Tournament Culture and Corporate Misconduct : Evidence using Machine Learning [*]

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Abstract

This paper examines the type of firm culture which leads to corporate misconduct activities. Using the management's tone in the 10-K report as a proxy for culture, we find that higher internal compete culture (or tournament culture) increases corporate misconduct activities such as restatements, earnings management, and accounting fraud by increasing the firm risk.The results are robust to external validity tests, firm-specific systematic risk, market competition, governance characteristics, CEO effects, and endogeneity concerns.

Keywords: Corporate Culture; Firm Risk; Corporate Misconduct.

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1 Introduction

Corporate culture is a widely held set of informal values, beliefs and norms that are taken for granted by the employees of a firm and that are necessary for coordination and action (Becker (1982) and Smircich (1983)). Kreps (1990) suggests that the importance of corporate culture is rooted in the impossibility of writing complete contracts. Graham, Harvey, Grennan, and Rajgopal. (2020) state that 90% of executives believe that culture is important or very important in their firms and 92% believe that improving culture would improve firm value. Guiso, Sapienza and Zingales (2015) discuss why culture might matter and find that a culture of integrity adds value, although this evidence is weaker among publicly traded companies. Similarly, Grennan (2019) finds strong support for the economic importance of the corporate culture channel and shows that corporate culture is an important channel through which shareholder governance affects a firms value. Thakor (2016) discusses how corporate culture may affect a banks performance and growth strategy, and suggests that there is no uniquely best culture for a firm. These and other papers [1] have increased our understanding of how a firms culture affects corporate decision-making and firm value, but there is little research on whether a firms culture can aggravate the misconduct behavior. Regulators and academicians have recently start thinking about the firm culture especially when governance system failed to curb corporate scandals, bank failures, too many litigation suits against the firms, and the cases of discrimination against employees. This paper examines which type of firm culture leads to corporate misconduct activities and what's the channel of it. Our main result suggests that higher internal competition culture (or tournament culture) increases misconduct activities by increasing the firm risk.

The term 'culture' is highly subjective and therefore, papers discuss it either using 'trust' as an underlying element of culture to know its role in cross country trade relationships (Guiso, Sapienza and Zingales (2006)), impact on firm value (Guiso et al. (2015)), participation in stock market

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[1]See the papers in the Journal of Financial Economics 2015 (Volume 117, Issue 1, 1-224).

(Guiso, Sapienza and Zingales (2008)), and similar others, or using epidemiological approach that unethical attitudes can be both imported to the immigrant country and also passed down to later generations(Simpser, 2015; Fisman and Miguel, 2007; Fernandez and Fogli (2009)). Differentiating from that literature, we use culture framework developed by Quinn and Rohrbaugh (1983) based on 30 organization effectiveness criteria suggested in Campbell (1977).[2] According to the CVF model, there are four types of cultural orientation: Collaborate, Control, Compete, and Create. Each firm has all the four culture dimensions but at varying degree, and each culture type has its own benefits and challenges. As per the CVF framework, for firms with create dominated culture, the effectiveness criteria is innovation and such firms allocate abundant resources to excel on that criteria and the observed artefacts of such firms are risk-taking, creativity, and adaptability. Similarly, for the firms with compete culture, effective criteria are increased market share, product quality, profit, and productivity and the observed artefacts in firms dominated with such culture are gathering customer and competitor information, goal setting, planning, task focus, competitiveness, and aggressiveness . In firms with control dominated culture, the effectiveness criteria are "efficiency, timeliness, and smooth functioning" and the observed artefacts are conformity and predictability. Such firms use "communication, routinization, formalization, and consistency" as tools to ace in their effectiveness criteria and their main focal point is to maintain the stability financially as well as at the organizational level. Lastly, in firms with collaborate dominated culture. The effectiveness criteria are employee satisfaction and commitment and the observed artefacts in such firms are team work, participation, employee involvement, and open communication. The main element in such firms is value for human affiliation. (For further details, refer panel B table 1).

As Thakor (2016) explains, a firm dominated by compete culture would be expected to gain market share, to increase profits, to have a higher bonus-to-base-pay ratio, and to carry out more acquisitions. A firm with compete culture is also more likely to emphasize interactions

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[2]We discuss and explain the CVF model in more detail in the next section.

with external shareholders and customers. In addition to this, the internal compete culture can also be relate to the seminal work of tournament theory by Lazear and Rosen (1981). In a tournament model, workers of a given rank in an organization compete for promotion to the next level of the job hierarchy, higher bonuses, or any other form of award. In such tournaments (or higher competitive environment), employees or executives would take any risk to win the award. In contrast to the compete culture, a firm characterized by a collaborate culture will be more engaged in the development of human capital and intangible assets. Such intangible assets are harder to identify and value. The foregoing comparison shows that a firm with a compete culture has relatively higher firm specific risk when compared to a firm with any other culture type. This might be because employees or executives are incentivized to take the risk for promotion to the next level of the job hierarchy, higher bonuses, or any other form of award. It implies that high internal competitive environment inculcates the risk taking behavior and that should reflect in firm-specific risk. Therefore, we hypothesize that a firm with high compete culture would be involved in corporate misconduct activities such as earnings restatements, earnings management, and accounting fraud due to increase in firm risk.

In order to measure firm-specific risk, we follow Gul, Srinidhi, and Ng (2011).[3] Following Roll (1988), a large body of empirical research has produced supportive evidence for the hypothesis that stock return variations are largely caused by private, firm-specific, information.[4] Grossman and Stiglitz (1980) argue that, when information acquisition is costly, share price only partially reflects the information of informed investors and therefore information acquisition is compensated by superior return. Veldkamp (2006) argues that when information production has a high fixed cost, rational investors will only purchase a subset of information, enabling only a small fraction

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[3]Firm specific risk is measured as $ln[(1-R^2)/R^2]$. The most common practice is to measure R^2 from a modified market model with current and lagged market and industry returns as explanatory variables. In this paper, we use the modified market model suggested by Dimson (1979). See section 3.3 for details.

[4]Roll (1988) shows that only about 40% of ex-post stock returns can be explained by looking back on market returns, industry returns and public firm-specific information, thus leading to the conclusion that private firm-specific information must be a plausible source of stock return variation. Morck et al. (2000 and 2013) extend Roll (1988) to global markets and provide supportive evidence.

of the expensive firm-specific information to be incorporated into stock prices. When firm-specific information becomes available to investors at a lower cost, investors will increase the demand for firm-specific information which will be ultimately incorporated into stock prices. The information acquisition cost for a relatively more transparent firm (as in compete culture) is likely to be lower than the information acquisition cost for a more opaque firm (as in collaborate culture). Therefore, a firm's culture type will have an impact on how much firm-specific information is captured by stock prices. Previous research has also shown that opaque financial statements lead to higher information acquisition costs and therefore, a lower level of information acquisition (Hutton et. al. (2009)).

Recent research has examined whether firm-specific risk can be explained by firm-specific characteristics such as board diversity (Gul et al. (2011)), board structure (Ferreira, Ferreira, and Raposo (2011)), corporate governance (Yu 2011), and corporate social responsibility (Becchetti, Ciciretti, and Hasan (2015)). Taken together, this strand of research shows that variables linked to corporate governance and corporate social responsibility can explain variations in firm-specific risk.

Some authors have argued that higher firm-specific return variation can also arise from noise and may not be a proxy for firm-specific information (Campbell, Lettau, Malkiel and Xu (2001), Bartram, Brown and Stulz (2012)). Li, Rajgopal and Venkatachalam (2014) examine this issue in more detail and recommend that the regression equation for idiosyncratic risk should control for elements of systematic risk (β) in order to check for noise. Following this suggestion, we control for firm-specific systematic risk in our tests.

In this paper, we examine the relation between a firm-specific risk and culture types for a sample of U.S. firms spanning the time period 1996-2014. Furthermore, also analyze whether a particular culture which increases firm specific risk also increases the misconduct behavior. To measure corporate culture, we use the Competing Values Framework (CVF) from the organization theory lit-

erature .[5] The premise of CVF is that there are four basic competing values/preferences/priorities within every company: create, compete, control, and collaborate. In this framework, there are two important dimensions of culture. One dimension captures the dichotomy between flexibility and stability, and the second dimension captures the dichotomy between internally-oriented versus externally oriented cultures. The create and collaborate cultures are grouped as flexible culture, and the control and compete cultures are grouped as stable culture. Similarly, the internally oriented dimension represents a combination of collaborate and create cultures, whereas the externally oriented dimension captures create and compete cultures. We measure these culture types from the 10-K reports using textual analysis (details are described in the methodology section). How managers respond to the tension created between these competing values will shape a companys culture, practices, products, incentive structure and ultimately, how it innovates and grows. Empirically, we find that internal compete culture can explain firm-specific risk, even after controlling for firm-specific characteristics and other factors such as board size, board diversity, and board independence. Furthermore, we also explore whether such a corporate culture is associated with corporate misconduct activities such as higher earnings restatements, earnings management, and accounting fraud. To do that, we use 2SLS regression model. In the first stage, we regress firm-specific risk on each culture type including all controls and the fitted value from this regression is used as independent variable in second stage where misconduct measures are used as dependent variables. We find that one percent increase in compete culture increases firm risk by 5.7% and the same culture type also develops the environment which increases misconduct activities such as earnings management by 2.6 %, restatements by 5 %, and also increases the possibility of accounting fraud. Lastly, as global financial crisis of 2007-2009 can result into structural changes in corporate culture and hence, it can affect the firm-risk differently, therefore, we check the association of these culture types with firm-risk before and after the crisis period. Interestingly, we find that the association of compete culture with firm-risk has decreased after the crises and it is still

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[5]We describe the CVF model in detail later in the paper. Thakor (2016) providers a lucid synopsis of the model.

