Brav et al., 2015; McCahary et al., 2016) that endeavor to provide direct evidence of institutional investors' preferences and actions on their portfolio of firms. Second, it contributes to the settling of the ongoing debate regarding the benefits and costs of institutional investors on corporate decision making (e.g., Massa et al., 2015; Giannetti and Yu, 2016; Harford et al., 2017) by investigating the impact of transient and dedicated investors on firms' competition culture, which inherently encapsulates the managers' decision-making environment instead of relying only on corporate outcomes like R&D, dividends, investments, financial fraud, etc. Also, as it is frequently very hard to measure corporate characteristics, we show how to operationalize such an empirical construct using textual analysis of the 10-K reports for all firms with such reports in the SEC Edgar database. Further, we also complement other

recent studies as in our analysis we demonstrate that firms' competition culture remains distinct from other conceptualizations of market competitiveness that center on product market competition (for example, Li et al., 2013a; Bushman et al., 2016).

The remainder of this chapter is presented as follows: the hypotheses are developed in Section 4.2, details of the data and summary statistics are presented in Section 4.3; Sections 4.4 presents the empirical results, and Section 4.5 concludes.

4.2 Measurement and Hypotheses

4.2.1 Measuring Competition Culture

It has long been argued that corporations are micro-societies that have the ability to shape distinct norms, values and practices i.e. cultures (Guiso et al., 2015a, 2015b; Zingales, 2015). These principles shape the essence of a company's identity as defined by beliefs, priorities and operating philosophy. In measuring such corporate culture, a strand of the literature relies on the competing values framework (CVF) (see, for example, Hartnell et al., 2011; Schneider et al., 2013; Cameron et al., 2014). This framework differentiates between competing values that emphasize an external orientation from those that focus on internal capability, integration, and effectiveness – the external-internal domain. Further, it distinguishes between corporate attributes that emphasize effectiveness criteria that focus on flexibility and discretion from those that are centered on stability and internal control – i.e. the flexibility-stability domain. These two dimensions intersect to define four distinct types of orientations that comprise the CVF, namely the *competition culture*, *creation culture*, *collaboration culture,* and *control culture*. Schematic

representations of the attributes that characterize the competing values associated with the CVF are depicted in Figure 4.1.

Organizations with the competition culture are externally focused and performance-driven and are therefore more likely to encourage organization-wide generation, dissemination, and integration of external environmental information in the pursuit of profitability (Kohli and Jaworski, 1990; Narver and Slater, 1990). Success is assessed on the basis of indicators such as increased revenues and profitability. As a result, corporate attributes of this kind are strongly associated with financial effectiveness and are important determinants of reported financial performance (Jaworski and Kohli, 1993; Harris and Ogbonna, 2001). Overall, speed is an indispensable component in maintaining a competitive edge, so *results-right-now* is a characteristic demand; hence, firms with an orientation towards the competition culture emphasize competitiveness and the aggressive pursuit of profits (Quinn and Cameron, 1983; Quinn and Rohrbaugh, 1983; Hartnel et al., 2011; Cameron et al., 2014).

As a comparison, corporate attributes associated with the creation culture are focused externally and center on creating future opportunity through innovation and cutting-edge output. These elements within the organization are supported by a flexible organizational structure which stipulates freedom of thought and action among employees and allows the firm to effectively handle discontinuity, change, and risk (Hartnell et al., 2011; Cameron et al., 2014). Conversely, the collaboration and control cultures are internally focused and place emphasis on integration. However, while the collaboration culture stresses employee development and consensus building that is facilitated by a flexible organizational structure aiming to support long-term development, corporate attributes that pertain to the control culture focus on creating value through internal improvements in efficiency supported by a stable organizational structure driven by strong internal

control mechanisms (Quinn and Cameron, 1983; Quinn and Rohrbaugh, 1983; Hartnell et al., 2011; Cameron et al., 2014).

In this chapter, we measure corporate attributes relating to a firm's competition culture using a textual analysis of 10-K filings obtained from the SEC's Edgar database. Textual analysis permits the systematic and objective quantification of semantic content recited in a specific body of text.[4] As such, we assume that the 10-K filings encapsulate useful information regarding corporate values that firms have developed over time which is not easy to observe using secondary data sources. Thus, parsing 10-K filings for specific lexical items allows us to quantify corporate attributes associated with the four cultures exemplified by the CVF.

To estimate annual frequencies for each firm's competition culture, we create a list of selected lexical items that best describe this culture, as theorized in the CVF. This is achieved by a two-step procedure that minimizes subjectivity in the selection process (Fiordelisi and Ricci, 2014). First, we select certain keywords suggested by Cameron et al. (2014) to identify corporate attributes associated with the competition culture. Second, all keywords selected in the first step are looked up in the Harvard IV-4 Psychosocial Dictionary to identify other synonyms. For instance, a relatively high frequency of keywords in 10-Ks describing "achievement", "profit", "performance", "competitiveness", "market", etc should be associated with the competition culture. In that respect, the set of synonyms comprises the bag of words that describe the firms' competition culture. We account for suffixes (forming grammatical and derivational variants of the same lexical item) by reducing these words to their stemmed form (e.g. "competitiveness" becomes "compet*"). This helps to ensure that when we conduct our word search, we count all

[4] There are numerous empirical studies to suggest that textual analysis of the 10-K filings is a source of semantics with useful information for finance and accounting research (refer to the review study by Loughran and McDonald (2016) and references therein).

variants of words that make up our list. We then investigate the items so as to exclude terms consistent with firm names, industries and other words likely to systematically bias our results. We follow similar steps to create the corresponding bag of words for the other three corporate cultural orientations (*creation culture*, *collaboration culture*, and *control culture*) as theorized by the CVF. The bag of words with all lexical items used to parse the 10-Ks are listed in Appendix A.

Specifically, we measure competition culture (*COMP)* by counting the number of times that the lexical items included in the bag of words describing corporate attributes for the competition culture are found in the 10-K filings. Since firms' 10-Ks can reflect other corporate attributes associated with collaborate, control and create orientations, we likewise apply our word count algorithm to also estimate frequencies on these alternative orientations and scale our measure as follows:[5]

$$COMP = \frac{Number\ of\ lexical\ items\ describing\ the\ competition\ culture}{Total\ number\ of\ lexical\ items\ for\ all\ types\ of\ cultures}. \quad (4.1)$$

As we have discussed in Chapter 3, similar textual analysis approaches have been shown to extract valuable information from firms' reports (Li, 2010a, 2010b; Li et al., 2013a; Loughran and McDonald, 2011, 2016; Fiordelisi and Ricci, 2014; Kearney and Liu, 2014; Audi et al., 2016; Bushman et al., 2016). What is more, some authors (e.g. Li et al, 2013a; Bushman et al., 2016) have used textual analysis to measure product market competition, which is a concept close in terminology to our own. These studies capture the relevant information extracted from discussions

[5] While conducting our count we exclude negation of the lexical items by ignoring occasions when the word is preceded by "no", "non", "not", "less", "few" or "limited" by three or fewer words.

of competition in the 10-K filings primarily by counting the number of occurrences of word inflections relating to the lexical item "competition".[6]

However, unlike these prior works we carefully construct our measurement approach to capture corporate attributes that describe a firm's competition culture by using a comprehensive bag of words that elicit the full array of firms' corporate cultures as theorized under the CVF in Cameron et al. (2014) and Hartnell et al. (2011). Scaling the frequency of lexical items describing a firm's competition culture by the total number of lexical items in the bags of words for all four cultural orientations allows us to construct a relative intensity measure of the competition culture that does not neglect the intensity of the rest of the corporate cultures that exist within firms.

Figure 4.2 presents some of the properties of our measure. In particular, it highlights the frequency of the competition culture related words used per 10-K report. We observe lexical items such as customer*, market*, result*, and performanc* ranking highest, with 10 to 15 occurrences on average per 10-K report. This distribution across words is consistent with the theoretical underpinnings in the CVF and is suggestive that our empirical measure is able to capture important facets of the competition culture.

Further, we consider the relationship between our measure of competition culture and Loughran and McDonald's (2011) sentiment classifications. Accordingly, we carefully compare our lexical items to the words found in the classification taxonomy reported in Loughran and McDonald (2011) so as to investigate the possibility that *COMP* may proxy for some persistent tone and sentiment of the corporate 10-K reports.[7] Figure 4.3 presents the competition culture words

[6] The studies by Li et al. (2013a) and Bushman et al. (2016) rely on a measure that counts the number of occurrences of the words, competition, competitor, competitive, compete and competing, and scaled by the total number of words in the document.

[7]The LM (2011) word list is available at http://www3.nd.edu/~mcdonald/Word_Lists.html

classified into the main sentiment/tone classifications found in Loughran and McDonald (2011). We note that the overlap between the lexical items for *COMP* and the tone classifications is minimal, as the majority of words that comprise our lexical items are not classified. More importantly, *COMP* does not present any important correlation with the Loughran and McDonald (2011) tone measures; for instance, the correlation of *COMP* with the Fin-Neg list is 0.04 and with the Fin-Pos is 0.02. Thus, we are confident that *COMP* does not overlap with other renowned business word lists, which are widely applied in finance and accounting research.

In introducing our measure we do not claim that our method or chosen framework represents the one best approach to assess culture in firms. To do so would be of course unreasonable since as we have discussed in Chapter 2 other authors have proposed alternative approaches to measuring organizational culture (see for example, Handy, 1976; Deal and Kennedy, 1982; Reynolds, 1986; Johnson, 1988; Denison, 1990, O'Reilly et al., 1991, 1996; Schein, 1990, 1992; Hofstede, 1980, 2001, 2011). However, we argue that our technique is practical as it allows us to quantify the key dimensions of organizational culture that have been found to matter and to do so in a manageable way for a large sample of firms. Further, our approach is objective as it permits the capture of firms' competition culture in a manner that is unlikely to be influenced by subjective biases. What is more, our measure and the framework upon which it is built do not only make sense but they are both valid. In particular, the competing values framework is supported by empirical literature and the underlying dimensions have a verified scholarly foundation (Quinn and Rohrbaugh, 1983). Beyond this, we assess the validity of our measure of firms' competition culture by relating it to other measures of firms' competition culture. Further, we show that our measure of competition culture is distinct from managerial short-termism and does not

significantly overlap with product-market competition as captured by Li et al.'s (2013a) text-based firm-specific competitive environment measure. [8]

4.2.2 Hypotheses

In this study, we use our measure of competition culture to investigate whether and how transient and dedicated institutional ownership is related to firms' competition culture. Based on past literature and our own reasoning we expect that since transient institutional owners emphasize short-term performance, these investors should propel a firm towards adopting a more competition culture relative to the other cultural orientations. Furthermore, consistent with past literature, we argue that such investors are more likely to intervene and exert pressure on managers to intensify their competition culture, aiming for *results-right-now* and more immediate financial performance (Bernardo and Welch, 2004, Fos and Kahn, 2015). Consequently, it is reasonable to expect that the management of a firm with more transient institutional investors will yield to such pressures in order to avoid these investors becoming unhappy and forcefully exiting the firm, thereby suppressing the firm's stock price. Hence, we propose the following hypothesis in alternate form;

H1: Transient institutional ownership is positively associated with firm's competition culture.

Conversely, it is widely accepted that dedicated institutional investors are more likely to stress long-term performance (see e.g. Bushee, 1998). Thus, we can expect that these investors will be

[8] Please see the Appendix A for univariate and multivariate validation and sanity checks on our measure of firms' competition culture.

motivated to dampen a firm's competition culture when management's overinvestment in this type of operating environment is likely to undermine the long-term performance and success of the firm. This proposition is plausible since it supports the notion that dedicated institutional investors also intervene and influence managers, but unlike transient investors, do so in line with their incentives to monitor and offset managerial myopia and to assess financial performance based on information beyond the current period (Gaspar et al., 2005; Chen et al., 2007, Harford et al., 2017). Thus, we propose the following hypotheses in alternate form;

H2: Dedicated institutional ownership is negatively associated with firm's competition culture.

4.3 Data, Variables and Sample Selection

4.3.1 Data

To conduct our empirical analysis, we build a unique dataset by merging information from various data sources. We obtain annual firm-level data of US publicly traded firms for the period 1994 to 2014 from Compustat. To measure the competition culture through textual analysis we obtain firms' 10-K reports from the SEC's Edgar database. For the institutional ownership variables, we employ data from the Thomson Reuters Institutional Holdings Database. Finally, we acquire Russell 1000 and Russell 2000 index constituents for the period 2003 until 2006 from the Russell Corporation.

Our analysis is carried out on all firms included in the Compustat database excluding financials (SIC 6000-6999) and utilities (SIC 4900-4999). To limit survivorship bias, firms that are inactive

and/or acquired by another firm during the period of study are retained in the sample. We also delete from our sample all firm-year observations with missing data on the variables of interest. This results in a final main sample consisting of 31,223 firm-year observations. Table 4.1 reports the definition of all the variables used in the empirical analysis.

4.3.2 Measuring Institutional Ownership

We adopt two measures of institutional ownership, namely transient and dedicated institutional ownership, as in Bushee (1998) and subsequently studied in numerous works.[9] Transient institutional ownership, *TRA*, is defined as the percentage of stock ownership in the firm by short-term institutional investors relative to total shares outstanding. Transient investors focus on short-term performance and invest based on the likelihood of earning short-term trading profits (Bushee, 1998, 2001; Callen and Fang, 2013). Dedicated institutional ownership, *DED*, is defined as the percentage of stock ownership in the firm by long-term institutional investors relative to total shares outstanding. Dedicated investors are defined as those that hold large stakes in a limited number of firms and have strong incentives to monitor the long-term performance of management (Bushee, 1998, 2001; Chen et al., 2001).

[9] An incomplete list of studies includes Shleifer and Vishny (1986), Gompers and Metrick (1998), Bushee (2001), Cai and Zheng (2004), Gaspar et al. (2005), Chen et al. (2007), Yan and Zhang (2009), Elyasiani and Jia (2010), Elyasiani et al. (2010), Callen and Fang (2013), Andreou et al. (2016) and Andreou et al. (2017).

4.3.3 Control Variables

We carefully select control variables for our empirical work based on the extant literature (Bushee, 1998, 2001; Chen et al., 2001; Cheng and Warfield, 2005; Callen and Fang, 2013). To begin with, we include in all specifications controls to capture firm-specific characteristics. In particular, we include the following: the number of years since the firm was first included in the CRSP database, *AGE*; financial leverage as indicated by total liabilities to total assets, *LEV*; market value of equity to book value of equity, *MTB*; return on total assets, *ROA*; and the natural logarithm of market value of equity, *SIZE*.

Further, in our main specifications, we control for investor heterogeneity since it is argued that this construct influences both variables. We control for investor heterogeneity by including the detrended average weekly stock trading volume, *DTURN*, average weekly returns, *RET*, and volatility of weekly returns, *STDEV*, over the fiscal year (Hong and Stein, 2003; Bushman et al., 2016).

4.3.4 Descriptive Statistics and Correlations

Table 4.2 presents the descriptive statistics of the variables used in our empirical analysis.[10] In particular, the mean value of our competition culture variable, *COMP*, is 0.49. The institutional ownership variables *TRA* and *DED* have respective mean values of 0.15 and 0.06. We observe that the summary statistics on the variables are largely comparable to the values reported in previous studies using these data (Bushee, 2001; Callen and Fang, 2013; Andreou et al., 2017).

[10] To mitigate the effects of outliers, all continuous variables are winsorized at the 1% and 99% levels.

We compute Pearson correlation coefficients for the variables used in our empirical analysis and report these in Table 4.3. Some of the more interesting correlations include the relation between *COMP* and *TRA* (*DED*), where we find a positive and significant correlation between *COMP* and *TRA* (correlation = 0.0958) and a negative and significant correlation between *COMP* and *DED* (correlation = -0.0621). These results are consistent with our expectations that transient institutional ownership intensifies the firm's competition culture, while dedicated institutional ownership diminishes it.

4.4 Empirical Results

In this section, we report our multivariate results based on the empirical approaches adopted to deal with the practical challenges associated with our research design. In particular, based on the extant literature, we would expect to observe rather persistent levels of competition culture over time (Cameron et al., 2014; Guiso et al., 2006; Hartnell et al., 2011; Guiso et al., 2015a, 2015b). What is more, previous works also suggest that the level of transient (dedicated) institutional ownership should change rather slowly from year to year (Bushee, 1998, 2001).

We investigate these expectations in Table 4.4 which present average annual transition probabilities by deciles of competition culture (*COMP*) (Panel A), transient institutional ownership (*TRA*) (Panel B), and dedicated institutional ownership (*DED*) (Panel C). We observe that firms in the lowest (1^{st}) decile of *COMP* in any one year have a 67% chance of remaining in the lowest *COMP* decile the following year, while firms in the highest (10^{th}) decile remain in that decile in the following year with a probability of 66%. Similarly, firms in the 1^{st} decile of *TRA* have a 49% probability of remaining in that decile the following year; meanwhile, firms in the 10^{th} decile of

TRA remain in that decile the following year with a probability of 47%. In addition, those firms in the 1st decile of *DED* have a 45% likelihood of remaining in the 1st decile the following year, and firms in the 10th decile of *DED* remain in that decile the next year with a probability of 58%. High persistence is also preserved for the other deciles in each case. These results suggest that observed *COMP*, *TRA,* and *DED* are indeed rather persistent over time.

Consequently, since our key variables do not show significant within-firm variation, we adopt cross-sectional OLS estimators as the primary regression tool for our empirical analysis. In addition, we provide generalized least square random effects (GLS-RE) regression estimates as supplementary results, as they are well-suited to this type of analysis since they allow for the inclusion of slow-moving or sluggish covariates without destabilizing the estimates of the effect of these variables. To be clear, we adopt OLS and GLS-RE regressions since, unlike fixed effects estimators, they are able to provide valid estimates of parameters that appear to change sluggishly or even depict a time-invariant behavior.

Next, we test H1 and H2 by investigating whether transient and dedicated institutional ownership are related to firms' competition culture. We expect that since transient institutional owners emphasize short-term performance, these investors should propel a firm towards adopting a competition culture. Meanwhile, since dedicated institutional investors are more likely to stress long-term performance, we expect that these investors will dampen a firm's competition culture. To test empirically whether transient (dedicated) institutional ownership is positively (negatively) related to competition culture, we estimate the following regression model:

$$COMP_{t+1} = \alpha_1 + \alpha_2 TRA_t (or\ DED_t) + \alpha_3 AGE_t + \alpha_4 DTURN_t + \alpha_5 LEV_t + \alpha_6 MTB_t + \alpha_7 RET_t + \alpha_8 ROA_t + \alpha_9 SIZE_t + \alpha_{10} STDEV_t + \varepsilon_t, \quad (4.2)$$

where *COMP* represents the level of firm's competition culture. The variables of interests *TRA* (*DED*) represent firm's level of transient (dedicated) institutional ownership. We include control variables that capture firm-specific characteristics. We adopt these control variables to ensure that the impact of our institutional ownership variables on the competition culture is not driven by other factors. Also, we include year dummies in all regressions to control for unobserved time-invariant year effects. In addition, the estimates include dummies based on Fama and French's (1997) 48 industry classifications to control for fixed industry effects. The standard errors are corrected for firm clustering to control for potential bias in the estimates that occur when the residuals are correlated across firms.

Further, we explore whether changes in a firm's competition culture are related to its composition of institutional ownership. For this, we rank firms into deciles based on their competition culture at time *t* and test whether institutional ownership structure can explain the *t* to *t+1* changes in a firm's decile rank of competition culture. Given the premise that transient institutional owners pressure a firm's management to adopt greater competition culture, we test empirically whether transient institutional ownership is significantly related to an *increase* in the firm's decile rank of competition culture by estimating the following regression model:

$$\begin{aligned}\Delta COMP\_INC_{t+1} \;=\; & \alpha_1 + \alpha_2 TRA_t + \alpha_3 AGE_t + \alpha_4 DTURN_t + \alpha_5 LEV_t \\ & + \alpha_6 MTB_t + \alpha_7 RET_t + \alpha_8 ROA_t + \alpha_9 SIZE_t \\ & + \alpha_{10} STDEV_t + \varepsilon_t, \end{aligned} \tag{4.3}$$

where Δ*COMP_INC* is an indicator variable that is set equal to one if the firm experiences an increase in the decile rank of *COMP* from last year, and is zero otherwise. In this model, *TRA* represents our variable of interest, while the control variables are used to capture firm-specific characteristics. As before, we include year dummies to control for unobserved time-invariant year

effects. In addition, we include dummies based on Fama and French's (1997) 48 industry classifications to control for fixed industry effects. The standard errors are clustered by firm.

Furthermore, since dedicated institutional investors are argued in H2 to be more likely to dampen a firm's competition culture, we investigate whether a firm's composition of dedicated institutional ownership is significantly related to a *decrease* in the firm's decile rank of competition culture. We test this empirically by estimating the following model:

$$\begin{aligned}\Delta COMP\_DEC_{t+1} = {} & \alpha_1 + \alpha_2 DED_t + \alpha_3 AGE_t + \alpha_4 DTURN_t + \alpha_5 LEV_t \\ & + \alpha_6 MTB_t + \alpha_7 RET_t + \alpha_8 ROA_t + \alpha_9 SIZE_t \\ & + \alpha_{10} STDEV_t + \varepsilon_t, \end{aligned} \tag{4.4}$$

where Δ*COMP_DEC* is an indicator variable set equal to zero if the firm experiences a decrease in the decile rank of *COMP* from the past year, and is one otherwise. The variable of interests *DED* represents a firm's level of dedicated institutional ownership, and as before we include control variables that capture firm-specific characteristics. Also, year and industry dummies are included to control for unobserved time-invariant year and industry effects. The standard errors are corrected for firm clustering to control for potential bias in the estimates that occur when the residuals are correlated across firms.

The estimates of Eq.'s (4.2) to (4.4) are provided in Table 4.5. The coefficient of interest is α_2, which is expected to be positive (negative) in the case of the relationship between transient (dedicated) institutional ownership and *COMP*. Consistent with H1 (H2), in Table 4.5 column (1) of Panel A (Panel B) we find that the coefficient term on the TRA_t (DED_t) is 0.053 (-0.021) and significant at the 1 percent (10 percent) level with a *t*-value of 5.01 (1.89). Not only are these results statistically significant, they are also economically significant. In particular, the coefficient value 0.053 on the TRA_t variable implies that an one standard deviation increase in transient

institutional ownership leads to an approximate 0.106 (= [0.053 × 0.12]/ 0.06) increase in a firm's competition culture than would otherwise be the case, and given a mean for competition culture of 0.49, this represents an approximate 22% increase in its value.

Furthermore, our GLS-RE estimates of Eq. (4.2), as shown in column (4) of Panel A (Panel B), provide additional empirical support that transient (dedicated) institutional ownership increases (decreases) a firm's competition culture. Besides this, our logistic regression estimates of Eq.'s (4.3) and (4.4), are presented in column (7) of Panel A (Panel B). These present further evidence consistent with H1 (H2) of the causal relationship between transient (dedicated) institutional ownership and increases (decreases) in a firm's competition culture. These results provide compelling evidence in support of our argument that transient institutional investors exert pressure on management to shift a firm's competition culture.

In further tests of the main hypotheses, we estimate models to examine the relationship between lagged values and differences in our institutional ownership variables and competition culture. These tests examine whether and how institutional ownership impacts a firm's competition culture at spans greater than one year. Regressions that examine the long-run relationship can help to further mitigate potential simultaneity issues and shed light on the direction of the relationship between institutional ownership and competition culture. If transient (dedicated) institutional ownership is positively (negatively) related to levels of competition culture and increases (decreases) in a firm's decile rank of competition culture in two and three years' time, it is more likely that transient (dedicated) institutional ownership alters a firm's competition culture than the inverse. In particular, we estimate the following empirical models:

$$COMP_{t+1} = \alpha_1 + \alpha_2 \Delta TRA_t (or\ \Delta DED_t) + \alpha_3 TRA_{t-1} (or\ DED_{t-1}) + \alpha_4 AGE_t + \alpha_5 DTURN_t + \alpha_6 LEV_t + \alpha_7 MTB_t + \alpha_8 RET_t$$

$$+ \alpha_9 ROA_t + \alpha_{10} SIZE_t + \alpha_{11} STDEV_t + \varepsilon_t, \quad (4.5)$$

$$\begin{aligned} \Delta COMP\_INC_{t+1} = {} & \alpha_1 + \alpha_2 \Delta TRA_t + \alpha_3 TRA_{t-1} \\ & + \alpha_4 AGE_t + \alpha_5 DTURN_t + \alpha_6 LEV_t + \alpha_7 MTB_t \\ & + \alpha_8 RET_t + \alpha_9 ROA_t + \alpha_{10} SIZE_t \\ & + \alpha_{11} STDEV_t + \varepsilon_t, \end{aligned} \quad (4.6)$$

$$\begin{aligned} \Delta COMP\_DEC_{t+1} = {} & \alpha_1 + \alpha_2 \Delta DED_t + \alpha_3 DED_{t-1} \\ & + \alpha_4 AGE_t + \alpha_5 DTURN_t + \alpha_6 LEV_t + \alpha_7 MTB_t \\ & + \alpha_8 RET_t + \alpha_9 ROA_t + \alpha_{10} SIZE_t \\ & + \alpha_{11} STDEV_t + \varepsilon_t, \end{aligned} \quad (4.7)$$

$$\begin{aligned} COMP_{t+1} = {} & \alpha_1 + \alpha_2 \Delta TRA_t (or\ \Delta DED_t) + \alpha_3 \Delta TRA_{t-1} (or\ \Delta DED_{t-1}) + \alpha_4 TRA_{t-2} (or\ DED_{t-2}) \\ & + \alpha_5 AGE_t + \alpha_6 DTURN_t + \alpha_7 LEV_t + \alpha_8 MTB_t + \alpha_9 RET_t + \alpha_{10} ROA_t \\ & + \alpha_{11} SIZE_t + \alpha_{12} STDEV_t + \varepsilon_t, \end{aligned} \quad (4.8)$$

$$\begin{aligned} \Delta COMP\_INC_{t+1} = {} & \alpha_1 + \alpha_2 \Delta TRA_t + \alpha_3 \Delta TRA_{t-1} + \alpha_4 TRA_{t-2} \\ & + \alpha_5 AGE_t + \alpha_6 DTURN_t + \alpha_7 LEV_t + \alpha_8 MTB_t + \alpha_9 RET_t \\ & + \alpha_{10} ROA_t + \alpha_{11} SIZE_t + \alpha_{12} STDEV_t \\ & + \varepsilon_t, \end{aligned} \quad (4.9)$$

and

$$\begin{aligned} \Delta COMP\_DEC_{t+1} = {} & \alpha_1 + \alpha_2 \Delta DED_t + \alpha_3 \Delta DED_{t-1} + \alpha_4 DED_{t-2} \\ & + \alpha_5 AGE_t + \alpha_6 DTURN_t + \alpha_7 LEV_t + \alpha_8 MTB_t + \alpha_9 RET_t \\ & + \alpha_{10} ROA_t + \alpha_{11} SIZE_t + \alpha_{12} STDEV_t \\ & + \varepsilon_t. \end{aligned} \quad (4.10)$$

The estimates for the above specifications are reported in Table 4.5. We find for Eq. (4.5) that the coefficient term 0.064 (-0.023) for TRA_{t-1} (DED_{t-1}), which is provided in Table 4.5 column (2) in Panel A (Panel B), is significantly positive (negative) at the 1 percent (10 percent) level with a *t*-value of 4.93 (1.75); similar results hold for ΔTRA_t (ΔDED_t), where the coefficient and *t*-value are 0.031 (-0.014) and 4.37 (1.74), thereby indicating a significantly positive (negative) relation between the change in transient (dedicated) institutional ownership and competition culture at the 1 percent (10 percent) level. Besides this, based on Eq. (4.8), in column (3) the coefficient is 0.066 (-0.029) on the TRA_{t-2} (DED_{t-2}) variable, suggesting a positive (negative) and significant relationship between transient (dedicated) institutional ownership and firms' disposition to compete three years into the future at the 1 percent (5 percent) level given a *t*-value of 4.53 (1.96). Further, the coefficients of ΔTRA_t and ΔTRA_{t-1} are positive and significant at the 1 percent level in column (3) with coefficient terms of 0.030 and 0.048, and *t*-values of 4.30 and 5.29, respectively. The fact that first and second differences in transient institutional ownership help to predict future competition culture suggests that not only the level but also the change in transient institutional ownership propels a firm's competition culture. Similar long-run estimates of Eq.'s (4.5) and (4.8) are produced using the GLS-RE estimator. These results are provided in Table 4.5 columns (5) and (6) and are consistent with the pooled OLS estimates of these equations. Moreover, the long-run estimates for the impact of transient (dedicated) institutional ownership on increases (decreases) in a firm's decile rank of competition culture, as specified in Eq.'s (4.6), (4.7), (4.9) and (4.10) are consistent with the prior estimates. These results are given in Table 4.5 columns (8) and (9) of Panels A and B and offer further evidence in support of our argument that transient institutional investors are able to pressurize management to increase a firm's competition culture, while dedicated institutional investors lessen it. In addition, for completeness, fixed effects

estimates of Eq.'s (4.2), (4.5), and (4.8) are provided in Appendix A. These results are consistent with our previous findings.

As a further test of H1 (H2), we adopt an instrumental variables (IV) approach to identify the causal effect of transient (dedicated) institutional ownership on firms' competition culture based on the composition of the popular Russell indexes. To do this, we note that each May 31st, Russell 1000/2000 indexes are formed based on firms' market capitalization rankings, where the largest thousand firms constitute the Russell 1000, while the next two thousand firms comprise the Russell 2000. Since firms are unable to control small variations in their market capitalization, and thus Russell rankings at the cutoff point, assignment to Russell 1000 or Russell 2000 is practically random. This random assignment to Russell 1000 or Russell 2000 near the threshold leads to large differences in index weights for firms around the Russell 1000/2000 cutoff point. Prior literature has noted that the discontinuity in the Russell 1000/2000 indexes drives a substantial difference in institutional ownership, since institutional investors are known to benchmark against the Russell 1000/2000 indexes, and hence are more likely to hold big positions in components that are assigned the largest index weights in order to reduce index-tracking error. Further, these differences in institutional ownership are likely to be unrelated to firm characteristics, since near the cutoff point observed differences in market capitalization are a small proportion of return variance (Crane et al., 2015; Appel et al., 2016).

Thus, our identification strategy is to use inclusion in the Russell 1000 or Russell 2000 as a source of exogenous variation in the institutional ownership structure of the firm. Consistent with prior literature, we posit that our instrument is correlated with variations observed in the transient and dedicated institutional ownership structures and that it meets the exclusion requirement, in that it should only affect the level of firms' competition culture via changes in transient and dedicated

institutional ownership. We take advantage of this exogenous variation to test whether transient (dedicated) institutional investors have a positive (negative) influence on a firm's competition culture. To do this, we estimate the following:

$$COMP_t = \alpha_1 + \alpha_2 \hat{T}RA(or\ \hat{D}ED_t) + \alpha_3 R2000_t \times RANK_t + \alpha_4 MRKCAP_t + \alpha_5 FLOAT_t + \varepsilon_t, \quad (4.11a)$$

$$TRA_t(or\ DED_t) = \gamma_1 + \delta_1 R2000_t + \beta_1 R2000_t \times RANK_t + \beta_2 MRKCAP_t + \beta_3 FLOAT_t + \mu_t, \quad (4.11b)$$

where *R2000* is a dummy variable equal to one if the firm is assigned to the Russell 2000 index and is zero if the firm is assigned to the Russell 1000 index, *RANK* is the firm's ranking order within the Russell index, measuring the distance from the index cutoff each year, which is based on firm's market capitalization, *MRKCAP* is firms' market capitalization on May 31st each year, and *FLOAT* is the difference between rank implied by the observed market capitalization and the rank assigned by Russell in June.

The results of Stock and Yogo's (2005) test for weak instruments (see Table 4.6 Panel B) indicate that *R2000* is a valid instrument and thus we adopt *R2000* as an instrument for transient (dedicated) institutional ownership. Table 4.6 Panel A reports the IV estimates, and the sign and significance of the fitted values of *TRA* (*DED*) are consistent with a causal relationship between transient (dedicated) institutional ownership and firms' competition culture in the direction that we postulate in H1 (H2).

In further support of our IV approach, we estimate a second IV model, which investigates the relation between one-year-ahead *COMP* and institutional ownership as measured in year *t*:

$$COMP_{t+1} = \alpha_1 + \alpha_2 \hat{T}RA(or\ \hat{D}ED_t) + \alpha_3 AGE_t + \alpha_4 DTURN_t + \alpha_5 LEV_t + \alpha_6 MTB_t + \alpha_7 ROA_t + \alpha_8 SIZE_t + \alpha_9 STDEV_t + \varepsilon_t, \quad (4.12a)$$

$$TRA_t(or\ DED_t) = \gamma_1 + \delta_1 DYIELD_t + \delta_2 RET_t + \delta_3 SGROWTH_t + \delta_4 SP500_t + \beta_1 AGE_t + \beta_2 DTURN_t + \beta_3 LEV_t + \beta_4 MTB_t + \beta_5 ROA_t + \beta_6 SIZE_t + \beta_7 STDEV_t + \mu_t, \quad (4.12b)$$

where consistent with prior work in this area (see, for example, Bushee, 2001; Callen and Fang, 2013), we adopt *DYIELD, RET, SGROWTH,* and *SP500* as instruments for dedicated and transient institutional ownership (refer to Table 4.1 for variable definitions). Compared to our prior instrumental variable estimation found in Table 4.6, where we instrument institutional ownership using inclusion in the Russell 2000 index, this approach allows us to conserve more of the main sample data and thereby increase the power of the analysis.

These estimates are provided in Table 4.7, where sign and significance of the fitted values of *TRA* (*DED*) are consistent with H1 (H2) and are in keeping with those presented in our previous analysis, according to which we find a positive (negative) relationship between competition culture and transient (dedicated) institutional ownership. Indeed, these instrumental variable results provide even stronger evidence in support of the relation between competition culture and our measures of institutional ownership, as we are also able to take into account the possibility that endogeneity affects the results. The results of Stock and Yogo's (2005) test for weak instruments indicate that the instruments used are appropriate.