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positive and statistically significant. However, the Wald test of coefficient equality is insignificant, indicating little change in its importance in determining firm-specific risk.

There is a possibility that our results are driven by specific way of measuring the culture types and firm-specific risk. Therefore, to mitigate such concerns, we also conduct external validity tests of these measures. To do that, we compute culture types based on Li, Mai, Shen, and Yan (2020), which uses topic modelling algorithm (Latent Dirichlet Allocation (LDA) method) to develop a framework with five culture types respect, teamwork, innovation, quality, and integrity. To prove the external validity of our culture constructs, we show their association with culture types from Li et al. (2020) and also with Net CSR score which is used as culture proxy in Bereskin, Byun, Officer, and Oh (2018). Similarly, to prove the external validity of firm-specific risk, we show its association with measure from Campbell, Hsinchun, Dhaliwal, Lu, and Steele (2014).

One may argue that, in equilibrium, a corporation chooses an optimal culture-type (or mix of types), and therefore, culture is an endogenous variable. To mitigate the self-selection bias, we conduct two endogenity tests. In first, we use 2SLS regression using patent per employee, product strength, community strength, and work-life benefits as instruments of create, compete, collaborate, and control. In second, CEO turnover is used as shock to firm culture and we examine the impact of change in firm culture on firm risk around the CEO turnover. The compete culture continues to be statistically significant in our tests even after controlling for endogeneity. For robustness checks, we test and compare our results in two sub-samples, i.e., for the time-period before the recent 2008-2009 financial crisis and after the crisis. Testing our hypothesis for the post-crisis sub-sample is motivated by the criticism that the financial crisis might have been caused, at least partially, by a corporate culture that lacks integrity. In additional robustness checks, following Li et al. (2014), we have included β as an independent variable. We have also tested our hypothesis by using R^2 as a dependent variable. Another important test is to check for the so-called CEO-effect. This effect arises from the fact that a CEO plays a pivotal role in deciding

a firms culture (Graham et al. 2020). We address this issue by clustering the errors at CEO level and controlling for CEO tenure. We find that our results continue to hold in all of these robustness tests, and corporate culture is a statistically significant explanatory variable for firm-specific risk. We also find that the compete type of culture has the strongest explanatory power for firm risk and this leads to misconduct activities such as earnings management, restatements, and fraud.

Our paper contributes to the literature at various fronts. Firstly, it provides a new way of measuring culture types based on organization effectiveness literature using the machine learning tool. To show the credibility of these measures, we also externally validate them using Li et al. (2020) and Bereskin et al. (2018) culture proxies. Secondly, it contributes toward literature on determinants of corporate misconduct activities (Amiram, Bozanic, Cox, Dupont, Karpoff, and Sloan (2018)) and show that the higher tournament culture inside the firm also leads to such activities. Thirdly, by showing that firm specific risk is the channel through which culture increases misconduct activities, it contributes by explaining the mechanism through which various firm cultures affects firm outcomes.

To the best of our knowledge, this is the first paper which demonstrates that how internal competitive culture (or tournament culture) increases misconduct activities by increasing the firm-risk.

The paper is organized as follows: section II reviews the relevant literature and describes hypotheses development, section III discusses data and methodology, section IV presents the empirical results, and section V concludes.

2 Literature Review and Hypotheses Development

In this section, we briefly review the large literature on corporate culture and we present our hypotheses regarding the link between corporate culture types, firm risk, and misconduct behavior.

2.1 Role of Culture in Economics and Finance

Although culture had no place in rational models of neo-classical economics (Hermalin (2001)), recent research has acknowledged that culture can influence the behavior of individuals and groups through its influence on expectations and preferences (Benabou and Tirole (2006), Tabellini (2008), Guiso et al. (2006)). Several papers have examined the effect of culture on economic and political outcomes (Barro and McCleary (2003); Fernandez and Fogli (2009); Giuliano (2007), Guiso et al. (2004, 2006, 2009); and Tabellini (2008)). Similarly, recent research in corporate finance has shown how corporate culture can determine the outcome of mergers (Bouwman (2013); Bereskin et al. (2018)), how culture affects the safety and soundness of banking institutions (Thakor (2016)), and how culture determines the success and failure of companies in navigating through financial crisis (Fang, Fiordelisi, Hasan,and Leung (2020)).

As mentioned previously, Graham et al. (2020) report that executives consider corporate culture to be very important for a wide range of decisions and actions, and ultimately for firm value. Other researchers reinforce this view and Grennan (2019) contends that the governance-value linkage works through the channel of corporate culture. Intuitively, governance produces observable (and external) rules and metrics, while culture produces intangible (and internal) rules that are based on a set of implicit values and norms (Guiso et al. (2015), Graham et al. (2020)). Thus, corporate culture (along with associated values and norms) is a firm-specific attribute.

2.2 A Model for Measuring Corporate Culture

As the term 'culture' is highly subjective, therefore, papers discussing it either use 'trust' as underlying element of culture to know its role in cross country trade relationships (Guiso et al. (2006)), impact on firm value (Guiso et al. (2015)), participation in stock market (Guiso et al. (2008)), and similar others, or individual's ethnicity or social norms from country of origin to understand his behavior (Fisman and Miguel, 2007; Fernandez and Fogli, 2009). Differentiating

from that literature, we use culture framework developed by Quinn and Rohrbaugh (1983) based on 30 organization effectiveness criteria suggested in Campbell (1977).[6] To measure corporate culture, we rely on the Competing Values Framework (CVF) developed by Quinn and Rohrbaugh (1983) and Cameron et al. (2006), and widely used in the organizational behavior literature (see, for example, Ostroff, Kinicki, and Tamkins (2003); Hartnell, Ou, and Kinicki (2011); Schneider, Ehrhart, and Macey (2013)). Among the various frameworks on organizational culture developed in the management literature (e.g. Hofstede (1991); O'Reilly, Chatman, and Caldwell (1991)), the CVF has various pros. First and foremost, this framework fits very well modern corporations, as managers regularly confront issues such as how to be innovative, how to stay competitive, how to organize and deploy resources, and how to collectively change and grow as a company. These four values compete in a very real sense for a company's limited resources (as funding, time, and people). How managers respond to the tension created between these competing values will shape a companys culture, practices, products, incentive structure, and ultimately, how it innovates and grows. Second, the CVF identifies the underlying organizational dimensions that exist in most human and organizational activities. Third, the CVF is intuitive and aligns with the four biological determined drives in the brain (the need to bond, to learn, to acquire, and to defend: Lawrence and Nohria (2002)). Panels A and B of Table 1 summarize key attributes of the CVFs four cultural dimensions (Cameron et al. (2006)).

There are two external organization-oriented cultural dimensions. The first dimension is the adhocracy culture (also called the create culture in the CVF). This cultural dimension focuses on creating future opportunities in the marketplace through innovation of a firms products and services. Firms with the adhocracy culture encourage entrepreneurship, vision, and constant change,

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[6]Campbell(1977) reviewed the literature on organization effectiveness and suggested 30 important criteria- overall effectiveness, efficiency, quality, growth, turnover, motivation, control, flexibility/adaptation, goal consensus, role and norm congruence, managerial task skills, information management & communication, evaluations by external entities, achievement emphasis, productivity, profit, accidents, absenteeism, job satisfaction, morale, conflict, planning/goal setting, managerial interpersonal skills, stability, value of human resource, and training & development emphasis. Quinn and Rohrbaugh (1983) used the help of academic experts and an algorithm to scale the multi dimension criteria to provide CVF framework.

e.g., allowing for freedom of thought and action among employees so that rule breaking and reaching beyond barriers are common characteristics of this corporate culture. They aim to develop new technologies, innovative product-line extensions, radical new process breakthroughs, and innovations in distribution and logistics that redefine entire industries. The second externally-oriented dimension is the market culture (also called the compete culture in the CVF). This cultural dimension focuses on a firms external effectiveness by pursuing enhanced competitiveness and emphasizing organizational effectiveness, fast response, and customer focus. Firms with market culture attach the highest priority to customers and shareholders and judge success based on indicators such as market shares, revenues, meeting budgetary targets, and profitability growth.

In addition to this, the internal compete culture can also be relate to the seminal work of tournament theory by Lazear and Rosen (1981). In a tournament model, workers of a given rank in a organization compete for promotion to the next level of the job hierarchy, higher bonuses, or any other form of award. Using the pay difference between CEO and other top executives within a firm as a proxy of tournament incentives, on the one side, it induces managers to pursue riskier corporate financing and investment policies (Kini and Williams (2012)), associated with superior corporate performance and greater firm value (Kale, Reis, and Venkateswaran (2009), Burns, Minnick, and Starks (2017)). On the other side, it also leads to riskier corporate policy choices result into greater cash-flow uncentainiy (Phan, Simpson, and Nguyen (2017)). Using industry tournament incentives (ITI) for CEOs, as measured by the compensation gap between a CEO at one firm and the highest-paid CEO among similar (industry, size) firms, Coles, Li, and Wang (2018) find that ITI is positively associated with firm performance, firm risk, and the riskiness of firm investment and financial policies . However, in support of ITI, Huang, Jain, and Kini (2019) find that it increases the value of cash by incentivizing CEOs to deploy cash strategically to capture its product market benefits. In cross country analysis, Burns et al. (2017) find that tournament structures to be significantly related to measures of a society's perceived desirability of

income inequality and competition. Unlike these papers, we use internal competitive environment as a proxy of tournament culture and in this regard, pay gap measure of tournament incentives used by other papers is just a subset of our measure. In such tournaments (or higher competitive environment), employees or executives would take any risk to win the award. Therefore, this risk taking environment would reflect in firm-specific risk and hence, will result into more corporate misconduct activities.

There are two internal oriented cultural dimensions. The first dimension is the hierarchy culture (also called the control culture in the CVF). This cultural dimension focuses on a firms control mechanisms to create value through internal improvements in efficiency and implementation of better processes (e.g., by the extensive use of processes, systems, and technology) and quality enhancements (such as statistical process control and other quality control processes). Firms with hierarchy culture make extensive use of standardized procedures and emphasize rule reinforcement and uniformity. The second internally-oriented dimension is the clan culture (also called the collaborate culture in the CVF). This cultural dimension focuses on employees and on various attempts to develop human competencies and strengthen organizational culture by building consensus. The logic behind such focuses is that human affiliation produces positive affective employee attitudes directed toward the organization. Firms with clan culture develop cooperative processes and attain cohesion through consensus and broad employee involvement (e.g., clarifying and reinforcing organizational values, norms, and expectations, developing employees and cross-functional work groups, implementing programs to enhance employee retention, and fostering teamwork and decentralized decision making). These firms succeed because they hire, develop, and retain their human resource base. Table 1 summarizes the attributes of the four types of corporate culture.

[Insert Table 1 About Here]

Panel A of Table 1 yields important insights about the CVF. First, all four cultural dimensions are

usually present in any organization, however, one or two dimensions typically dominate. Second, some pairs of cultural dimensions share a common focus, while some other pairs have tensions or competing values between them. For example, adhocracy and market cultures are externally focused, while clan and hierarchy cultures are internally focused. Adhocracy tends to clash with hierarchy, and market tends to clash with clan. Such clashes exist because these cultural dimensions emphasize different forms of value creation.

Panel B discusses how these culture types are different in their ideologies and criteria of firm effectiveness. According to CVF framework, for the firms with adhocracy dominated culture, the effectiveness criteria is innovation and therefore, such firms would allocate abundant resources to excel on that criteria and the observed artefacts of such firms are risk-taking, creativity, and adaptability. Similarly, for the firms with market culture, effective criteria are increased market share, product quality, profit, and productivity and the observed artefacts in firms dominated with such culture are gathering customer and competitor information, goal setting, planning, task focus, competitiveness, and aggressiveness . In firms with hierarchy dominated culture, the effectiveness criteria are efficiency, timeliness, and smooth functioning and the observed artefacts are conformity and predictability. Such firms use communication, routinization, formalization, and consistency as tools to ace in their effectiveness criteria and their main focal point is to maintain the stability financially as well as at the organizational level. Lastly, in firms with clan dominated culture, the effectiveness criteria are employee satisfaction and commitment and the observed artefacts in such firms are team work, participation, employee involvement, and open communication. In such firms, the main element is human affiliation.

2.3   Firm-Specific Information and Firm Culture

Since all firms have some elements of each type of culture, it is also important to examine whether any particular type of culture (from the set of the above four types, Collaborate, Control,

Compete and Create) has relatively more explanatory power for firm-specific risk. As explained in the introduction, a firm characterized by compete culture would be expected to gain market share, to increase profits, to have a higher bonus-to-base-pay ratio, and to carry out more acquisitions (Thakor (2016)). A firm with "compete" culture is also more likely to emphasize interactions with external shareholders and customers.[7] In addition to this, the internal compete culture can also be relate to the seminal work of tournament theory by Lazear and Rosen (1981). In a tournament model, workers of a given rank in a organization compete for promotion to the next level of the job hierarchy, higher bonuses, or any other form of award. In such tournaments (or higher competitive environment), employees or executives would take any risk to win the award. This risk taking environment would reflect in firm-specific risk measure. In contrast to the compete culture, a firm characterized by a collaborate culture will be more engaged in the development of human capital and intangible assets. As collaborate culture encourages friendly environment among employees and less competitive one, therefore, it will not enhance risk environment of the firm. We theorize that:

Hypothesis 1: Internal compete culture (or tournament culture) increases firm-specific risk more as compared to other culture types.

Using cultural background information on key company insiders, Liu (2016) find that firms with a culture of high opportunistic behavior are more likely to engage in earnings management, accounting fraud, option backdating, and opportunistic insider trading. Extending that argument, we are proposing that it is internal competitive environment which enhances the risk-taking behav-

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[7]Our focus is on a firms internal environment. Prior research has shown that product market competition (which is a part of the firms external environment) can have an impact on idiosyncratic volatility. For example, Gaspar and Massa (2006) show that firms in highly competitive industry have high idiosyncratic volatility. Our results are consistent with prior research, but we find that internal compete culture has additional and significant explanatory power for firm-specific risk even after including external competition in the regression.

ior (or opportunistic behavior) of the employees and in such environment, there is high probability of misconducts. In tournament culture, the employees or executives are incentivized to take the risk to win promotion, bonus, or any other award. On the one side, the pay difference between CEO and other top executives within a firm (proxy of tournament incentives) induces managers to pursue riskier corporate financing and investment policies (Kini and Williams (2012)) and associated with superior corporate performance and greater firm value (Kale, Reis, and Venkateswaran (2009), Burns et al., 2017). On the other side, it also leads to riskier corporate policy choices result into greater cash-flow uncentainity (Phan et al. (2017)). Using industry tournament incentives (ITI) for CEOs, as measured by the compensation gap between a CEO at one firm and the highest-paid CEO among similar (industry, size) firms, Coles et al. (2018) find that ITI is positively associated with firm performance, firm risk, and the riskiness of firm investment and financial policies . The base of all these tournament incentives is excessive compete culture and therefore, we hypothesize that high compete culture increases the possiblity of misconduct activities.

Hypothesis 2: The compete type of firm culture increases corporate misconduct activities as compared to other culture types.

Since culture types may affect firm behavior during a financial crisis (Fang et. al. (2020)), we also test whether the relation between culture and firm-specific risk has changed after the 2008-09 financial crisis which led to widespread complaints about corporate culture. Rajan (2011) suggests that the risk-taking behavior of the senior executive officers contributed to the crisis of 2008-09. As a result of this kind of criticism, corporate boards have started to take extra precaution after the 2008-09 crisis and to monitor the behavior of senior executives. In post-crisis era, the US firms have to work under strict internal and external regulations. Thus, firms have to compete in this

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controlled environment for higher profitability. Therefore, we expect that the compete culture will be more effective after the crisis than before the crisis.

Hypothesis 3: The explanatory power of the compete type of culture for firm-specific risk is higher in post-crisis period than the pre-crisis period.

3 Data and Methodology

In this section, we explain our data and sample selection, the estimation procedures for our corporate culture variables, firm-specific risk measure, misconduct variables, and the control variables included in our tests. We also present and discuss the summary statistics.