Finally, we estimate a dynamic panel GMM model, since it is plausible that the relationship between *COMP* and *TRA* (*DED*) is in fact dynamically endogenous. Thus, it is possible that causation runs both ways and that current levels of competition culture could affect both future institutional ownership and competition culture. Hence, to control for potential dynamic endogeneity, unobserved heterogeneity, and simultaneity, we follow Wintoki et al. (2012) by adopting the dynamic panel GMM model as proposed by Arellano and Bover (1995) and Blundell

and Bond (1998). This approach allows us to explicitly control for lagged values of *COMP*. What is more, we are able to use the firms' information within our dataset as instruments. We estimate the following empirical model:

$$COMP_t = \alpha_1 + \alpha_2 TRA_t (or\ DED_t) + \gamma_1 COMP_{t-1} + \gamma_2 COMP_{t-2} + \beta_1 AGE_t + \beta_2 DTURN_t + \beta_3 LEV_t + \beta_4 MTB_t + \beta_5 RET_t + \beta_6 ROA_t + \beta_7 SIZE_t + \beta_8 STDEV_t + \eta_t + \varepsilon_t, \quad (4.13)$$

where we first-difference Eq. (4.13) to eliminate unobserved heterogeneity and potential omitted variable bias. Next, we estimate the first-differenced model by GMM using lagged values (and differences) of competition culture and other firm characteristics as instruments. By using lagged variables as instruments, we control for potential simultaneity and reverse causality.

The results of the system GMM estimates are presented in Table 4.8. Consistent with the previously mentioned results, we evince a positive (negative) relationship between competition culture and transient (dedicated) institutional ownership. Further to the previous analyses, the GMM approach allows us to treat all independent and control variables as endogenous. In fact, in our empirical analysis, we assume that only firm age and the year dummies are exogenous. The *AR*(1) and *AR*(2) serial correlation tests results suggest that we cannot reject the null hypothesis of no serial correlation. Further, we apply Hansen's (1982) test for overidentification, as in Arellano and Bond (1991) to assess the validity of our instruments, and based on the results we do not reject the null hypothesis that our instruments are valid. In addition, we conduct the difference-in-Hansen test of exogeneity in a manner like Bond et al. (2001) to determine whether the subset of instruments used in the level equation is exogenous. Again, we do not reject the null hypothesis that our instruments are exogenous. All told, the results of these specification tests lead us to conclude that our dynamic GMM regressions are valid and lend further credence to our arguments.

In summary, we provide robust evidence that transient ownership positively influences a firm's competition culture. This finding suggests that transient institutional owners pressurize managers to propel their firms' corporate culture toward the competition culture possibly in the pursuit of short-term financial objectives that may be harmful to the long-term value of the firm. Furthermore, we demonstrate that dedicated ownership lessens a firm's competition culture, and this is suggestive of dedicated institutional investors acting as effective monitors of management, thereby pushing managers to adopt a less intensive competition culture.

4.5 Summary

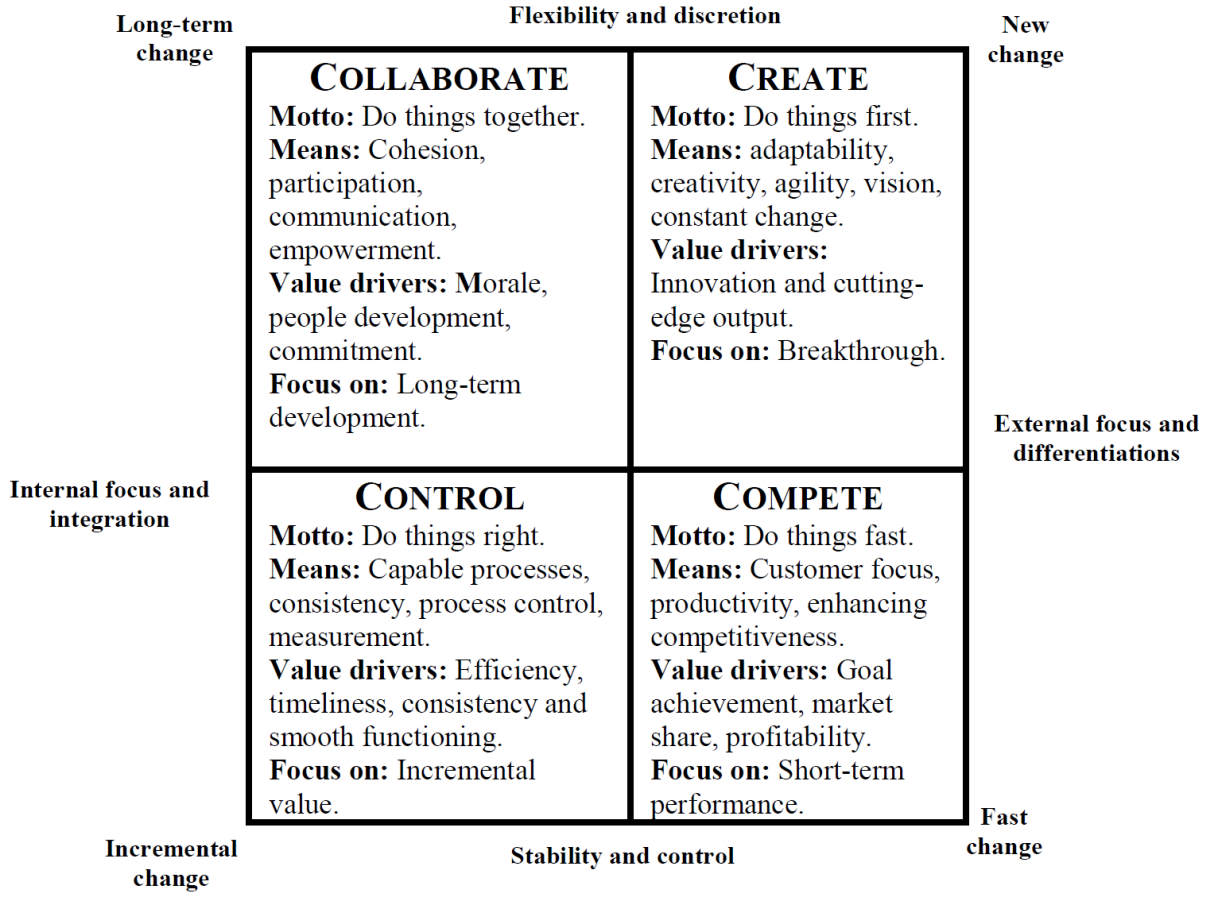
This chapter investigates the important role institutional ownership plays in determining firms' corporate culture. More specifically, we investigate how a firm's competition culture is influenced by institutional investors. Using a text-based measure of firms' competition culture, we document robust evidence that transient institutional ownership increases a firm's competition culture, while dedicated institutional ownership diminishes it. These results suggest that transient institutional ownership reinforces managements' competition culture, while dedicated institutional ownership helps to soothe it.

Our results have important implications of interest to academics and the wider business community. This is because the effect of institutional ownership on competition culture has implications for the manner in which firms are governed and managed. Our main findings should be of interest to boards of directors, who have a responsibility to eliminate any pressures on managers from outside investors to increase their competition culture in order to achieve short-term financial objectives. At the same time, boards should be savvy in designing strategies to

attract institutional investors, since we observe that their investment horizons can have an impact of firms' corporate culture, which in turn has implications for firms' economic outcomes.

Figure 4.1: Schematic Representation of the Four Corporate Cultures

Associated with the Competing Values Framework (CVF)



Source: Adapted from Cameron et al. (2014)

Figure 4.2: Lexical Items per 10-K Report for a Firm's Competition Culture

This figure presents the per 10-K report frequency of the lexical items used to identify the competition Culture.

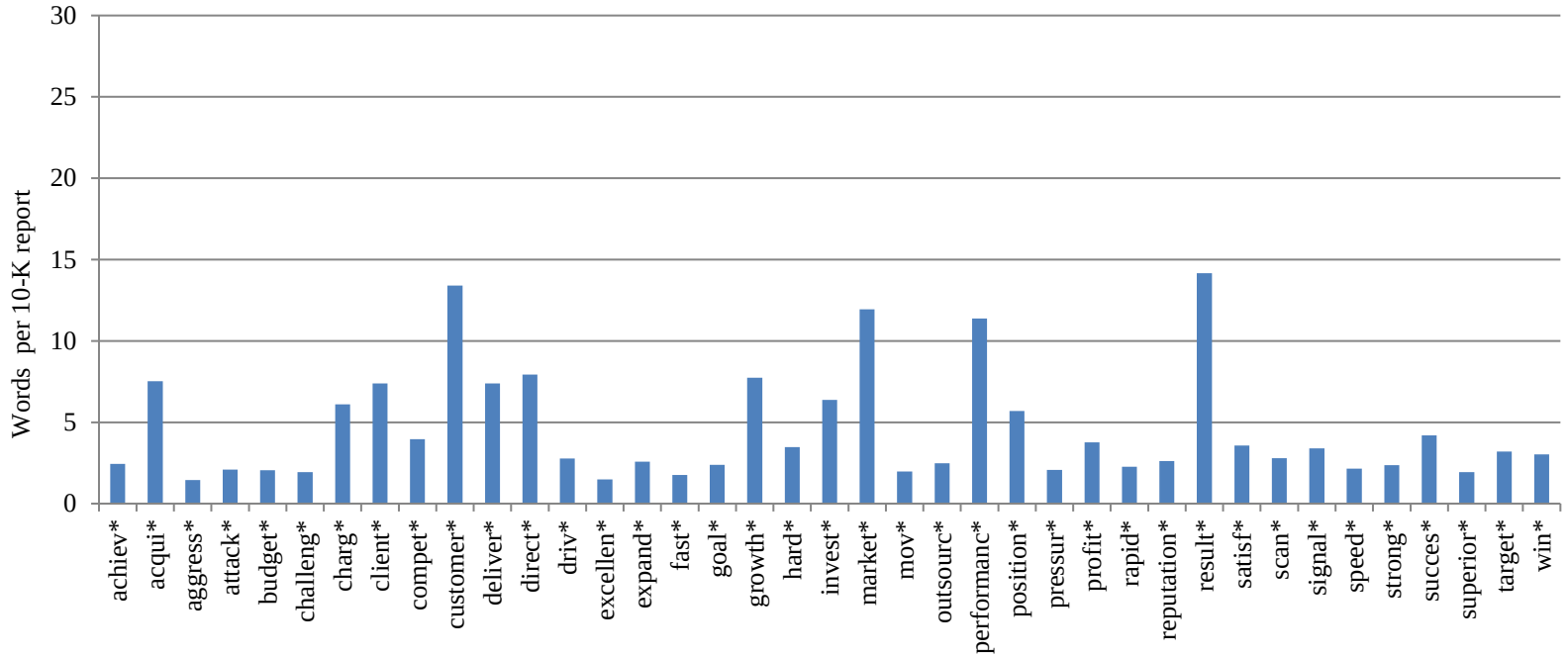


Figure 4.3: Classifications of Competition Words

This graph highlights the compete culture keywords classified into the main tonal classes identified in Loughran and McDonald (2011) and Bodnaruk et al. (2015), computed as a percentage of total competition culture words. Loughran and McDonald (2011) develop a dictionary of words from all 10-K filings during 1994 to 2008. After carefully examining all words occurring in at least 5% of the documents they classify each word according to its most likely usage and sentiment in financial documents. As such, those words classified as "Negative" are indicative of some adverse implication. Conversely, "Positive" words are those that carry a favorable connotation in business. Those words classified as "Uncertainty" are indicative of imprecision and/or risk, while those that reflect the potential for legal contestation are denoted as "Litigious". Those words that express either strong or weak levels of confidence (i.e. strong and weak modal words) are grouped and classified here as "Model". Adopting a similar methodology used by Loughran and McDonald (2011), Bodnaruk et al. (2015) classify "Constraining" words as those that suggest financial constraints.

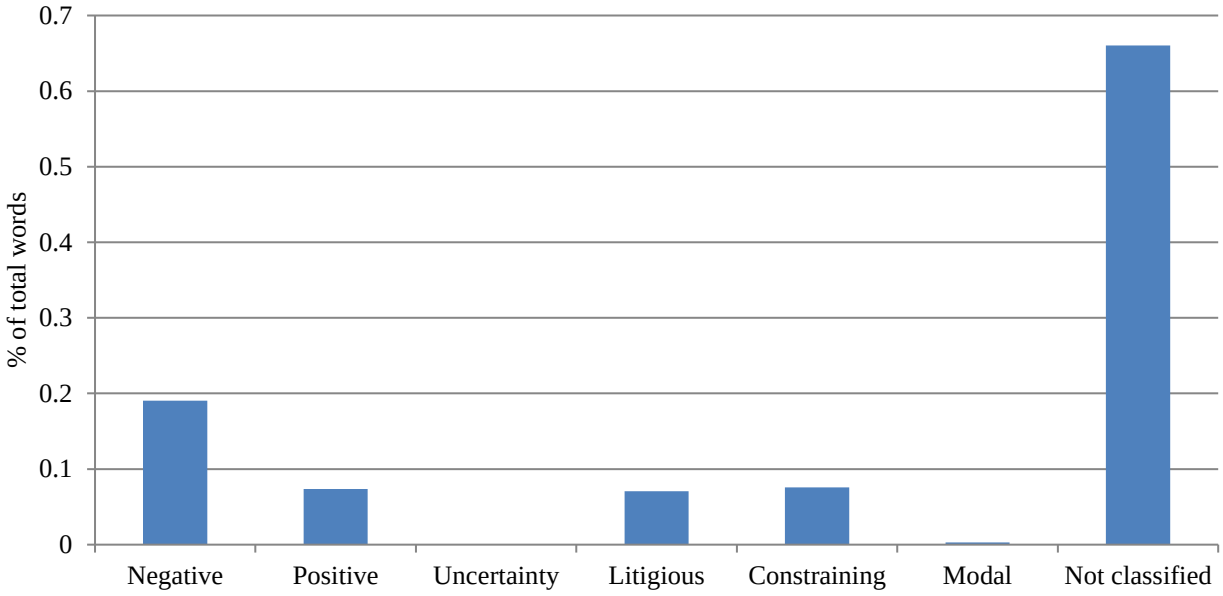


Table 4.1: Definition of Variables

	Symbol		Definitions
Competition culture			
	COMP	=	the intensity of a firm's competition culture estimated for each fiscal year using the text-analysis approach;
Institutional ownership			
	TRA	=	the percentage of stock ownership in the firm by transient institutional investors relative to total shares outstanding;
	DED	=	the percentage of stock ownership in the firm by dedicated institutional investors relative to total shares outstanding;
Other variables			
	AGE	=	number of years since the firm first appears in CRSP;
	DTURN	=	average monthly turnover for the current fiscal year, minus the average monthly share turnover for the previous year;
	DYIELD	=	annual dividend yield;
	FLOAT	=	the difference between rank implied by the observed market capitalization and the rank assigned by Russell in June;
	HHI	=	the Herfindahl-Hirschman concentration ratio computed using total assets for each firm by FF 48 index and state;
	LEV	=	long-term debt by total assets;
	MKTCAP	=	natural logarithm of market capitalization at May 31 for each calendar year;
	MTB	=	market to book value of equity at the end of the fiscal year;
	RANK	=	the rank order of the Russell index based on market capitalizations on May 31 of each calendar year;
	RET	=	average weekly returns for the fiscal year;
	ROA	=	return on assets defined as income before extraordinary items divided by total assets;
	R2000	=	equal to 1 if the firm is in the Russell 2000 index and is 0 if the firm is a member of the Russell 1000 index;
	SGROWTH	=	sales for the fiscal year divided by sales for the prior fiscal year;
	SIZE	=	natural logarithm of the market value of equity at the end of the fiscal year;
	SP500	=	equal to 1 if the firm is included in the S&P 500 index, and is 0 otherwise; and
	STDEV	=	the volatility of firm-specific weekly returns.

Table 4.2: Descriptive Statistics for the Variables used in the Empirical Analyses

This table presents the mean, median, 25th percentile, 75th percentile, and the number of observations for the variables used in the study for the period 1994 to 2014.

Variable	Obs.	Mean	Std. Dev.	25th Pctl.	Median	75th Pctl.
COMP	31,223	0.49	0.06	0.45	0.49	0.54
TRA	31,223	0.15	0.12	0.06	0.13	0.22
DED	31,223	0.06	0.09	0	0.01	0.09
AGE	31,223	23.64	12.98	14	20	32
DTURN	31,223	1.19	23.18	–5.97	0.4	7.76
DYIELD	31,223	0.01	0.05	0	0	0.01
FLOAT	2,608	103.45	132.92	-485	3	78
HHI	31,223	0.43	0.29	0.2	0.35	0.6
LEV	31,223	0.47	0.29	0.28	0.46	0.62
MKTCAP	2,900	20.66	1.57	16.91	19.53	20.41
MTB	31,223	3.38	55.44	1.32	2.13	3.58
RANK	2,900	413.88	830.87	-999	-314	415
RET	31,223	–0.2	0.21	–0.25	–0.12	–0.06
ROA	31,223	0.01	0.26	0	0.05	0.08
R2000	2,900	0.65	0.48	0	0	1
SGROWTH	30,910	1.37	21.47	1	1.09	1.23
SIZE	31,223	6.29	1.78	5.02	6.2	7.43
SP500	31,223	0.21	0.41	0	0	0
STDEV	31,223	0.06	0.03	0.04	0.05	0.07

Table 4.3: Pearson Correlation Matrix

This table presents Pearson correlation coefficients for the variables used in the empirical analyses. The bold figures indicate significance at the 10 percent level or better.

	COMP	*TRA*	*DED*	*AGE*	*DTURN*	*DYIELD*	*FLOAT*	*HHI*
TRA	**0.0958**							
DED	**-0.0621**	-0.0114						
AGE	**-0.1571**	**-0.1061**	**0.0644**					
DTURN	**-0.0259**	**0.1298**	-0.0062	0.0112				
DYIELD	**-0.0286**	**-0.0468**	0.0052	**0.0831**	0.0039			
FLOAT	0.0124	**0.1529**	**-0.0713**	**-0.2818**	**0.1225**	**-0.0747**		
HHI	**-0.0776**	**-0.0928**	**-0.0228**	**0.1830**	0.0026	**0.0466**	-0.0369	
LEV	**-0.0876**	-0.0055	**0.0588**	**0.1012**	**0.0261**	**0.0409**	**-0.0665**	**0.0779**
MKTCAP	-0.0238	**-0.1210**	0.0323	**0.2523**	-0.0163	0.0152	**-0.1697**	**0.0826**
MTB	0.0019	0.0071	0.0039	0.0032	0.0006	0.0011	-0.0177	-0.0040
PCTCOMP	**0.1389**	0.0012	**0.0651**	**-0.1616**	**-0.0315**	**-0.0575**	**0.0705**	**-0.0745**
RANK	**0.0532**	-0.0177	**-0.1236**	**-0.4013**	0.0181	0.0034	**0.5787**	**-0.0897**
RET	**-0.1054**	**-0.0803**	**0.0322**	**0.2821**	**-0.1528**	**0.0776**	**-0.2513**	**0.1216**
ROA	**-0.0239**	**0.0465**	**0.0243**	**0.1305**	**0.0498**	**0.0451**	**-0.0707**	**0.0702**
R2000	**0.0538**	**0.1221**	**-0.1499**	**-0.3297**	**0.0778**	-0.0121	**0.4682**	**-0.0903**
SGROWTH	**0.0278**	-0.0028	-0.0046	-0.0109	0.0115	-0.0037	0.0040	-0.0075
SIZE	**-0.0512**	**0.2368**	**0.0241**	**0.2867**	**0.0792**	**0.0151**	**-0.4069**	0.0122
SP500	**-0.1022**	**0.0626**	**0.0881**	**0.4053**	**0.0245**	**0.0330**	**-0.3701**	**0.0565**
STDEV	**0.1141**	**0.1165**	**-0.0271**	-0.3387	**0.1427**	**-0.0965**	**0.2944**	**-0.1413**

(continued on the next page)

Table 4.3 cont'd

	LEV	*MKTCAP*	*MTB*	*RET*	*ROA*	*R2000*	*SGROWTH*	*SIZE*	*SP500*
LEV									
MKTCAP	**0.0460**								
MTB	0.0035	0.0158							
RANK	**-0.1815**	**-0.3372**	**-0.0445**						
RET	**0.0512**	**0.1404**	-0.0085						
ROA	**-0.3109**	**0.0986**	-0.0032	**0.2943**					
R2000	**-0.1415**	**-0.2984**	**-0.0461**	**-0.3223**	**-0.1942**				
SGROWTH	0.0004	-0.0025	0.0000	-0.0045	-0.0057	-0.0230			
SIZE	**0.0994**	**0.4559**	**0.0205**	**0.3559**	**0.2017**	**-0.7712**	0.0068		
SP500	**0.1399**	**0.3268**	0.0046	**0.2191**	**0.1060**	**-0.6470**	0.0078	**0.6406**	
STDEV	**-0.0691**	**-0.1973**	0.0045	**-0.9629**	**-0.2903**	**0.4077**	0.0055	**-0.4243**	**-0.2758**

Table 4.4: Transition Matrices

This table presents average annual transition matrices between year *t* and year *t+1* deciles of competition culture [Panel A]; transient institutional ownership [Panel B]; and dedicated institutional ownership [Panel C]. The diagonal elements are presented in bold figures.

Panel A: Competition culture

			$COMP_{t+1}$									
			1	2	3	4	5	6	7	8	9	10
	Lowest	1	**0.6712**	0.1907	0.0617	0.0301	0.0183	0.0092	0.0078	0.0034	0.0050	0.0026
		2	0.2148	**0.4020**	0.2124	0.0841	0.0414	0.0191	0.0135	0.0080	0.0032	0.0016
		3	0.0642	0.2418	**0.2990**	0.2031	0.1057	0.0449	0.0229	0.0091	0.0057	0.0036
		4	0.0234	0.0917	0.2232	**0.2876**	0.1903	0.1030	0.0490	0.0198	0.0080	0.0041
$COMP_t$		5	0.0132	0.0435	0.1002	0.2175	**0.2519**	0.2007	0.0992	0.0471	0.0181	0.0085
		6	0.0066	0.0198	0.0505	0.0956	0.2225	**0.2666**	0.1886	0.0991	0.0425	0.0082
		7	0.0060	0.0081	0.0213	0.0489	0.1033	0.2074	**0.2793**	0.2087	0.0932	0.0237
		8	0.0047	0.0076	0.0105	0.0230	0.0424	0.0924	0.2241	**0.3142**	0.2241	0.0568
		9	0.0029	0.0032	0.0037	0.0107	0.0184	0.0377	0.0944	0.2251	**0.3889**	0.2149
	Highest	10	0.0043	0.0024	0.0016	0.0037	0.0062	0.0112	0.0268	0.0677	0.2121	**0.6640**

Panel B: Transient institutional ownership

			TRA_{t+1}									
			1	2	3	4	5	6	7	8	9	10
	Lowest	1	**0.4942**	0.2250	0.1081	0.0600	0.0395	0.0249	0.0184	0.0118	0.0096	0.0086
		2	0.2079	**0.3168**	0.1814	0.1055	0.0658	0.0416	0.0300	0.0212	0.0172	0.0127
		3	0.0969	0.1810	**0.2493**	0.1690	0.1037	0.0728	0.0467	0.0355	0.0262	0.0189
		4	0.0502	0.0974	0.1732	**0.2113**	0.1542	0.1201	0.0797	0.0545	0.0373	0.0223
TRA_t		5	0.0334	0.0617	0.1077	0.1666	**0.1913**	0.1481	0.1173	0.0838	0.0555	0.0346
		6	0.0208	0.0406	0.0715	0.1152	0.1622	**0.1822**	0.1540	0.1205	0.0852	0.0477
		7	0.0130	0.0254	0.0453	0.0756	0.1193	0.1675	**0.1918**	0.1647	0.1242	0.0731
		8	0.0089	0.0170	0.0273	0.0487	0.0794	0.1280	0.1789	**0.2055**	0.1892	0.1170
		9	0.0061	0.0101	0.0196	0.0312	0.0509	0.0757	0.1247	0.1973	**0.2645**	0.2200
	Highest	10	0.0054	0.0087	0.0132	0.0178	0.0300	0.0442	0.0679	0.1158	0.2279	**0.4691**

Panel B: Transient institutional ownership

			DED_{t+1}									
			1	2	3	4	5	6	7	8	9	10
	Lowest	1	**0.4490**	0.1694	0.1078	0.0651	0.0589	0.0495	0.0317	0.0250	0.0255	0.0180
		2	0.1774	**0.3205**	0.1666	0.1107	0.0757	0.0458	0.0395	0.0285	0.0192	0.0161
		3	0.0881	0.1801	**0.2711**	0.1597	0.1087	0.0758	0.0490	0.0331	0.0208	0.0134
		4	0.0578	0.0991	0.1678	**0.2444**	0.1523	0.1056	0.0709	0.0490	0.0355	0.0177
DED_t		5	0.0406	0.0572	0.1028	0.1539	**0.2234**	0.1602	0.1085	0.0808	0.0476	0.0248
		6	0.0357	0.0361	0.0536	0.1028	0.1604	**0.2222**	0.1674	0.1134	0.0770	0.0314
		7	0.0262	0.0324	0.0414	0.0613	0.1046	0.1630	**0.2243**	0.1774	0.1138	0.0556
		8	0.0238	0.0233	0.0259	0.0422	0.0641	0.0953	0.1876	**0.2543**	0.1974	0.0862
		9	0.0210	0.0186	0.0169	0.0243	0.0335	0.0581	0.0992	0.1908	**0.3276**	0.2101
	Highest	10	0.0150	0.0165	0.0150	0.0154	0.0213	0.0276	0.0410	0.0741	0.1905	**0.5836**

Table 4.5: OLS, Random Effects and Logistic Regressions of Institutional Ownership on Competition Culture

This table presents OLS (columns 1 - 3), GLS-RE (columns 4 - 6) and logistic regression (columns 7 – 9) estimates used to investigate the impact of transient (*TRA*) [Panel A] and dedicated (*DED*) [Panel B] institutional ownership on the level of firms' competition culture (*COMP*) (columns 1 – 6) and increases (Δ*COMP_INC*) or decreases (Δ*COMP_DEC*) in the decile rank of firm's competition culture (columns 7 – 9). All regressions include year fixed effects, while the OLS and logistic regression estimates also include industry fixed effects. The standard errors are all clustered at the firm-level.

Panel A. The effect of transient institutional ownership on competition culture.

	$COMP_{t+1}$						$\Delta COMP\_INC_{t+1}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
TRA_t	0.053***			0.022***			0.066***		
	(5.01)			(3.10)			(3.03)		
ΔTRA_t		0.031***	0.030***		0.011**	0.009*		0.056**	0.058**
		(4.37)	(4.30)		(2.02)	(1.79)		(2.26)	(2.33)
TRA_{t-1}		0.064***			0.034***			0.074***	
		(4.93)			(3.67)			(2.92)	
ΔTRA_{t-1}			0.048***			0.023***			0.083***
			(5.29)			(3.22)			(2.84)
TRA_{t-2}			0.066***			0.035***			0.069**
			(4.53)			(3.25)			(2.49)
AGE_t	–0.087***	–0.085***	–0.085***	–0.143***	–0.141***	–0.141***	0.049**	0.050**	0.049**
	(6.06)	(5.97)	(5.97)	(9.47)	(9.34)	(9.34)	(2.34)	(2.35)	(2.32)
$DTURN_t$	–0.019***	–0.019***	–0.018***	–0.004	–0.004	–0.003	0.015	0.015	0.01
	(4.26)	(4.27)	(4.07)	(1.22)	(1.32)	(0.98)	(0.69)	(0.70)	(0.44)
LEV_t	–0.057***	–0.057***	–0.057***	–0.01	–0.009	–0.009	-0.023	-0.023	-0.023
	(4.85)	(4.81)	(4.81)	(1.08)	(1.00)	(1.00)	(0.94)	(0.93)	(0.94)
MTB_t	–0.012	–0.011	–0.011	–0.009*	–0.009*	–0.009	-0.023	-0.023	-0.024
	(1.32)	(1.22)	(1.19)	(1.78)	(1.67)	(1.62)	(1.45)	(1.46)	(1.45)
RET_t	–0.065**	–0.070**	–0.069**	–0.054***	–0.059***	–0.058***	-0.223***	-0.226***	-0.227***
	(2.26)	(2.44)	(2.41)	(2.80)	(3.03)	(2.97)	(3.13)	(3.14)	(3.16)
ROA_t	–0.004	–0.004	–0.004	–0.017***	–0.017***	–0.017***	-0.006	-0.006	-0.006
	(0.35)	(0.35)	(0.34)	(2.69)	(2.72)	(2.69)	(0.27)	(0.28)	(0.30)
$SIZE_t$	–0.013	–0.017	–0.017	0.039***	0.034**	0.034**	-0.027	-0.027	-0.025
	(0.83)	(1.06)	(1.05)	(2.81)	(2.41)	(2.40)	(1.13)	(1.16)	(1.07)
$STDEV_t$	–0.043	–0.049	–0.048	–0.054**	–0.059***	–0.058***	-0.227***	-0.230***	-0.230***
	(1.27)	(1.43)	(1.40)	(2.42)	(2.63)	(2.59)	(2.88)	(2.89)	(2.89)
R^2	0.18	0.18	0.18	0.05	0.05	0.05	0.02	0.02	0.02
N	31,223	31,223	31,223	31,223	31,223	31,223	13,034	13,034	13,034

(continued on the next page)

Table 4.5 cont'd.

Panel B. The effect of dedicated institutional ownership on competition culture.

	$COMP_{t+1}$						$\Delta COMP\_DEC_{t+1}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
DED_t	–0.021*			–0.022***			-0.036		
	(1.89)			(2.68)			(1.64)		
ΔDED_t		–0.014*	–0.012		–0.016***	–0.016***		-0.074***	-0.075***
		(1.74)	(1.55)		(2.67)	(2.64)		(2.62)	(2.66)
DED_{t-1}		–0.023*			–0.025**			-0.01	
		(1.75)			(2.44)			(0.36)	
ΔDED_{t-1}			–0.006			–0.014*			-0.021
			(0.59)			(1.78)			(0.75)
DED_{t-2}			–0.029**			–0.032***			-0.004
			(1.96)			(2.69)			(0.13)
AGE_t	–0.094***	–0.094***	–0.094***	–0.147***	–0.147***	–0.146***	-0.02	-0.019	-0.02
	(6.58)	(6.58)	(6.57)	(9.75)	(9.74)	(9.71)	(0.95)	(0.91)	(0.92)
$DTURN_t$	–0.014***	–0.014***	–0.013***	–0.002	–0.002	–0.002	0.040*	0.039*	0.039*
	(3.15)	(3.14)	(3.09)	(0.69)	(0.68)	(0.64)	(1.90)	(1.87)	(1.86)
LEV_t	–0.056***	–0.056***	–0.056***	–0.009	–0.009	–0.009	-0.013	-0.015	-0.015
	(4.76)	(4.75)	(4.71)	(1.02)	(1.01)	(0.98)	(0.65)	(0.75)	(0.78)
MTB_t	–0.013	–0.013	–0.013	–0.009*	–0.009*	–0.009*	-0.063	-0.061	-0.061
	(1.37)	(1.38)	(1.44)	(1.67)	(1.68)	(1.73)	(1.30)	(1.28)	(1.28)
RET_t	–0.031	–0.031	–0.031	–0.044**	–0.044**	–0.044**	-0.052	-0.052	-0.052
	(1.08)	(1.09)	(1.09)	(2.26)	(2.27)	(2.28)	(0.70)	(0.70)	(0.70)
ROA_t	–0.001	–0.001	–0.001	–0.016**	–0.016**	–0.016**	-0.005	-0.005	-0.005
	(0.13)	(0.13)	(0.13)	(2.49)	(2.50)	(2.48)	(0.26)	(0.25)	(0.25)
$SIZE_t$	0.01	0.01	0.011	0.050***	0.050***	0.051***	0.041*	0.039*	0.039
	(0.65)	(0.66)	(0.72)	(3.75)	(3.76)	(3.79)	(1.75)	(1.66)	(1.63)
$STDEV_t$	–0.005	–0.006	–0.006	–0.044*	–0.044**	–0.045**	-0.026	-0.024	-0.024
	(0.15)	(0.17)	(0.18)	(1.95)	(1.97)	(1.98)	(0.32)	(0.30)	(0.30)
R^2	0.17	0.17	0.17	0.05	0.05	0.05	0.02	0.02	0.02
N	31,223	31,223	31,223	31,223	31,223	31,223	13,037	13,037	13,037

*p<0.1; ** p<0.05; *** p<0.01

Table 4.6: Instrumental Variable Regressions of Institutional Ownership on Competition Culture

This table presents instrumental variable (IV) regressions of the relationships between transient (*TRA*) and dedicated (*DED*) institutional ownership and competition culture (*COMP*) [Panel A], and the results of a Stock and Yogo (2005) weak instruments test [Panel B]. The regressions include year and industry fixed effects and the standard errors are clustered by firm.

Panel A. IV regression first and second stage results.

	1st stage: TRA_t	*$COMP_t$*	*1st stage: DED_t*	*$COMP_t$*
	(1)	(2)	(3)	(4)
TRA_t		0.039**		
		(2.41)		
DED_t				-0.064**
				(2.13)
$R2000_t$	0.263***		-0.161***	
	(6.91)		(3.78)	
$R2000_t \times RANK_t$	-0.350***	0.012**	-0.641**	-0.006
	(10.09)	(2.16)	(2.04)	(1.31)
$MRKCAP_t$	-0.068***	0.001	-0.007	-0.002
	(5.73)	(0.48)	(0.86)	(1.03)
$FLOAT_t$	0.957***	-0.005**	-0.039	-0.001
	(5.38)	(2.05)	(0.23)	(0.79)
R^2	0.18		0.08	
N	2,440	2,440	2,440	2,440

Panel B. Stock and Yogo (2005) Weak Instruments Test.

Instrumented variables	Instruments	First stage F – Statistic	Critical value
TRA_t	$R2000_t$	50.46	16.38
DED_t	$R2000_t$	60.21	16.38

*p<0.1; ** p<0.05; *** p<0.01

Table 4.7: Instrumental Variable Regressions of Institutional Ownership on Competition Culture

This table presents instrumental variable (IV) regressions used to investigate the relationship between transient (*TRA*) and dedicated (*DED*) ownership and competition culture (*COMP*). The regressions include year and industry fixed effects and the standard errors are clustered by firm.