3.1 Data sources and Sample Selection

Following Loughran and McDonald (2011), we first download 10-K reports from the Edgar website (www.sec.gov) related to the period 1996-2014 (due to data availability, as Edgar only started to cover 10-Ks since 1994), with the exception of the amended documents.[8] We include only one filing per firm in each calendar year, with at least 180 days between filings. Finally, we use the classic machine learning method i.e. textual analysis to quantify the tone of the management in the financial statements and that is used as a proxy of the culture. In textual analysis, we have used a bag of words method (or dictionary method) that requires us to parse the 10-K documents into vectors of words and word counts (excluding tables and exhibits). The raw score for each cultural dimension is the frequency of its synonyms (as listed in Panel C of Table 1) normalized by the total number of words in the 10-K section.[9] To estimate the companies firm-specific risk we

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[8]We start the sample from 1996 rather than from 1994 because Edgar server coverage of firms is consistent from 1996.

[9]As Benoit (2019) points out, the key challenge with dictionary approaches is calibrating the matches to dictionary concepts in a valid fashion, using only crude fixed patterns as indicators of semantic content (meaning). The

follow Gul et. al (2011), we obtain their daily stock returns from CRSP and run expanded market model regressions for each fiscal firm-year with weekly returns (after constructing weekly returns from the daily returns data). We supplement these data with accounting information obtained from Compustat and with board data from RiskMetrics. We include all publicly listed companies that are in the intersection of all of the aforementioned databases over the period between 1996 and 2014. We exclude financial firms (SIC codes between 6000 and 6999) from the sample because these firms are heavily regulated. The final sample consists of 1,803 firms or 12,323 firm-year observations. We lag all explanatory variables by one year to mitigate endogeneity concerns. [10]

3.2   Measuring Corporate Culture using Text Mining

In the past, researchers have attempted to measure firm culture in a number of different ways. These include the firm's appearance in the rankings of the top 100 Great Places to Work (Edmans, 2012); more fine-grained data from the organization including the larger sample of the non-top 100 ranked firms (Guiso et al. 2015); textual analysis of employee-generated reviews of their firms culture from career intelligence websites such as Glassdoor.com, Careerbliss.com, and Vault.com (Grennan (2019)); appearance of the word trust in the MD&A section of a firms 10-K filing (Audi, Loughran and McDonald (2015)); firms corporate social responsibility (CSR) behavior, from the KLD database (Hoi, Wu and Zhang (2013)); attitudes toward risk and uncertainty associated with an executives cultural heritage based on Hofstedes uncertainity avoidance index (UAI) (Pan, Siegel, and Wang (2017)) ; and finally, the CEOs unethical behavior (Davidson, Dey, and Smith (2012)).

In spite of value of these measures, there is room for improvement with each of these proxies.

difficulty lies in constructing a text analysis dictionary so that all relevant terms are matched (no false negatives), but that no irrelevant or wrong terms are not (no false positives). The first problem is known as specificity, and is closely related to the machine learning performance measure known as precision. The second problem is known as sensitivity, and relates to the machine learning concept of recall.

[10]In robustness tests, reported later, we also use instrumental variables to control for endogeneity.

For instance, several of these measures focus exclusively on human relations variables or corporate social responsibility variables, although a firms culture likely encompasses many other dimensions. Textual analysis, which covers a variety of techniques, has achieved some successful external validation (Graham et al. (2020)). Thus, we apply textual analysis to estimate Cameron and Quinn's (2006) corporate culture dimensions.[11]

Textual analysis is an objective and systematic technique which can be applied to examine the characteristics specific to a text. It has been widely used by finance and management researchers in collecting semantic content from the publicly available official documents of companies. [12] The rationale behind our textual analysis approach is based on the assumption that a companys culture, which is developed gradually over time, determines the words and expressions used by its members in their public official documents (10-K reports filed with SEC), and thus can be quantified by systematically analyzing its text. [13]

To estimate Cameron and Quinn's (2006) four cultural dimensions, namely collaborate, control, compete, and create, we identify a large set of synonyms for each of these dimensions. To minimize the subjectivity in selecting these synonyms, we follow Carretta, Farina, Martelli, Fiordelisi, and Schwizer (2011) and use a two-step procedure. In the first step, we follow Cameron and Quinn (2006) and use the same synonyms they have identified for each dimension. In the second step, we look up each of the selected words from the first step in the reliable dictionaries like Oxford, Cambridge and others to identify other synonyms. This way we create four tags compete, create, collaborate, and compete and each tag is linked with words synonym to it. It is the same way by which tags in the Harvard-IV psychosocial dictionary and Loughran and McDonald dictionaries are created. The exact bag of words used for measuring each cultural dimension is adapted from

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[11]Bereskin et al. (2018) use CSR score similarity to proxy for cultural similarity between two firms. We find that our measure of culture dimensions is positively correlated with the CSR measures as well.

[12]For review of such methods, refer Kearney and Liu (2014).

[13]The qualitative information for textual analysis in Finance mainly comes from three sources: public corporate disclosures/filings, media articles, internet messages. Public corporate disclosures are a natural source of textual sentiment for researchers as they are official releases that come from insiders who have better knowledge of the firm than outsiders (Kearney and Liu (2014)).

Fiordelisi and Ricci (2014) and is provided in Panel C of Table 1. Starting from the words reported in the belief, value, artifact, and effectiveness criteria of Figure 1 Panel B in Table 1, Fiordelisi and Ricci (2014) identify synonyms for each cultural dimension. They then drop words that occur in more than one bag of words for each cultural dimension in order to identify only unique words that capture a particular cultural dimension. For example, words like begin, change, and envision are taken as representing adhocracy and a relatively high frequency of their use in corporate documents suggests that the firm has an adhocracy-oriented culture. Words like achieve, drive, and expand are taken as representing market, words like caution, conservation, and efficiency are taken as representing hierarchy, and words like capability, collective, and cooperation are taken as representing clan. Fifty words for each culture tag are shown in Appendix A1. [14]

For each listed US firm between 1996 and 2014, we estimate the four corporate culture types by counting the number of times that the synonyms occur in its 10-K document. We construct each of the four culture variables, i.e., collaborate (COLLABORATE), control (CONTROL), compete (COMPETE) and create (CREATE), by dividing its count of synonyms by the total number of words (computed as a percentage). For example, if there are 5 synonyms for competition among 100 words, then we represent the compete culture as 5%.

In order to check if our measure of culture type is correctly capturing a specific firms culture, we examine a randomly chosen subset of 20 firms and check if a firms relative strength in a particular culture type matches our intuitive perception of the firms cultural profile. For example, one would expect that a firm engaged in significant R&D, such as Abbott Labs, would have a relatively higher score in Create culture, and a relatively lower score in other culture types. So, for Abbott Labs, we compute the difference between Abbotts score for each culture type and the median score for that culture type for all firms in our sample, and we compare this relative score to figure out the dominant culture type in Abbott. This is an intuitive test for validity because it shows whether

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[14]Although most researchers apply textual analysis to 10-K reports, some recent papers apply this technique to earnings call transcripts. See Li et. al., (2020).

Abbott Labs is relatively more creative than other firms. To confirm our results, we also read the Glassdoor reviews, company's website, and MD&A section of 10-K report for these 20 firms.[15] The names of these 20 firms with their dominant culture type are reported in the Appendix A2. We describe a more rigorous attempt to test for external validity in a later section.

3.3   Measuring Firm-specific Risk

To obtain R^2 and firm-specific risk, we estimate the following expanded index model regression for each company in each fiscal year:

$$r_{j,t} = \alpha_j + \beta_{1,j} r_{m,t-1} + \beta_{2,j} r_{m,t} + \beta_{3,j} r_{m,t+1} + \beta_{4,j} r_{i,t-1} + \beta_{5,j} r_{i,t} + \beta_{6,j} r_{i,t+1} + \epsilon_{j,t} \tag{1}$$

where $r_{j,t}$ is the excess return on stock j in week t, $r_{m,t}$ is the value-weighted CRSP market index returns, and $r_{i,t}$ is the value-weighted industry index returns following the Fama-French 49 industry classification. We allow for nonsynchronous trading by including the lead and lag terms for the market and industry indexes (Dimson, 1979).[16] We estimate equation (1) for each firm-year and require a minimum of 26 weeks of available observations for the estimation. $1\text{-}R^2$ (estimated from equation (1)) captures the proportion of return variation that is unexplained by the market and industry. However, since $1\text{-}R^2$ is skewed (as shown by Durnev, Morck, and Yeung(2004)), we follow the common practice use logarithmic transformation of R^2, which can range from negative to positive infinity (Morck, Yeung and Yu (2000), Hutton et al. (2009); Gul et al. (2011)):

$$\text{Firm-Specific Risk}_{j,t} = ln[1 - R^2_{j,t}/(R^2_{j,t})] \tag{2}$$

We also use another measure of firm-risk based on Campbell et al. (2014) as external validity test.

3.4   Measuring Corporate Misconduct

We use three measures of corporate misconduct - earnings management, the number of earnings re-statements, and accounting fraud. Although managing earnings does not considered as fraudulent behav-

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[15]We also verify the computed culture types using SeekEdgar database.