	1st stage: TRA_t	*$COMP_{t+1}$*	*1st stage: DED_t*	*$COMP_{t+1}$*
	(1)	(2)	(3)	(4)
TRA_t		0.197***		
		(4.14)		
DED_t				–0.296*
				(1.79)
$DYIELD_t$	–0.106***		–0.029***	
	(12.57)		(3.78)	
$SGROWTH_t$	0.026***		–0.021***	
	(4.18)		(3.77)	
$SP500_t$	–0.252***		0.036	
	(7.27)		(1.24)	
RET_t	0.527***		0.152***	
	(21.12)		(6.64)	
AGE_t	–0.090***	–0.062***	–0.025**	–0.102***
	(7.94)	(3.77)	(2.31)	(6.45)
$DTURN_t$	0.090***	–0.031***	0.003	–0.013***
	(16.61)	(4.84)	(0.81)	(2.93)
LEV_t	0.016	–0.059***	0.035***	–0.047***
	(1.62)	(4.87)	(3.85)	(3.53)
MTB_t	0.002	–0.012	–0.026***	–0.020*
	(0.24)	(1.22)	(3.79)	(1.80)
ROA_t	0.041***	–0.019*	–0.007	–0.008
	(4.65)	(1.75)	(1.00)	(0.72)
$SIZE_t$	0.429***	–0.058***	0.105***	0.039*
	(29.24)	(2.59)	(9.23)	(1.78)
$STDEV_t$	0.599***	0.009	0.102***	0.012
	(22.03)	(0.74)	(3.85)	(0.76)
R^2	0.33		0.38	
N	30,910	30,910	30,910	30,910

Panel B. Stock and Yogo (2004) weak instruments test

Instrumented variables	Instruments	First stage *F* – Statistic	Critical value
TRA_t	*$DYIELD_t$; $SGROWTH_t$; $SP500_t$; RET_t*	183.72	10.27
DED_t	*$DYIELD_t$; $SGROWTH_t$; $SP500_t$; RET_t*	18.33	10.27

*p<0.1; ** p<0.05; *** p<0.01

Table 4.8: Dynamic System GMM Regressions of Institutional Ownership on Competition Culture

This table presents dynamic panel GMM estimates of the relationship between transient (*TRA*) and dedicated (*DED*) ownership and competition culture (*COMP*). *AR*(1) and *AR*(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The Hansen test of over-identification is under the null that all instruments are valid. The Diff-in-Hansen test exogeneity is under the null that instruments used for the equations in levels are exogenous.

	$COMP_t$	
	(1)	(2)
TRA_t	0.098**	
	(1.99)	
DED_t		–0.100*
		(1.68)
AGE_t	–0.031	–0.071**
	(1.62)	(2.53)
$DTURN_t$	–0.035	–0.014
	(0.96)	(0.42)
LEV_t	–0.096**	–0.064
	(2.18)	(0.96)
MTB_t	–0.038	0.025
	(0.93)	(0.51)
RET_t	–0.063	0.071
	(0.43)	(0.45)
ROA_t	–0.029	0.028
	(0.59)	(0.49)
$SIZE_t$	0.124**	0.063
	(2.54)	(0.79)
$STDEV_t$	–0.025	0.063
	(0.16)	(0.38)
$COMP_{t-1}$	0.580***	0.428***
	(6.22)	(4.18)
$COMP_{t-2}$	0.152**	0.121
	(1.98)	(1.61)
AR(1) test *p*-value	0.00	0.00
AR(2) test *p*-value	0.46	0.44
Hansen test for over-identification *p*-value	0.71	0.27
Diff–in–Hansen tests of exogeneity *p*-value	0.81	0.34
N	15,993	15,993

*p<0.1; ** p<0.05; *** p<0.01

Chapter 5 The Effect of Firms' Competition Culture on Meeting/ Beating Earnings Forecast and Crash Risk

5.1 Introduction

A number of recent studies have explored the importance of firms' corporate culture for predicting various economic outcomes (see, for example, Cronqvist et al., 2007; Popadak, 2013; Fiordelisi and Ricci, 2014; Guiso et al., 2006, 2015a, 2015b; Zingales, 2015; Callen and Fang, 2015; Erhard et al., 2016; Grieser et al., 2016; Bhandari et al., 2017). In this chapter, we extend this literature by investigating whether and how firms' competition culture influences the propensity to meet and/or beat analysts' earnings forecasts, and whether and how competition culture relates to firm-specific stock price crash risk. Furthermore, we explore whether firm's competition culture is a channel through which institutional investors are able to affect firm's crash risk.

To conduct this study, we perform a textual analysis of 10-K filings to measure firms' *competition culture* based on the competing values framework (CVF) (e.g., Quinn and Cameron, 1983; Quinn and Rohrbaugh, 1983; Cameron et al., 2014). In doing so, we follow a growing body of literature that applies textual analysis of firms' 10-K filings in finance-related research (see, for instance, Tetlock, 2007; Loughran and McDonald, 2009; Hoberg and Phillips, 2010, 2016; Li et al., 2013a; Hoberg et al., 2014; Kearney and Liu, 2014). We adopt this measurement approach because past literature suggests that it provides an efficient way of capturing firms' values related to the competition culture for a large number of US publicly listed firms (Fiordelisi and Ricci, 2014; Bhandari et al., 2017). Hence, as described in Chapter 4 and consistent with past works we operationalize our measure of competition culture by parsing 10-K filings to identify a set of lexical items relating to attributes that shape firms norms and values.

As we have mentioned, Cameron et al. (2014) define the competition culture as a type of corporate value that focuses the firm on achieving superior financial performance by assimilating and responding to external environmental information. Further recall that the competing values framework postulates competition culture as an important corporate value that impacts corporate decision-making. Thus, within this framework, the competition culture of a firm is said to encapsulate those value-creating activities that are empowered by the forceful pursuit of profitability and financial performance. Hence, firms with an intensified competition culture are argued to have a proclivity towards meeting and beating analysts' earnings forecasts. Equally, when a firm's competition culture is excessive, it could be argued that the management can become highly susceptible to engaging in bad news hoarding and/or making suboptimal investment decisions that can potentially harm shareholder value creation.

Thus, having established the influential role of institutional investors on a firm's competition culture in Chapter 4 of this thesis, we argue that firms with greater levels of competition culture should be motivated to consistently meet and/or beat analysts' earnings expectations. In particular, we contend that the thrust towards being more aggressive in the pursuit of profitability, a theoretical core trait of firms with high levels of competition culture, increases the probability that such firms are able to meet and/or beat their earnings forecast. In this vein, we make use of our measure of competition culture to investigate whether firms, which place more emphasis on this cultural orientation, are indeed more likely to meet and/or beat analysts' forecasts. Consistent with our expectations, we find a significantly greater tendency to meet and/or beat analysts' forecasts for firms with greater competition culture.

Further, if firms with a greater competition culture exhibit much higher proclivity to meet and/or beat earnings expectations, then it is possible that this is achieved by being more secretive and

by concealing negative information about the firm, as documented by Andreou et al. (2017). If this is so, then, on average, we would also expect firms with greater competition culture to be prone to firm-specific stock price crashes. Given this, we investigate the relation between competition culture and a firm's proclivity to engage in bad news hoarding that results in stock price crashes. In general, managers have financial incentives and other career motives to overstate performance by opportunistically suppressing bad news while accelerating the release of good news in the hoping that a firm's current poor performance will be masked by better future performance (Kim and Zhang, 2011a, 2011b, 2015). However, such practices make firms vulnerable to adverse economic outcomes in the form of large idiosyncratic stock price declines, known as crash risk (Hutton et al., 2009; Callen and Fang, 2013, 2015; Andreou et al., 2017). For firms with an intense competition culture, managerial incentives to conceal negative information would be naturally heightened, since such firms need to consistently deliver superior results as they inherently have an inclination to assimilate and cater to external market expectations. Thus, after controlling for known crash risk determinants, we empirically test this proposition and show a strong positive relation between competition culture and one-year-ahead crash risk. As crash risk associated with stock price drop, this evidence corroborates that on average competition culture appears to be harmful to firms' shareholder value creation.

Combining the result that transient (dedicated) institutional ownership intensifies (lessens) firms' competition culture (please see Chapter 4) with the evidence that such behavior leads to an increased propensity for crash risk, we suspect that competition culture is a channel through which institutional ownership can indirectly influence a firm's policies and outcomes. To further investigate this, we conduct subsample and mediation analyses and the results are consistent with our expectations. For instance, we find that the positive relation between competition culture and

the one-year-ahead crash risk is present only within the subsample of firms that is dominated by high levels of transient institutional ownership and low levels of dedicated institutional ownership. This analysis shows that competition culture is in and of itself not value-destroying; rather, the striking result is that the competition culture becomes harmful only when it is associated with a high proportion of transient and a low proportion of dedicated ownership. Thus, taken altogether, we conclude that institutional investors constitute a key corporate governance mechanism which can (either curb or) exacerbate a firm's competition culture, that can then give rise to the opportunistic behavior of managers to strategically withhold and accumulate negative information pertaining to their firms' poor performance which impacts its policies and outcomes.

To safeguard against the possibility that our analyses are negatively affected by simultaneous causality issues, all of our baseline regression models rely on a one-year time-lag between the independent and dependent variables. Thus, our models are less susceptible to the presence of a contemporaneous feedback mechanism (i.e., reverse causality) between the key variables. Further, to mitigate other endogeneity concerns, we re-estimate all of our empirical models using an instrumental variable (IV) analysis and we reach similar, and in certain cases even stronger results.

Our study contributes to the recent literature by first demonstrating that firms with a dominate competition culture are more inclined to achieve earnings expectations; however, we also reveal a dark-side to competition culture: as greater competition culture results in increased firm-specific stock price crash risk, especially when a firm's investor base is represented by high (low) levels of transient (dedicated) institutional investors. In so doing, we contribute in the burgeoning literature that focuses on the impact of firms' organizational norms and principles to policies and economic outcomes (see, for example, Loughran et al., 2009; Popadak, 2013; Fiordelisi and Ricci, 2014; Guiso et al., 2006, 2015a, 2015b; Zingales, 2015; Callen and Fang, 2015; Erhard et al., 2016)

by introducing competition culture as another organizational effectiveness factor that links to shareholder value creation.

The remainder of this chapter is presented as follows: Section 5.2 develops the main hypotheses; details of the data and summary statistics are presented in Section 5.3; Sections 5.4 present the empirical results; and Section 5.5 concludes.

5.2 Hypotheses

In this chapter, we first investigate the impact of competition culture on firms' propensity to meet and/or beat analysts' earnings expectations. Theory and prior empirical works suggest that managers at firms with greater levels of the competition culture are more motivated towards the aggressive pursuit of superior financial results for investors (Hartnell et al., 2011; Cameron et al., 2014). Hence, consistent with this past literature and our own reasoning within the CVF, we argue that the pressure towards being more forceful in the quest for financial performance should result in such firms consistently meeting and/or beating analysts' forecasts expectations. Consequently, we posit the following hypothesis in alternative form;

H1: Competition culture is positively associated with meeting/ beating analysts' earnings forecast.

What is more, if managers at firms with high competition culture are more likely to cater to investors and the capital markets by consistently meeting and/or beating earnings expectations, it is plausible that this is achieve, in part, by being more secretive and by concealing negative

information about the firm (Andreou et al., 2017). If this is so, then, on average, we would also expect firms with greater competition culture to be more prone to experience firm-specific stock price crashes (e.g. Kim and Zhang, 2011a, 2011b, 2015) as bad news hoarding make firms vulnerable to adverse economic outcomes in the form of large idiosyncratic stock price declines, when such bad news is eventually revealed to the market (Hutton et al., 2009; Callen and Fang, 2013, 2015; Andreou et al., 2016, 2017). Consequently, we posit the following hypothesis in alternative form;

H2: Competition culture is positively associated with firm-specific stock price crash risk.

5.3 Data, Variables and Sample

5.3.1 Data

Ours is a unique dataset built by merging information from a number of publicly available data sources. We obtain annual firm-level data of US publicly traded firms for the period 1994 to 2014 from Compustat. To measure the competition culture through textual analysis we obtain firms' 10-K reports from SEC's Edgar database. For the institutional ownership variables, we employ data from the Thomson Reuters Institutional Holdings Database. We obtain analyst forecast data from the Institutional Brokers Estimate System (I/B/E/S) database provided by the Thomson Reuters Corporation.

We perform analysis on all firms included in the Compustat database excluding financials (SIC 6000-6999) and utilities (SIC 4900-4999). Also, to limit survivorship bias, firms that are inactive and/or acquired by another firm during the period of study are retained in the sample. Further, we

also delete from our sample all firm-year observations with missing data on the variables of interest. This results in a final main sample consisting of 31,223 firm-year observations. Table 5.1 reports the definition of all the variables used in the analysis.

5.3.2 Measuring Competition Culture

In this study, we measure corporate attributes relating to a firm's competition culture using a textual analysis of 10-K filings obtained from SEC's Edgar database. As we have mentioned, textual analysis permits the systematic and objective quantification of the information content present in a specific body of text. Hence, we assume that the 10-K filings encapsulate useful information regarding the corporate culture that firms have developed over time which is not easy to observe using secondary data sources. Thus parsing 10-K filings for specific lexical items allows us to quantify corporate attributes associated with the four cultures exemplified by the CVF. Hence, as in Chapter 4, we measure a firm's competition culture (*COMP*) by counting the number of times that the lexical items included in the bag of words describing corporate attributes for the competition culture are found in the 10-K filings and scale our measure by counts of the lexical items that describe the other cultural orientations as follows:[11]

$$COMP = \frac{Number\ of\ lexical\ items\ describing\ the\ Competition\ Culture}{Total\ number\ of\ lexical\ items\ for\ all\ types\ of\ cultures}. \quad (5.1)$$

As has been noted in Chapter 3, similar textual analysis approaches have been shown to extract valuable information from firms' reports (Li, 2010a, 2010b; Li et al., 2013a; Loughran and McDonald, 2011, 2016; Fiordelisi and Ricci, 2014; Kearney and Liu, 2014; Audi et al., 2016;

[11] While conducting our count we exclude negation of the lexical items by ignoring occasions when the word is preceded by "no", "non", "not", "less", "few" or "limited" by three or fewer words.

Bushman et al., 2016). In this work, we carefully construct our measurement approach to capture corporate attributes that describe a firm's competition culture by using a comprehensive bag of words that elicit the full array of firms' cultural orientations as theorized under the CVF in Cameron et al. (2014) and Hartnell et al. (2011). Scaling the frequency of lexical items describing a firm's competition culture by the total number of lexical items in the bag of words for all four cultural orientations allows us to construct a relative measure of the competition culture that does not neglect the intensity of the rest of corporate cultures that exist within firms.

5.3.3 Measuring Meeting/ Beating Earnings Forecasts

We employ analysts'-forecast-based measures to capture firms' propensity to meet and/ or beat analysts' earnings forecasts. In particular, we follow Cheng and Warfield (2005) to develop measures that are based on meeting and beating analysts' consensus forecasts. Specifically, we compute these measures by taking the difference between actual earnings per share and the consensus of analysts' forecasts. If earnings meet analysts' forecasts, we assign the indicator variable, *MEET*, a value of one, and zero otherwise. If earnings meet or beat the consensus forecast by at most 1 cent, then the indicator variable *MB*_1 is assigned the value one, and zero otherwise. Finally, if the difference between analysts' forecasts and earnings is at most (positive) 2 cents we assign the indicator variable, *MB*_2, a value of one, and zero otherwise.

5.3.4 Measuring Stock Price Crash Risk

We estimate the following three firm-specific measures of stock price crash risk, namely *DUVOL*, *ESIGMA*, and *NCSKEW*. Each of these measures reflects different aspects of the

distribution of returns (Chen et al., 2001; Hutton et al., 2009; Callen and Fang, 2013; Andreou et al., 2016, 2017) and is computed by estimating firm-specific weekly returns using the following expanded index model regression:

$$r_{j,w} = \alpha_j + \beta_{1,j} r_{m,w-2} + \beta_{2,j} r_{m,w-1} + \beta_{3,j} r_{m,w} + \beta_{4,j} r_{m,w+1} + \beta_{5,j} r_{m,w+2} + \varepsilon_{j,w}, \quad (5.2)$$

where $r_{j,w}$ is the return on the stock of firm *j* in the week *w* and $r_{m,w}$ is the CRSP value-weighted market index for the week *w*. We permit non-synchronous trading by including lead and lag terms for the market index as in Dimson (1979). Further, our regression removes market-wide return movements from firm returns, and thus the residuals of our model is able to capture the weekly firm-specific returns. As the residuals from Eq. (5.2) are skewed, we compute the firm-specific weekly return for firm *j* in week *w* ($R_{j,w}$) as the natural logarithm of the residual plus one.

The *DUVOL* stock price crash risk measure is computed for each firm *j* over a fiscal year *t*, where all weeks with firm-specific returns that are below the annual mean are separated from those above the annual mean. *DUVOL* is the log of the ratio of the standard deviations of the weeks below the mean (DOWN) over the weeks above the mean (UP), and is computed as follows:

$$DUVOL_{j,t} = \log\{(n_u - 1) \sum_{\text{DOWN}} R_{j,w}^2 / (n_d - 1) \sum_{\text{UP}} R_{j,w}^2\}, \quad (5.3)$$

where n_u and n_d are the number of UP and DOWN weeks of the fiscal year *t*.

The *ESIGMA* stock price crash risk measure is the negative of the worst standard deviation of firm-specific weekly returns from the average firm-specific weekly return divided by the standard deviation of firm-specific weekly returns. We compute *ESIGMA* for a given firm in a fiscal year as follows:

$$ESIGMA_{j,t} = -\min \frac{R_{j,w} - \bar{R}_j}{\sigma_{R_j}}, \quad (5.4)$$

where $\bar{R}_j$ and σ_{R_j} are the mean and standard deviation of the firm-specific weekly returns $R_{j,w}$ for the firm *j* over the fiscal year *t*.

The *NCSKEW* stock price crash risk measure is defined as the negative of the third moment of firm-specific weekly returns for each firm-year divided by the standard deviation of firm-specific weekly returns raised to the third power, and is computed as follows:

$$NCSKEW_{j,t} = -\frac{\left(n(n-1)^{\frac{3}{2}} \sum R_{j,w}^3\right)}{\left((n-1)(n-2)\left(\sum R_{j,w}^2\right)^{\frac{3}{2}}\right)}, \tag{5.5}$$

where *n* is the number of observations of firm-specific weekly returns during the fiscal year *t*. The denominator in Eq. (5.5) is a normalization factor.

Larger values of *DUVOL*, *ESIGMA*, and *NCSKEW* signify greater crash risk.

1.1.1 Measuring Institutional Ownership

In this study, we adopt two measures for firms' institutional ownership structure, namely transient and dedicated institutional ownership (Bushee, 1998). Transient institutional ownership, *TRA*, is the percentage of stock ownership in the firm by stort-term investors relative to total shares outstanding. Transient investors focus on short-term performance and invest based on the likelihood of earning short-term trading profits (Bushee, 1998, 2001; Callen and Fang, 2013). Dedicated institutional ownership, *DED*, is defined as the percentage of stock ownership in the firm by long-term institutional investors relative to total shares outstanding. Dedicated investors are defined as those that hold large stakes in a limited number of firms, invest of the long term,

and therefore have strong incentives to monitor the long-term performance of management (Bushee, 1998, 2001; Chen et al. 2001).

5.3.5 Control Variables

We carefully select control variables for our empirical work based on the extant literature (Bushee, 1998, 2001; Chen et al., 2001; Cheng and Warfield, 2005; Callen and Fang, 2013). To begin with, we include in all specifications controls to capture firm-specific characteristics. In particular we include the following: the number of years since the firm was first included in the CRSP database, *AGE*; financial leverage as indicated by total liabilities to total assets, *LEV*; market value of equity to book value of equity, *MTB*; return on total assets, *ROA*; and the natural logarithm of market value of equity, *SIZE*.

Further, when investigating the relation between competition culture and firms' proclivity to meet analysts' expectations, we include controls that are likely to be correlated with the indicators of meeting and/or beating analysts' forecasts that have been adopted in prior studies (Cheng and Warfield, 2005). In particular, we include implicit claims, *ICLAIM*, since according to Bowen et al. (1995) the implicit claims between the firm and shareholders can be negatively affected (due to adverse publicity) should the firm not meet analysts' forecasts. In addition, we include net operating assets, *NOA*, as Barton and Simko (2002) find that firms with higher beginning-of-period net operating assets are less likely to meet analysts' forecasts. We also include controls for the number of analysts, *NUMEST*, and the dispersion of their forecast, *CVAF*. We include these variables because it has been argued that incentives to meet analysts forecast increase according to the number of analysts following the firm and the consensus of their estimates (Payne and Robb,

2000). Finally, we include sales growth, *SGROWTH*, since incentives to meet analysts' expectations are usually higher for growth firms (Skinner and Sloan, 2002).

Similarly, in our specifications that include crash risk as a dependent variable, we control for investor heterogeneity since it is argued that this construct influences both variables. We control for investor heterogeneity by including the detrended average weekly stock trading volume, *DTURN*, average weekly returns, *RET*, and volatility of weekly returns, *STDEV*, over the fiscal year (Hong and Stein, 2003; Bushman et al., 2016).

5.3.6 Descriptive Statistics and Correlations

Table 5.2 presents descriptive statistics of the variables used in our empirical analysis.[12] In particular, the mean value of our competition culture variable, *COMP*, is 0.49, and the mean values of the meeting and beating analysts' forecasts variables, *MEET*, *MB*_1, and *MB*_2 are 0.14, 0.28, and 0.36, respectively. Our stock price crash risk measures *DUVOL*, *ESIGMA*, and *NCSKEW* have mean values of –0.04, 2.61, and 0.04, respectively. We observe that the summary statistics on the variables are largely comparable to the values reported in previous studies using these data (Bushee, 2001; Callen and Fang, 2013; Andreou et al., 2016).

We compute Pearson correlation coefficients for the variables used in our empirical analysis and report these in Table 5.3. Some of the more interesting correlations include the relation between *COMP* and two of our meet and/or beat analysts' forecasts variables, *MB*_1 and *MB*_2.

[12] To mitigate the effects of outliers, all continuous variables are winsorized at the 1% and 99% levels.

Principally, we observe a positive and significant correlation between *COMP* and *MB*_1 (correlation = 0.0277), and between *COMP* and *MB*_2 (correlation = 0.0365).

Pearson correlation results consistent with our expectations are also found for the relationship between *COMP* and the crash risk measures *DUVOL*, *ESIGMA*, and *NCSKEW*. Specifically, we find positive and significant correlations between *COMP* and the various measures of crash risk, with 0.0179 correlation coefficient for *DUVOL*, 0.0278 correlation coefficient for *ESIGMA* and 0.0250 correlation coefficient for *NCSKEW*, all indicating that higher levels of *COMP* induce higher crash risk.

5.4 Empirical Results

In this section, we report our multivariate results based on empirical approaches adopted to deal with the practical challenges associated with our research design. Specifically, based on the extant literature (and our past results in Chapter 4), we expect and observe rather persistent levels of competition culture over time (Cameron et al., 2014; Guiso et al., 2006; Hartnell et al., 2011; Guiso et al., 2015a, 2015b). As a result, we adopt cross-sectional OLS estimators as the primary regression tool for our empirical analysis. In addition, we provide generalized least square random effects (GLS-RE) regression estimates as supplementary results (provided in Appendix B), as they are well-suited to this type of analysis since they allow for the inclusion of slow-moving or sluggish covariates without destabilizing the estimates of the effect of these variables.

5.4.1 Competition Culture and Meeting/ Beating Earnings Forecast

First, to test H1 we explore the relationship between *COMP* and firms' propensity to meet and/ or beat firms' analysts' consensus forecasts. We consider this relation since it is plausible that managers at firms with a strong competition culture are more driven to achieve superior financial performance and therefore should be more likely to meet if not beat analysts' expectations. Hence, we test whether competition culture is positively related to one-year-ahead analysts' consensus forecasts. To do this, we estimate the following regression models:

$$\begin{aligned} AF_{t+1} = {} & \alpha_1 + \alpha_2 COMP_t + \alpha_3 AGE_t + \alpha_4 CVAF_t + \alpha_5 ICLAIM_t + \alpha_6 LEV_t + \alpha_7 MTB_t \\ & + \alpha_8 NOA_t + \alpha_9 NUMEST_t + \alpha_{10} ROA_t + \alpha_{11} SGROWTH_t \\ & + \alpha_{12} SIZE_t + \varepsilon_t, \end{aligned} \tag{5.6}$$

where the variable *AF* is measured by one of *MEET*, *MB*_1 or *MB*_2. To ensure that the impact of competition culture on firms' inclination to meet and/ or beat analysts' consensus forecasts is not as a result of other factors, we include control variables that capture firm-specific characteristics. In addition, the regression models include year and industry dummies to control for unobserved year and industry factors; further, the standard errors are clustered at the firm-level. Our coefficient of interest is α_2, and we expect this to be positive and significant.

The results are provided in Table 5.4, where the coefficients terms 0.060, 0.059, and 0.070 on the *COMP* variable in columns (1), (3), and (5) capture the effect of competition culture on the firm-level measures of meeting/ beating analysts' forecasts. Consistent with our expectations, we find evidence that this relationship is positive and significant at the 10 percent (columns 1), 5 percent (column 3) and 1 percent (column 5) levels with *t*-values of 1.73, 2.10, and 2.62, respectively. We repeat these estimates using the GLS-RE regressions (please see Appendix B) and find similar results. In addition, Table 5.4 columns (2), (4), and (6) report the odds ratios

(ORs) with indicate that relationship between competition culture and our firm-level measures of meeting/ beating analysts' forecasts is indeed economically significant. For instance, our OR in column (2) of 2.751 (0.876 – 8.638) indicates that a unit increase in *COMP* increases the chance of meeting analysts' earnings forecast by 2.751 times than would otherwise be the case.

The relationship between competition culture and meeting and/or beating analysts' forecasts could suffer from simultaneity bias. This is because it is plausible that in addition to competition culture driving firms to meet investor and capital market expectations, managements' disposition to the competition culture could also be affected by firms' past ability to meet and/or beat analysts' forecasts. As a result, we estimate the following instrumental variable model to allow for potential endogeneity:

$$AF_{t+1} = \alpha_1 + \alpha_2 \hat{COMP}_t + \alpha_3 AGE_t + \alpha_4 CVAF_t + \alpha_5 ICLAIM_t + \alpha_6 LEV_t + \alpha_7 MTB_t + \alpha_8 NOA_t + \alpha_9 NUMEST_t + \alpha_{10} ROA_t + \alpha_{11} SGROWTH_t + \alpha_{12} SIZE_t + \varepsilon_t, \quad (5.7a)$$

$$COMP_t = \gamma_1 + \delta_1 HHI_t + \delta_2 STATE_t + \delta_3 SP500_t + \beta_1 AGE_t + \beta_2 CVAF_t + \beta_3 ICLAIM_t + \beta_4 LEV_t + \beta_5 MTB_t + \beta_6 NOA_t + \beta_7 NUMEST_t + \beta_8 ROA_t + \beta_9 SGROWTH_t + \beta_{10} SIZE_t + \mu_t, \quad (5.7b)$$

where *AF* represents *MEET*, *MB*_1, and *MB*_2. To estimate the above empirical models, we adopt *HHI*, *STATE,* and *SP500* as instruments for competition culture. These instruments are consistent with the prior work of (Bushman et al., 2016), and the results of the Stock and Yogo (2005) test for weak instruments suggest that they are suitable.

The results of the Hausman (1978) tests for endogeneity suggest that we should reject the null hypothesis that *COMP* is exogenous. Table 5.5 provides estimates for the first and second stage regressions; the results are consistent with H1 and those in the main analysis, where we found that

competition culture heightens managers' tendency to meet and/or beat analysts' earnings expectations.

5.4.2 Competition Culture and Stock Price Crash Risk

Next, we consider the relation between firms' competition culture and firm-specific stock price crash risk. Given that our prior results, it is also likely that firms with a strong competition culture are more prone to stock price crashes when bad news, which was once concealed, is released to the market. Thus, to test H2 which states that competition culture is indeed positively related to firm-specific stock price crash risk, we estimate the following model:

$$CRASH_{t+1} = \alpha_1 + \alpha_2 COMP_t + \alpha_3 AGE_t + \alpha_4 DTURN_t + \alpha_5 LEV_t + \alpha_6 MTB_t + \alpha_7 RET_t + \alpha_8 ROA_t + \alpha_9 SIZE_t + \alpha_{10} STDEV_t + \varepsilon_t, \quad (5.8)$$

where *CRASH* is used to denote our stock price crash risk measures, *DUVOL*, *ESIGMA*, and *NCSKEW*. As with our prior analysis, we account for the impact of other factors by including control variables that capture relevant firm-specific characteristics known to affect crash risk. We also include in our estimates year and industry dummies in all specifications to control for unobserved time-invariant year and industry effects. The coefficient of interest, α_2, is predicted to be positive and significant.

Table 5.6 presents the empirical analysis conducted to assess this relationship, where the coefficient terms 0.015, 0.018, and 0.019 on the *COMP* variable in columns (1), (2) and (3) indicate the nature of the link between competition culture and firm-specific crash risk. In particular, we find evidence of a positive and significant relation between competition culture and future crash risk at the 10 percent (column 1) and 5 percent levels (columns 2 and 3) with *t*-values equal to

1.82, 2.14, and 2.26, respectively. Furthermore, we note that our results are also economically significate as in column (1) the coefficient of 0.015 suggest that a one standard deviation increase in competition culture redounds to a 0.00243 (=[0.015 ×0.06]/ 0.37) or 6% increase in the mean level of firm specific stock price crash risk as indicated by *DUVOL*. We also provide in Appendix B GLS-RE regression estimates of Eq. (5.8) and OLS re-estimates of the same where we also include controls for managers' short-term incentives. The nature of our results remains unchanged.

Further, we estimate instrumental variables models to allow for potential endogeneity in the relation between competition culture and stock price crash risk. Specifically, we estimate the following:

$$CRASH_{t+1} = \alpha_1 + \alpha_2 \hat{C}OMP_t + \alpha_3 AGE_t + \alpha_4 DTURN_t + \alpha_5 LEV_t + \alpha_6 MTB_t + \alpha_7 RET_t + \alpha_8 ROA_t + \alpha_9 SIZE_t + \alpha_{10} STDEV_t + \varepsilon_t, \quad (5.9a)$$

$$COMP_t = \gamma_1 + \delta_1 HHI_t + \delta_2 STATE_t + \delta_3 SP500_t + \beta_1 AGE_t + \beta_2 DTURN_t + \beta_3 LEV_t + \beta_4 MTB_t + \beta_5 RET_t + \beta_6 ROA_t + \beta_7 SIZE_t + \beta_8 STDEV_t + \mu_t, \quad (5.9b)$$

where *CRASH* denotes our stock price crash risk variables *DUVOL*, *ESIGMA*, and *NCSKEW*, while the variables *HHI*, *STATE*, and *SP500* instrument for competition culture. The Hausman (1978) tests suggest that *COMP* is endogenous, and the results are consistent with those presented in the prior analysis, where we argued and found that competition culture increases firm-specific stock price crash risk.

Our empirical findings presented in Table 5.7 support the notion that firms with a more intensified corporate culture to compete tend to also be more prone to stock price crashes. Overall, the results are consistent with those presented in the previous analysis, where we argue and find that the competition culture increases firm-specific stock price crash risk.

5.4.3 Does Competition Culture Mediate the Relationship between Institutional Ownership and Stock Price Crash Risk?

Finally, we investigate whether firms' competition culture is a channel through which institutional ownership affects crash risk. Our previous findings in Chapter 4 suggest that transient (dedicated) institutional ownership intensifies (diminishes) firms' competition culture and that such firms are more likely to meet/ beat analyst' earnings forecasts and experience stock price crashes. Consistent with these observations and prior work in this area (Bushee, 1998, 2001; Callen and Fang, 2013; Andreou et al., 2016), we argue that since transient institutional owners exert pressures on the firm to achieve short-term performance objectives (at the expense of long-term value), this serves to enhance competition culture, which in turn increases firm-specific crash risk. Further, since dedicated institutional investors appear to serve as effective monitors of the firm, this scrutiny serves to dampen excessive orientation toward the competition culture and thereby firm-specific crash risk.

To explore this, we re-estimate Eq. (5.8) for subsamples of *TRA* and *DED* that are sorted into subsamples of HIGH and LOW transient and dedicated institutional ownership. We define a subsample group as HIGH (LOW) if it is above (below) the yearly median of our institutional ownership measures. Thus, if competition culture serves the purpose that we describe, we would expect to observe that the relationship between competition culture and crash risk is stronger for those firms with above yearly median *TRA* and below yearly median *DED* (i.e. HIGH *TRA* and LOW *DED*). We expect this because a significant presence of transient institutional owners is likely to pressurize managers to emphasize short-term performance objectives. This coupled with an absence of dedicated investors, who tend to focus on long-term firm value, creates a less-than-

effective counter to managerial myopia in firms with greater competition culture, which in turn triggers higher instances of stock price crashes for such firms.

The results of this subsample analysis are presented in Table 5.8, where we find that competition culture increases future firm-specific crash risk only for those firm-years where transient institutional ownership is above, and dedicated institutional ownership below, the yearly median (i.e., first quadrant in Table 5.8 labelled "HIGH *TRA* & LOW *DED*"). This result is exactly as we expect and suggests a strong interrelationship between institutional ownership, competition culture, and stock price crash risk. In addition to the OLS estimates presented in Table 5.8, we provide GLS-RE estimates of these relations in Appendix B. These estimates also suggest a statistically significant relationship between *COMP* and our measures of stock price crash risk only when transient institutional ownership is above and dedicated ownership below, the yearly median. We find these results indeed striking, as they show that competition culture in and of itself is not value destroying; rather, these results suggest that competition culture becomes harmful only when it is associated with a high proportion of transient and a low proportion of dedicated ownership.

As an additional check, we conduct further empirical analysis to investigate whether competition culture does indeed mediate the relationship between institutional ownership and stock price crash risk. To do this, we estimate the following system of Seemingly Unrelated Regressions (SURs) to allow for correlations across error terms:

$$\begin{aligned} CRASH_{t+1} = {} & \alpha_1 + \alpha_2 COMP_t + \alpha_3 TRA(or\ DED_t) + \alpha_4 AGE_t + \alpha_5 DTURN_t + \alpha_6 LEV_t \\ & + \alpha_7 MTB_t + \alpha_8 RET_t + \alpha_9 ROA_t + \alpha_{10} SIZE_t + \alpha_{11} STDEV_t \\ & + \varepsilon_t, \end{aligned} \tag{5.10a}$$

$$COMP_t = \beta_1 + \beta_2 TRA(or\ DED_t) + \beta_3 AGE_t + \beta_4 DTURN_t + \beta_5 LEV_t + \beta_6 MTB_t$$

$$+ \beta_7 RET_t + \beta_8 ROA_t + \beta_9 SIZE_t + \beta_{10} STDEV_t + \varepsilon_t, \quad (5.10b)$$

where all variables are as previously defined and we include in our SUR estimates year and industry dummies. To shed further light as to whether competition culture mediates the relationship between transient and dedicated institutional ownership and firm-specific crash risk, we compute the Sobel test (with delta-method standard errors).

Table 5.9 presents our SUR estimates and Sobel test results. We observe significant test results for the indirect relationship between transient institutional ownership and stock price crash risk as indicated by *ESIGMA* (*p*-value = 0.09) and *NCSKEW* (*p*-value = 0.09) in Panel A. These findings, coupled with our subsample analysis results, suggest that a firm's competition culture is a channel through which institutional ownership affects future firm-specific stock price crash risk.