[16]Our findings remain qualitatively similar if we include either no leads and lag terms or two lead and lag terms in the expanded index model regression.

ior but managed earnings have the potential to mislead investors and can lead to earnings restatements, shareholder lawsuits, and SEC enforcement actions resulting in significant losses for shareholders (Liu (2016)).

Following Dechow and Dichev (2002), we measure earnings management as absolute value of abnormal discretionary accruals. [17] The second measure for corporate misconduct used is earnings restatements. From Audit Analytics dataset, we use only those restatements which has adverse impact on financial statements. [18]

Lastly, to measure fraud, we follow Liu (2016) and compute fraud as a dummy variable which takes value 1 (zero otherwise) if the firm has experienced one of following three events in a year - class action lawsuit, misstated earnings as per SECs Accounting and Auditing Enforcement Releases (AAER) or earnings restatement which classified as irregularity according to General Accounting Office (GAO) database. Lawsuit data are obtained from the Stanford Securities Class Action Clearinghouse database. Cases involving initial public offering (IPO) underwriters, analysts, or mutual funds rather than firm management are excluded from the sample. Dismissed cases and cases with settlement less than 3 million USD are excluded following Dyck, Morse, and Zingales (2010) to avoid cases that are settled due to negative publicity alone. AAER data for misstated earnings is from Audit Analytics and data on earnings restatement classified as irregularity is from Hennes, Leone, and Miller (2008).

3.5 Control Variables

We include a number of control variables that have been reported by prior researchers to have an association with firm-specific risk. Firm size is an important determinant of firm-specific risk. Roll (1988) documents that R^2 increases with firm size, and Hutton, Marcus, and Tehranian (2009) also documents that firm size is negatively related to firm-specific Risk. We measure firm size (SIZE) with the natural

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[17]Dechow and Dichev (2002) measure of earnings management is improvised version from Modified Jones method. Although Dechow and Dichev (2002) measure further refined in Kothari et al. (2005) and Francis et al. (2005) but correlation between all these measures is high enough and therefore, we have showed results only using Dechow and Dichev (2002).

[18]We also use total number of restatements in place of restatements with adverse impact to verify the results and as expected, the results are same.

logarithm of market capitalization. We also include the natural logarithm of firm age in our analysis. Gul et al. (2011) and Armstrong et al. (2012) show that more mature firms have significantly lower firm-specific risk. Financial leverage (LEV) is computed as the sum of long-term and short-term debts, all divided by total assets. Prior studies tend to find an insignificant association between leverage and firm-specific risk. We control for the ratio of market to book equity (MB) as prior studies show that it is a significant determinant of firm-specific risk (Hutton et al. (2009), Gul et al. (2011)). Firm profitability is measured by return on equity (ROE) and total risk is defined as the monthly return volatilities (RISK) estimated over the 12-month period in the previous fiscal year. To account for the potential impact of corporate governance and board gender diversity on firm-specific risk (Gul et al. (2011), Armstrong et al. (2012)), we include the fraction of independent directors (BINDEP), board size (BSIZE), and the fraction of female directors (GDIV) as well as the entrenchment index (EINDEX) compiled by Bebchuk, Cohen, and Ferrell (2009) in the regressions. Detailed definitions of all variables are provided at the end of the paper.

3.6   Empirical Specification

To examine the association of corporate culture with firm-specific risk, we formulate an empirical model as follows:

$$FIRM-SPECIFICRISK_{j,t} = \alpha + \beta_1 Collaborate_{j,t-1} + \beta_2 Control_{j,t-1} + \beta_3 Compete_{j,t-1} + \beta_4 Create_{j,t-1} + \gamma X_{j,t-1} +$$
$$\delta_1 BINDEP_{j,t-1} + \delta_2 BSIZE_{j,t-1} + \delta_3 GDIV_{j,t-1} + \delta_4 EINDEX_{j,t-1} + Industry_j + Year_t + \epsilon_{j,t} \tag{3}$$

In equation (3), j and t denote firm and year, respectively. Collaborate, Control, Compete, and Create are four culture types. X designates the vector of the firms fundamentals such as size, leverage, Tobin's Q, and monthly return volatilities. The variation of culture across industries and across time suggests the need for controlling for industries and time in our analysis. Accordingly, our reported estimates are based on industry and year fixed effects. As mentioned previously, there is a possibility that these culture types are proxies for board diversity, board independence, board

size, E-Index, or corporate social responsibility (CSR) which have firm-specific risk as already reported in the literature. BINDEP, BSIZE, GDIV, and EINDEX are board independence, board size, gender diversity in board, and E-Index for firm j at t-1.

To test Hypothesis 2, we use the difference-in-difference methodology by comparing the significance of the firms culture in the post-crisis period compared to pre-crisis period. To implement this test, we interact the culture variables with Post Crisis and 1- Post Crisis dummy (with industry and year fixed effects).

$$FIRM - SPECIFICRISK_{j,t} = \alpha + \beta_1 Post\_CrisisXCollaborate_{j,t-1} + \beta_2(1 - Post\_Crisis)XCollaborate_{j,t-1} +$$
$$\beta_3 Post\_CrisisXControl_{j,t-1} + \beta_4(1-Post\_Crisis)XControl_{j,t-1} + \beta_5 Post\_CrisisXCompete_{j,t-1} + \beta_6(1-Post\_Crisis)XCompete_{j,t-1} +$$
$$\beta_7 Post\_CrisisXCreate_{j,t-1} + \beta_8(1 - Post\_Crisis)XCreate_{j,t-1} + \gamma X_{j,t-1} + \delta_1 BINDEP_{j,t-1} + \delta_2 BSIZE_{j,t-1} + \delta_3 GDIV_{j,t-1} +$$
$$\delta_4 EINDEX_{j,t-1} + Industry_j + Year_t + \epsilon_{j,t} \tag{4}$$

In equation (4), post crisis dummy (Post_Crisis) takes value 1 if year is post 2009; otherwise null. Similarly, pre crisis dummy (1-Post_Crisis) takes value 1 if year is pre 2009; otherwise null. Unlike, using dummy with values 0 and 1 for post crisis, we use this specification because in this, this specification provides convenient way to compare the coefficient of firm risk on culture types before and after the crisis. Finally, to test Hypothesis 3, we use proxies of corporate misconduct (MISCONDUCT) like earnings restatements, earnings management, and accounting fraud as dependent variables and check which culture type is highly associated with this kind of activities. Because culture types are associated with the firm-specific risk, therefore, we believe that this can be a channel through which it is associated with the misconduct activities. Therefore, we use 2SLS regression to demonstrate that. In first stage, we run regression of firm specific risk on individual culture types with all the controls and then use the fitted values from this stage as main independent variables in second stage where misconduct activities' measures are dependent variables. The empricial specifications for first stage and second stage are as follows:

$$FIRM-SPECIFICRISK_{j,t} = \alpha + \beta Culture\_Type_{j,t-1} + \gamma X_{j,t-1} + \delta_1 BINDEP_{j,t-1} + \delta_2 BSIZE_{j,t-1} +$$

$$\delta_3 GDIV_{j,t-1} + \delta_4 EINDEX_{j,t-1} + Industry_j + Year_t + \epsilon_{j,t} \quad (5)$$

$$MISCONDUCT_{j,t} = \alpha + \beta \widehat{Culture\_Type}_{j,t-1} + \gamma X_{j,t-1} + Industry_j + Year_t + \epsilon_{j,t-1} \quad (6)$$

Equation (5) show first stage regression specification. The fitted value from first stage is used as main independent variable in second stage regression (equation (6)). MISCONDUCT is measured as earnings restatements, earnings management, or fraud. Culture_Type is collaborate, control, compete, or create culture. X is a vector of control variables same as used in empirical specification (3).

4   Results and Discussion

4.1   Summary Statistics

Table 2 presents summary statistics for our variables. For our sample, synonyms for competition-oriented culture are more frequent in the 10-K reports, and COMPETE has a mean of 4.1%. The second largest percentage of word count belongs to synonyms for control-oriented culture, which has a mean (median) of 2.6% (2.5%). It is then followed by CREATE and COLLABORATE, which have means of 1.14% and 1.09%, respectively.