5.5 Summary

In this chapter, we explore the role that firms' competition culture plays in determining corporate policies and outcomes. More specifically, we investigate whether and how firms' competition culture is related to firms' propensity to meet and/or beat analysts' forecasts, and whether and how firms' competition culture is associated with adverse outcomes such as an increase in future firm-specific crash risk. Using a text-based measure of firms' competition culture, we find that firms with greater competition culture exhibit higher incidence of meeting and/or beating analysts' forecasts but are more prone to stock price crashes.

Overall, our results primarily suggest that firm's competition culture can lead to incentives for managers to extend themselves in an endeavor to meet and/or beat the consensus earnings

forecasts. However, we note that such behavior on average increases firms' stock price crash risk. Further, we find that although the competition culture can result in increased stock price crashes, this behavior is only observed for those firms with above median levels of transient and below median levels of dedicated institutional ownership. This result suggests that firms' competition culture is a channel through which institutional ownership affects crash risk; a finding that is supported by further mediation tests.

The results of the chapter have important implications of interest to academics and the wider business community. In particular, the influence of competition culture on firms' ability to meet and/ or beat analysts' forecasts and stock price crash risk has repercussions for investor activity. In this vein, our results can be used by investors to screen firms, thereby reducing the potential that they will experience value destroying stock price crashes, and by regulators forming policies regarding firms' governance systems.

Table 5.1: Definition of Variables

	Symbol		Definitions
Competition culture			
	COMP	=	the firm's competition culture estimated for each fiscal year using the text-analysis approach;
Meeting/ beating earnings forecasts			
	MEET	=	an indicator that is equal to 1 if earnings meet analysts' forecasts and is 0 otherwise;
	*MB*_1	=	an indicator that is equal to 1 if earnings meet or just beat by a maximum of 1 cent of analysts' forecasts and is 0 otherwise;
	*MB*_2	=	an indicator that is equal to 1 if earnings meet or just beat by a maximum of 2 cents of analysts' forecasts and is 0 otherwise;
Crash risk			
	DUVOL	=	for each firm over a fiscal year, all the weeks with firm-specific returns below the annual mean are separated from those firm-specific weekly returns which are above the annual mean; we categorize these weeks as "down weeks" and "up weeks", respectively. *DUVOL* is the log of the ratio of the standard deviations of the two subsamples, the one for the "down weeks" over the standard deviation of the "up weeks";
	ESIGMA	=	the negative of the worst deviation of firm-specific weekly returns from the average firm-specific weekly return divided by the standard deviation of firm-specific weekly returns;
	NCSKEW	=	the negative of the third moment of firm-specific weekly returns for each firm and year by the standard deviation of firm-specific weekly returns raised to the third power;
Institutional ownership			
	TRA	=	the percentage of stock ownership in the firm by transient institutional investors relative to total shares outstanding;
	DED	=	the percentage of stock ownership in the firm by dedicated institutional investors relative to total shares outstanding;
Other variables			
	AGE	=	number of years since the firm first appears in CRSP;
	CVAF	=	the coefficient of variation (standard deviation scaled by the mean) of the consensus forecast;
	DTURN	=	average monthly turnover for the current fiscal year, minus the average monthly share turnover for the previous year;
	HHI	=	the Herfindahl-Hirschman concentration ratio computed using total assets for each firm by FF 48 index and state;
	ICLAIM	=	implicit claim proxied by labor intensity, calculated as 1 minus the ratio of gross property plant and equipment to total assets at the end of the fiscal year;

(continued on the next page)

Table 5.1 cont'd.

LEV	=	long-term debt by total assets;
MTB	=	market to book value of equity at the end of the fiscal year;
NOA	=	net operating asset (i.e., shareholders' equity minus and marketable securities, plus total debt) at the end of the prior fiscal year, scaled by sales for the prior fiscal year;
NUMEST	=	number of analysts whose forecast are included in the consensus forecast;
RET	=	average weekly returns for the fiscal year;
ROA	=	return on assets defined as income before extraordinary items divided by total assets;
SGROWTH	=	sales for the fiscal year divided by sales for the prior fiscal year;
SIZE	=	natural logarithm of the market value of equity at the end of the fiscal year;
SP500	=	equal to 1 if the firm is included in the S&P 500 index, and is 0 otherwise;
STATE	=	equal to 1 if firms in the state have above median competition culture, and is 0 otherwise; and
STDEV	=	the volatility of firm-specific weekly returns.

Table 5.2: Descriptive Statistics for the Variables used in the Empirical Analyses

This table presents the mean, median, 25th percentile, 75th percentile, and the number of observations for the variables used in the study for the period 1994 to 2014.

Variable	Obs.	Mean	Std. Dev.	25th Pctl.	Median	75th Pctl.
COMP	31,223	0.49	0.06	0.45	0.49	0.54
MEET	26,331	0.14	0.34	0	0	0
MB_1	26,331	0.28	0.45	0	0	1
MB_2	26,331	0.36	0.48	0	0	1
DUVOL	31,223	–0.04	0.37	–0.29	–0.05	0.19
ESIGMA	31,223	2.61	0.76	2.08	2.44	2.97
NCSKEW	31,223	0.04	0.84	–0.41	–0.01	0.42
TRA	31,223	0.15	0.12	0.06	0.13	0.22
DED	31,223	0.06	0.09	0	0.01	0.09
AGE	31,223	23.64	12.98	14	20	32
CVAF	22,863	0.06	0.92	0	0.04	0.1
DTURN	31,223	1.19	23.18	–5.97	0.4	7.76
HHI	31,223	0.43	0.29	0.2	0.35	0.6
ICLAIM	31,100	0.51	0.38	0.31	0.6	0.8
LEV	31,223	0.47	0.29	0.28	0.46	0.62
MTB	31,223	3.38	55.44	1.32	2.13	3.58
NOA	31,022	2.66	127.98	0.3	0.51	0.81
NUMEST	26,389	7.52	6.4	3	6	10
RET	31,223	–0.2	0.21	–0.25	–0.12	–0.06
ROA	31,223	0.01	0.26	0	0.05	0.08
SGROWTH	30,910	1.37	21.47	1	1.09	1.23
SIZE	31,223	6.29	1.78	5.02	6.2	7.43
SP500	31,223	0.21	0.41	0	0	0
STATE	30,478	0.51	0.5	0	1	1
STDEV	31,223	0.06	0.03	0.04	0.05	0.07

Table 5.3: Pearson Correlation Matrix

This table presents Pearson correlation coefficients for the variables used in the empirical analyses. The bold figures indicate significance at the 10 percent level and above.

	COMP	*MEET*	*MB_1*	*MB_2*	*DUVOL*	*ESIGMA*	*NCSKEW*	*TRA*	*DED*	*AGE*	*CVAF*	*DTURN*
MEET	0.0048											
MB_1	**0.0277**	**0.6496**										
MB_2	**0.0365**	**0.5282**	**0.8132**									
DUVOL	**0.0179**	0.0015	–0.0017	–0.0040								
ESIGMA	**0.0278**	–0.0133	**–0.0223**	**–0.0242**	**0.7837**							
NCSKEW	**0.0250**	0.0000	–0.0045	–0.0080	**0.9531**	**0.8308**						
TRA	**0.0958**	**0.0211**	**0.0645**	**0.0766**	**0.1261**	**0.0832**	**0.1232**					
DED	**–0.0621**	**0.0581**	**0.0701**	**0.0624**	0.0026	**–0.0188**	0.0007	–0.0114				
AGE	**–0.1571**	**0.0319**	**0.0418**	**0.0374**	–0.0006	**–0.0343**	**–0.0241**	**–0.1061**	**0.0644**			
CVAF	–0.0073	–0.0052	–0.0050	–0.0047	0.0049	0.0043	–0.0002	–0.0049	0.0018	0.0091		
DTURN	**–0.0259**	–0.0092	–0.0099	–0.0131	**0.0465**	**0.0307**	**0.0469**	**0.1298**	–0.0062	0.0112	0.0072	
HHI	**–0.0776**	–0.0020	–0.0147	**–0.0160**	–0.0143	–0.0028	**–0.0235**	**–0.0928**	**–0.0228**	**0.1830**	0.0005	0.0026
ICLAIM	**0.2689**	**0.0265**	**0.0466**	**0.0579**	**0.0384**	**0.0709**	**0.0539**	**0.1037**	**–0.0300**	**–0.1770**	**–0.0189**	–0.0117
LEV	**–0.0876**	**–0.0381**	**–0.0612**	**–0.0681**	**–0.0268**	**–0.0214**	**–0.0297**	–0.0055	**0.0588**	**0.1012**	–0.0040	**0.0261**
MTB	0.0019	0.0033	0.0112	0.0099	0.0120	0.0132	0.0129	0.0071	0.0039	0.0032	0.0043	0.0006
NOA	–0.0137	–0.0057	–0.0089	–0.0097	0.0132	0.0143	**0.0159**	–0.0061	–0.0084	**–0.0157**	–0.0037	–0.0028
NUMEST	**–0.0331**	**0.0445**	**0.0767**	**0.0920**	**0.0859**	**0.0332**	**0.0629**	**0.1481**	**–0.0162**	**0.1382**	–0.0019	0.0093
RET	**–0.1054**	0.0146	0.0154	**0.0220**	**0.0610**	**0.0288**	**0.0148**	**–0.0803**	**0.0322**	**0.2821**	**0.0206**	**–0.1528**
ROA	**–0.0239**	**0.0552**	**0.0809**	**0.0890**	**0.0827**	**0.0452**	**0.0539**	**0.0465**	**0.0243**	**0.1305**	**0.0465**	**0.0498**
SGROWTH	–0.0055	–0.0034	–0.0053	–0.0065	0.0011	–0.0008	0.0032	–0.0028	–0.0046	–0.0109	0.0017	0.0115
SIZE	**–0.0512**	**0.0469**	**0.0774**	**0.0925**	**0.1751**	**0.0876**	**0.1370**	**0.2368**	**0.0241**	**0.2867**	0.0049	**0.0792**
SP500	**–0.1022**	**0.0671**	**0.0907**	**0.0967**	**0.0365**	–0.0119	**0.0156**	**0.0626**	**0.0881**	**0.4053**	0.0037	**0.0245**
STATE	**0.1467**	–0.0017	0.0150	**0.0249**	0.0103	**0.0219**	**0.0191**	0.0141	**0.0393**	**–0.1119**	0.0010	**–0.0322**
STDEV	**0.1141**	–0.0139	**–0.0171**	**–0.0246**	**–0.0593**	**–0.0240**	–0.0090	**0.1165**	**–0.0271**	–0.3387	**–0.0172**	**0.1427**

(continued on the next page)

Table 5.3 cont'd.

	HHI	*ICLAIM*	*LEV*	*MTB*	*NOA*	*NUMEST*	*RET*	*ROA*	*SGROWTH*	*SIZE*	*SP500*	*STATE*
ICLAIM	**–0.0642**											
LEV	**0.0779**	**–0.1759**										
MTB	–0.0040	0.0007	0.0035									
NOA	–0.0120	–0.0043	0.0088	–0.0004								
NUMEST	**–0.0757**	**–0.0242**	**0.0424**	0.0139	–0.0042							
RET	**0.1216**	**–0.1192**	**0.0512**	–0.0085	**–0.0170**	**0.2011**						
ROA	**0.0702**	**–0.0424**	**–0.3109**	–0.0032	**–0.0280**	**0.1278**	**0.2943**					
SGROWTH	–0.0075	0.0022	0.0004	0.0000	–0.0004	0.0057	–0.0045	–0.0057				
SIZE	0.0122	–0.0106	**0.0994**	**0.0205**	0.0034	**0.7334**	**0.3559**	**0.2017**	0.0068			
SP500	**0.0565**	**–0.0591**	**0.1399**	0.0046	0.0008	**0.5407**	**0.2191**	**0.1060**	0.0078	**0.6406**		
STATE	**–0.1998**	**0.1375**	**–0.0973**	0.0136	0.0047	**0.0256**	**–0.0735**	**–0.0606**	–0.0056	**–0.0374**	**–0.0382**	
STDEV	**–0.1413**	**0.1332**	**–0.0691**	0.0045	**0.0161**	**–0.2357**	**–0.9629**	**–0.2903**	0.0055	**–0.4243**	**–0.2758**	**0.0883**

Table 5.4: Logistic Regressions of Competition Culture on Meet/Beat Earnings Forecasts

This table presents logistic regression estimates (with odds ratios and 95% confidence intervals) used to investigate the relationship between competition culture and meeting and/or beating analysts' forecasts. Columns (1), (3) and (5) present the logistic regression coefficients and *t*-statistics in parentheses, while columns (2), (4) and (6) show the odds ratios with the 95% confidence intervals given in parentheses. All regressions include year and industry fixed effects and the standard errors are clustered at the firm-level.

	$MEET_{t+1}$		MB_1_{t+1}		MB_2_{t+1}	
	(1)	(2)	(3)	(4)	(5)	(6)
$COMP_t$	0.060*	2.751	0.059**	2.716	0.070***	3.294
	(1.73)	(0.876-8.638)	(2.10)	(1.069-6.897)	(2.62)	(1.348-8.046)
AGE_t	0.024	1.002	0.009	1.001	0.005	1.000
	(0.69)	(0.997-1.007)	(0.27)	(0.996-1.006)	(0.17)	(0.996-1.005)
$CVAF_t$	–0.026	0.932	–0.028	0.929	–0.011	0.971
	(0.98)	(0.809-1.073)	(1.29)	(0.831-1.039)	(0.58)	(0.879-1.073)
$ICLAIM_t$	0.007	1.021	0.046	1.141	0.05	1.154
	(0.15)	(0.781-1.335)	(1.14)	(0.91-1.432)	(1.33)	(0.935-1.426)
LEV_t	–0.095***	0.655	–0.123***	0.580	–0.135***	0.550
	(2.65)	(0.479-0.895)	(4.09)	(0.446-0.752)	(4.78)	(0.43-0.703)
MTB_t	0.095***	1.024	0.073***	1.019	0.065***	1.017
	(2.99)	(1.008-1.041)	(2.86)	(1.006-1.032)	(2.67)	(1.004-1.029)
NOA_t	–0.003	0.996	–0.028	0.963	–0.008	0.990
	(0.10)	(0.912-1.087)	(0.92)	(0.89-1.043)	(0.27)	(0.921-1.064)
$NUMEST_t$	0.119***	1.019	0.119***	1.019	0.130***	1.021
	(2.86)	(1.006-1.032)	(3.26)	(1.008-1.031)	(3.63)	(1.01-1.032)
ROA_t	0.161***	3.301	0.178***	3.747	0.168***	3.455
	(4.29)	(1.912-5.696)	(5.81)	(2.399-5.852)	(5.91)	(2.29-5.215)
$SGROWTH_t$	–0.078***	0.782	–0.044*	0.871	–0.063***	0.820
	(2.60)	(0.649-0.941)	(1.79)	(0.749-1.013)	(2.71)	(0.71-0.947)
$SIZE_t$	0.007	1.005	0.079*	1.052	0.094**	1.062
	(0.14)	(0.944-1.069)	(1.81)	(0.996-1.111)	(2.21)	(1.007-1.12)
R^2 / Pseudo R^2	0.05		0.06		0.07	
N	13,068		13,141		13,141	

*p<0.1; ** p<0.05; *** p<0.01

Table 5.5: Instrumental Variables Regressions of Competition Culture on Meet/Beat Earnings Forecasts

This table presents instrumental variable estimates used to investigate the relationship between competition culture and meeting/ beating analysts' forecasts [Panel A], and the results of a Stock and Yogo (2005) weak instruments test [Panel B]. The regressions include year and industry fixed effects and the standard errors are clustered by firm.

Panel A. OLS first stage (column 1) and Probit regression second stage estimates (columns 2 - 4).

	1st stage: $COMP_t$	$MEET_{t+1}$	MB_1_{t+1}	MB_2_{t+1}
	(1)	(2)	(3)	(4)
$COMP_t$		0.036*	0.039**	0.045***
		(1.94)	(2.32)	(2.72)
HHI_t	0.021			
	(1.12)			
$STATE_t$	0.198***			
	(6.83)			
$SP500_t$	–0.118**			
	(2.21)			
AGE_t	–0.025	0.011	0.003	0.001
	(1.28)	(0.57)	(0.15)	(0.07)
$CVAF_t$	0.006	–0.013	–0.015	–0.006
	(0.81)	(0.93)	(1.22)	(0.51)
$ICLAIM_t$	0.221***	0.011	0.032	0.039*
	(9.94)	(0.45)	(1.41)	(1.76)
LEV_t	–0.018	–0.052***	–0.073***	–0.082***
	(1.10)	(2.74)	(4.26)	(4.87)
MTB_t	–0.016	0.049***	0.041***	0.037**
	(1.31)	(2.77)	(2.69)	(2.51)
NOA_t	0.084***	–0.002	–0.016	–0.003
	(5.50)	(0.11)	(0.92)	(0.20)
$NUMEST_t$	–0.013	0.064***	0.072***	0.080***
	(0.64)	(2.79)	(3.29)	(3.63)
ROA_t	0.013	0.080***	0.098***	0.096***
	(0.91)	(4.07)	(5.69)	(5.85)
$SGROWTH_t$	0.016*	–0.041**	–0.025*	–0.036***
	(1.70)	(2.48)	(1.73)	(2.63)
$SIZE_t$	–0.011	0.003	0.044*	0.055**
	(0.39)	(0.10)	(1.70)	(2.12)
R^2	0.25			
N	13,141	13,068	13,141	13,141

Panel B. Stock and Yogo (2005) Weak Instruments Test.

Instrumented variables	Instruments	First stage F – Statistic	Critical value
$COMP_t$	HHI_t; $STATE_t$; $SP500_t$	16.8061	9.08

*p<0.1; ** p<0.05; *** p<0.01

Table 5.6: OLS Regressions of Competition Culture on Stock Price Crash Risk

This table presents OLS estimates used to investigate the relationship between competition culture and crash risk. All regressions include year and industry fixed effects and the standard errors are clustered at the firm-level.

	$DUVOL_{t+1}$	$ESIGMA_{t+1}$	$NCSKEW_{t+1}$
	(1)	(2)	(3)
$COMP_t$	0.015*	0.018**	0.019**
	(1.82)	(2.14)	(2.26)
AGE_t	–0.036***	–0.031***	–0.040***
	(4.18)	(3.54)	(4.64)
$DTURN_t$	0.025***	0.022***	0.022***
	(3.26)	(2.78)	(2.87)
LEV_t	–0.023***	0.002	–0.015*
	(2.65)	(0.29)	(1.78)
MTB_t	0.003	–0.002	0.002
	(0.35)	(0.31)	(0.22)
RET_t	0.146***	0.092***	0.155***
	(5.33)	(3.37)	(5.70)
ROA_t	0.068***	0.055***	0.052***
	(7.85)	(5.94)	(5.77)
$SIZE_t$	0.177***	0.095***	0.164***
	(18.11)	(9.80)	(16.92)
$STDEV_t$	0.156***	0.102***	0.192***
	(5.08)	(3.34)	(6.28)
R^2	0.05	0.03	0.05
N	18,654	18,654	18,654

*p<0.1; ** p<0.05; *** p<0.01

Table 5.7: Instrumental Variable Regressions of Competition Culture on Stock Price Crash Risk

This table presents estimates from instrument variable regressions used to investigate the relationship between competition culture and crash risk [Panel A], and the results of a Stock and Yogo (2005) weak instruments test [Panel B]. The regressions include year and industry fixed effects and the standard errors are clustered by firm.

Panel A. IV regression first and second stage results.

	1st stage: $COMP_t$	$DUVOL_{t+1}$	$ESIGMA_{t+1}$	$NCSKEW_{t+1}$
	(1)	(2)	(3)	(4)
$COMP_t$		0.167**	0.228***	0.187***
		(2.35)	(3.11)	(2.62)
HHI_t	0.028			
	(1.62)			
$STATE_t$	0.217***			
	(8.42)			
$SP500_t$	–0.108**			
	(2.18)			
AGE_t	–0.095***	–0.019	–0.008	–0.021*
	(5.58)	(1.61)	(0.64)	(1.77)
$DTURN_t$	–0.025***	0.029***	0.027***	0.027***
	(4.44)	(3.66)	(3.36)	(3.33)
LEV_t	–0.040***	–0.015	0.013	–0.007
	(2.79)	(1.57)	(1.36)	(0.71)
MTB_t	–0.019**	0.005	0.001	0.005
	(1.64)	(0.68)	(0.14)	(0.58)
RET_t	–0.010	0.145***	0.091***	0.154***
	(0.26)	(5.16)	(3.20)	(5.50)
ROA_t	0.001	0.069***	0.055***	0.052***
	(0.11)	(7.57)	(5.61)	(5.57)
$SIZE_t$	0.051**	0.173***	0.089***	0.160***
	(2.38)	(16.74)	(8.39)	(15.35)
$STDEV_t$	–0.001	0.153***	0.099***	0.189***
	(0.03)	(4.85)	(3.09)	(5.98)
R^2	0.19			
N	18,654	18,654	18,654	18,654

Panel B. Stock and Yogo (2005) Weak Instruments Test.

Instrumented variables	Instruments	First stage F – Statistic	Critical value
$COMP_t$	HHI_t; $STATE_t$; $SP500_t$	25.31	9.08

*p<0.1; ** p<0.05; *** p<0.01

Table 5.8: Subsample Analyses of Competition Culture on Stock Price Crash Risk

This table presents OLS estimates used to investigate the relationship between competition culture and crash risk for subsamples of firms. All regressions include year and industry fixed effects and the standard errors are clustered at the firm-level.

Panel A. The effect of competition culture on crash risk for subsamples of high transient and low (or high) dedicated ownership firms.

	HIGH *TRA* & LOW *DED*			HIGH *TRA* & HIGH *DED*		
	$DUVOL_{t+1}$	$ESIGMA_{t+1}$	$NCSKEW_{t+1}$	$DUVOL_{t+1}$	$ESIGMA_{t+1}$	$NCSKEW_{t+1}$
	(1)	(2)	(3)	(4)	(5)	(6)
$COMP_t$	0.051***	0.058***	0.056***	0.008	0.002	0.011
	(2.80)	(3.06)	(3.05)	(0.42)	(0.11)	(0.56)
AGE_t	–0.023	–0.002	–0.029	–0.035*	–0.017	–0.038**
	(1.20)	(0.13)	(1.51)	(1.82)	(0.81)	(2.00)
$DTURN_t$	0.041***	0.036**	0.041***	0.041**	0.025	0.040**
	(2.71)	(2.26)	(2.65)	(2.40)	(1.46)	(2.41)
LEV_t	–0.043**	–0.025	–0.038**	–0.016	0.021	–0.008
	(2.31)	(1.25)	(2.00)	(0.79)	(0.98)	(0.41)
MTB_t	0.004	0.001	0.003	0.027*	0.005	0.024
	(0.19)	(0.06)	(0.13)	(1.81)	(0.31)	(1.51)
RET_t	0.063	–0.013	0.043	0.134*	0.137*	0.130*
	(0.95)	(0.18)	(0.65)	(1.74)	(1.72)	(1.71)
ROA_t	0.043**	0.047**	0.034	0.048**	0.038	0.029
	(2.15)	(2.14)	(1.55)	(2.00)	(1.41)	(1.11)
$SIZE_t$	0.159***	0.098***	0.132***	0.130***	0.063**	0.108***
	(5.55)	(3.38)	(4.56)	(4.93)	(2.25)	(4.07)
$STDEV_t$	0.09	0.033	0.102	0.170**	0.182**	0.181**
	(1.24)	(0.44)	(1.41)	(2.14)	(2.17)	(2.28)
R^2	0.05	0.04	0.04	0.06	0.04	0.05
N	4,011	4,011	4,011	3,575	3,575	3,575

(continued on the next page)

Table 5.8 cont'd.

Panel B. The effect of competition–orientation on crash risk for subsamples of low transient and low (or high) dedicated ownership firms.

	LOW *TRA* & LOW *DED*			LOW *TRA* & HIGH *DED*		
	$DUVOL_{t+1}$	$ESIGMA_{t+1}$	$NCSKEW_{t+1}$	$DUVOL_{t+1}$	$ESIGMA_{t+1}$	$NCSKEW_{t+1}$
	(1)	(2)	(3)	(4)	(5)	(6)
$COMP_t$	0.008	0.004	0.01	–0.002	0.005	–0.002
	(0.50)	(0.27)	(0.65)	(0.11)	(0.27)	(0.09)
AGE_t	–0.022	–0.021	–0.022	–0.037*	–0.050***	–0.041**
	(1.26)	(1.28)	(1.28)	(1.89)	(2.64)	(2.20)
$DTURN_t$	–0.006	–0.012	–0.02	–0.03	–0.027	–0.035
	(0.36)	(0.75)	(1.25)	(1.22)	(1.07)	(1.44)
LEV_t	–0.005	0.019	0.005	–0.011	–0.001	–0.01
	(0.28)	(1.18)	(0.29)	(0.55)	(0.03)	(0.49)
MTB_t	0.002	0	0.004	–0.001	0	–0.008
	(0.10)	(0.01)	(0.25)	(0.05)	(0.01)	(0.45)
RET_t	0.07	0.072	0.082*	0.160**	0.039	0.167**
	(1.39)	(1.49)	(1.68)	(2.15)	(0.53)	(2.33)
ROA_t	0.063***	0.048***	0.050***	0.076***	0.076***	0.057**
	(4.04)	(2.97)	(3.25)	(3.48)	(3.43)	(2.51)
$SIZE_t$	0.216***	0.131***	0.205***	0.107***	0.038*	0.107***
	(10.06)	(6.26)	(9.61)	(4.58)	(1.74)	(4.64)
$STDEV_t$	0.074	0.069	0.118**	0.129	0.017	0.175**
	(1.29)	(1.27)	(2.10)	(1.63)	(0.22)	(2.26)
R^2	0.08	0.05	0.06	0.05	0.04	0.04
N	4,505	4,505	4,505	3,088	3,088	3,088

*p<0.1; ** p<0.05; *** p<0.01

Table 5.9: Seemingly Unrelated Regressions of Institutional Ownership, Competition Culture, and Stock Price Crash Risk

This table presents seemingly unrelated regression estimates and Sobel test results used to investigate the indirect relationship between transient and dedicated institutional ownership and crash risk as mediated by competition culture. All regressions include year and industry fixed effects and the standard errors are clustered at the firm-level.

Panel A. The indirect effect of transient institutional ownership on crash risk.

	$COMP_t$	$DUVOL_{t+1}$	$COMP_t$	$ESIGMA_{t+1}$	$COMP_t$	$NCSKEW_{t+1}$
	(1)	(2)	(3)	(4)	(5)	(6)
$COMP_t$		0.015*		0.017*		0.017**
		(1.75)		(1.95)		(2.00)
TRA_t	0.029***	0.080***	0.029***	0.057***	0.029***	0.079***
	(3.26)	(8.32)	(3.26)	(5.87)	(3.26)	(8.20)
AGE_t	–0.094***	–0.026***	–0.094***	–0.023**	–0.094***	–0.030***
	(10.74)	(2.84)	(10.74)	(2.37)	(10.74)	(3.16)
$DTURN_t$	–0.032***	0.019**	–0.032***	0.013	–0.032***	0.013
	(4.14)	(2.24)	(4.14)	(1.50)	(4.14)	(1.55)
LEV_t	–0.055***	–0.024***	–0.055***	0.001	–0.055***	–0.017*
	(6.67)	(2.71)	(6.67)	(0.08)	(6.67)	(1.87)
MTB_t	–0.018**	0.011	–0.018**	0.003	–0.018**	0.009
	(2.23)	(1.24)	(2.23)	(0.34)	(2.23)	(1.03)
RET_t	–0.006	0.116***	–0.006	0.083**	–0.006	0.118***
	(0.18)	(3.56)	(0.18)	(2.51)	(0.18)	(3.60)
ROA_t	0	0.060***	0	0.053***	0	0.045***
	(0.04)	(6.29)	(0.04)	(5.45)	(0.04)	(4.72)
$SIZE_t$	0.008	0.139***	0.008	0.068***	0.008	0.125***
	(0.80)	(12.51)	(0.80)	(5.99)	(0.80)	(11.23)
$STDEV_t$	0.01	0.120***	0.01	0.093***	0.01	0.153***
	(0.31)	(3.48)	(0.31)	(2.63)	(0.31)	(4.40)
Breusch–Pagan test chi^2		0.00		0.00		0.00
Breusch–Pagan test *p*–value		1.00		1.00		1.00
Sobel test statistic		1.54		1.67		1.70
Sobel test *p*–value		0.12		0.09		0.09
R^2	0.18	0.05	0.18	0.03	0.18	0.04
N	15,179	15,179	15,179	15,179	15,179	15,179

(continued on the next page)

Table 5.9 cont'd.

Panel B. The indirect effect of dedicate institutional ownership on crash risk.

	$COMP_t$	$DUVOL_{t+1}$	$COMP_t$	$ESIGMA_{t+1}$	$COMP_t$	$NCSKEW_{t+1}$
	(1)	(2)	(3)	(4)	(5)	(6)
$COMP_t$		0.017**		0.019**		0.019**
		(1.98)		(2.09)		(2.21)
DED_t	–0.028***	0.006	–0.028***	–0.007	–0.028***	–0.001
	(2.60)	(0.51)	(2.60)	(0.58)	(2.60)	(0.11)
AGE_t	–0.099***	–0.038***	–0.099***	–0.031***	–0.099***	–0.041***
	(11.39)	(4.14)	(11.39)	(3.30)	(11.39)	(4.45)
$DTURN_t$	–0.030***	0.025***	–0.030***	0.018**	–0.030***	0.020**
	(3.85)	(3.02)	(3.85)	(2.05)	(3.85)	(2.33)
LEV_t	–0.054***	–0.023**	–0.054***	0.002	–0.054***	–0.015*
	(6.51)	(2.55)	(6.51)	(0.22)	(6.51)	(1.69)
MTB_t	–0.018**	0.011	–0.018**	0.003	–0.018**	0.009
	(2.25)	(1.29)	(2.25)	(0.37)	(2.25)	(1.07)
RET_t	0.016	0.161***	0.016	0.118***	0.016	0.164***
	(0.53)	(5.01)	(0.53)	(3.59)	(0.53)	(5.06)
ROA_t	0.001	0.064***	0.001	0.056***	0.001	0.049***
	(0.06)	(6.70)	(0.06)	(5.72)	(0.06)	(5.10)
$SIZE_t$	0.021**	0.167***	0.021**	0.089***	0.021**	0.154***
	(2.19)	(15.71)	(2.19)	(8.24)	(2.19)	(14.40)
$STDEV_t$	0.034	0.175***	0.034	0.134***	0.034	0.207***
	(1.06)	(5.13)	(1.06)	(3.85)	(1.06)	(6.07)
Breusch–Pagan test chi^2		0.00		0.00		0.00
Breusch–Pagan test *p*–value		1.00		0.99		1.00
Sobel test statistic		–1.57		–1.63		–1.68
Sobel test *p*–value		0.12		0.10		0.10
R^2	0.18	0.05	0.18	0.03	0.18	0.04
N	15,179	15,179	15,179	15,179	15,179	15,179

*p<0.1; ** p<0.05; *** p<0.01

Chapter 6 The Effect of Banks' Competition Culture on Bank Lending and Loan Loss Provisioning

6.1 Introduction

A number of studies on the role of corporate culture and its effects on the economic outcomes of banks have surfaced in recent years (see, for example, Thakor, 2015; Barth, 2016; Song and Thakor, 2017; Nguyen et al., 2018). In this chapter, we will explore whether the culture that theoretically should drive banks' management to be more focused on satisfying investors and achieving external market expectations; namely banks' competition culture (please see Cameron et al., 2014; Thakor, 2015), has implications for bank lending and loan loss provisioning. And in so doing, we explore the type of bank culture that emphasizes those competitive actions that lead to increased profitability albeit at the expense of additional risk taking. In keeping with prior literature, we term this type of organizational philosophy banks' competition culture and consider the role it plays in determining banks' lending and loan loss provisioning behavior.

We focus our attention on the US banking industry as it has consistently grown in economic importance in recent decades (Antill et al., 2014). In fact, the entire financial services industry represented approximately 7.9% (or $1.7 trillion) of the gross domestic product as at the year ended 2012 and this is expected to increase to 12% of US GDP by the end of 2018. What's more, the banking industry's unique mode of financing, regulatory peculiarities, and heighten public scrutiny makes it an interesting area to study the effects of corporate culture. And, while prior studies have explored the effect of culture on organizational outcomes in nonfinancial firms (see., e.g. see, for example, Loughran et al., 2009; Edmans, 2011; Popadak, 2013; Fiordelisi and Ricci, 2014; Guiso et al., 2015b; Erhard et al., 2016; among others), we argue that competition culture plays a particularly important role in explaining various corporate phenomenon associated with banks decision making, thereby making the banking industry an interesting study in its own right. Without a doubt, banks play a central role in the sound functioning of the entire financial system,

and of particular concern to bank regulators is whether and how excessive risk-taking by individual banks poses a threat to the financial system as a whole (see, e.g. Acharya et al., 2010; Hanson, et al., 2011). In this vein, important undecided issues related to the extent to which banks' orientation toward the competition culture mitigates or exacerbates incentives for marginal bank lending and excessive loan loss provisioning. Furthermore, banks present a special case for understanding the relation between competition culture and organizational outcomes such as earnings manipulation since banks' specific accruals (e.g., loan loss provisions) can be more easily isolated and modeled. As a result, we are motivated to consider the following research questions; "*what is the relationship between banks' competition culture and bank lending and loan loss provisioning?*" and "*how does banks' pre-crisis competition culture relate to crisis period lending and loan loss provisioning?*".

To answer these research questions, we first develop a text-based measure of competition culture by analyzing banks' 10-K reports for lexical items relating to attributes that determine organizational culture. We expect that those banks which use a relatively high frequency of words that reflect a desire to satisfy investors, achieve external market expectations and to pursue enhanced competitiveness in order to realize increased profitability are more likely to be driven by a corporate philosophy that is skewed and articulated towards the competition culture. Hence, we compute the relative frequency of these words compared to lexical items that describe alternative organizational cultures (please see e.g. Cameron et al., 2014). We believe that this measurement approach provides a practical way to quantify competition culture for a large sample of banks. In addition, relying on the information provided in banks' 10-K filings creates an opportunity to bypass the severe data limitation problems that have been shown to be associated with the measurement of subtly perceptible concepts such as organizational culture (see, e.g., Guiso et al., 2015b).

In keeping with our expectations, we find evidence that banks with greater levels of competition culture are likely to engage in more lending and loan loss provisioning activity. In addition, we find that banks' competition culture promotes more procyclic lending and higher levels of loan loss provisioning during the recent economic crisis.