[Insert Table 2 About Here]

Table 2 also reports the median values for each culture type and the dimensions of culture for different sub-periods. We find that the medians of CONTROL and COMPETE have increased gradually over time. In particular, comparing between the sub periods 1997-2000 and 2010-2014, median COMPETE increases from 3.66% to 4.13% (equivalent to a 12.8% increase) whereas the median CONTROL increases from 2.24% to 2.61% (equivalent to a 16.5% increase). Besides, CREATE became considerably higher during the 2007-2009 crisis period and reverted to its pre-crisis level during 2010-2014. On the other hand,

we do not find evidence that COLLABORATE has varied much over time. These statistics suggest a gradual shift towards a more competitive- and control-oriented culture over time in the US public firms.[19] Similarly, regarding the external vs internal culture, we observe a gradual increase in EXTERNAL over time whereas INTERNAL appears to spike during the crisis and then has declined to its pre-crisis level during 2010-2014. Among the STABLE and FLEXIBLE culture dimensions, the former has increased over time and the latter was high during the crisis period but it has declined after that. This pattern suggests that more firms are transforming their businesses from flexible culture to more stable culture. Regarding the firm-risk estimates, the mean (median) R^2 is 43.5% (42.5%) and mean (median) Firm-specific Risk is 0.32 (0.30). We find that, for our sample, median R^2 (Firm-specific Risk) increases (decreases) monotonically over time. The mean (median) values of misconduct activities - earnings management, fraud, and restatements are 0.029 , 0.02, and 0.058. The summary statistics of misconduct activities is align with Liu (2016). Average firm size as captured by market capitalization is $6.4 billion. The mean of total debt to asset ratio is 21.9%, average market to book equity ratio is 1.40, average return on equity is 33.7%, and average monthly return volatility is 11.3%. Moreover, the average fraction of independent directors, board size, and a fraction of female directors are 72.1%, 9, and 9.9%, respectively. These statistics are consistent with those reported in prior studies (e.g., Hutton et al. (2009), Gul et al. (2011), Kim et al. (2011)).

4.2   Empirical Results

4.2.1   Univariate Analysis

We begin with a univariate analysis of firms with high and low values in each of the cultural dimensions based on their sample medians. The group means for our dependent and independent variables, the between-group differences and the statistical significance based on the mean tests are reported in Table 3.

[Insert Table 3 About Here]

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[19]We also develop a graph to check whether these culture types change with time or not. We find that adoption of compete and control cultures have increased with time compare to other two culture types.

Panel A presents results for INTERNAL and EXTERNAL dimensions. We find that firms with a more internally-oriented culture have significantly lower firm-specific risk, and firms with a more externally-oriented culture are associated with higher firm-specific risk. Both differences are significant at the 5% level or better. These findings provide support to our hypothesis that corporate culture is related to (and may affect) firm-specific risk. As for the other firm characteristics, firms with a more internally-oriented culture tend to be less conservative in debt financing and have greater growth opportunities, lower profitability, greater board independence, and a smaller board. Similarly, firms with a more externally-oriented culture are smaller and younger, use less debt financing, and have greater growth opportunities, lower profitability, smaller board size, lower board gender diversity and fewer antitakeover provisions.

Panel B reports results for each of the four cultural dimensions as identified by Cameron and Quinn (2006). We find that if a firm has more collaboration-oriented culture or less control-oriented culture or more competition-oriented culture then that firm has higher firm-specific risk.

There are several differences in firm-characteristics among the four culture types. First, more competition-oriented firms are significantly smaller whereas more control-oriented firms are significantly bigger. Second, control-oriented firms are more mature and have less monthly return volatilities (in the lagged year) whereas the remaining three cultural dimensions are associated with lower firm age and higher return volatilities. Third, more collaboration and control oriented firms (both of which are internally-oriented cultures) tend to have more gender diversity in the boardroom whereas firms with more competitive-oriented firms have less board gender diversity. Finally, firms with a greater collaboration- and control-oriented culture have more antitakeover protections whereas it is the opposite for competitive and create oriented cultures.

4.2.2 Multivariate Analysis

Table 4 shows the regression results of equation (1) for the effect of four culture types on firm-specific risk. Results imply that compete and control types of culture are statistically significant, although the level of significance decreases when we include other firm-specific variables. The coefficient of compete is positive and the coefficient of control is negative in all the regressions reported in Table 4. The positive

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coefficient for compete is consistent with our hypothesis that firms with a compete culture have more firm-specific risk. The 'compete' coefficient in Column 3 Table 4 implies that 1% increase in 'compete' culture increases firm risk by 5.7 % and this result is robust to firm fundamentals and governance characteristics. A negative coefficient for control culture is inconsistent with our hypothesis. We suspect that this is the result of not addressing the endogeneity problem in our tests. Therefore, we test the regressions after correcting for endogeneity, and we find that control is no longer a statistically significant variable. The only culture-type that continues to be statistically significant and has the correctly signed coefficient is compete. These tests are described in the following section.

[**Insert Table 4 About Here**]

We also found that firm fundamentals such as size, age, market to book value (or Tobin's Q), and stock price volatility are statistically significant. Previous work has shown that board diversity matters for firm-specific risk (Gul et al. (2011)); thus, we also check the results controlling for board size, board independence, board diversity and E-Index. We find that our results remain consistent even after controlling for these factors. In particular, board diversity, board independence, and board size are significant for firm-specific risk.

We recognize that culture is a latent variable and therefore our measurements of the four types of culture contain errors in measurement. In order to mitigate this concern, first, we check the possibility of a measurement error by using the test proposed by Delgado and Manteiga (2001), and then we run a structural equation model to get the error adjusted results. These results are reported in column 4 of Table 4 and it shows that compete culture is positively associated, and control culture is negatively associated, with firm-specific risk even after adjusting for the measurement error.

4.2.3 Resolving the Endogeneity Problem

One may argue that, in equilibrium, a firm chooses the type of corporate culture which is optimal for its purposes. Thus, culture is endogenously determined. In order to resolve this problem of self-selection bias, we have used an instrumental variable approach. Andersson, Quigley, and Wilhelmsson (2005)

analyses the spatial distribution of creativity using the commercial patent activity in Sweden between 1994 and 2001. Their results document the importance of agglomeration and spatial factors in influencing creativity: patent activity is increased in larger and more dense labor markets and in regions in which a larger fraction of the labor force is employed in medium-sized firms. As this paper demonstrates that the creativity and patent activity are highly associated , therefore, we use patents per employee (PATENTS PER EMP) as an instrument for the create culture.

Furthermore, to develop the instruments for compete, collaborative, and control culture, we use the KLD database. As the firm with a compete culture is more market oriented, therefore, for such a firm, customers view on product strength would matter a lot as compared to a firm following any other culture type (Lucas and Ferrell (2000)). Therefore, we measure net product strength (PRODUCT STRENGTH) as an instrument for the compete culture. The net product strength is computed as total number of product strengths minus the total number of product concerns.

As the firm with a collaborative culture focuses more on the human capital, therefore, it is probable that such firms also reciprocates towards community development more as compared to other firms (Muthuri, Matten, and Moon (2009)). Therefore, we measure net community strengths (COMMUNITY) as total number of community strengths minus community concerns as an instrument for collaborative culture.

Lastly, we use the work-life benefits as an instrument for control culture. As a firm with control culture (or hierarchy) would be less intend to provide work-life benefits to its employees (Burke, Jones, and Westman (2013)), therefore, we expect the negative association between work-life benefits and control culture.

Table 5 shows the correlation matrix between firm risk, culture types and its instrument variables. The table shows that there is a positive correlation between firm risk (FIRM-SPECIFIC RISK) with compete culture (COMPETE) and its instrument variable net product strength (PRODUCT STRENGTH). The create culture (CREATE) is positively correlated with patents per employee (PATENTS PER EMP), control culture (CONTROL) is negatively correlated with work-life benefits (WORK-LIFE BENEFITS), collaborative culture is positively associated with net community strengths (COMMUNITY). The table

also shows that there is a weak correlation between firm risk with the instrument variables.

[Insert Table 5 About Here]

To resolve the endogeneity problem, we run a 2SLS regression of FIRM-SPECIFIC RISK on culture types. In the first stage, we run the regression of culture types on the instruments, including all the controls. The fitted value from this regression is used as the independent variable in the second stage. The results of first stage and second stage regressions are provided in Panel B and Panel C of Table 5.

The first stage regression outcomes confirm the correlation matrix results. It shows that control culture is negatively associated with work-life benefits, create culture is positively associated with patents per employee, and compete culture is positively associated with net product strength. These results are consistent with our earlier explanations and expectations.

The fitted values from first stage regression are used as main independent variables in second stage. The table 8 shows that the predicted value of compete culture ((COMPETE)) is positively associated with firm risk (FIRM-SPECIFIC RISK). Although the results for create culture and collaborate culture are also significant but because these results were not significant in Table 4, therefore, we avoid making any inference from their endogeneity adjusted results.

To further strengthen the results of endogenity test, we use CEO change as a shock to firm culture and examine whether change in compete culture is positively related to change in firm-risk. This test is motivated by Van den Steen (2010) which proposes a model of corporate culture and predicts that the appointment of a new CEO will lead to turnover through both selection and self- sorting. Thus, although corporate culture tends to be persistent over time, it is likely to change in a significant way around new CEO appointments. Panel D of Table 5 shows the regression results of corporate culture on firm-risk around the CEO turnover. Column 2 results confirms that there is a positive association of change in compete culture and firm risk. 1 % change in compete culture (*TURNOVER X COMPETE*) increases firm risk by 6.8 % and these results are significant at 1% . As CEO turnover is itself a time dummy, therefore, year fixed effect is not used for this regression.