In conducting our analysis, we carefully design our approach to tackling econometric issues that may cloud the interpretation of the results. For instance, since banks' competition culture is reported to be a rather persistent variable over time (please see Chapter 4), we utilize pooled cross-sectional models for our primary analyses where we include time fixed effects. We also conduct generalized least squares random effects (GLS-RE) estimates for the main relations, as this approach also allows us to capture the effects of slow-moving variables and permits an efficient estimation of model parameters. In addition, to safeguard against simultaneous causality issues, we supplement our main baseline regressions by estimating dynamic panel generalized method of moments (GMM) models for the relations between banks' competition culture and bank lending and loan loss provisioning.

This study makes important contributions to the banking literature by offering an examination of the arguments regarding whether and how banks' corporate culture affects banks' lending and loan loss provisioning practices. Recent studies on the effects of banks' corporate culture have suggested that corporate culture has significant economically meaningful effects on bank managers' propensity to engage in marginal lending activity (see e.g. Song and Thakor, 2016; Thakor, 2016). Further, this stream of literature suggests that when prominent banks adopt corporate cultures that are overly aggressive, for instance by having higher levels of competition cultures, this can lead to over-lending in the entire banking system as other banks follow suit. Nevertheless, to date, there is little convincing evidence concerning the effects of banks' corporate

culture on banks' lending behavior, loan loss provisioning and overall banking risk. Hence, this study seeks to bridge this gap.

Furthermore, this study also has important policy implications and its findings would be of interest to bank regulators, bank managers, and the research community. This is because the effect of banks' competition culture on lending and loan loss provisioning has implications for the manner in which banks and other financial firms are governed and managed. The insights provided here could be used to help reduce systematic risk, as banks manage the downside risk associated with the competition culture, and thereby attract additional capital to such banks, especially during times of economic crisis when bank capital and financing is most under threat (Ahmed et al., 1999; Beatty and Harris, 1999; Altamuro and Beatty, 2010; Ivashina and Scharfstein, 2010; Beatty and Liao, 2011; Beatty et al., 2012).

The following section presents the main hypotheses. Section 6.3 highlights the details of the data and summary statistics; Sections 6.4 presents the preliminary empirical results; while Section 6.5 concludes.

6.2 Hypotheses

In this chapter, we use our measure of banks' competition culture to investigate whether and how it is related to bank lending activity. We expect that banks which are more orientated towards the competition culture should engage in more lending activity. This proposition is reasonable since such banks are argued to engage in more forceful and aggressive pursuit of performance objectives. In so doing, banks with a higher level of competition culture would likely be more willing to engage in marginal lending activity as they reach for yield (e.g., Becker and Ivashina, 2015) thereby accepting greater levels of risks (particularly credit risk) in exchange for interest

revenues generated by extending such loans. Consequently, we posit the following hypothesis in the alternate form:

H1: Banks' competition culture is positively associated with the change in banks' lending activity.

Next, we investigate whether banks' competition culture is related to banks' discretionary loan loss provisioning. We expect that banks with higher competition culture will engage in more discretionary loan loss provisioning. This relationship is plausible for two main reasons. First, if banks with higher competition culture engage in more marginal lending activity, then it is likely that such banks should also engage in abnormal loan loss provisioning when compare to other banks on account of the elevated levels of credit risk that such banks will face. In addition, a positive relation between banks' competition culture and abnormal loan loss provisioning is possible since managers at high competition culture banks are more likely to pursue opportunistic income increasing accounting practices in an attempt to achieve targeted earnings levels. As a result, we posit the following hypothesis in alternative form;

H2: Banks' competition culture is positively associated with banks' discretionary loan loss provisioning.

Further, we argue that high competition culture banks should exhibit procyclical lending behavior. As a result, we expect that the positive relationships between banks' competition culture and bank lending should reverse during crisis periods. We argue that this is plausible since Ivashina and Scharfstein (2010) and Beatty and Liao (2011) note that during periods of financial crisis bank lending is likely to be negatively affected since banks' financing and capital are more

under threat. This is in part due to banks' inability to refinance during the crisis period as a result of severe financing frictions at these times (Myers and Majluf, 1984). We argue that this phenomenon is likely to be more pronounced for those banks that adopt a higher competition culture since such banks should be perceived as especially risky due to their more marginal pre-crisis period lending. Thus, we argue that banks with higher levels of pre-crisis competition culture will exhibit less crisis period lending.

Moreover, we expect that banks with higher levels of competition culture will engage in more discretionary loan loss provisioning during financial crisis periods. We believe that this is possible since banks are known to face more severe agency problems during times of financial crisis. In this vein, we argue that managers at banks with higher competition culture should be particularly reluctant to report "bad" news as to do so would further diminish banks' reported performance and jeopardize their tenure. Further, since such banks should engage in more marginal pre-crisis period lending, it is likely that during financial crises these banks engage in abnormal loan loss provisioning when compare to other banks on account of increased loan delinquency rates. For these reasons we expect, a positive relation between banks' pre-crisis period competition culture and discretionary loan loss provisioning during crisis periods. Thus, we present in the alternative form the following hypotheses:

H3: Banks' pre-crisis period competition culture is positively associated with the change in banks' lending activity during the crisis period.

H4: Banks' pre-crisis period competition culture is positively associated with banks' discretionary loan loss provisioning during the crisis period.

6.3 Data, Variable and Sample

6.3.1 Data

To investigate relations between banks' competition culture, bank lending and loan loss provisioning we compile a unique sample by gathering information assimilated from a number of data sources. First, we obtain US publicly listed bank (SIC 6000 – 6999) accounting and market data from the COMPUSTAT/CRSP merge database for the period 1994 – 2014. In addition, to measure competition culture, we obtain from the SEC's Edgar database banks' 10–K reports. Prior to the data analyses, we attempt to mitigate the effects of outliers by winsorizing all continuous variables at the 1% and 99% levels. Additionally, we attempt to limit survivorship bias by permitting banks that became inactive and/or that were acquired during the study period to remain in the study sample. Also, we delete all observations with missing data on the key variables of interest. Further, the National Bureau of Economic Research (NBER) recognizes the most recent recessionary period as occurring between 2007 and 2009 and we adopted this period as the crisis period for our investigations. Definitions of the variables used in this chapter are presented in Table 6.1.

6.3.2 Measuring Banks' Competition Culture

It is well known that corporate culture forms the essence of a company's identity by defining the organization's beliefs and operating philosophy. In measuring corporate culture, some researchers have relied on the competing values framework (CVF) (see, e.g., Hartnell et al., 2011; Schneider et al., 2013; Cameron et al., 2014). This framework differentiates between corporate cultures that underscore an external cultural orientation from those that are internally focused –

i.e. the external-internal domain. Additionally, it differentiates between corporate cultures that focus on effectiveness criteria that emphasize flexibility from those that are more concerned with stability and internal control – i.e. the flexibility-stability domain. These two dimensions intersect to define four distinct types of cultural orientations that comprise the CVF, namely the; *competition*, *creation*, *collaboration* and *control* corporate cultures.

Using the 10–K reports obtained from the SEC's Edgar database, we develop a measure of banks competition culture by conducting a textual analysis of these documents. This approach permits the quantification of semantic content found in a body of text. In keeping with recent work, we assume that firms' documents (e.g. the 10–K reports) can reveal information concerning firms underlying culture (Guiso et al., 2015b). To compute our measure, we first pre-process each firm-year 10–K report to ensure that capitalization, URLs, non-words and punctuations, and white spaces are ignored. Following this necessary pre-processing, we then produce our measure of competition culture, *COMP*, by counting the number of times lexical items for selected competition culture keywords appear in a bank's 10-K report. We then scale this count by the total number of times lexical items for the four main types of organizational culture as theorized by CVF appear in the report. Simply put, we apply our simple word count algorithm to estimate banks competition culture as follows:

$$COMP = \frac{Number\ of\ lexical\ items\ describing\ the\ Competition\ Culture}{Total\ number\ of\ lexical\ items\ for\ all\ types\ of\ cultures}. \quad (6.1)$$

In advancing our measure we do not claim that it or the chosen framework represent the single best approach to assess culture in banks, as to do so would be unreasonable given the number of available alternative approaches (see. e.g.,;Hofstede et al., 1990; Hofstede, 2011; O'Reilly, 2014). However, we argue that our technique is based on a valid theory of organizational culture, as the CVF is supported by empirical literature and the underlying dimensions have shown to have a

solid foundation (Quinn and Rohrbaugh, 1983). Further, we argue that our approach to operationalizing competition culture is reasonable as it allows us to quantify the key dimensions of organizational CVF for a large corpus of bank 10–K fillings. Given all this, we are convinced that our approach allows us to construct a relative measure of banks' competition culture.

6.3.3 Measuring Banks' Lending

To capture the change in a bank's lending activity we make use of the following simple measure: Δ*LOAN*, which is the change from the beginning of the fiscal year in the natural log of loans [Compustat item: lntal].

6.3.4 Measuring Banks' Loan Loss Provisioning

We follow prior literature in measuring banks' discretionary loan loss provisioning (see, e.g., Wahlen, 1994; Beatty et al., 1995; Collins et al., 1995; Beaver and Engel, 1996; Kim and Kross, 1998; Liu and Ryan, 2006; Kanagaretnam et al., 2010; Bushman and Williams, 2012; Beck and Narayanamoorthy, 2013; Beatty and Liao, 2014; Bushman et al., 2016). In particular, we adopt a two-stage approach where we first estimate the normal or nondiscretionary component of banks' loan loss provision using the empirical models listed below. Then, we determine the discretionary component of loan loss provision as the absolute value of the residuals from the following models;

$$LLP_t = \alpha_1 + \alpha_2 \Delta NPA_{t+1} + \alpha_3 \Delta NPA_t + \alpha_4 \Delta NPA_{t-1} + \alpha_5 \Delta NPA_{t-2} + \alpha_6 SIZE_{t-1} + \alpha_7 \Delta LOAN_t + \alpha_8 \Delta GDP_t + \alpha_9 CSRET_t + \alpha_{10} UNEMP_t + \varepsilon_t, \quad (6.2a)$$

and,

$$LLP_t = \alpha_1 + \alpha_2 \Delta NPA_{t+1} + \alpha_3 \Delta NPA_t + \alpha_4 \Delta NPA_{t-1} + \alpha_5 \Delta NPA_{t-2} + \alpha_6 SIZE_{t-1} + \alpha_7 \Delta LOAN_t + \alpha_8 \Delta GDP_t + \alpha_9 CSRET_t + \alpha_{10} \Delta UNEMP_t + \alpha_{11} ALW_t + \varepsilon_t, \quad (6.2b)$$

where, we denote the absolute value of the residuals from Eq.'s (6.2a) and (6.2b) *DLLP*a and *DLLP*b, respectively. The variable *LLP*, represents a bank's loan loss provision (COMPUSTAT "pll") scaled by lagged total loans(COMPUSTAT "lntal"); Δ*NPA*, the change in bank's non-performing assets (COMPUSTAT "napt") divided by lagged total loans (COMPUSTAT "lntal"); *SIZE*, denotes the natural log of bank total assets (COMPUSTAT "at"); the variable Δ*Loan*, is the change in total loans (COMPUSTAT "lntal") divided by lagged total loans; Δ*GDP*, represents the change in GDP over the year; *CSRET*, the return on the Case-Shiller Real Estate Index over the year; Δ*UNEMP*, the change in unemployment rates over the year; and *ALW*, the loan loss allowance (COMPUSTAT "rcl") divided by total loans (COMPUSTAT "lntal").

6.3.5 Control Variables

Following past work in this area (see e.g. Betty and Liao, 2014), we include the following control variables in order to statistically control for bank-specific characteristics. In particular, we include the following: *CAP*1 is the bank's tier 1 risk-adjusted capital ratio [Compustat item: capr1] at the beginning of the fiscal year, divided by 100. The variable Δ*CAP*1is the change in *CAP*1 of the fiscal year. The variable Δ*UNEMP* represents the change in the employment rate over the fiscal year. The variable *DEPOSITS* is the lagged total deposits [Compustat item: dptc] divided by total assets [Compustat item: at]. The variable *SIZE* is the natural logarithm of bank's total assets [Compustat item: at].

6.3.6 Descriptive Statistics and Correlations

Table 6.2 provides descriptive statistics of the variables used in our empirical analysis.[13] In particular, the mean value of our banks' competition culture variable, *COMP*, is 0.45, the mean for the change in lending variable, Δ*LOAN*, is 4.51, and the mean values of our discretionary loan loss provisioning measures, *DLLP*a, and, *DLLP*b, are 0.00009 and -0.00002, respectively. We observe that the summary statistics on the variables are largely comparable to the values reported in previous studies using these data (see, e.g., Beatty et al., 1995; Allen et al., 2012; Betty and Liao, 2014; Bushman et al., 2016).

Further, we compute Pearson correlation coefficients for the variables used in our empirical analysis and report these in Table 6.3. Some of the more interesting correlations include the relation between *COMP* and Δ*LOAN*, *DLLP*a and *DLLP*b, where we find a positive and significant correlation between *COMP* and Δ*LOAN* (correlation = 0.1601), a positive and significant correlation between *COMP* and *DLLP*a (correlation = 0.0589), and a positive and significant correlation between *COMP* and *DLLP*b (correlation = 0.0473). These results are consistent with our expectations that banks' competition culture increases bank lending and abnormal loan loss provisioning activity.

[13] To mitigate the effects of outliers, all continuous variables are winsorized at the 1% and 99% levels.

6.4 Empirical Results

In this section, we report the results of the multivariate analysis pertaining to our examination of the relationship between banks' competition culture, lending and abnormal loan loss provisioning.

6.4.1 Banks' Competition Culture and Bank Lending Behavior

First, we investigate whether banks' competition culture is related to bank lending activity. As proposed in H1, we expect that banks which are more orientated towards the competition culture should engage in more aggressive lending activity. To empirically test this we estimate the following regression model:

$$\Delta LOAN_t = \alpha_1 + \alpha_2 COMP_t + \alpha_3 CAP1_t + \alpha_4 \Delta UNEMP_t + \alpha_5 \Delta CAP1_t + \alpha_6 DEPOSITS_{t-1} + \alpha_7 SIZE_{t-1} + \varepsilon_t, \quad (6.3)$$

where all other variables are as previously defined. In addition, we include year dummies to control for unobserved time-invariant year factors in this and all subsequent models.

In further tests of H1, we estimate models to examine the relationship between lagged values and differences in our measure of competition culture and bank lending activity. These tests examine whether and how bank competition culture impacts changes in bank lending in future periods. Regressions that examine the long-run relationship can help to further mitigate potential simultaneity issues and shed light on the direction of the relationship between banks' competition culture and banks' lending activity. If banks' competition culture is positively related to changes in bank lending in future periods, it is more likely that banks' competition culture affects bank

lending activity rather than the opposite. In particular, we estimate the following empirical models:

$$\Delta LOAN_t = \alpha_1 + \alpha_2 \Delta COMP_t + \alpha_3 COMP_{t-1} + \alpha_4 CAP1_t + \alpha_5 \Delta UNEMP_t + \alpha_6 \Delta CAP1_t + \alpha_7 DEPOSITS_{t-1} + \alpha_8 SIZE_{t-1} + \varepsilon_t, \quad (6.4)$$

and,

$$\Delta LOAN_t = \alpha_1 + \alpha_2 \Delta COMP_t + \alpha_3 \Delta COMP_t + \alpha_4 COMP_{t-1} + \alpha_5 CAP1_t + \alpha_6 \Delta UNEMP_t + \alpha_7 \Delta CAP1_t + \alpha_8 DEPOSITS_{t-1} + \alpha_9 SIZE_{t-1} + \varepsilon_t. \quad (6.5)$$

Table 6.4 presents the results where we find evidence consistent with high competition culture banks engaging in more lending activity. In particular, we report the coefficients term 0.045 on the $COMP_t$ variable in column (1). This coefficient captures the effect of competition culture on the change in bank lending activity and consistent with our expectations and H1, we find evidence that this relationship is positive and significant at the 1 percent level (*t*-value=4.13). What's more, we find that this relationship is not only statistically significant but is also economically significant since a one standard deviation increase firms' competition culture implies a 0.03% ([0.045 × 0.06]/ 1.8 =0.0015; 0.0015/ 4.51 = 0.03%) increase in the mean change in banks' lending activity. Further, we find for Eq. (6.4) that the coefficient term 0.039 for $COMP_{t-1}$, in column (2) is significantly positive at the 1 percent level (*t*-value = 3.06). Besides this, estimates of Eq. (6.5), presented in column (3) document a coefficient of 0.037 on the $COMP_{t-2}$,variable, suggesting a positive and significant relationship between competition culture and changes in bank lending activity two years into the future at the 5 percent level given a *t*-value of 2.44. Furthermore, the coefficients of $\Delta COMP_t$ in column (2) and $\Delta COMP_t$ and $\Delta COMP_{t-1}$ in column (3) are positive and significant with coefficient terms of 0.023, 0.028, and 0.048, and *t*-values of 2.30, 2.50 and 3.70, respectively. The fact that first and second differences in competition culture help to predict

future changes in banks' lending behavior suggests that not only the level but also the change in banks' competition culture effects lending. Similar long-run estimates of Eq.'s (6.3) to (6.5) are produced using the GLS-RE estimator. These results are provided in columns (4) to (6) and are consistent with the pooled OLS estimates of these equations. Furthermore, we re-estimate Eq.'s (6.3) to (6.5) where we include controls for a bank's state of origin and find similar results. These results are presented in Appendix C.

Besides this, we estimate a dynamic panel GMM model to further examine the relationship between banks' competition culture and banks' lending activity. We adopt this estimation approach to control for the possibility that the relationship between *COMP* and $\Delta LOAN$ is dynamically endogenous. To be clear, if the relationship between *COMP* and $\Delta LOAN$ is in fact dynamically endogenous then this implies that the causal relationship between *COMP* and $\Delta LOAN$ runs in both directions, thereby biasing our previous estimates. Furthermore, in spite of the fact that we carefully select control variables to capture firm-specific effects, our prior results are open to the criticism that they are biased due to omitted variables. Hence, to control for potential dynamic endogeneity, unobserved heterogeneity, and simultaneity, in the relationship between *COMP* and $\Delta LOAN$ we follow Wintoki et al. (2012) by adopting the dynamic panel GMM model as proposed by Arellano and Bover (1995) and Blundell and Bond (1998). This approach allows us to explicitly control for lagged values of $\Delta LOAN$. In addition, we are able to use firm information within our dataset as instruments. We estimate the following empirical model:

$$\Delta LOAN_t = \alpha_1 + \alpha_2 COMP_t + \gamma_1 \Delta LOAN_{t-1} + \beta_1 CAP1_t + \beta_2 \Delta UNEMP_t + \beta_3 \Delta CAP_t + \beta_4 DEPOSITS_{t-1} + \beta_5 SIZE_{t-1} + \eta_t + \varepsilon_t, \quad (6.6)$$

where we first-difference Eq.'s (6.6) to eliminate unobserved heterogeneity and potential omitted variable bias. Then, we estimate the first-differenced model by GMM using lagged values (and

differences) of $\Delta LOAN$ and the controls as instruments. By using lagged variables as instruments, we control for potential simultaneity and reverse causality.

The system GMM estimates are presented in Table 6.5, where consistent with the previous results, we find a positive relationship between banks' competition culture and change in bank lending activity. When estimating the GMM model we assume that only the year dummies are exogenous. The *AR*(1) and *AR*(2) serial correlation tests results suggest that we cannot reject the null hypothesis of no serial correlation. Further, we apply Hansen's (1982) test for overidentification, as in Arellano and Bond (1991) to assess the validity of our instruments, and based on the results we do not reject the null hypothesis that our instruments are valid. In addition, we conduct the difference-in-Hansen test of exogeneity in a manner like Bond et al. (2001) to determine whether the subset of instruments used in the level equation is exogenous. Again, we do not reject the null hypothesis that our instruments are exogenous. All told, the results of these specification tests lead us to conclude that our dynamic GMM regressions are valid and lend further support to our argument that banks' competition culture, in fact, increases bank lending activity.

6.4.2 Banks' Competition Culture and Bank Loan Loss Provisioning

Next, we investigate whether banks' competition culture is related to banks' discretionary loan loss provisioning. As stated in H2, we expect that banks that are more orientated towards the competition culture will engage in more aggressive loan loss provisioning. We believe that this relationship is plausible since such banks should face elevated levels of credit risk due to more marginal lending, and because managers at banks with a strong competition culture should be more

sensitive to capital market expectations and should, therefore, be more motivated/ incentivized to manage earnings via banks loan loss provision. We estimate the following empirical model to test this proposition:

$$DLLP_t = \alpha_1 + \alpha_2 COMP_t + \alpha_3 CAP1_t + \alpha_4 \Delta UNEMP_t + \alpha_5 \Delta CAP1_t + \alpha_6 DEPOSITS_{t-1} + \alpha_7 SIZE_{t-1} + \varepsilon_t, \quad (6.7)$$

where, *DLLP*, represents the discretionary component of loan loss provisioning estimate as the absolute value of the residuals using Eq. (6.2a) and (6.2b).

Table 6.6 presents the empirical results where we find evidence that high competition culture banks engage in more discretionary loan loss provisioning behavior, where the coefficients terms 0.045 and 0.035 on the *COMP* variable in columns (1) and (2) capture the effect of competition culture on banks' discretionary loan loss provisioning. Consistent with our expectations, we find evidence that this relationship is positive and significant at the 5 percent (columns 1) and 1 percent (column 2) levels with *t*-values of 2.79 and 2.28, respectively. Further, we find that this relation is economically significant as in the case of column (1) a standard deviation increase in competition culture leads to a 0.27 (=[0.045 × 0.06]/ 0.01) increase in banks' discretionary loan loss provisioning than would otherwise be the case, while in column (2) this it redounds to a 0.21 (=[0.035 × 0.06]/ 0.01) increase. In addition, we repeat these estimates using the GLS-RE estimator. These regressions are presented in columns (3) and (4) and we find similar results. We also re-estimate Eq. (6.7) by including state dummies to control for fixed effects due to a bank's state of origin. These results are presented in Appendix C and we find results consistent with those previously provided.

In a further test of H2 we estimate a dynamic panel GMM model to explore the relationship between banks' competition culture and discretionary loan loss provisioning. In estimating this

model we control for the possibility that the relationship between bank's competition culture and discretionary loan loss provisioning is dynamically endogenous or suffers from unobserved heterogeneity and simultaneity. Further, this approach allows us to explicitly control for lagged values of *DLLP*. What is more, we are able to use firm information within our dataset as instruments. We estimate the following empirical model:

$$DLLP_t = \alpha_1 + \alpha_2 COMP_t + \gamma_1 DLLP_{t-1} + \gamma_2 DLLP_{t-2} + \beta_1 CAP1_t + \beta_2 \Delta UNEMP_t + \beta_3 \Delta CAP_t + \beta_4 DEPOSITS_{t-1} + \beta_5 SIZE_{t-1} + \eta_t + \varepsilon_t, \quad (6.8)$$

where we take the first-difference of Eq.'s (6.8) to eliminate unobserved heterogeneity and potential bias due to omitted variables. Following this, we estimate the first-differenced model for both equations by GMM using lagged values (and differences) of our measures of *DLLP*; namely, *DLLP*a and *DLLP*b, and the control variables as instruments.

The system GMM estimates are presented in Table 6.7, and consistent with our previously reported results, we find a positive relationship between banks' competition culture and our measures of discretionary loan loss provisioning. In our GMM model estimations, we assume that only the year dummies are exogenous. The *AR*(1) and *AR*(2) serial correlation tests results suggest that we cannot reject the null hypothesis of no serial correlation. Further, we apply Hansen's (1982) test for overidentification to assess the validity of our instruments, and based on the results we do not reject the null hypothesis that our instruments are valid. Furthermore, we conduct the difference-in-Hansen test of exogeneity to determine whether the subset of instruments used in the level equation is exogenous. We do not reject the null hypothesis that our instruments are exogenous. Altogether, the results of these specification tests lead us to conclude that our dynamic GMM regressions are valid and lend further support to our argument that banks' competition culture, in fact, increases abnormal loan loss provisioning.

6.4.3 Banks' Competition Culture and Procyclicality

To test H3 we utilize the financial crisis of 2007 - 2009 to explore whether high *COMP* banks engage in greater procyclical lending. In particular, we explore the relationship between banks' pre-crisis period competition culture and crisis period lending where we denote, *CRISIS*, as a variable coded one for the years 2007 to 2009 and zero otherwise. We then use, *CRISIS*, to consider the impact of competition culture in the year preceding the financial crisis, *PRE_CRISIS_COMP*, on crisis period lending. To do this we estimate the following empirical model:

$$\Delta LOAN_t = \alpha_1 + \alpha_2 CRISIS_t + \alpha_3 CRISIS_t \times PRE\_CRISIS\_COMP + \alpha_4 CAP1_t + \alpha_5 \Delta UNEMP_t + \alpha_6 \Delta CAP1_t + \alpha_7 DEPOSITS_{t-1} + \alpha_8 SIZE_{t-1} + \varepsilon_t. \quad (6.9)$$

The estimates of this models are provided in Table 6.8 below where the sign and significance of the coefficients associated with the interaction term *CRISIS* × *PRE_CRISIS_COMP* is consistent with banks that have greater pre-crisis competition culture engaging in less crisis period lending (column 1). In particular, we find in column (1) the coefficient of our interaction term of interest to be -0.073 (*t*-value = 2.56), while this term in column (2) for our GLS-RE regression is -0.075 (*t*-value = 2.46). Also, we re-estimate Eq. (6.9) by including state dummies to control for a bank's state of origin. These results are presented in Appendix C and are similar to those provided above.

Finally, we examine H4 which suggest that high *COMP* banks also engage in more crisis period loan loss provisioning. To do this, we explore the relationship between banks' pre-crisis period competition culture and crisis period abnormal loan loss provisioning. As in the preceding model, we let the variable, *CRISIS*, be coded one for the years 2007 to 2009 and zero otherwise. We then

use, *CRISIS*, to consider the impact of competition culture in the year preceding the financial crisis, *PRE_CRISIS_COMP*, on the crisis period loan loss provisioning. In particular, we estimate the following empirical model:

$$DLLP_t = \alpha_1 + \alpha_2 CRISIS_t + \alpha_3 CRISIS_t \times PRE\_CRISIS\_COMP + \alpha_4 CAP1_t + \alpha_5 \Delta UNEMP_t + \alpha_6 \Delta CAP1_t + \alpha_7 DEPOSITS_{t-1} + \alpha_8 SIZE_{t-1} + \varepsilon_t. \quad (6.10)$$

Table 6.9 presents OLS (columns 1 – 2) and GLS-RE estimates (columns 3 – 4) the estimate of Eq. (6.10) where the sign and significance of the coefficients associated with the interaction term *CRISIS* × *PRE_CRISIS_COMP* are consistent with greater pre-crisis competition culture banks engaging in more crisis period discretionary loan loss provisioning. In particular, we find in column (1) the coefficient of our interaction term of interest to be 0.114 (*t*-value = 2.10), while this term in columns (2), (3) and (4) is 0.110 (*t*-value = 2.11), 0.120 (*t*-value = 2.18), and 0.122 (*t*-value = 2.25), respectively. Re-estimate of Eq. (6.10) are provided in Appendix C where we specifically include controls for state fixed effects. The results are consistent with those previously provided.

6.5 Summary

In summary, we conduct a textual analysis of banks' 10-K filings to examine the effect of competition culture on banks' lending and loan loss provisioning. We find evidence that banks with greater competition culture are more likely to engage in more lending and loan loss provisioning activity. Further, we find that banks with higher competition culture are more likely to engage in less lending during the recent financial crisis but more abnormal loan loss provisioning. In particular, we report that during the recent financial crisis, those banks with higher

pre-crisis period levels of competition culture reduce lending more and engage in more pronounced in loan loss provisioning compared to other banks.

All told, this study has important policy implications and its findings would be of interest to bank regulators, bank managers, and the research community. This is because the effect of bank's competition culture on lending and discretionary loan loss provisioning has implications for the manner in which banks and other financial institutions are governed and managed. The insights provided here could be used to help banks attract capital investment especially during times of economic crisis and be used to help reduce systematic risk.

Table 6.1: Definition of Variables

	Symbol		Definitions
Competition culture			
	COMP	=	the bank's competition culture estimated for each fiscal year using the text-analysis approach;
Bank lending			
	Δ*LOAN*	=	the change from the beginning of the fiscal year in the natural log of loans [Compustat item: lntal];
Discretionary loan loss provisioning			
	*DLLP*a	=	the absolute value of the residual from the following equation: $LLP_t = \alpha_1 + \alpha_2 \Delta NPA_{t+1} + \alpha_3 \Delta NPA_t + \alpha_4 \Delta NPA_{t-1} + \alpha_5 \Delta NPA_{t-2} + \alpha_6 SIZE_{t-1} + \alpha_7 \Delta LOAN_t + \alpha_8 \Delta GDP_t + \alpha_9 CSRET_t + \alpha_{10} \Delta UNEMP_t + \varepsilon$; where *LLP* is loan loss provision [Compustat item: pll] divided by lagged total loans [Compustat item: lntal], Δ*NPA* is the change in non-performing assets [Compustat item: npat], *SIZE* is the natural logarithm of bank's total assets [Compustat item: at], Δ*LOAN* is the change in total loans [Compustat item: lntal], Δ*GDP* is the change in GDP over the fiscal year, CSRET is the return on the Case-Shiller Real Estate Index over the fiscal year, and Δ*UNEMP* represents the change in the employment rate over the fiscal year;
	*DLLP*b	=	the absolute value of the residual from the following equation: $LLP_t = \alpha_1 + \alpha_2 \Delta NPA_{t+1} + \alpha_3 \Delta NPA_t + \alpha_4 \Delta NPA_{t-1} + \alpha_5 \Delta NPA_{t-2} + \alpha_6 SIZE_{t-1} + \alpha_7 \Delta LOAN_t + \alpha_8 \Delta GDP_t + \alpha_9 CSRET_t + \alpha_{10} \Delta UNEMP_t + \alpha_{11} \boldsymbol{ALW}_t + \varepsilon$; where *LLP* is loan loss provision [Compustat item: pll] divided by lagged total loans [Compustat item: lntal], Δ*NPA* is the change in non-performing assets [Compustat item: npat], *SIZE* is the natural logarithm of bank's total assets [Compustat item: at], Δ*LOAN* is the change in total loans [Compustat item: lntal], Δ*GDP* is the change in GDP over the fiscal year, CSRET is the return on the Case-Shiller Real Estate Index over the fiscal year, and Δ*UNEMP* represents the change in the employment rate over the fiscal year, and ***ALW*** is the loan loss allowance [Compustat item: rcl] divided by total loans [Compustat item: lntal];
Other variables			
	*CAP*1	=	is the bank's tier 1 risk-adjusted capital ratio [Compustat item: capr1] at the beginning of the fiscal year, divided by 100;
	Δ*UNEMP*	=	the change in the US employment rate over the fiscal year;
	Δ*CAP*1	=	annual dividend yield;
	DEPOSITS	=	the lagged total deposits [Compustat item: dptc] divided by total assets [Compustat item: at]; and
	SIZE	=	the natural logarithm of bank's total assets [Compustat item: at].

Table 6.2: Descriptive Statistics

This table presents the mean, median, 25th percentile, 75th percentile, minimum value, maximum value, and the number of observations for all variables used in the study.

Variable	Obs.	Mean	S.D.	Min	0.25	Mdn	0.75	Max
COMP	5,683	0.45	0.06	0	0.42	0.45	0.49	1
Δ*LOAN*	5,176	4.51	1.8	-2.78	3.39	4.39	5.52	13.03
*DLLP*a	5,683	0.00009	0.01	-0.04	-0.004	-0.001	0.002	0.11
*DLLP*b	5,683	-0.00002	0.01	-0.06	-0.004	-0.001	0.002	0.11
*CAP*1	5,683	0.12	0.04	-0.03	0.09	0.11	0.13	0.54
Δ*UNEMP*	5,683	-0.08	1.04	-1.2	-0.6	-0.4	0.1	3.5
Δ*CAP*1	5,683	0.00003	0.02	-0.27	-0.01	0	0.01	0.31
DEPOSITS	5,683	0.75	0.1	0.16	0.69	0.77	0.82	0.97
SIZE	5,683	7.37	1.45	4.05	6.36	7.02	8.02	14.61

Table 6.3: Pearson Correlation Matrix

This table presents the Pearson correlation coefficients for the main variables used in the empirical analyses. The bold figures indicate significance at the five percent level and above.

	COMP	Δ*LOAN*	*DLLP*a	*DLLP*b	*CAP*1	Δ*UNEMP*	Δ*CAP*1	*DEPOSITS*
Δ*LOAN*	**0.1601**							
*DLLP*a	**0.0589**	0.0167						
*DLLP*b	**0.0473**	**0.0369**	**0.9757**					
*CAP*1	0.0040	**-0.2212**	**-0.0406**	**-0.0655**				
Δ*UNEMP*	**0.0841**	**-0.0891**	0.0112	0.0166	**-0.0933**			
Δ*CAP*1	0.0007	-0.0062	**0.0402**	0.0232	**0.2778**	**-0.0342**		
DEPOSITS	**0.0692**	**-0.2495**	**0.0327**	0.0073	**0.0782**	**-0.1314**	-0.0248	
SIZE	**0.1878**	**0.7849**	0.0015	0.0135	**-0.2086**	**0.0353**	0.0236	**-0.3452**

Table 6.4: OLS and Random Effects Estimates of Banks' Competition Culture and Lending

This table presents OLS (columns 1 - 3) and GLS-RE (columns 4 - 6) estimates for the relations between banks' competition culture and bank lending. The dependent variable Δ*LOAN* is the change from the beginning of the fiscal year in the natural log of loans [Compustat item: lntal]. The value of *COMP* is the competition culture estimated from the bank's 10-K filings. The variable Δ*COMP* represents the change in *COMP* over the fiscal year. The value of the variable *CAP*1 is the bank's tier 1 risk-adjusted capital ratio [Compustat item: capr1] at the beginning of the fiscal year, divided by 100. The variable Δ*CAP*1 is the change in *CAP*1 over the fiscal year. The variable Δ*UNEMP* represents the change in the employment rate over the fiscal year. The variable *DEPOSITS* is the lagged total deposits [Compustat item: dptc] divided by total assets [Compustat item: at]. The variable *SIZE* is the natural logarithm of bank's total assets [Compustat item: at]. The estimates include year dummies to control time-invariant fixed year-specific effects. All models include a constant and the standard errors are clustered at the bank-level. The *t*-statistics are given in parentheses.

	$\Delta LOAN_t$					
	(1)	(2)	(3)	(4)	(5)	(6)
$COMP_t$	0.045***			0.027***		
	(4.13)			(2.66)		
$\Delta COMP_t$		0.023**	0.028**		0.012	0.020*
		(2.30)	(2.5)		(1.27)	(1.87)
$COMP_{t-1}$		0.039***			0.022*	
		(3.06)			(1.79)	
$\Delta COMP_{t-1}$			0.048***			0.036**
			(3.34)			(2.49)
$COMP_{t-2}$			0.037**			0.027*
			(2.44)			(1.88)
$CAP1_t$	-0.017	-0.053***	-0.060***	0.02	-0.009	-0.012
	(1.26)	(3.83)	(3.7)	(1.38)	(0.56)	(0.61)
$\Delta UNEMP_t$	0.330**	0.444**	0.356***	0.298*	0.400**	0.337**
	(2.12)	(2.34)	(2.66)	(1.91)	(2.07)	(2.55)
$\Delta CAP1_t$	-0.008	0.00	0.012	-0.01	-0.003	0.005
	(0.73)	(0.00)	(0.88)	(1.02)	(0.23)	(0.33)
$DEPOSITS_{t-1}$	0.024*	0.026**	0.036**	0.024*	0.021	0.037**
	(1.82)	(1.99)	(2.47)	(1.80)	(1.46)	(2.39)
$SIZE_{t-1}$	0.770***	0.776***	0.779***	0.743***	0.755***	0.768***
	(62.95)	(58.64)	(52.6)	(54.77)	(50.53)	(49.43)
R^2	0.63	0.65	0.66	0.63	0.64	0.66
N	5,176	4,096	3,138	5,176	4,096	3,138

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 6.5: Dynamic System GMM Regressions of Banks' Competition Culture and Lending

This table presents dynamic panel GMM estimates of the relations between banks' competition culture and bank lending. The dependent variable $\Delta LOAN$ is the change from the beginning of the fiscal year in the natural log of loans [Compustat item: lntal]. The value of *COMP* is the competition culture estimated from the bank's 10-K filings. The variable $\Delta COMP$ represents the change in *COMP* over the fiscal year. The value of the variable *CAP*1 is the bank's tier 1 risk-adjusted capital ratio [Compustat item: capr1] at the beginning of the fiscal year, divided by 100. The variable $\Delta CAP1$ is the change in *CAP*1 over the fiscal year. The variable $\Delta UNEMP$ represents the change in the employment rate over the fiscal year. The variable *DEPOSITS* is the lagged total deposits [Compustat item: dptc] divided by total assets [Compustat item: at]. The variable *SIZE* is the natural logarithm of bank's total assets [Compustat item: at]. The estimates include year dummies to control time-invariant fixed year-specific effects. *AR*(1) and *AR*(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The Hansen test of over-identification is under the null that all instruments are valid. The Diff-in-Hansen test exogeneity is under the null that instruments used for the equations in levels are exogenous. The model includes a constant and the standard errors are clustered at the bank-level. The *t*-statistics are given in parentheses.

	$\Delta LOAN_t$
$COMP_t$	0.121**
	(2.06)
$CAP1_t$	-0.019
	(0.28)
$\Delta UNEMP_t$	-0.014
	(0.42)
$\Delta CAP1_t$	0.157*
	(1.84)
$DEPOSITS_{t-1}$	0.101*
	(1.91)
$SIZE_{t-1}$	0.746***
	(8.22)
$\Delta LOAN_{t-1}$	-0.001
	(0.01)
AR(1) test *p*-value	0.00
AR(2) test *p*-value	0.33
Hansen test for over-identification *p*-value	0.70
Diff–in–Hansen tests of exogeneity *p*-value	0.30
N	3,374

*$p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 6.6: OLS and Random Effects Regressions of Banks' Competition Culture and Loan Loss Provisioning

This table presents OLS (columns 1 - 2) and GLS-RE (columns 2 - 4) estimates for the relationship between banks' competition culture and abnormal loan loss provisioning. The dependent variables *DLLP*a and *DLLP*b represent the absolute value of bank's abnormal loan loss provision estimated using Eq.'s (6.2a) and (6.2b), respectively. The variable *COMP* is bank's competition culture estimated from the 10-K filings. The value of the variable *CAP*1 is the bank's tier 1 risk-adjusted capital ratio [Compustat item: capr1] at the beginning of the fiscal year, divided by 100. The variable Δ*CAP*1 is the change in *CAP*1 over the fiscal year. The variable Δ*UNEMP* represents the change in the employment rate over the fiscal year. The variable *DEPOSITS* is the lagged total deposits [Compustat item: dptc] divided by total assets [Compustat item: at]. The variable *SIZE* is the natural logarithm of bank's total assets [Compustat item: at]. The estimates include year dummies to control time-invariant fixed year-specific effects. All models include a constant and the standard errors are clustered at the bank-level. The *t*-statistics are given in parentheses.

	$DLLPa_t$	$DLLPb_t$	$DLLPa_t$	$DLLPb_t$
	(1)	(2)	(3)	(4)
$COMP_t$	0.045***	0.035**	0.050***	0.039***
	(2.79)	(2.28)	(3.40)	(2.70)
$CAP1_t$	-0.082***	-0.098***	-0.078***	-0.095***
	(4.64)	(5.78)	(3.85)	(4.96)
$\Delta UNEMP_t$	-0.156	-0.260**	-0.148	-0.235*
	(1.46)	(2.20)	(1.18)	(1.75)
$\Delta CAP1_t$	0.039**	0.031*	0.041***	0.034**
	(2.49)	(1.85)	(2.76)	(2.16)
$DEPOSITS_{t-1}$	0.019	0.00	0.016	-0.006
	(0.71)	(0.01)	(0.52)	(0.20)
$SIZE_{t-1}$	-0.007	-0.004	0.014	0.01
	(0.31)	(0.19)	(0.58)	(0.45)
R^2	0.07	0.05	0.07	0.05
N	5,683	5,683	5,683	5,683

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 6.7: Dynamic System GMM Regressions of Banks' Competition Culture and Discretionary Loan Loss Provisioning

This table presents dynamic panel GMM estimates of the relations between banks' competition culture and discretionary loan loss provisioning. The dependent variables *DLLP*a and *DLLP*b represent the absolute value of bank's abnormal loan loss provision estimated using Eq.'s (6.2a) and (6.2b), respectively. The value of *COMP* is the competition culture estimated from the bank's 10-K filings. The variable Δ*COMP* represents the change in *COMP* over the fiscal year. The value of the variable *CAP*1 is the bank's tier 1 risk-adjusted capital ratio [Compustat item: capr1] at the beginning of the fiscal year, divided by 100. The variable Δ*CAP*1 is the change in *CAP*1 over the fiscal year. The variable Δ*UNEMP* represents the change in the employment rate over the fiscal year. The variable *DEPOSITS* is the lagged total deposits [Compustat item: dptc] divided by total assets [Compustat item: at]. The variable *SIZE* is the natural logarithm of bank's total assets [Compustat item: at]. The estimates include year dummies to control time-invariant fixed year-specific effects. *AR*(1) and *AR*(2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The Hansen test of over-identification is under the null that all instruments are valid. The Diff-in-Hansen test exogeneity is under the null that instruments used for the equations in levels are exogenous. All models include a constant and the standard errors are clustered at the bank-level. The *t*-statistics are given in parentheses.

	$DLLPa_t$	$DLLPb_t$
	(1)	(2)
$COMP_t$	0.212*	0.250*
	(1.66)	(1.80)
$CAP1_t$	0.125	0.125
	(1.09)	(0.98)
$\Delta UNEMP_t$	0.114**	0.088**
	(2.44)	(2.05)
$\Delta CAP1_t$	0.008	-0.004
	(0.08)	(0.05)
$DEPOSITS_{t-1}$	0.174	0.175
	(1.35)	(1.33)
$SIZE_{t-1}$	0.068	0.090
	(0.72)	(0.82)
$DLLPa_{t-1}$	0.399**	
	(2.15)	
$DLLPa_{t-2}$	-0.044	
	0.399**	
$DLLPb_{t-1}$		0.362**
		(2.14)
$DLLPb_{t-2}$		-0.107
		(0.79)
AR(1) test *p*-value	0.01	0.03
AR(2) test *p*-value	0.45	0.58
Hansen test for over-identification *p*-value	0.17	0.15
Diff–in–Hansen tests of exogeneity *p*-value	0.58	0.76
N	3,082	3,082

*p<0.1; ** p<0.05; *** p<0.01

Table 6.8: OLS and Random Effects Regressions of Banks' Pre-Crisis Competition Culture and Crisis-period Lending

This table presents OLS (column 1) and GLS-RE (columns 2) estimates for the relationship between banks' pre-crisis period competition culture and crisis-period bank lending. The dependent variable $\Delta LOAN$ is the change from the beginning of the fiscal year in the natural log of loans [Compustat item: lntal]. The variable *CRISIS* is coded one for the years 2007 to 2009 and zero otherwise. The variable *PRE_CRISIS_COMP* represents bank's competition culture estimated from the 10-K filings in the fiscal year 2006. The value of the variable *CAP*1 is the bank's tier 1 risk-adjusted capital ratio [Compustat item: capr1] at the beginning of the fiscal year, divided by 100. The variable $\Delta CAP1$ is the change in *CAP*1 over the fiscal year. The variable $\Delta UNEMP$ represents the change in the employment rate over the fiscal year. The variable *DEPOSITS* is the lagged total deposits [Compustat item: dptc] divided by total assets [Compustat item: at]. The variable *SIZE* is the natural logarithm of bank's total assets [Compustat item: at]. The estimates include year dummies to control time-invariant fixed year-specific effects. All models include a constant and the standard errors are clustered at the bank-level. The *t*-statistics are given in parentheses.

	$\Delta LOAN_t$	
	(1)	(2)
$CRISIS_t$	-1.854***	-1.643**
	(2.64)	(2.33)
$CRISIS_t \times PRE\_CRISIS\_COMP$	-0.073**	-0.075**
	(2.56)	(2.46)
$CAP1_t$	-0.017	0.02
	(1.24)	(1.35)
$\Delta UNEMP_t$	0.345**	0.298*
	(2.22)	(1.91)
$\Delta CAP1_t$	-0.009	-0.01
	(0.79)	(1.09)
$DEPOSITS_{t-1}$	0.031**	0.029**
	(2.44)	(2.14)
$SIZE_{t-1}$	0.784***	0.753***
	(67.88)	(57.76)
R^2	0.63	0.63
N	5,176	5,176

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 6.9: OLS and Random Effects Regressions of Banks' Pre-Crisis Competition Culture and Crisis-period Loan Loss Provisioning

This table presents OLS (column 1) and GLS-RE (columns 2) estimates for the relationship between banks' pre-crisis period competition culture and crisis period abnormal loan loss provisioning. The dependent variables *DLLP*a and *DLLP*b represent the absolute value of bank's abnormal loan loss provision estimated using Eq.'s (6.2a) and (6.2b), respectively. The variable *CRISIS* is coded one for the years 2007 to 2009 and zero otherwise. The variable *PRE_CRISIS_COMP* represents bank's competition culture estimated from the 10-K filings in the fiscal year 2006. The value of the variable *CAP*1 is the bank's tier 1 risk-adjusted capital ratio [Compustat item: capr1] at the beginning of the fiscal year, divided by 100. The variable Δ*CAP*1 is the change in *CAP*1 over the fiscal year. The variable Δ*UNEMP* represents the change in the employment rate over the fiscal year. The variable *DEPOSITS* is the lagged total deposits [Compustat item: dptc] divided by total assets [Compustat item: at]. The variable *SIZE* is the natural logarithm of bank's total assets [Compustat item: at]. The estimates include year dummies to control time-invariant fixed year-specific effects. All models include a constant and the standard errors are clustered at the bank-level. The *t*-statistics are given in parentheses.

	$DLLPa_t$	$DLLPb_t$	$DLLPa_t$	$DLLPb_t$
	(1)	(2)	(3)	(4)
$CRISIS_t$	0.798**	1.176***	0.761*	1.067**
	(2.02)	(2.73)	(1.74)	(2.28)
$CRISIS_t \times PRE\_CRISIS\_COMP$	0.114**	0.110**	0.120**	0.122**
	(2.10)	(2.11)	(2.18)	(2.25)
$CAP1_t$	-0.076***	-0.093***	-0.072***	-0.089***
	(4.31)	(5.47)	(3.53)	(4.65)
$\Delta UNEMP_t$	-0.119	-0.231*	-0.111	-0.203
	(1.12)	(1.96)	(0.89)	(1.53)
$\Delta CAP1_t$	0.038**	0.030*	0.040***	0.033**
	(2.43)	(1.80)	(2.69)	(2.10)
$DEPOSITS_{t-1}$	0.023	0.002	0.019	-0.004
	(0.84)	(0.06)	(0.65)	(0.13)
$SIZE_{t-1}$	-0.002	-0.001	0.018	0.012
	(0.07)	(0.05)	(0.76)	(0.53)
R^2	0.07	0.05	0.07	0.05
N	5,683	5,683	5,683	5,683

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Chapter 7 Conclusion

7.1 Overview and Concluding Remarks

In this thesis, we explore the role that a specific type of corporate culture; namely, competition culture plays in corporate finance. To be sure firms' culture is a broad, intangible and inherently complex concept (See e.g. Kreps, 1990; Schein, 1990, 1992; Benabou and Tirole, 2003, 2011; Guiso et al., 2006; Zingales, 2015; Graham et al., 2017), which is expected to be influenced by and reflect the values and practices of top management and those charged with governance. Further, this construct is expected to have a significant effect on firms' economic outcomes as it incentivizes particular behaviors and influences the environment within which decisions are taken. Thus, following insights provided by the competing values framework (CVF) for corporate culture, we introduce firms' competition culture and an important, economically valid and significant empirical construct that is of increasing relevance and interest to researchers in finance and economics.

To measure competition culture, we rely on the textual analysis of firms' 10-K reports as this approach has recently been shown to be a valuable tool in finance for detecting economically relevant information from various bodies of texts (see e.g. Antweiler and Murray, 2004; Hoberg and Hanley, 2010; Hoberg and Phillips, 2010; Li, 2008; Loughran and McDonald, 2011, 2016; Tetlock, 2007; Tetlock et al., 2008; Kearney and Liu, 2014). Specifically, we show that this approach can be applied to quantify corporate culture and although it remains debatable as to whether corporate culture is best measured using this method, we argue that our measure is reasonable based on the intuition that the words used by the management of a firm reflect the values that these individuals have developed over time. Further, we validate our empirical construct by relating it to alternative measures of competition culture.

Hence, using our text-based measure of competition culture we document in the first study (see Chapter 4) that firms' institutional ownership structure influences the level of competition culture. This finding provides evidence that firms' institutional ownership structure is an important determinant of firms' corporate culture. Specifically, we show that transient institutional ownership help to promote the competition culture, while dedicated institutional ownership dampens this type of culture in firms.

In the second study of the thesis (see Chapter 5), we use our measure of firms' competition culture to show that firms with higher competition culture are more likely to meet and/or beat analysts' forecasts. However, we also reveal a darker side to firms' competition culture as firms with this type of corporate culture are more prone to experience stock price crash risks. Interestingly, we document this phenomenon particularly among firms with a high proportion of transient and a low proportion of dedicated institutional ownership, and that is consistent with competition culture playing a mediating role.

In the final study (see Chapter 6) we examine the effect of banks' competition culture on bank lending and loan loss provisioning and find that banks with greater competition culture are likely to engage in greater lending and loan loss provisioning activity. However, we report that during the recent financial crisis banks with higher pre-crisis competition culture reduce their lending more and have a more pronounced increase in loan loss provisioning during the crisis period.

Taken together, these results suggest that dedicated institutional ownership helps to soothe managements' orientation towards the competition culture, while transient institutional ownership reinforces it and hence works as a stimulus for management to engage in opportunistic behavior that can negatively affect firms' economic outcomes. In particular, since our results suggest that

institutional investors have a positive effect on a firm's orientation towards competition culture, it should come as no surprise that firms with high competition culture are more likely to meet/ beats analysts' forecasts possibly in an attempt to meet the performance expectations of transient investors. However, it is also likely that managers at such firms may feel pressured to conceal "bad" news in an attempt to reach the expected levels of performance and hence firms with greater competition culture are more likely to experience large firm-specific declines in their stock prices when this "bad" news is released to the market. Furthermore, building on this story for financial firms, it is reasonable that high competition culture in banks encourages managers to engage in greater marginal lending and loan loss provisioning activity.

All told, the results of this thesis have important implications of interest to academics, bank regulators, and the wider business community. This is because the effect of institutional ownership on competition culture has implications for the manner in which firms are governed and managed. In particular, our main findings should be of interest to those charged with governance, who have a responsibility to eliminate any pressures on managers from outside investors to increase their competition culture in order to achieve short-term financial objectives which may increase idiosyncratic and systematic risks.

Future research will explore the role played by other cultural orientations under the CVF in explaining firms' economic outcomes. Also, we leave it to future studies to directly consider the effects of banks' corporate culture on risk-taking activity.

Bibliography

Acharya, V.V., Cooley, T.F., Richardson, M.P., Walter, I., 2010. Regulating Wall Street: The Dodd-Frank Act and the New Architecture of Global Finance. Hoboken, NJ: John Wiley and Sons.

Ahern, K.R., Sosyura, D., 2014. Who Writes the News? Corporate Press Releases During Merger Negotiations. The Journal of Finance 69, 241-291.

Ahern, K.R., Daminelli, D., Fracassi, C., 2015. Lost in Translation? The Effect of Cultural Values on Mergers around the World. Journal of Financial Economics 117, 165-189.

Ahmed, A.S., Takeda, C., Thomas, S., 1999. Bank Loan Loss Provisions: A Reexamination of Capital Management, Earnings Management and Signaling Effects. Journal of Accounting and Economics 28, 1-25.

Akerlof, G.A., 1980. A Theory of Social Custom, of which Unemployment may be one Consequence. The Quarterly Journal of Economics 94, 749-775.

Altamuro, J., Beatty, A., 2010. How does Internal Control Regulation Affect Financial Reporting?. Journal of Accounting and Economics 49, 58-74.

Andreou, P.C., Antoniou, C., Horton, J., Louca, C., 2016. Corporate Governance and Firm-Specific Stock Price Crashes. European Financial Management 22, 916-956.

Andreou, P.C., Louca, C., Petrou, A.P., 2017. CEO Age and Stock-price Crash Risk. Review of Finance 21, 1287-1325.

Angrist, J., 1990. Lifetime Earnings and the Vietnam Era Draft Lottery: Evidence from Social Security Administrative Records. The American Economic Review 80, 313-336.

Angrist, J., 1991. The Draft Lottery and Voluntary Enlistment in the Vietnam Era. Journal of the American Statistical Association 86, 584–595.

Angrist, J., 1998. Estimating the Labor Market Impact of Voluntary Military Service Using Social Security Data on Military Applicants. Econometrica 66,249–288.

Antill, S., Hou, D., Sarkar, A., 2014. Components of US Financial Sector Growth, 1950-2013. Available at SSRN 2421317.

Antweiler, W., Frank, M.Z., 2004. Is All That Talk Just Noise? The Information Content of Internet Stock Message Boards. The Journal of Finance 59, 1259-1294.

Appel, I.R., Gormley, T.A., Keim, D.B., 2016. Passive Investors not Passive Owners. Journal of Financial Econometrics 121, 111-141.

Arellano, M., Bond, S., 1991. Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. The Review of Economic Studies 58, 277-297.

Arellano, M., Bover, O., 1995. Another Look at the Instrumental Variable Estimation of Error-Components Models. Journal of Econometrics 68, 29-51.

Arrow, K., 1972. Some Mathematical Models of Race in the Labor Market. In Racial Discrimination in Economic Life, Edited by Pascal A. H. Lexington, MA: Lexington Books.

Au, S.Y., Dong, M., Tremblay, A., 2016. When Culture Matters-Corporate Flexibility and Stock Returns. Available at SSRN 2883353

Audi, R., Loughran, T., McDonald, B., 2016. Trust, but Verify: MD&A Language and the Role of Trust in Corporate Culture. Journal of Business Ethics 139, 551-561.

Barth, A., 2016. The Role of Corporate Culture in the Financial Industry. Available at SSRN 2707078.

Barton, J., Simko, P.J., 2002. The Balance Sheet as an Earnings Management Constraint. The Accounting Review 77, 1-27.

Beatty, A., Chamberlain, S.L., Magliolo, J., 1995. Managing Financial Reports of Commercial Banks: The Influence of Taxes, Regulatory Capital, and Earnings. Journal of Accounting Research 33, 231-261.

Beatty, A., Harris, D.G., 1999. The Effects of Taxes, Agency Costs and Information Asymmetry on Earnings Management: A Comparison of Public and Private Firms. Review of Accounting Studies 4, 299-326.

Beatty, A., Liao, S., 2011. Do Delays in Expected Loss Recognition Affect Banks' Willingness to Lend?. Journal of Accounting and Economics 52, 1-20.

Beatty, A. and Liao, S., 2014. Financial Accounting in the Banking Industry: A Review of the Empirical Literature. Journal of Accounting and Economics 58, 339-383.

Beaver, W.H., Engel, E.E., 1996. Discretionary Behavior with Respect to Allowances for Loan Losses and the Behavior of Security Prices. Journal of Accounting and Economics 22, 177-206.

Bebchuk, L., Brav, A., Jian, W., 2015. The Long-term Effects of Hedge Fund Activism. Columbia Law Review 115, 1085-1155.

Beck, P.J., Narayanamoorthy, G.S., 2013. Did the SEC Impact Banks' Loan Loss Reserve Policies and their Informativeness?. Journal of Accounting and Economics 56, 42-65.

Becker, G. S. 1957.The Economics of Discrimination. Chicago, IL: University of Chicago Press.

Becker, B., Ivashina, V., 2015. Reaching for Yield in the Bond Market. The Journal of Finance 70, 1863-1902.

Bellstam, G., Bhagat, S., Cookson, J.A., 2017. A Text-based Analysis of Corporate Innovation. Available at SSRN 2803232.

Benabou, R., Tirole, J., 2003. Intrinsic and Extrinsic Motivation. The Review of Economic Studies 70, 489-520.

Benabou, R., Tirole, J., 2011. Identity, Morals, and Taboos: Beliefs as Assets. The Quarterly Journal of Economics 126, 805-855.

Benmelech, E., Frydman, C., 2015. Military CEOs. Journal of Financial Economics 117, 43-59.

Bereskin, F.L., Byun, S.K., Officer, M.S., Oh, J.M., 2017. The Effect of Cultural Similarity on Mergers and Acquisitions: Evidence from Corporate Social Responsibility. Journal of Financial and Quantitative Analysis (Forthcoming). Available at SSRN 2920129.

Bernardo, A.E., Welch, I., 2004. Liquidity and Financial Market Runs. The Quarterly Journal of Economics 119,135-158.

Bhandari, A., Mammadov, B., Thevenot, M., Vakilzadeh, S.H., 2017. The Invisible Hand: Corporate Culture and Its Implications for Earnings Management. Working Paper, Warrington College of Business, Gainesville, FL.

Biddle, G.C., Hilary, G.,Verdi, R.S., 2009. How does Financial Reporting Quality Relate to Investment Efficiency?. Journal of Accounting and Economics 48, 112-131.

Biggerstaff, L., Cicero, D.C., Puckett, A., 2015. Suspect CEOs, Unethical Culture, and Corporate Misbehavior. Journal of Financial Economics 117, 98-121.

Blei, D.M., Ng, A.Y., Jordan, M.I., 2003. Latent Dirichlet Allocation. Journal of Machine Learning Research 3, 993-1022.

Blundell, R., Bond, S., 1998. Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. Journal of Econometrics 87, 115-143.

Bodnaruk, A., Loughran, T., McDonald, B., 2015. Using 10-K Text to Gauge Financial Constraints. Journal of Financial and Quantitative Analysis 50, 623-646.

Bond, S.R., Hoeffler, A., Temple, J.R.W., 2001. GMM Estimation of Empirical Growth Models. Washington, DC: Center for Economic Policy Research.

Bonsall IV, S.B., Leone, A.J., Miller, B.P., Rennekamp, K., 2017. A Plain English Measure of Financial Reporting Readability. Journal of Accounting and Economics 63, 329-357.

Boukus, E., Rosenberg, J.V., 2006. The Information Content of FOMC Minutes. Available at SSRN 922312.

Bowen, R.M., DuCharme, L., Shores, D., 1995. Stakeholders' Implicit Claims and Accounting Method Choice. Journal of Accounting and Economics 20, 255-295.

Brav, A., Jiang, W., Kim, H., 2015. The Real Effects of Hedge Fund Activism: Productivity, Asset Allocation, and Labor Outcomes. Review of Financial Studies 28, 2723-2769.

Braguinsky, S., Mityakov, S., 2015. Foreign Corporations and the Culture of Transparency: Evidence from Russian Administrative Data. Journal of Financial Economics 117, 139-164.

Bushee, B.J., 1998. The Influence of Institutional Investors on Myopic R&D Investment Behavior. Accounting Review 73, 305-333.

Bushee, B.J., 2001. Do Institutional Investors Prefer Near-Term Earnings Over Long-Run Value? Contemporary Accounting Research 18, 207-246.

Bushman, R.M., Davidson, R.H., Dey, A., Smith, A., 2017. Bank CEO Materialism: Risk Controls, Culture and Tail Risk. Journal of Accounting and Economics 65, 191-220.

Bushman, R.M., Hendricks, B.E., Williams, C.D., 2016. Bank Competition: Measurement, Decision-Making, and Risk-Taking. Journal of Accounting Research 54, 777-826.

Bushman, R.M., Williams, C.D., 2012. Accounting Discretion, Loan Loss Provisioning, and Discipline of Banks' Risk-taking. Journal of Accounting and Economics 54, 1-18.

Cai, F., Zheng, L., 2004. Institutional Trading and Stock Returns. Finance Research Letters 1, 178-189.

Callen, J.L., Fang, X., 2013. Institutional Investor Stability and Crash Risk: Monitoring Versus Short-Termism? Journal of Banking and Finance 37, 3047-3063.

Callen, J.L., Fang, X., 2015. Religion and Stock Price Crash Risk. Journal of Financial and Quantitative Analysis 50, 169-195.

Callen, J.L., Morel, M., Richardson, G., 2011. Do Culture and Religion Mitigate Earnings Management? Evidence from a Cross-country Analysis. International Journal of Disclosure and Governance 8, 103-121.

Cella, C., Ellul, A., Giannetti, M., 2013. Investors' Horizons and the Amplification of Market Shocks. Review of Financial Studies 26, 1607-1648.

Cameron, K.S., Quinn, R.E., 2011. Diagnosing and Changing Organizational Culture: Based on the Competing Values Framework. Hoboken, NJ: John Wiley and Sons.

Cameron, K., Quinn, R., DeGraff, J., Thakor, A., 2014. Competing Values Leadership. Northampton, MA: Edward Elgar Publishing.

Chen, H., De, P., Hu, Y.J., Hwang, B.H., 2014. Wisdom of Crowds: The Value of Stock Opinions Transmitted Through Social Media. The Review of Financial Studies 27, 1367-1403.

Chen, J., Hong, H., Stein, J.C., 2001. Forecasting Crashes: Trading Volume, Past Returns, and Conditional Skewness in Stock Prices. Journal of Financial Economics 61, 345-381.

Chen, X., Harford, J., Li, K., 2007. Monitoring: Which Institutions Matter? Journal of Financial Economics 86, 279-305.

Chen, J., Li, F., 2017. Estimating the Amount of Estimation in Accruals. Available at SSRN 2738842.

Cheng, Q., Warfield, T.D., 2005. Equity Incentives and Earnings Management. The Accounting Review 80, 441-476.

Chui, A.C., Titman, S., Wei, K.J., 2010. Individualism and Momentum around the World. The Journal of Finance 65, 361-392.

Cohen, L., Malloy, C.J., Nguyen, Q.H., 2016. Lazy Prices. Available at SSRN 1658471.

Collins, J.H., Shackelford, D.A., Wahlen, J.M., 1995. Bank Differences in the Coordination of Regulatory Capital, Earnings, and Taxes. Journal of Accounting Research, pp.263-291.

Crane, A.D., Michenaud, S., Weston, J.P., 2015. The Effect of Institutional Ownership on Payout Policy: Evidence from Index Thresholds. Review of Financial Studies 29, 1377-1408.

Cremer, J., 1993. Corporate Culture and Shared Knowledge. Industrial and Corporate Change 2, 351–386.

Cronqvist, H., Low, A. Nilsson, M., 2007. Does Corporate Culture Matter for Firm Policies?. Working Paper, Fisher College of Business, Columbus, OH.

Da, Z., Engelberg, J., Gao, P., 2015. The Sum of All FEARS Investor Sentiment and Asset Prices. The Review of Financial Studies 28, 1-32.

Dang, T., Faff, R., Luong, H., Nguyen, L., 2017. National Culture and Stock Price Crash Risk. Available at SSRN 2711204.

Davidson, R., Dey, A., Smith, A., 2015. Executives' "off-the-job" Behaviour, Corporate Culture, and Financial Reporting Risk. Journal of Financial Economics 117, 5-28.

Davis, A.K., Piger, J.M., Sedor, L.M., 2012. Beyond the Numbers: Measuring the Information Content of Earnings Press Release Language. Contemporary Accounting Research 29, 845-868.

Davis, A.K., Tama-Sweet, I., 2012. Managers' use of Language across Alternative Disclosure Outlets: Earnings Press Releases versus MD&A. Contemporary Accounting Research 29, 804-837.

Das, S.R., Chen, M.Y., 2007. Yahoo! for Amazon: Sentiment Extraction from Small Talk on the Web. Management Science 53, 1375-1388.

Deal, T.E., Kennedy, A.A., 1982. Corporate Cultures: The Rites and Rituals of Organizational Life. Boston, MA: Addison-Wesley.

DeBacker, J., Heim, B.T., Tran, A., 2015. Importing Corruption Culture from Overseas: Evidence from Corporate Tax Evasion in the United States. Journal of Financial Economics 117, 122-138.

Denison, D.R., 1990. Corporate Culture and Organizational Effectiveness. Hoboken, NJ: John Wiley and Sons.

Dikolli, S.S., Kulp, S.L., Sedatole, K.L., 2009. Transient Institutional Ownership and CEO Contracting. The Accounting Review 84, 737–770.

Dimson, E., 1979. Risk Measurement When Shares are Subject to Infrequent Trading. Journal of Financial Economics 7, 197-226.

Doran, J.S., Peterson, D.R., Price, S.M., 2012. Earnings Conference Call Content and Stock Price: The Case of REITs. The Journal of Real Estate Finance and Economics 45, 402-434.

Dougal, C., Engelberg, J., Garcia, D., Parsons, C.A., 2012. Journalists and the Stock Market. The Review of Financial Studies 25, 639-679.

Doupnik, T.S., 2008. Influence of Culture on Earnings Management: A Note. Abacus 44, 317-340.

Dyer, T., Lang, M., Stice-Lawrence, L., 2017. The Evolution of 10-K Textual Disclosure: Evidence from Latent Dirichlet Allocation. Journal of Accounting and Economics 64, 221-245.

Edmans, A., 2014. Blockholders and Corporate Governance. Annual Review of Financial Economics 6, 23-50.

Edmans, A., 2011. Does the Stock Market Fully Value Intangibles? Employee Satisfaction and Equity Prices. Journal of Financial Economics 101, 621-640.

Elyasiani, E., Jia, J., 2010. Distribution of Institutional Ownership and Corporate Firm Performance. Journal of Banking and Finance 34, 606-620.

Elyasiani, E., Jia, J.J., Mao, C.X., 2010. Institutional Ownership Stability and the Cost of Debt. Journal of Financial Markets 13, 475-500.

Erhard, W., Jensen, M., Zaffron, S., 2016. Integrity: A Positive Model that Incorporates the Normative Phenomena of Morality, Ethics and Legality. Available at SSRN 1542759.

Fama, E.F., French, K.R., 1997. Industry Costs of Equity. Journal of Financial Economics 43, 153-193.

Eun, C.S., Wang, L., Xiao, S.C., 2015. Culture and R 2. Journal of Financial Economics 115, 283-303.

Feldman, R., Govindaraj, S., Livnat, J., Segal, B., 2010. Management's Tone Change, Post Earnings Announcement Drift and Accruals. Review of Accounting Studies 15, 915-953.

Fernández, R., 2011. Does Culture Matter? In Handbook of Social Economics, Edited by Benhabib, J., Bisin, A., Jackson, M.O. Alkmaar, Holland: North Holland Publishing.

Ferris, S.P., Hao, Q., Liao, M.Y., 2012. The Effect of Issuer Conservatism on IPO Pricing and Performance. Review of Finance 17, 993-1027.

Fiordelisi, F., Ricci, O., 2014. Corporate Culture and CEO Turnover. Journal of Corporate Finance 28, 66-82.

Fos, V., Kahn, C., 2015. Governance through Threat of Intervention and Threat of Exit. Working Paper, University of Illinois at Urbana–Champaign, Champaign, IL.

Friebel, G., Giannetti, M., 2009. Fighting for Talent: Risk-Taking, Corporate Volatility and Organisation Change. The Economic Journal 119, 1344-1373.

Garcia, D., 2013. Sentiment during Recessions. The Journal of Finance 68, 1267-1300.

Gaspar, J.M., Massa, M., Matos, P., 2005. Shareholder Investment Horizons and the Market for Corporate Control. Journal of Financial Economics 76, 135-165.

Giannetti, M., Yafeh, Y., 2012. Do Cultural Differences Between Contracting Parties Matter? Evidence from Syndicated Bank Loans. Management Science 58, 365-383.

Giannetti, M., Yu, X., 2016. The Corporate Finance Benefits of Short Horizon Investors. Available at SSRN 2723357.

Gompers, P.A., Metrick, A., 1998. Institutional Investors and Equity Prices. Cambridge, MA: National Bureau of Economic Research.

Graham, J.R., Harvey, C.R., Popadak, J., Rajgopal, S., 2017. Corporate Culture: Evidence from the Field. Cambridge, MA: National Bureau of Economic Research.

Graham, J.R., Harvey, C.R., Rajgopal, S., 2005. The Economic Implications of Corporate Financial Reporting. Journal of Accounting and Economics 40, 3-73.

Gray, S.J., 1988. Towards a Theory of Cultural Influence on the Development of Accounting Systems Internationally. Abacus 24, 1-15.

Grieser, W.D., Kapadia, N., Li, R., Simonov, A., 2016. Fifty Shades of Corporate Culture. Available at SSRN 2843776.

Guiso, L., Sapienza, P., Zingales, L., 2006. Does Culture Affect Economic Outcomes? The Journal of Economic Perspectives 20, 23-48.

Guiso, L., Sapienza, P. and Zingales, L., 2008. Trusting the Stock Market. The Journal of Finance 63, 2557-2600.

Guiso, L., Sapienza, P., Zingales, L., 2009. Cultural Biases in Economic Exchange?. The Quarterly Journal of Economics 124, 1095-1131.