4.3 Robustness Checks

We conduct several tests to ensure the robustness of our estimation procedures and model specifications. We report these results below.

4.3.1 External Validation of Culture Dimensions and Firm Risk

We understand that the measuring culture types by using textual analysis raises a question of external validation. As perfect alternative proxy for measuring culture is hard to find, therefore, we prove the validity of our culture measures by showing their association with two other culture measures - Li et al (2020) culture constructs and KLD CSR score. The Li et al. (2020) used LDA algorithm of topic modelling to find topics (or tags) in earnings call reports related to culture types. Paper find that there are five key culture types - Innovation , Integrity, Quality, TeamWork, and Respect in a firm. To validate our measures, first we compute the Li et al. (2020) culture types in 10-K report and MDA section of it using the same word list, and then we run the regression of our culture measures on Li et al. (2020) culture measures to show the association. The results are provided in Table 6 Panel A. The COMPETE culture is positively associated with Innovation and Quality, COLLABORATE is positively associated with Innovation, Integrity, TeamWork, and Respect, CREATE is positively associated with Innovation, Respect and TeamWork, and CONTROL is positively associated with Innovation and Integrity. These results are significant at 1 % level. To mitigate the concerns due to unobservables, we also use firm and year fixed effects.

As KLD CSR score is a another proxy for the firms culture used in the literature (Bereskin et. al (2018); Hoi et. al. (2013)). Therefore, we also show its association with our four culture types. We construct a firm-level composite CSR score (NetCSR) using data from the MSCI KLD database. NetCSR is the relative difference between the strengths and concerns for a firm in the MSCI KLD database. The relative difference is computed as the number of all strength indicators reported by a firm divided by the total number of strength indicators in KLD minus the number of all concerns reported by a firm divided by the total number of concerns in KLD.

In Appendix B Panel A, we report the correlation of NetCSR with all four culture types. Although

the correlation coefficients are low, the correlation with all four culture types and the cultural dimensions are statistically significant at the 1 % level. The regression of CSR on the culture types shows that CSR has different loadings on the different culture types. Finally, in Panel B, we provide the regression results using NetCSR as a proxy for firm culture. The results show that CSR is statistically significant for firm-specific risk at 5 % level. These results provide some reassurance that our text-based measures of culture are consistent with a commonly used measure for corporate culture, viz, CSR. .

[**Insert Table 6 about here**]

To show external validity of firm risk variable, following Campbell et al. (2014), we measure another proxy of it as the logarithm of number of following keywords related to firm-specific risk in 10-K disclosure: "Acquisition, Adequate staffing, Advertising, Asset (impairment—impairments), Asset (securitization—securitizations), Assimilation, Backlog, Brand, Brand recognition, California power crisis, Certification, Clinical (trial—trials), Commercialize, Concentration, Consolidation, Construction, (Contract—contracts), (Copyright—copyrights), Cost control, Customer concentration, Customer service, Delivery, Distribution, (Distributor—distributors), Downsizing, Economies of scale, Embargo, Enron, Expand, Expanding, Expansion, (Export—exports), , Goodwill, Information technology, Innovation, Insurance coverage, Intangible, Intellectual, Internet, Key personnel, Labor relations, Limited operating history, Maintenance, Management retention, Market acceptance, Material (weakness—weaknesses), Natural disasters, Personnel, Product performance, Production, Redundancy, Restructuring, Restructuring implementation, Variable interest entity, Technological obsolescence, Technologies, Technology, Trade, Single customer, Single supplier, Software, Special purpose entity, (Tariff—tariffs), (Synergy—synergies), Supply chain".

4.3.2 Alternative Specifications

First, we test whether our results are sensitive to alternative estimation approaches. In regression (1), we apply a generalized least squares random effect (GLS RE) technique following Baltagi and Wu's (1999) procedure. Normally, a firm fixed effects model would be appropriate and could be helpful by absorbing time-invariant omitted firm characteristics. However, the firm fixed effects within-estimator

requires that there are sufficient within-firm variations (over time) in the variables to produce consistent and efficient estimates. Since some of our culture and governance variables do not vary much over time, the fixed effects estimates may be imprecise. As shown in regression (1), our results hold using the GLS RE estimation approach.

[Insert Table 7 About Here]

Second, we estimate a Fama-MacBeth (1973) cross-sectional regression (with Newey-West (1987) correction for autocorrelation) that only analyses the cross-sectional relationship between the culture variables and firm-specific risk. As regression (2) shows, our results are qualitatively similar.

Third, we re-estimate equation (2) and replace FIRM-SPECIFIC RISK with $\hat{R2}$. Our results are similar in magnitude and become even more significant, suggesting that the log-transformation has little effects on our results (see regression (3)).

Fourth, we use alternative standard errors that are double-clustered by firm and year, finding results that are similar in statistical significance (see regression (4)).

Fifth, we exclude the observations during the global financial crisis (i.e., years 2007, 2008 and 2009). As shown in regression (5), our results are unaffected.

Sixth, Li et al.(2014) shows that log transformation of R^2 does not capture the firm-specific risk due to systematic risk inherent in the R^2 metric. Therefore, to confirm our results we control for systematic risk (BETA) and we find that the results are robust even controlling for systematic risk. Regression result is shown in column (6) of the table.

Seventh, we investigate whether the relationship between the culture variables and firm-specific risk is non-linear by including the squared terms of the former to equation (2). Our results show little evidence of non-linearity.

Eighth, Prior research has shown that there is a close connection between a companys CEO and its culture (Baron and Hannan (2002)). O'Reilly et. al (2014) show that a CEOs personality affects a firms culture and that culture is subsequently related to a broad set of organizational outcomes including a firms financial performance (revenue growth, Tobin's Q), reputation, analysts stock recommendations, and employee attitudes. Because of this close relationship between culture and CEO, we control for the

CEO effect in two ways: we include CEO tenure as an independent variable in our robustness tests and we also use two-way clustering . Our results remained unchanged even after controlling for CEO effects. We find that compete culture is positively associated with the firm-specific risk.

Finally, Gaspar and Massa (2006) argue that the competitive positioning of a firm can influence the impact of firm-specific shocks, and show that the level of idiosyncratic noise in a firms returns is lower if a firm enjoys more market power relative to its peers. Therefore, we test whether the explanatory power of our internal compete culture for a firms firm-specific risk is impacted by a firms external competitive environment. We measure the level of external competition by the Herfindahl Index (HHI) in the firms industry. The results of the regression after including industry HHI are reported in last column of Table 6. First, these results confirm that external competition has explanatory power, as reported in prior literature. Secondly, the results show that the statistical significance of the internal compete culture is not diminished even after including the measure for external competition. Taken together, these results provide additional support for our hypothesis that a firms culture has explanatory power for firm-specific risk.

Is there a structural change in the effect of corporate culture on firm-specific risk?

The 2008-2009 financial crisis raised serious and widespread concern about corporate culture. Therefore, we examine whether there has been a change in the relevance of corporate culture in explaining firm risk after the 2007-2009 financial crisis. To examine this issue, we test whether the effect of corporate culture variables in determining firm-specific risk is different after the financial crisis. We construct two dummy variables: Post-Crisis equals one after 2009 and null otherwise and (1 - Post Crisis) is 1 if year is pre or same as 2009 and null otherwise. We interact these dummy variables with each of our culture variables in the baseline model and perform Wald tests to examine whether the coefficients differ before and after 2009. These estimation results are reported in Table 8.

[Insert Table 8 About Here]

In regression (1) where the individual culture variables are considered, we find that the negative effect of CONTROL is only significant during the post-crisis period and that such increase in negative effect is

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significant at the 5% level. As for COMPETE, we find that its coefficient is positive and significant both before and after 2009. Interestingly, we find that the association of compete culture with firm-risk has decreased after the crises but it is still positive and statistically significant. However, the Wald test of coefficient equality is insignificant, indicating little change in its importance in determining firm-specific risk. Interestingly, although we do not find any significant coefficient for CREATE both before and after 2009, we document that its coefficient has turned into positive during the post-crisis period and such increase is significant at the 1% level.

Overall, we find evidence that the corporate culture has become increasingly important in influencing the firm-specific risk.