Guiso, L., Sapienza, P., Zingales, L., 2015a. Corporate Culture, Societal Culture, and Institutions. American Economic Review 105, 336-339.

Guiso, L., Sapienza, P., Zingales, L., 2015b. The Value of Corporate Culture. Journal of Financial Economics 117, 60-76.

Hambrick, D., P. Mason. 1984. Upper Echelons: The Organization as a Reflection of its Top Managers. Academy of Management Review 9, 193-206.

Handy, C.B., 1976. Understanding Organizations. Oxford, UK: Oxford University Press.

Hanley, K.W., Hoberg, G., 2010. The Information Content of IPO Prospectuses. The Review of Financial Studies 23, 2821-2864.

Hansen, L.P., 1982. Large Sample Properties of Generalized Method of Moments Estimators. Econometrica: Journal of the Econometric Society 50, 1029-1054.

Hanson, S.G., Kashyap, A.K., Stein, J.C., 2011. A Macro-prudential Approach to Financial Regulation. Journal of Economic Perspectives 25, 3-28.

Harford, J., Kecskes, A., Mansi, S., 2017. Do Long-term Investors Improve Corporate Decision Making?. Journal of Corporate Finance (Forthcoming). Available at SSRN 2505261.

Harris, L.C., Ogbonna, E., 2001. Strategic Human Resource Management, Market Orientation, and Organizational Performance. Journal of Business Research 51, 157-166.

Harrison, R., 1972. Organization's Character. Boston, MA: Harvard Business Review.

Hartnell, C.A., Ou, A.Y., Kinicki, A., 2011. Organizational Culture and Organizational Effectiveness: A Meta-Analytic Investigation of the Competing Values Framework's Theoretical Suppositions. Journal of Applied Psychology 96, 677.

Hausman, J.A., 1978. Specification Tests in Econometrics. Econometrica: Journal of the Econometric Society 46, 1251-1271.

Henry, E., 2008. Are Investors Influenced by how Earnings Press Releases are Written?. The Journal of Business Communication45, 363-407.

Heston, S.L., Sinha, N.R., 2015. News versus Sentiment: Predicting Stock Returns from News Stories. Available at SSRN 2311310.

Hermalin, B.E., 2012. Leadership and Corporate Culture. In The International Handbook of Organizational Culture and Climate, Edited by Cooper, C.A., Cartwright, S. and Earley, P.C., London, UK: Blackwell Publishers.

Hillert, A., Niessen-Ruenzi, A., Ruenzi, S., 2014. Mutual Fund Shareholder Letter Tone-Do Investors Listen?. Working Paper, University of Mannheim, Mannheim, Germany.

Hoberg, G., Phillips, G., 2010. Product Market Synergies and Competition in Mergers and Acquisitions: A Text-Based Analysis. Review of Financial Studies 23, 3773-3811.

Hoberg, G., Phillips, G., 2016. Text-based Network Industries and Endogenous Product Differentiation. Journal of Political Economy 124, 1423-1465.

Hoberg, G., Phillips, G., Prabhala, N., 2014. Product Market Threats, Payouts, and Financial Flexibility. The Journal of Finance 69, 293-324.

Hofstede, G., 1980. Culture and Organizations. International Studies of Management and Organization 10, 15-41.

Hofstede, G., 2001. Cultural Consequences. Thousand Oaks, CA: Sage Publications.

Hofstede, G., 2011. Dimensionalizing Cultures: The Hofstede Model in Context. Online Readings in Psychology and Culture. Available at https://doi.org/10.9707/2307-0919.1014.

Hofstede, G., Neuijen, B., Ohayv, D.D., Sanders, G., 1990. Measuring Organizational Cultures: A Qualitative and Quantitative Study across Twenty Cases. Administrative Science Quarterly 35,286-316.

Hong, H., Stein, J.C., 2003. Differences of Opinion, Short-Sales Constraints, and Market Crashes. Review of Financial Studies 16, 487-525.

Huang, A.H., Zang, A.Y., Zheng, R., 2014a. Evidence on the Information Content of Text in Analyst Reports. The Accounting Review 89, 2151-2180.

Huang, X., Teoh, S.H., Zhang, Y., 2014b. Tone Management. The Accounting Review 89, 1083-1113.

Hutton, A.P., Marcus, A.J., Tehranian, H., 2009. Opaque Financial Reports, R 2, and Crash Risk. Journal of Financial Economics 94, 67-86.

Ivashina, V., Scharfstein, D., 2010. Bank Lending during the Financial Crisis of 2008. Journal of Financial Economics 97, 319-338.

Jaffe, A.B., 1986. Technological Opportunity and Spill-overs of R&D: Evidence from Firms' Patents, Profits and Market Value. American Economic Review 76, 984-1001

Jaworski, B.J., Kohli, A.K., 1993. Competition Culture: Antecedents and Consequences. The Journal of Marketing 57, 53-70.

Johnson, G., 1988. Rethinking Incrementalism. Strategic Management Journal 9, 75-91.

Kanagaretnam, K., Krishnan, G.V., Lobo, G.J., 2010. An Empirical Analysis of Auditor Independence in the Banking Industry. The Accounting Review 85, 2011-2046.

Kanagaretnam, K., Lim, C.Y., Lobo, G.J., 2013. Influence of National Culture on Accounting Conservatism and Risk-taking in the Banking Industry. The Accounting Review 89, 1115-1149.

Kearney, C., Liu, S., 2014. Textual Sentiment in Finance: A survey of Methods and Models. International Review of Financial Analysis 33, 171-185.

Kerlinger, F., 1973. Foundations of Behavioral Research, New York, NY: Holt, Rinehart and Winston.

Kim, J.B., Li, Y., Zhang, L., 2011a. CFOs versus CEOs: Equity Incentives and Crashes. Journal of Financial Economics 101, 713-730.

Kim, J.B., Li, Y., Zhang, L., 2011b. Corporate Tax Avoidance and Stock Price Crash Risk: Firm-level Analysis. Journal of Financial Economics 100, 639-662.

Kim, J.B., Zhang, L., 2016. Accounting Conservatism and Stock Price Crash Risk: Firm-level Evidence, Contemporary Accounting Research 33, 412–441.

Kim, M.S., Kross, W., 1998. The Impact of the 1989 Change in Bank Capital Standards on Loan Loss Provisions and Loan Write-offs. Journal of Accounting and Economics 25, 69-99.

Kohli, A.K., Jaworski, B.J., 1990. Competition Culture: The Construct, Research Propositions, and Managerial Implications. The Journal of Marketing 54, 1-18.

Kothari, S.P., Li, X., Short, J.E., 2009. The Effect of Disclosures by Management, Analysts, and Business Press on Cost of Capital, Return Volatility, and Analyst Forecasts: A Study using Content Analysis. The Accounting Review 84, 1639-1670.

Kotter, J.P., Heskett, J., 1992. Corporate Culture and Performance. New York, NY: The Free Press.

Kreps, D.M., 1990. Corporate Culture and Economic Theory. In Perspectives on Positive Political Economy, Edited by Alt, J.E. and Shepsle, K.A. New York, NY: Cambridge University Press.

Lauderdale, D., Kestenbaum, B., 2000. Asian American Ethnic Identification by Surname. Population Research and Policy Review 19, 283–300.

Lawrence, A., 2013. Individual Investors and Financial Disclosure. Journal of Accounting and Economics 56,130-147.

Lehavy, R., Li, F., Merkley, K., 2011. The Effect of Annual Report Readability on Analyst Following and the Properties of their Earnings Forecasts. The Accounting Review 86, 1087-1115.

Li, E.X., Ramesh, K., 2009. Market Reaction Surrounding the Filing of Periodic SEC Reports. The Accounting Review 84, 1171-1208.

Li, F., 2008. Annual Report Readability, Current Earnings, and Earnings Persistence. Journal of Accounting and Economics 45, 221-247.

Li, F., 2010a. Textual Analysis of Corporate Disclosures: A Survey of the Literature. Journal of Accounting Literature 29, 143.

Li, F., 2010b. The Information Content of Forward-Looking Statements in Corporate Filings: A Naive Bayesian Machine Learning Approach. Journal of Accounting Research 48, 1049-1102.

Li, F., 2011. Managers' Self-serving Attribution Bias, Overconfidence, and Corporate Financial Policies. Working Paper. University of Michigan, Ann Arbor, MI.

Li, F., Lundholm, R., Minnis, M., 2013a. A Measure of Competition Based on 10 - K Filings. Journal of Accounting Research 51, 399-436.

Li, K., Griffin, D., Yue, H., Zhao, L., 2013b. How does Culture Influence Corporate Risk-taking?. Journal of Corporate Finance 23, 1-22.

Li, X., 2010c. The Impacts of Product Market Competition on the Quantity and Quality of Voluntary Disclosures. Review of Accounting Studies 15, 663-711.

Liu, C.C., Ryan, S.G., 2006. Income smoothing over the Business Cycle: Changes in Banks' Coordinated Management of Provisions for Loan Losses and Loan Charge-offs from the Pre-1990 bust to the 1990s boom. The Accounting Review 81, 421-441.

Liu, X., 2016. Corruption Culture and Corporate Misconduct. Journal of Financial Economics 122, 307-327.

Lo, A.W., 2015. The Gordon Gekko Effect: The Role of Culture in the Financial Industry. Cambridge, MA: National Bureau of Economic Research.

Loughran, T., McDonald, B., Yun, H., 2009. A Wolf in Sheep's Clothing: The Use of Ethics-Related Terms in 10-K Reports. Journal of Business Ethics 89, 39–49.

Loughran, T., McDonald, B., 2011. When is a Liability not a Liability? Textual Analysis, Dictionaries, and 10-Ks. The Journal of Finance 66, 35-65.

Loughran, T., McDonald, B., 2013. IPO First-day Returns, Offer Price Revisions, Volatility, and Form S-1 Language. Journal of Financial Economics 109, 307-326.

Loughran, T., McDonald, B., 2014. Measuring Readability in Financial Disclosures. The Journal of Finance 69, 1643-1671.

Loughran, T., McDonald, B., 2016. Textual Analysis in Accounting and Finance: A survey. Journal of Accounting Research 54, 1187-1230.

Massa, M., Wu, F., Zhang, H., Zhang, B., 2015. Saving Long-term Investment from Short-termism: The Surprising role of Short Selling. Available at SSRN 2558876.

Mayew, W.J., Venkatachalam, M., 2012. The Power of Voice: Managerial Affective States and Future Firm Performance. The Journal of Finance 67, 1-43.

McCahery, J.A., Sautner, Z., Starks, L.T., 2016. Behind the Scenes: The Corporate Governance Preferences of Institutional Investors. The Journal of Finance 63, 1729-1775.

Miller, B.P., 2010. The Effects of Reporting Complexity on Small and Large Investor Trading. The Accounting Review 85, 2107-2143.

Mironov, M., 2015. Should one Hire a Corrupt CEO in a Corrupt Country?. Journal of Financial Economics 117, 29-42.

Mosteller, F., Wallace, D., 1964. Inference and Disputed Authorship: The Federalist. Reading, MA: Addison-Wesley.

Myers, S.C., Majluf, N.S., 1984. Corporate Financing and Investment Decisions when Firms have Information that Investors do not have. Journal of Financial Economics 13, 187-221.

Narver, J.C., Slater, S.F., 1990. The Effect of a Competition Culture on Business Profitability. The Journal of Marketing 54, 20-35.

Nelson, K.K., Pritchard, A.C., 2007. Litigation Risk and Voluntary Disclosure: The use of Meaningful Cautionary Language. Available at SSRN 998590.

Nguyen, D.D., Nguyen, L., Sila, V., 2018. Bank Culture and Financial Stability: Evidence from Bank Lending Channels. British Journal of Management (Forthcoming). Available at SSRN 2789000.

Nofsinger, J.R., Sias, R.W., 1999. Herding and Feedback Trading by Institutional and Individual Investors. The Journal of Finance 54, 2263-2295.

O'Reilly, C.A., Chatman, J.A., 1996. Culture as Social Control: Corporations, Cults, and Commitment. In Research in Organizational Behavior: An Annual Series of Analytical Essays and Critical Reviews, Edited by Staw B.M., Cummings L.L. Stamford, CT: Elsevier Science/JAI Press.

O'Reilly, C.A., Chatman, J., Caldwell, D.F., 1991. People and Organizational Culture: A Profile Comparison Approach to Assessing Person-organization Fit. Academy of Management Journal 34, 487-516.

O'Reilly, C.A.I., Chatman, J., Caldwell, D.F., 1996. People and Organizational Culture: A Profile Comparison Approach to Assessing Person-Organization Fit. Academy of Management Journal 34, 487-516.

O'Reilly III, C.A., Caldwell, D.F., Chatman, J.A., Doerr, B., 2014. The Promise and Problems of Organizational Culture: CEO Personality, Culture, and Firm Performance. Group and Organization Management 39, 595-625.

Payne, J.L., Robb, S.W.G., 2000. Earnings Management: The Effect of Ex Ante Earnings Expectations. Journal of Accounting, Auditing and Finance 15, 371-392.

Popadak, J., 2013. A Corporate Culture Channel: How Increased Shareholder Governance Reduces Firm Value. Available at SSRN 2345384.

Price, S.M., Doran, J.S., Peterson, D.R., Bliss, B.A., 2012. Earnings Conference Calls and Stock Returns: The Incremental Informativeness of Textual Tone. Journal of Banking & Finance 36, 992-1011.

Quinn, R.E., Cameron, K., 1983. Organizational Life Cycles and Shifting Criteria of Effectiveness: Some Preliminary Evidence. Management Science 29, 33-51.

Quinn, R.E., Rohrbaugh, J., 1981. A Competing Values Approach to Organizational Effectiveness. Public Productivity Review 5, 122-140.

Quinn, R.E., Rohrbaugh, J., 1983. A Spatial Model of Effectiveness Criteria: Towards a Competing Values Approach to Organizational Analysis. Management Science 29, 363-377.

Reynolds, P.D., 1986. Organizational Culture as Related to Industry, Position and Performance: A Preliminary Report. Journal of Management Studies 23, 333-345.

Rogers, J.L., Van Buskirk, A., Zechman, S.L., 2011. Disclosure Tone and Shareholder Litigation. The Accounting Review 86, 2155-2183.

Saunders, M.N.K., Philip Lewis, P., Thornhill, T., 2011. Research Methods for Business Students, 7th Edition. Essex, UK: Pearson Education.

Schein, E.H., 1990. Organizational Culture: What it is and How to Change it. In Human Resource Management in International Firms. London, England: Palgrave Macmillan.

Schein, E. H., 1992. Organizational Culture and Leadership: A Dynamic View. San Francisco, CA: Jossey-Bass.

Schneider, B., Ehrhart, M.G., Macey, W.H., 2013. Organizational Climate and Culture. Annual Review of Psychology 64, 361-388.

Schwartz, S.H., 1992. Universals in the Content and Structure of Values: Theoretical Advances and Empirical Tests in 20 Countries. In Advances in Experimental Social Psychology, Edited by Zanna, M. New York, NY: Academic Press.

Schwartz, S. H., 1994. Beyond Individualism and Collectivism: New Cultural Dimensions of Values. In Individualism and Collectivism: Theory, Method, and Applications, Edited by Kim, U., Triandis, H.C., Kagit-cibasi, C., Choi, S.C., Yoon, G. Newbury Park, CA: Sage.

Shleifer, A., Vishny, R.W., 1986. Large Shareholders and Corporate Control. The Journal of Political Economy 94, 461-488.

Simon, A., 1997. Administrative Behaviour, 4th Edition. New York, NY: The Free Press.

Skinner, D.J., Sloan, R.G., 2002. Earnings Surprises, Growth Expectations, and Stock Returns or don't let an Earnings Torpedo Sink Your Portfolio. Review of Accounting Studies 7, 289-312.

Solomon, D.H., Soltes, E., Sosyura, D., 2014. Winners in the Spotlight: Media Coverage of Fund Holdings as a Driver of Flows. Journal of Financial Economics 113, 53-72.

Song, F., Thakor, A., 2017. Bank Culture. Available at SSRN 3069252.

Sørensen, J.B., 2002. The Strength of Corporate Culture and the Reliability of Firm Performance. Administrative Science Quarterly 47, 70-91.

Stock, J.H., Yogo, M., 2005. Testing for Weak Instruments in Linear IV Regression. Identification and Inference for Econometric Models. Essays in Honor of Thomas Rothenberg. New York, NY: Cambridge University Press.

Ten Have, S., Ten Have, W., Stevens, F., 2003. Key Management Models: The Management Tools and Practices that will improve your Business. Essex, UK: Pearson Education.

Tetlock, P.C., 2007. Giving Content to Investor Sentiment: The Role of Media in the Stock Market. The Journal of Finance 62, 1139-1168

Tetlock, P.C., Saar-Tsechansky, M., Macskassy, S., 2008. More than Words: Quantifying Language to Measure firms' Fundamentals. The Journal of Finance 63, 1437-1467.

Thakor, A., 2015. Corporate Culture in Banking. Available at SSRN 2565514.

Tremblay, A., 2016. Cultural Differences, Synergies and Mergers and Acquisitions. Available at SSRN 2895110.

Van den Steen, E., 2010a. On the Origin of Shared Beliefs (and Corporate Culture). The RAND Journal of Economics 41, 617-648.

Van den Steen, E., 2010b. Culture Clash: The Costs and Benefits of Homogeneity. Management Science 56, 1718-1738.

Wahlen, J.M., 1994. The Nature of Information in Commercial Bank Loan Loss Disclosures. Accounting Review 69, 455-478.

Wintoki, M.B., Linck, J.S., Netter, J.M., 2012. Endogeneity and the Dynamics of Internal Corporate Governance. Journal of Financial Economics 105, 581-606.

Yan, X.S., Zhang, Z., 2009. Institutional Investors and Equity Returns: Are Short-Term Institutions Better Informed? Review of Financial Studies 22, 893-924.

Zingales, L., 2015. The 'Cultural Revolution' in Finance. Journal of Financial Economics 117, 1-4.

Appendix A

The Effect of Institutional Investors on Firms' Competition Culture

A.1 Overview

In what follows, we provide further details on the data, research design and execution to assist with the digestibility of our results. We provide the results of supplemental analyses conducted to add support to the empirical work included in Chapter 4. In particular, we provide evidence concerning the validity of our measure, before differentiating it from product market competition. The tables are as follows:

- **Table A.1 presents the bag of words with synonyms that we use to construct our measure of competition culture.**
- **Table A.2 presents univariate and multivariate analyses of the relationship between our measure of competition culture and other indicators of corporate culture.** In Panel's A and B we present comparisons between *COMP* and Fiordelisi and Ricci's (2014) text-based measures of corporate culture. In Panel C and D we compare *COMP* with a firm's profit margin, measured as earnings before interest and taxes scaled by the firm's total sales revenue. Profit margin is a theoretically (Cameron et al. 2014 and empirically valid proxy for the intensity of firms' competition culture (see e.g., Tremblay, 2016).
- **Table A.3 presents univariate analyses of the relationships between institutional ownership, corporate competition culture, and product market competition.**
- **Table A.4 presents OLS estimates used to investigate the relations between institutional ownership, competition culture, and Li et al.'s (2013a) product market competition (*PCTCOMP*).** We present comparisons between *COMP* and *PCTCOMP* based on the same set of observations.
- **Table A.5 presents GLS-RE estimates used to investigate the relations between institutional ownership, competition culture, and Li et al.'s (2013a) product market competition.** We present comparisons between *COMP* and *PCTCOMP* based on the same set of observations.

- **Table A.6 presents instrumental variable (IV) regressions of the relationships between transient and dedicated institutional ownership and Li et al.'s (2013a) product market competition**.
- **Table A.7 presents fixed effects estimates used to investigate the impact of transient [Panel A] and dedicated [Panel B] institutional ownership on competition culture.** We include year and firm dummies to capture time-invariant year and firm-specific fixed effects.

A.2 Measuring Competition Culture

To construct our measure of firms' competition culture, *COMP*, we first convert each firm-year 10–K report in our sample into lower case so that capitalization is ignored. Next, we replace any URLs embedded in the document with the text "HTTP". This form of URL normalization helps to ensure that our measure is not biased due to web addresses contained in the firms' 10–K. Next, all non–words and punctuations are removed and all white spaces (e.g. tabs and newlines) are trimmed to a single space. Following this necessary pre-processing, we then produce our measure of firms' competition culture, *COMP*, by counting the number of times the lexical items for competition appears in a firm's annual 10–K report. We account for inflections (i.e., various forms of the same word) by using the stemmed form (e.g. "compete" becomes "compet"). This helps to ensure that when we conduct our word search, we count all variants of that word. We account for negation by excluding those times when "not", "less", "few" or "limited" precede "compet" by three or fewer words. We also ignore references to the word "competent". Finally, we produce our relative measure of firms' competition culture by controlling for the other cultural types. In particular, we scale the raw word count for lexical items consistent with the competition culture by the total count of lexical items for all cultures indicated by the competing values framework (CVF). Table A.1 present the lexical items that describe the four corporate cultures (compete, create, collaborate, and control) as theorized by CVF (please see Cameron et al., 2014).

A.3 Is our Measure of Competition Culture Valid?

According to Kerlinger (1973) evidence of construct validity is present when the pattern of associations among variables conforms to what is predicted by theory. In this regard, we have reasons to expect that if our relative measure of competition culture, *COMP* is a valid measure then it should be positively and significantly related to other indicators of firms' competition culture. Hence, we posit the following proposition;

P1: There is a strong positive relationship between our measure of competition culture and other indicators of competition culture.

To investigate P1 we adopt two approaches where we first explore the relationship between our measure of competition culture and Fiordelisi and Ricci's (2014) text-based measures of corporate culture. Following this, we examine the relationship between our measure of competition culture and several non-text indicators of firm's corporate culture that are not only consistent with theory, reasonable and intuitive, but that have been used in past empirical studies for this very purpose (see e.g. Tremblay, 2016). In all cases, we document evidence consistent with our measure of competition culture capturing firm attributes that reflect the thrust to compete. In particular, we first explore the plausibility of P1 by estimating the following model:

$$COMP_t = \alpha_1 + \alpha_2 COMPETE\_FR_t + \alpha_3 COLLAB\_FR_t + \alpha_4 CONTROL\_FR_t + \alpha_5 CREATE\_FR_t + \varepsilon_t, \quad \text{(A.1)}$$

where, the variables *COMPETE_FR*, *COLLAB_FR*, *CONTROL_FR*, and *CREARE_FR* represent are the four corporate cultures; namely, *compete*, *collaborate*, *control*, and *create* as theorized by the CVF and as measured following the exact approach that is taken in Fiordelisi and Ricci (2014).

In addition, we investigate whether P1 is reasonable by estimating the empirical model presented below;

$$COMP_t = \alpha_1 + \alpha_2 EBIT\_SALES_t + \alpha_3 EMPLOY\_AT_t + \alpha_4 TURNOVER_t + \alpha_5 R\&D\_AT_t + \varepsilon_t, \quad \text{(A.2)}$$

where the variable *EBIT_SALES* is a firm's profit margin measured by a firm's income before interest and taxes divided by firm's total sales. The variable *EMPLOY_AT* denotes the number of employees of the firm scaled by firm's total assets. *TURNOVER* is the firm's total sales scaled by total assets. The variable *R&D_AT* represents the firm's research and development expenditure divided by the firm's total assets. As suggested in past studies (see e.g., Tremblay, 2016), the variables *EBIT_SALES*, *EMPLOY_AT*, *TURNOVER*, and *R&D_AT* can be used as indicators of firms' intensity of the CVF's *compete culture*, *collaborate culture*, *control culture*, and *create culture*.

Table A.2 Panel A presents the Pearson correlations between *COMP*, and Fiordelisi and Ricci's (2014) text-based measures of corporate culture (*COMPETE_FR*, *COLLAB_FR*, *CONTROL_FR*, and *CREARE_FR*). And, consistent with P1, we find that our relative measure of firms' competition culture *COMP* is positively and significantly related to Fiordelisi and Ricci's (2014) text-based measure of competition culture; namely, *COMPETE_FR* (correlation = 0.6290). Further, Panel B of Table A.2 provides OLS (column 1) and GLS-RE (column 2) estimates of Eq. (A.1). In keeping with P1, we find a positive and significant relationship between *COMP* and

COMPETE_FR as indicated by the coefficient term on *COMPETE_FE* of 0.972 (*t*-value = 33.22) in column (1) and 0.922 (*t*-value = 27.13) in column (2).

Pearson correlations for the relationship between *COMP* and indicators of the intensity of firm's corporate culture that are based on firm's financial numbers are presented in Table A.2 Panel C. We find that our relative measure of competition culture *COMP* is positively and significantly related to *EBIT_SALES* (correlation = 0.0137), a proxy of firm's competition culture (see e.g., Tremblay, 2016). In addition, we present in Panel D of Table A.2 OLS (column 1) and GLS-random effect (column 2) estimates of Eq. (A.2) and consistent with P1, we find a positive and significant relationship between *COMP* and *EBIT_SALES* as indicated by the coefficient term on *EBIT_SALES* of 0.009 (*t*-value = 5.72) in column (1) and 0.004 (*t*-value = 6.68) in column (2).

What's more, in a further check on the sanity of our measure we note that prior works suggest that a firm's corporate culture is slow to change and should, therefore, persist over time (Hartnell et al., 2011; Cameron et al., 2014; Fiordelisi and Ricci, 2014; Guiso et al., 2015a, 2015b). This expectation is explained in part because a firm's corporate culture is argued to be composed of those organizational attributes that form the core traits of the firm and these core attributes can impact economic relations well beyond those who initially formed and instilled them. Given this, it is reasonable to observe rather persistent levels of firms' competition culture and thus we posit the following;

P2: Competition culture is a persistent characteristic of a firm.

Evidence consistent with P2 is provided in Table 4.4 Panel A (please see Chapter 4) where we find that those firms in the lowest decile (1st) of *COMP* in any one year have a 67% probability of

remaining in that decile, while firms in the decile of the highest rank (10^{th}) remain in that decile 66% of the time.

A.4 Competition Culture and Product Market Competition

We present further analyses aimed at supplementing the results and findings previously presented. Even though the *COMP* measure is designed to capture firms' competition culture under the CVF it is plausible that it may have an association with measures indented to capture firms' product market competition through textual analysis. In this regard, we explore whether our measure of firm's competition culture is indeed distinct from Li et al.'s (2013a) product market competition measure, as they measure the intensity of firms' product market competition in a manner that is seemingly close to our approach. Specifically, they count the number of times the words "competition(s)", "competitor(s)", "competitive(s)", "compete(s)", "competing(s)", appear in the firm's 10-K filing minus those occasions when these words are proceeded by "not", "less", "few" or "limited" by three or fewer words. They then control for the length of the 10-K by scaling by the number of words in the report.

However, unlike Li et al. (2013a) we compute *COMP* using a more comprehensive bag of words that captures corporate values relevant to a firm's operating philosophy under the CVF, particularly the *compete*, *create*, *collaborate*, and *control* corporate cultures. We then scale the number of competition culture words by the total number of the words characterizing all four corporate cultures (as opposed to the total number of words in the 10-K). This approach allows us to construct an intensity measure of a firm's competition culture, which is consistent to the CVF that theorizes a context in which the four different corporate cultures vie with each other.

Nevertheless, if our measure simply reflects variations in product market competition then it is possible that the relationship that we discover between *TRA* (*DED*) and *COMP* is driven by the intensity of firms' product market competition as opposed to the intensity of firms' competition culture. To preclude such possibility, we analyze in Table A.3 the relations between *TRA* (*DED*), our measure of competition culture, *COMP*, and product market competition, *PCTCOMP*, as computed in Li et al. (2013a).[14] Table A.3 Panel A presents mean scores for *TRA* (*DED*) by deciles of *COMP* and *PCTCOMP*, respectively, inclusive of the results of *t*-tests conducted to assess the significance of the difference in means between the highest (10^{th}) and the lowest (1^{st}) deciles. Panel B of Table A.3 highlights Pearson correlations between *COMP*, *TRA*, *DED*, and *PCTCOMP*. Interestingly, we find that while our prior results suggest that transient institutional ownership (*TRA*) is strongly positively related to competition culture as measured by *COMP*, transient institutional ownership *is not* related to product market competition as measured by *PCTCOMP*.

In addition, we estimate the following models to present comparisons between *COMP* and *PCTCOMP* based on the same set of observations.

$$COMP_{t+1}\ (or\ PCTCOMP_{t+1}) = \alpha_1 + \alpha_2 TRA_t (or\ DED_t) + \alpha_3 AGE_t + \alpha_4 DTURN_t + \alpha_5 LEV_t + \alpha_6 MTB_t + \alpha_7 RET_t + \alpha_8 ROA_t + \alpha_9 SIZE_t + \alpha_{10} STDEV_t + \varepsilon_t, \quad (A.3)$$

$$COMP_{t+1}\ (or\ PCTCOMP_{t+1}) = \alpha_1 + \alpha_2 \Delta TRA_t (or\ \Delta DED_t) + \alpha_3 TRA_{t-1} (or\ DED_{t-1}) + \alpha_4 AGE_t + \alpha_5 DTURN_t + \alpha_6 LEV_t + \alpha_7 MTB_t + \alpha_8 RET_t + \alpha_9 ROA_t + \alpha_{10} SIZE_t + \alpha_{11} STDEV_t + \varepsilon_t, \quad (A.4)$$

and

$$COMP_{t+1}\ (or\ PCTCOMP_{t+1}) = \alpha_1 + \alpha_2 \Delta TRA_t (or\ \Delta DED_t) + \alpha_3 \Delta TRA_{t-1} (or\ \Delta DED_{t-1}) + \alpha_4\ TRA_{t-2} (or\ DED_{t-2}) + \alpha_5 AGE_t + \alpha_6 DTURN_t$$

[14] Li et al. (2013a) product market data are obtained from: http://webuser.bus.umich.edu/feng.

$$+ \alpha_7 LEV_t + \alpha_8 MTB_t + \alpha_9 RET_t + \alpha_{10} ROA_t + \alpha_{11} SIZE_t + \alpha_{12} STDEV_t + \varepsilon_t. \quad \text{(A.5)}$$

The OLS estimates for Eq.'s (A.3) to (A.5) are shown in Table A.4. The results suggest that *COMP* measures something that is distinctly different from *PCTCOMP*. In particular, our findings indicate that *COMP* has a significant positive (negative) relationship with transient (dedicated) institutional ownership, while *PCTCOMP* does not have any relationship with institutional ownership structure whatsoever. In addition to the OLS estimates presented in Table A.4, we provide RE estimates of for Eq.'s (A.3) to (A.5) for completeness in Table A.5. These estimates also suggest a statistically significant relationship between *COMP* and our measures of institutional ownership, while being unable to detect any significant relations for *PCTCOMP*.

What's more, we further test the relationship between *TRA* (*DED)* and *PCTCOMP* directly by estimating the following instrumental variable model:

$$PCTCOMP_t = \alpha_1 + \alpha_2 \widehat{TRA}_t (or\ \widehat{DED}_t) + \alpha_3 R2000_t \times RANK_t + \alpha_4 MRKCAP_t + \alpha_5 FLOAT_t + \varepsilon_t, \quad \text{(A.6a)}$$

$$TRA_t (or\ DED_t) = \gamma_1 + \delta_1 R2000_t + \beta_1 R2000_t \times RANK_t + \beta_2 MRKCAP_t + \beta_3 FLOAT_t + \mu_t, \quad \text{(A.6b)}$$

where *R2000* is a dummy variable that is equal to one if the firm is a member of the Russell 2000 index and is zero if the firm is assigned to the Russell 1000 index, *RANK* is the firm's rank within the Russell index based on firm's market capitalization, *MRKCAP* is firms' market capitalization on May 31st each year, and *FLOAT* is the difference between rank implied by the observed market capitalization and the rank assigned by Russell in June.

The estimates of the two-stage model Eq.'s (A.6a) and (A.6b) are presented in Table A.6. The coefficient of interest, α_2, of Eq (A.4a) is insignificant.

Taken altogether, our findings imply that the relationship between *TRA* (*DED*) and our measure of competition culture is not driven by managers' perception of firms' product market competition. Rather, they are consistent with *COMP* measuring corporate attributes pertaining to the competition culture, which is reflected in the choice of words used to construct firms' 10-K reports.

Table A.1: Bag of Words

This table reports the bag of words with synonyms that best describe the four corporate cultures (compete, create, collaborate, and control) of the competing value framework (CVF) (Cameron et al., 2014). Words ending with "*" indicate that we utilize all suffixes for those words to count as many words as possible with a close meaning. While conducting our count, we exclude negation of the lexical items by ignoring occasions when the word is preceded by "no", "non", "not", "less", "few" or "limited" by three or fewer words.

Compete culture:
achiev*, acqui*, aggress*, attack*, budget*, challeng*, charg*, client*, compet*, customer*, deliver*, direct*, driv*, excellen*, expand*, fast*, goal*, growth*, hard*, invest*, market*, mov*, outsourc*, performanc*, position*, pressur*, profit*, rapid*, reputation*, result*, sale*, satisf*, scan*, signal*, speed*, strong*, succes*, superior*, target*, win*
Create culture:
adapt*, begin*, chang*, creat*, discontin*, dream*, elabor*, entrepre*, envis*, experim*, fantas*, freedom*, futur*, idea*, init*, innovat*, intellec*, learn*, new*, origin*, pioneer*, predict*, radic*, risk*, start*, thought*, trend*, unafra*, ventur*, vision*
Collaborate culture:
boss*, burocr*, cautio*, cohes*, certain*, chief*, collab*, conservat*, cooperat*, detail*, document*, efficien*, error*, fail*, help*, human*, inform*, logic*, method*, outcom*, partner*, people*, predictab*, relation*, qualit*, regular*, solv*, share*, standard*, team*, teamwork*, train*, uniform*, work*, group*
Control culture:
capab*, collectiv*, commit*, competenc*, conflict*, consens*, control*, coordin*, cultur*, decentr*, employ*, empower*, engag*, expectat*, facilitator*, hir*, interpers*, involv*, life*, long-term*, loyal*, mentor*, monit*, mutual*, norm*, parent*, partic*, procedur*, productiv*, retain*, reten*, skill*, social*, tension*, value*

Table A.2: Univariate and Multivariate Analyses of the Relationships between Our Measure of Competition Culture and Other Indicators of Firm's Corporate Culture

This table presents univariate and multivariate analyses of the relationships between our measure of competition culture and other indicators of the four corporate cultures (compete, create, collaborate, and control) that are theorized by the competing values framework (CVF) (Cameron et al., 2014). Panels A highlights Pearson's correlation results between our measure of competition culture and Fiordelisi and Ricci's (2014) text-based measures of corporate culture. Panel B presents OLS (column 1) and GLS-RE (column 2) estimates for the relation between *COMP* and Fiordelisi and Ricci's (2014) text-based measures of corporate culture. In Panels C we provide Pearson's correlation results between the measure of competition culture and other proxies for the intensity of firms' corporate culture that are based on firms' financial numbers (see e.g. Tremblay, 2016). Panel D provides OLS (column 1) and GLS-RE (column 2) estimates for the relation between the measure of competition culture and other proxies for the intensity of firms' corporate culture that are based on firms' financial numbers (see e.g. Tremblay, 2016). The correlation results utilize bold figures to indicate significance at the 10 percent level and above. The regressions all include year and industry dummies to capture year and industry-specific fixed effects; the standard errors are clustered at the firm-level.

Panel A. Pearson's correlations for the relation between *COMP* and Fiordelisi and Ricci's (2014) text-based measures of corporate culture.

	COMP	*COMPETE_FR*	*COLLAB_FR*	*CONTROL_FR*
COMPETE_FR	**0.6290**			
COLLAB_FR	**-0.1877**	**0.2946**		
CONTROL_FR	**-0.2818**	**0.3619**	**0.1582**	
CREATE_FR	**-0.1439**	**0.2199**	**0.0761**	**0.2549**

Panel B. OLS and GLS-RE estimates for the relation between *COMP* and Fiordelisi and Ricci's (2014) text-based measures of corporate culture.

	$COMP_t$	
	(1)	(2)
$COMPETE\_FR_t$	0.972***	0.922***
	(33.22)	(27.13)
$COLLAB\_FR_t$	-0.387***	-0.420***
	(31.83)	(27.54)
$CONTROL\_FR_t$	-0.491***	-0.421***
	(7.65)	(6.18)
$CREATE\_FR_t$	-0.192***	-0.174***
	(3.96)	(3.64)
R^2	0.86	0.86
N	24,912	24,912

continued on the next page)

Table A.2 cont'd.

Panel C. Pearson's correlations for the relation between *COMP* and proxies for the intensity of firms' corporate culture that are based on firms' financial numbers.

	COMP	*EBIT_SALES*	*EMP_AT*	*TURNOVER*
EBIT_SALES	**0.0137**			
EMP_AT	**-0.0469**	0.0051		
TURNOVER	**-0.0143**	**0.0625**	**0.0512**	
RD_AT	**0.0388**	**-0.0585**	**-0.1722**	**-0.7591**

Panel D. OLS and GLS-RE estimates for the relation between *COMP* and proxies for the intensity of firms' corporate culture that are based on firms' financial numbers.

	$COMP_t$	
	(1)	(2)
$EBIT\_SALES_t$	0.009***	0.004***
	(5.72)	(6.68)
EMP_AT_t	-0.243***	-0.155***
	(3.88)	(3.26)
$TURNOVER_t$	-0.01	-0.020*
	(0.65)	(1.80)
RD_AT_t	-0.037*	-0.042***
	(1.75)	(3.22)
R^2	0.19	0.19
N	16,695	16,695

*p<0.1; ** p<0.05; *** p<0.01

Table A.3: Univariate Analyses of the Relationships between Institutional Ownership, Competition Culture, and Product Market Competition

This table presents univariate analyses of the relationships between transient (*TRA*) and dedicated (*DED*) institutional ownership, competition culture (*COMP*), and Li et al.'s (2013a) product market competition (*PCTCOMP*). Panel A shows the results by deciles of competition culture, and product market competition. The significance of the difference between means in deciles 10 and 1 are indicated in the last row where, "*", "**", and "***" indicate significance at the 10 percent, 5 percent, and 1 percent levels, respectively. Panel B highlights Pearson's correlation results between the institutional ownership, competition culture, and product market competition. The bold figures indicate significance that the 10 percent level and above.

Panel A. Deciles analysis.

		COMP		*PCTCOMP*	
		TRA	*DED*	*TRA*	*DED*
Lowest	1	0.1287	0.0501	0.1422	0.0402
	2	0.1306	0.0392	0.1396	0.048
	3	0.1333	0.038	0.1458	0.0502
	4	0.1329	0.0366	0.1453	0.0525
	5	0.1409	0.0354	0.1405	0.0535
	6	0.1451	0.0373	0.1447	0.0559
	7	0.1463	0.0367	0.137	0.0652
	8	0.1449	0.0357	0.1385	0.0616
	9	0.149	0.034	0.1368	0.0592
Highest	10	0.145	0.0406	0.1448	0.0643
Diff (10) - (1)		0.0164	-0.0095	0.0026	0.0241
t–stat		6.18***	-5.69***	0.77	11.14***

Panel B. Pearson's correlations.

	PCTCOMP
COMP	**0.1389**
TRA	0.0012
DED	**0.0651**

Table A.4: OLS Regressions of Institutional Ownership on Competition Culture and Product Market Competition

This table presents OLS estimates used to investigate the relations between transient and dedicated institutional ownership, competition culture, and Li et al.'s (2013a) product market competition. All regressions include control variables, year and industry fixed effects. The standard errors are clustered at the firm-level.

Panel A. The effect of transient institutional ownership on competition culture and product market competition.

	$COMP_{t+1}$			$PCTCOMP_{t+1}$		
	(1)	(2)	(3)	(4)	(5)	(6)
TRA_t	0.062***			0.008		
	(4.42)			(0.73)		
ΔTRA_t		0.044***	0.043***		0.006	0.005
		(4.45)	(4.49)		(0.67)	(0.60)
TRA_{t-1}		0.069***			0.007	
		(4.05)			(0.57)	
ΔTRA_{t-1}			0.059***			0.002
			(4.70)			(0.20)
TRA_{t-2}			0.068***			0.009
			(3.54)			(0.63)
R^2	0.17	0.17	0.17	0.32	0.32	0.32
N	15,242	15,242	15,242	15,242	15,242	15,242

Panel B. The effect of dedicated institutional ownership on competition culture and product market competition.

	$COMP_{t+1}$			$PCTCOMP_{t+1}$		
	(1)	(2)	(3)	(4)	(5)	(6)
DED_t	–0.028*			–0.019		
	(1.82)			(1.57)		
ΔDED_t		–0.023**	–0.023**		–0.016	–0.015
		(2.04)	(1.99)		(1.64)	(1.54)
DED_{t-1}		–0.027			–0.018	
		(1.46)			(1.25)	
ΔDED_{t-1}			–0.01			–0.009
			(0.79)			(0.79)
DED_{t-2}			–0.035*			–0.019
			(1.73)			(1.20)
R^2	0.17	0.17	0.17	0.33	0.33	0.33
N	15,242	15,242	15,242	15,242	15,242	15,242

*p<0.1; ** p<0.05; *** p<0.01

Table A.5: Random Effects Regressions of Institutional Ownership on Competition Culture and Product Market Competition

This table presents GLS-RE estimates used to investigate the relations between institutional ownership, competition culture, and Li et al.'s (2013a) product market competition. All regressions include controls, year and industry fixed effects. The standard errors are clustered at the firm level.

Panel A. The effect of transient institutional ownership on competition culture and product market competition.

	$COMP_{t+1}$			$PCTCOMP_{t+1}$		
	(1)	(2)	(3)	(4)	(5)	(6)
TRA_t	0.031***			0.005		
	(3.27)			(0.51)		
ΔTRA_t		0.019***	0.018***		0.005	0.006
		(2.70)	(2.58)		(0.63)	(0.72)
TRA_{t-1}		0.044***			–0.001	
		(3.48)			(0.10)	
ΔTRA_{t-1}			0.031***			–0.002
			(3.14)			(0.21)
TRA_{t-2}			0.047***			0.004
			(3.22)			(0.28)
R^2	0.07	0.07	0.07	0.28	0.28	0.28
N	15,242	15,242	15,242	15,242	15,242	15,242

Panel B. The effect of dedicated institutional ownership on competition culture and product market competition.

	$COMP_{t+1}$			$PCTCOMP_{t+1}$		
	(1)	(2)	(3)	(4)	(5)	(6)
DED_t	–0.021*			–0.012		
	(1.84)			(1.09)		
ΔDED_t		–0.021**	–0.022**		–0.012	–0.012
		(2.44)	(2.55)		(1.30)	(1.26)
DED_{t-1}		–0.016			–0.008	
		(1.12)			(0.63)	
ΔDED_{t-1}			–0.013			–0.004
			(1.19)			(0.33)
DED_{t-2}			–0.02			–0.011
			(1.20)			(0.70)
R^2	0.07	0.07	0.07	0.28	0.28	0.28
N	15,242	15,242	15,242	15,242	15,242	15,242

*p<0.1; ** p<0.05; *** p<0.01

Table A.6: Instrumental Variable Regressions of Institutional Ownership on Product Market Competition

This table presents instrumental variable (IV) regressions of the relationships between transient (*TRA*) and dedicated (*DED*) institutional ownership and Li et al.'s (2013a) product market competition (*PCTCOMP*) [Panel A], and the results of a Stock and Yogo (2005) weak instruments test [Panel B]. The regressions include year and industry fixed effects and the standard errors are clustered by firm.

Panel A. IV regression first and second stage results.

	1st stage: TRA_t	*$PCTCOMP_t$*	*1st stage: DED_t*	*$PCTCOMP_t$*
	(1)	(2)	(3)	(4)
TRA_t		0.013		
		(0.53)		
DED_t				0.005
				(0.18)
$R2000_t$	0.263***		-0.161***	
	(6.91)		(3.78)	
$R2000_t \times RANK_t$	-0.350***	0.152***	-0.641**	0.152***
	(10.09)	(4.45)	(2.04)	(4.44)
$MRKCAP_t$	-0.068***	-0.031***	-0.007	-0.031***
	(5.73)	(4.11)	(0.86)	(4.06)
$FLOAT_t$	0.957***	0.005	-0.039	0.005
	(5.38)	(0.29)	(0.23)	(0.29)
R^2	0.18		0.08	
N	2,440	1,808	2,440	1,808

Panel B. Stock and Yogo (2005) Weak Instruments Test.

Instrumented variables	Instruments	First stage F – Statistic	Critical value
TRA_t	$R2000_t$	50.46	16.38
DED_t	$R2000_t$	60.21	16.38

*p<0.1; ** p<0.05; *** p<0.01

Table A.7: Fixed Effects Regressions of Institutional Ownership on Competition Culture

This table presents fixed effects estimates used to investigate the impact of transient (*TRA*) [Panel A] and dedicated (*DED*) [Panel B] institutional ownership on the level of firms' competition culture (*COMP*). All regressions include year and firm fixed effects. The standard errors are all clustered at the firm-level.

Panel A. The effect of transient institutional ownership on competition culture.

	$COMP_{t+1}$		
	(1)	(2)	(3)
TRA_t	0.014*		
	(1.83)		
ΔTRA_t		0.024**	
		(2.42)	
TRA_{t-1}			0.024**
			(2.04)
ΔTRA_{t-1}		0.005	0.004
		(0.95)	(0.70)
TRA_{t-2}			0.015**
			(2.00)
AGE_t	0.11	0.11	0.11
	(1.34)	(1.34)	(1.34)
$DTURN_t$	0.001	0	0.001
	(0.19)	(0.10)	(0.36)
LEV_t	0.023**	0.024**	0.024**
	(2.05)	(2.11)	(2.11)
MTB_t	-0.017***	-0.016***	-0.016***
	(2.90)	(2.82)	(2.78)
RET_t	-0.048**	-0.052**	-0.050**
	(2.38)	(2.56)	(2.50)
ROA_t	-0.025***	-0.025***	-0.024***
	(3.43)	(3.46)	(3.42)
$SIZE_t$	0.110***	0.106***	0.106***
	(5.39)	(5.14)	(5.14)
$STDEV_t$	-0.065***	-0.069***	-0.068***
	(2.78)	(2.94)	(2.90)
R^2	0.08	0.08	0.08
N	31,223	31,223	31,223

continued on the next page)

Table A.7 cont'd.

Panel B. The effect of dedicated institutional ownership on competition culture.

	$COMP_{t+1}$		
	(1)	(2)	(3)
DED_t	-0.019**		
	(2.25)		
ΔDED_t		-0.023**	
		(2.05)	
DED_{t-1}			-0.029**
			(2.20)
ΔDED_{t-1}		-0.015**	-0.015**
		(2.33)	(2.34)
DED_{t-2}			-0.014*
			(1.68)
AGE_t	0.108	0.108	0.109
	(1.31)	(1.31)	(1.32)
$DTURN_t$	0.002	0.002	0.002
	(0.51)	(0.53)	(0.56)
LEV_t	0.023**	0.023**	0.023**
	(2.08)	(2.08)	(2.09)
MTB_t	-0.016***	-0.016***	-0.016***
	(2.82)	(2.82)	(2.85)
RET_t	-0.041**	-0.041**	-0.041**
	(2.04)	(2.04)	(2.05)
ROA_t	-0.024***	-0.024***	-0.024***
	(3.30)	(3.31)	(3.29)
$SIZE_t$	0.117***	0.118***	0.118***
	(5.86)	(5.86)	(5.87)
$STDEV_t$	-0.058**	-0.059**	-0.059**
	(2.49)	(2.51)	(2.51)
R^2	0.08	0.08	0.08
N	31,223	31,223	31,223

*p<0.1; ** p<0.05; *** p<0.01

Appendix B

The Effect of Firms' Competition Culture on Meeting/ Beating Earnings Forecast and Crash Risk

B.1 Overview

This appendix provides further details on the research design and execution to assist with the digestibility of our main results. As such, we present the results of supplemental analyses conducted to add support to the main empirical work included in Chapter 5. These tables are as follows:

- **Table B.1 presents GLS-RE estimates used to investigate the relationship between competition culture and meeting and/or beating earnings expectations.**
- **Table B.2 presents GLS-RE estimates used to investigate the relationship between competition culture and stock price crash risk.**
- **Table B.3 presents OLS estimates used to investigate the relationship between competition culture and stock price crash risk.** These estimates include additional controls for managerial short-termism.
- **Table B.4 presents GLS-RE estimates used to investigate the relationship between competition culture and crash risk for subsamples of firms.**

Table B.1: Random Effects Regressions of Competition Culture on and Meeting and/or Beating Earnings Expectations.

This table presents GLS-RE estimates used to investigate the relationship between competition culture and meeting and/or beating earnings expectations. All regressions include year fixed effects and the standard errors are clustered at the firm level.

	$MEET_{t+1}$	MB_1_{t+1}	MB_2_{t+1}
	(1)	(2)	(3)
$COMP_t$	0.065*	0.075***	0.086***
	(1.96)	(2.61)	(3.07)
AGE_t	0.012	–0.01	–0.009
	(0.33)	(0.28)	(0.26)
$CVAF_t$	–0.025	–0.029	–0.01
	(0.89)	(1.16)	(0.44)
$ICLAIM_t$	0.074*	0.126***	0.145***
	(1.86)	(3.67)	(4.40)
LEV_t	–0.114***	–0.145***	–0.139***
	(3.31)	(4.78)	(4.62)
MTB_t	0.101***	0.071***	0.061**
	(3.06)	(2.60)	(2.29)
NOA_t	–0.046	–0.093***	–0.085***
	(1.32)	(2.90)	(2.85)
$NUMEST_t$	0.124***	0.147***	0.156***
	(2.84)	(3.82)	(4.05)
ROA_t	0.156***	0.164***	0.154***
	(4.01)	(5.11)	(5.18)
$SGROWTH_t$	–0.091***	–0.053**	–0.077***
	(2.88)	(1.96)	(2.97)
$SIZE_t$	0.009	0.044	0.05
	(0.16)	(0.93)	(1.07)
R^2/PseudoR^2	0.03	0.05	0.05
N	13,141	13,141	13,141

*p<0.1; ** p<0.05; *** p<0.01

Table B.2: Random Effect Regressions of Competition Culture on Stock Price Crash Risk

This table presents GLS-RE estimates used to investigate the relationship between competition culture and crash risk. All regressions include year fixed effects and the standard errors are clustered at the firm level.

	$DUVOL_{t+1}$	$ESIGMA_{t+1}$	$NCSKEW_{t+1}$
	(1)	(2)	(3)
$COMP_t$	0.018**	0.029***	0.024***
	(2.34)	(3.62)	(3.13)
AGE_t	–0.041***	–0.037***	–0.047***
	(4.85)	(4.29)	(5.63)
$DTURN_t$	0.024***	0.018**	0.021***
	(3.12)	(2.37)	(2.73)
LEV_t	–0.028***	–0.013*	–0.025***
	(3.54)	(1.70)	(3.13)
MTB_t	0.008	0.008	0.009
	(1.06)	(1.07)	(1.14)
RET_t	0.129***	0.079***	0.132***
	(4.75)	(2.89)	(4.88)
ROA_t	0.066***	0.041***	0.047***
	(7.90)	(4.57)	(5.33)
$SIZE_t$	0.188***	0.097***	0.178***
	(20.03)	(10.22)	(18.80)
$STDEV_t$	0.139***	0.089***	0.168***
	(4.62)	(2.93)	(5.56)
R^2	0.04	0.02	0.03
N	18,654	18,654	18,654

*p<0.1; ** p<0.05; *** p<0.01

Table B.3: OLS Regressions of Competition Culture on Stock Price Crash Risk

This table presents OLS estimates used to investigate the relationship between competition culture and crash risk with additional controls for managerial short-termism. These additional controls are as follows: *RDC* equal to 1 if the firm experiences a cut in R&D expenditure over the past year; *RDI*, firm's R&D intensity measured as total R&D expenditure for the fiscal year scaled by sales; *RDII*, industry R&D intensity measured as total R&D expenditure for all firms in the industry for the fiscal year scaled by total industry sales; *ΔGDP*, the natural logarithm of the change in US GDP. All regressions include year and industry fixed effects and the standard errors are clustered at the firm-level.

	$DUVOL_{t+1}$	$ESIGMA_{t+1}$	$NCSKEW_{t+1}$
	(1)	(2)	(3)
$COMP_t$	0.025**	0.029***	0.028***
	(2.34)	(2.67)	(2.64)
AGE_t	-0.034***	-0.034***	-0.039***
	(2.80)	(2.89)	(3.27)
$DTURN_t$	0.022**	0.016	0.018*
	(2.26)	(1.56)	(1.80)
LEV_t	-0.016	0.018	-0.008
	(1.43)	(1.62)	(0.70)
MTB_t	0.006	-0.003	0.007
	(0.60)	(0.27)	(0.77)
RET_t	0.167***	0.091***	0.172***
	(4.77)	(2.59)	(4.98)
ROA_t	0.079***	0.078***	0.064***
	(7.27)	(7.06)	(5.77)
$SIZE_t$	0.180***	0.093***	0.166***
	(14.46)	(7.66)	(13.35)
$STDEV_t$	0.199***	0.121***	0.235***
	(5.02)	(3.07)	(5.96)
RDC_t	-0.014	-0.032	-0.011
	(0.62)	(1.42)	(0.47)
RDI_t	0.006	0.018	0.01
	(0.58)	(1.56)	(0.81)
$RDII_t$	-0.058	0.006	-0.061
	(0.96)	(0.09)	(0.96)
ΔGDP_t	0.602*	-0.958***	0.42
	(1.70)	(4.21)	(1.43)
R^2	0.06	0.03	0.05
N	11,343	11,343	11,343

*p<0.1; ** p<0.05; *** p<0.01

Table B.4: Subsample Analyses of Competition Culture on Stock Price Crash Risk

This table presents GLS-RE estimates used to investigate the relationship between competition culture and crash risk for subsamples of firms. All regressions include year and industry fixed effects and the standard errors are clustered at the firm level.

Panel A. The effect of competition culture on crash risk for subsamples of high transient and low (or high) dedicated ownership firms.

	HIGH *TRA* & LOW *DED*			HIGH *TRA* & HIGH *DED*		
	$DUVOL_{t+1}$	$ESIGMA_{t+1}$	$NCSKEW_{t+1}$	$DUVOL_{t+1}$	$ESIGMA_{t+1}$	$NCSKEW_{t+1}$
	(1)	(2)	(3)	(4)	(5)	(6)
$COMP_t$	0.047***	0.061***	0.053***	0.006	0.013	0.013
	(2.83)	(3.48)	(3.15)	(0.34)	(0.69)	(0.70)
AGE_t	–0.029	–0.012	–0.036*	–0.048**	–0.036*	–0.053***
	(1.54)	(0.67)	(1.95)	(2.57)	(1.81)	(2.80)
$DTURN_t$	0.042***	0.034**	0.041***	0.040**	0.021	0.038**
	(2.77)	(2.16)	(2.66)	(2.38)	(1.24)	(2.31)
LEV_t	–0.036**	–0.038**	–0.037**	–0.031*	–0.001	–0.028
	(2.17)	(2.11)	(2.16)	(1.71)	(0.05)	(1.50)
MTB_t	0.009	0.016	0.011	0.035**	0.025	0.034**
	(0.46)	(0.81)	(0.56)	(2.49)	(1.58)	(2.23)
RET_t	0.057	–0.034	0.034	0.125*	0.104	0.118
	(0.87)	(0.49)	(0.52)	(1.67)	(1.33)	(1.60)
ROA_t	0.039**	0.032	0.027	0.043*	0.016	0.016
	(2.06)	(1.50)	(1.28)	(1.86)	(0.58)	(0.64)
$SIZE_t$	0.165***	0.093***	0.136***	0.141***	0.067**	0.122***
	(5.90)	(3.23)	(4.82)	(5.72)	(2.47)	(4.83)
$STDEV_t$	0.083	0.006	0.089	0.158**	0.140*	0.165**
	(1.16)	(0.08)	(1.27)	(2.06)	(1.71)	(2.16)
R^2	0.04	0.03	0.03	0.04	0.02	0.04
N	4,011	4,011	4,011	3,575	3,575	3,575

(continued on the next page)

Table B.4 cont'd.

Panel B. The effect of competition culture on crash risk for subsamples of low transient and low (or high) dedicated ownership firms.

	LOW *TRA* & LOW *DED*			LOW *TRA* & HIGH *DED*		
	$DUVOL_{t+1}$	$ESIGMA_{t+1}$	$NCSKEW_{t+1}$	$DUVOL_{t+1}$	$ESIGMA_{t+1}$	$NCSKEW_{t+1}$
	(1)	(2)	(3)	(4)	(5)	(6)
$COMP_t$	0.012	0.012	0.016	0.008	0.031*	0.01
	(0.80)	(0.81)	(1.07)	(0.46)	(1.73)	(0.58)
AGE_t	–0.014	–0.018	–0.018	–0.043**	–0.048**	–0.046**
	(0.86)	(1.12)	(1.10)	(2.24)	(2.49)	(2.43)
$DTURN_t$	–0.005	–0.011	–0.02	–0.037	–0.037	–0.044*
	(0.31)	(0.71)	(1.21)	(1.54)	(1.43)	(1.82)
LEV_t	–0.007	0.009	0.001	–0.02	–0.023	–0.02
	(0.45)	(0.63)	(0.09)	(1.04)	(1.23)	(1.03)
MTB_t	–0.001	0.002	0.002	0.018	0.016	0.01
	(0.06)	(0.11)	(0.10)	(0.99)	(0.86)	(0.53)
RET_t	0.053	0.056	0.059	0.134*	0.019	0.146**
	(1.06)	(1.15)	(1.20)	(1.82)	(0.26)	(2.06)
ROA_t	0.066***	0.039***	0.049***	0.073***	0.048**	0.051**
	(4.46)	(2.64)	(3.36)	(3.54)	(2.26)	(2.36)
$SIZE_t$	0.214***	0.130***	0.205***	0.119***	0.047**	0.117***
	(10.35)	(6.35)	(9.85)	(5.60)	(2.26)	(5.53)
$STDEV_t$	0.053	0.047	0.092*	0.103	–0.007	0.152**
	(0.94)	(0.86)	(1.65)	(1.33)	(0.10)	(2.01)
R^2	0.07	0.04	0.05	0.04	0.02	0.03
N	4,505	4,505	4,505	3,088	3,088	3,088

*p<0.1; ** p<0.05; *** p<0.01

Appendix C

The Effect of Banks' Competition Culture on Bank Lending and Loan Loss provisioning

C.1 Overview

In this appendix, we provide the results of further analyses designed to assist with the interpretation of the main results of Chapter 6. These tables the present these supplemental analyses are as follows:

- **Table C.1 presents OLS and GLS-RE estimates used to investigate the relationship between banks' competition culture and bank lending**. These results include year and state dummies to time and state fixed effects.
- **Table C.2 presents OLS and GLS-RE estimates used to investigate the relationship between banks' competition culture and discretionary loan loss provisioning**. These results include year and state dummies to capture time and state fixed effects.
- **Table C.3 presents OLS and GLS-RE regressions of banks' pre-crisis competition culture and crisis-period bank lending.** These results include year and state dummies to capture time and state fixed effects.
- **Table C.4 presents OLS and GLS-RE regressions of banks' pre-crisis competition culture and crisis-period discretionary loan loss provisioning.** These results include year and state dummies to capture time and state fixed effects.

Table C.1: OLS and Random Effects Regressions of Banks' Competition Culture and Lending

This table presents OLS (columns 1 - 3) and GLS-RE (columns 4 - 6) estimates for the relations between banks' competition culture and bank lending. The dependent variable Δ*LOAN* is the change from the beginning of the fiscal year in the natural log of loans [Compustat item: lntal]. The value of *COMP* is the competition culture estimated from the bank's 10-K filings. The variable Δ*COMP* represents the change in *COMP* over the fiscal year. The value of the variable *CAP1* is the bank's tier 1 risk-adjusted capital ratio [Compustat item: capr1] at the beginning of the fiscal year, divided by 100. The variable Δ*CAP* is the change in *CAP1* over the fiscal year. The variable Δ*UNEMP* represents the change in the employment rate over the fiscal year. The variable *DEPOSITS* is the lagged total deposits [Compustat item: dptc] divided by total assets [Compustat item: at]. The variable *SIZE* is the natural logarithm of bank's total assets [Compustat item: at]. The estimates include year and state dummies to control time-invariant fixed year and state-specific effects. All models include a constant and the standard errors are clustered at the bank-level. The *t*-statistics are given in parentheses.

	$\Delta LOAN_t$					
	(1)	(2)	(3)	(4)	(5)	(6)
$COMP_t$	0.037***			0.023**		
	(3.47)			(2.20)		
$\Delta COMP_t$		0.019*	0.025**		0.01	0.018*
		(1.85)	(2.30)		(0.86)	(1.65)
$COMP_{t-1}$		0.028**			0.01	
		(2.25)			(1.06)	
$\Delta COMP_{t-1}$			0.040***			0.030**
			(2.81)			(2.07)
$COMP_{t-2}$			0.025*			0.02
			(1.73)			(1.13)
$CAP1_t$	-0.016	-0.050***	-0.054***	0.02	0.01	0.01
	(1.18)	(3.56)	(3.19)	(1.28)	(0.56)	(0.55)
$\Delta UNEMP_t$	-0.026	0.005	0.009	0.20	0.32	0.493*
	(1.11)	(0.18)	(0.33)	(0.87)	(1.21)	(1.84)
$\Delta CAP1_t$	-0.008	-0.002	0.012	0.01	0.00	0.01
	(0.76)	(0.11)	(0.84)	(0.97)	(0.25)	(0.34)
$DEPOSITS_{t-1}$	0.012	0.016	0.025*	0.01	0.01	0.027*
	(0.9)	(1.19)	(1.69)	(1.02)	(0.70)	(1.71)
$SIZE_{t-1}$	0.766***	0.770***	0.768***	0.739***	0.749***	0.757***
	(60.6)	(55.07)	(49.17)	(51.01)	(46.45)	(45.79)
Year dummies	YES	YES	YES	YES	YES	YES
State dummies	YES	YES	YES	YES	YES	YES
R^2	0.63	0.65	0.66	0.64	0.66	0.67
N	5,176	4,096	3,138	5,176	4,096	3,138

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table C.2: OLS and Random Effects Regressions of Banks' Competition Culture and Loan Loss Provisioning

This table presents OLS (columns 1 - 2) and GLS-RE (columns 2 - 4) estimates for the relationship between banks' competition culture and abnormal loan loss provisioning. The dependent variables *DLLP*a and *DLLP*b represent the absolute value of bank's abnormal loan loss provision estimated using Eq.'s (6.2a) and (6.2b), respectively. The variable *COMP* is bank's competition culture estimated from the 10-K filings. The value of the variable *CAP*1 is the bank's tier 1 risk-adjusted capital ratio [Compustat item: capr1] at the beginning of the fiscal year, divided by 100. The variable Δ*CAP*1 is the change in *CAP*1 over the fiscal year. The variable Δ*UNEMP* represents the change in the employment rate over the fiscal year. The variable *DEPOSITS* is the lagged total deposits [Compustat item: dptc] divided by total assets [Compustat item: at]. The variable *SIZE* is the natural logarithm of bank's total assets [Compustat item: at]. The estimates include year and state dummies to control time-invariant fixed year and state-specific effects. All models include a constant and the standard errors are clustered at the bank-level. The *t*-statistics are given in parentheses.

	$DLLPa_t$	$DLLPb_t$	$DLLPa_t$	$DLLPb_t$
	(1)	(2)	(3)	(4)
$COMP_t$	0.042***	0.030**	0.047***	0.035**
	(2.58)	(1.98)	(3.18)	(2.41)
$CAP1_t$	-0.083***	-0.099***	-0.078***	-0.095***
	(4.59)	(5.72)	(3.67)	(4.75)
$\Delta UNEMP_t$	0.076***	0.059**	0.757***	0.650**
	(2.85)	(2.06)	(2.73)	(2.12)
$\Delta CAP1_t$	0.040**	0.031*	0.041***	0.034**
	(2.54)	(1.86)	(2.78)	(2.18)
$DEPOSITS_{t-1}$	0.015	-0.008	0.014	-0.01
	(0.48)	(0.26)	(0.45)	(0.30)
$SIZE_{t-1}$	-0.01	-0.007	0.018	0.013
	(0.40)	(0.30)	(0.70)	(0.54)
Year dummies	YES	YES	YES	YES
State dummies	YES	YES	YES	YES
R^2	0.07	0.06	0.07	0.06
N	5,683	5,683	5,683	5,683

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table C.3: OLS and Random Effects Regressions of Banks' Pre-Crisis Competition Culture and Crisis-period Lending

This table presents OLS (column 1) and GLS-RE (columns 2) estimates for the relationship between banks' pre-crisis period competition culture and crisis period bank lending. The dependent variable $\Delta LOAN$ is the change from the beginning of the fiscal year in the natural log of loans [Compustat item: lntal]. The variable *CRISIS* is coded one for the years 2007 to 2009 and zero otherwise. The variable *PRE_CRISIS_COMP* represents bank's competition culture estimated from the 10-K filings in the fiscal year 2006. The value of the variable *CAP*1 is the bank's tier 1 risk-adjusted capital ratio [Compustat item: capr1] at the beginning of the fiscal year, divided by 100. The variable $\Delta CAP1$ is the change in *CAP*1 over the fiscal year. The variable $\Delta UNEMP$ represents the change in the employment rate over the fiscal year. The variable *DEPOSITS* is the lagged total deposits [Compustat item: dptc] divided by total assets [Compustat item: at]. The variable *SIZE* is the natural logarithm of bank's total assets [Compustat item: at]. The estimates include year and state dummies to control time-invariant fixed year and state-specific effects. All models include a constant and the standard errors are clustered at the bank-level. The *t*-statistics are given in parentheses.

	$\Delta LOAN_t$	
	(1)	(2)
$CRISIS_t$	0.382***	-1.146
	(3.36)	(1.07)
$CRISIS_t \times PRE\_CRISIS\_COMP$	-0.069**	-0.075**
	(2.39)	(2.40)
$CAP1_t$	-0.015	0.018
	(1.15)	(1.27)
$\Delta UNEMP_t$	-0.097***	0.198
	(5.99)	(0.87)
$\Delta CAP1_t$	-0.009	-0.01
	(0.85)	(1.04)
$DEPOSITS_{t-1}$	0.018	0.018
	(1.37)	(1.29)
$SIZE_{t-1}$	0.779***	0.749***
	(63.69)	(53.08)
Year dummies	YES	YES
State dummies	YES	YES
R^2	0.65	0.64
N	5,176	5,176

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table C.4: OLS and Random Effects Regressions of Banks' Pre-Crisis Competition Culture and Crisis-period Loan Loss Provisioning

This table presents OLS (column 1) and GLS-RE (columns 2) estimates for the relationship between banks' pre-crisis period competition culture and crisis period abnormal loan loss provisioning. The dependent variables *DLLP*a and *DLLP*b represent the absolute value of bank's abnormal loan loss provision estimated using Eq.'s (6.2a) and (6.2b), respectively. The variable *CRISIS* is coded one for the years 2007 to 2009 and zero otherwise. The variable *PRE_CRISIS_COMP* represents bank's competition culture estimated from the 10-K filings in the fiscal year 2006. The value of the variable *CAP*1 is the bank's tier 1 risk-adjusted capital ratio [Compustat item: capr1] at the beginning of the fiscal year, divided by 100. The variable Δ*CAP*1 is the change in *CAP*1 over the fiscal year. The variable Δ*UNEMP* represents the change in the employment rate over the fiscal year. The variable *DEPOSITS* is the lagged total deposits [Compustat item: dptc] divided by total assets [Compustat item: at]. The variable *SIZE* is the natural logarithm of bank's total assets [Compustat item: at]. The estimates include year and state dummies to control time-invariant fixed year and state-specific effects. All models include a constant and the standard errors are clustered at the bank-level. The *t*-statistics are given in parentheses.

	$DLLPa_t$	$DLLPb_t$	$DLLPa_t$	$DLLPb_t$
	(1)	(2)	(3)	(4)
$CRISIS_t$	-0.556***	-0.540***	-2.837***	-2.450**
	(5.51)	(4.95)	(2.66)	(2.06)
$CRISIS_t \times PRE\_CRISIS\_COMP$	0.118**	0.113**	0.126**	0.127**
	(2.17)	(2.17)	(2.29)	(2.33)
$CAP1_t$	-0.077***	-0.095***	-0.071***	-0.089***
	(4.29)	(5.44)	(3.36)	(4.45)
$\Delta UNEMP_t$	0.217***	0.195***	0.771***	0.661**
	(7.40)	(6.62)	(2.79)	(2.16)
$\Delta CAP1_t$	0.038**	0.030*	0.040***	0.033**
	(2.48)	(1.82)	(2.70)	(2.12)
$DEPOSITS_{t-1}$	0.017	-0.007	0.017	-0.008
	(0.57)	(0.22)	(0.55)	(0.25)
$SIZE_{t-1}$	-0.005	-0.005	0.022	0.014
	(0.21)	(0.22)	(0.87)	(0.60)
Year dummies	YES	YES	YES	YES
State dummies	YES	YES	YES	YES
R^2	0.08	0.06	0.07	0.06
N	5,683	5,683	5,683	5,683

* $p<0.1$; ** $p<0.05$; *** $p<0.01$