4.3.3 Culture and Misconduct

Till now, the analysis is conducted to show the positive relation between compete culture and firm-specific risk, and to prove how robust this relation is. Next, we show how the higher internal compete culture leads to misconduct behavior and this happens by increasing firm-specific risk. To show it empirically, we use 2SLS regression. Table 9 Panel A shows regression results of first stage i.e. results of regressing firm-specific risk on individual culture types controlling for firm fundamentals and governance characteristics. Column (2) shows that the coefficient of compete ($COMPETE$) is 0.053 and it is significant at 1 %. It implies that 1% increase compete culture leads to 5.3 % increase in firm risk. Panel B shows the role of corporate culture in misconduct activities by affecting the firm-risk. The fitted values of firm-risk on culture types from first stage are used as independent variables in second stage. Columns (1)-(4) show regression results of earnings management measure on fitted values from first stage. Column (2) shows that the coefficient of increase in firm risk due to compete culture ($\widehat{COMPETE}$) is 0.026 and this implies that 1% increase in firm-specific risk due to compete culture increases earnings management by 2.6%. Similarly, Columns (5)-(8) show regression results of restatements' measure on fitted values from first stage. Columns (6) shows that the coefficient of increase in firm risk due to compete culture ($\widehat{COMPETE}$) is 0.057 and this implies that 1% increase in firm-specific risk due to compete culture increases earnings management by 5.7%. Lastly, Columns(9)-(12) show logistic regression results of fraud

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dummy on fitted values from first stage. Column (10) shows that the coefficient of increase in firm risk due to compete culture ($\widehat{COMPETE}$) is 1.517 and this implies that 1 unit increase in firm-specific risk due to compete culture increases the log odds of accounting fraud by 1.517 units. The relation of misconduct activities with fitted values of other culture types is negative and statistically insignificant.

[**Insert Table 9 About Here**]

In sum, these results shows that compete culture is positively associated with corporate misconduct activities and this happens because it increases firm-specific risk.

5 Conclusion

This paper examines whether different culture types explain the firm-specific risk differently and how this relationship of culture with firm-risk leads to misconduct activities such as earnings management, earnings restatement, and accounting fraud. We find supporting evidence that the higher internal compete culture increases the firm risk and this increase in firm specific risk leads to misconduct activities.

We measure corporate culture by using the Competing Values Framework (CVF) from organization theory. We select this model because it is a statistically validated and widely used tool to diagnose culture. The CVF model describes four types of culture: create, control, collaborate and compete (Quinn and Rohrbaugh (1983), Cameron and Quinn (2006)). We measure these culture types by conducting text analysis on the 10K reports. Our conclusion is consistent with the hypothesis that different culture types are associated with different degrees of firm-specific risk and this impact on firm-risk leads to misconduct activities. Out of four culture types, the positive association of compete culture with firm risk is statistically significant. We find that one percent increase in compete culture increases firm risk by 5.7%

We recognize that firms may self-select into a particular type of culture and thus create an endogeneity problem. Therefore, we use an instrument for each culture type. The instruments are patent per employee (for create culture), work-life benefits (for control culture), net community strength (for collaborate

culture), and net product strength (for compete culture). We find that only compete culture is statistically significant out of the four different culture types. This is consistent with our earlier findings regarding compete culture. We conduct a large number of robustness tests and our results remain unchanged even after controlling for firm fundamentals, board diversity, board independence, board size, and the E-Index, systematic risk (Beta), and CEO effects.

Lastly, we examine the relation between culture types and misconduct behavior. We find that high 'compete' culture (or tournament culture) increases the misconduct activities such as earnings management, earnings restatements, and accounting fraud by increasing the firm risk. We find that 'compete' culture type which develops risky environment increases misconduct activities such as earnings management by 2.6 %, restatements by 5%, and it also increases the possibility of accounting fraud.

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Table 1: Introduction to the Competing Values Framework

This table provides an introduction to the Competing Values Framework originated in Quinn and Rohrbaugh (1983) and further developed in Cameron et al. (2006), the theoretical framework for the corporate cultural dimensions employed in this paper. Panel A presents the Competing Values Framework (CVF). Panel B defines Cameron et al.s (2006) four cultural dimensions built on the CVF framework. Panel C reports the bag of words used in text analysis to capture each cultural dimension. The bag of words is obtained in two steps. First, we consider the synonyms suggested by Cameron et al. (2006) to identify each cultural dimension. Second, we look up each of the selected words from the first step in the reliable dictionaries like Oxford, Cambridge and others to identify other synonyms. This way we create four tags compete, create, collaborate, and compete and each tag is linked with words synonym to it. All words with the identified prefixes are part of the bag of words to measure corporate cultural dimensions. In this way, we are able to include as many words as possible with close meaning without reporting all of them.

Panel A: The Competing Values Framework
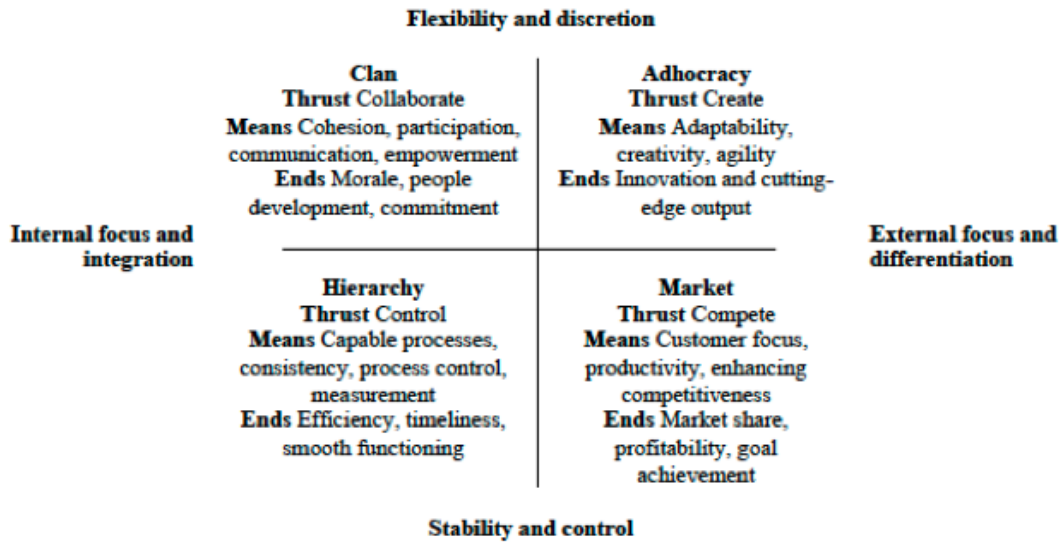
Source: Hartnell et al. (2011, p.679), Figure 1, which is adapted from Figure 3.1 in Cameron et al. (2006)

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Panel B: The four cultural dimensions based on the CVF

Cultural dimensions	Assumptions	Beliefs	Values	Artefacts (behaviours)	Effectiveness criteria
Adhocracy	Change	People behave appropriately when they understand the importance and impact of the task.	Growth, stimulation, variety, autonomy, and attention to detail	Risk-taking, creativity, and adaptability	Innovation
Market	Achievement	People behave appropriately when they have clear objectives and are rewarded based on their achievements	Communication, competition, competence, and achievement	Gathering customer and competitor information, goal-setting, planning, task focus, competitiveness, and aggressiveness	Increased market share, profit, product quality, and productivity
Hierarchy	Stability	People behave appropriately when they have clear roles and procedures are formally defined by rules and regulation	Communication, routinisation, formalisation, and consistency	Conformity and predictability	Efficiency, timeliness and smooth functioning
Clan	Human affiliation	People behave appropriately when they have trust in, loyalty to, and membership in the organisation	Attachment, affiliation, collaboration, trust, and support	Teamwork, participation, employee involvement, and open communication	Employee satisfaction and commitment

Source: Adapted from Hartnell et al. (2011, p.679), Figure 2

Panel C: Bag of words (semantic fields) to measure corporate cultural dimensions

Cultural dimensions	Synonyms
Adhocracy	adapt*, begin*, chang*, creat*, discontin*, dream*, elabor*, entrepre*, envis*, experim*, fantas*, freedom*, futuri*, idea*, init*, innovat*, intellec*, learn*, new*, origin*, pioneer*, predict*, radic*, risk*, start*, thought*, trend*, unafra*, ventur*, vision*
Market	achiev*, aggress*, agreem*, attack*, budget*, challeng*, charg*, client*, compet*, customer*, deliver*, direct*, driv*, excellen*, expand*, fast*, goal*, growth*, hard*, initiat*, invest*, market*, monit*, mov*, outsourc*, performanc*, position*, pressur*, profit*, rapid*, reputation, result*, revenue*, satisf*, scan*, share*, signal*, speed*, strong, superior, target*, win*
Hierarchy	boss*, bureaucr* cautio*, certain*, chief*, conservat*, control*, detail*, document*, efficien*, error*, fail*, inform*, logic*, method*, outcom*, predictab*, procedur*, productiv*, qualit*, regular*, solv*, standard*, uniform*
Clan	capab*, co-*, cohes*, collab*, collectiv*, commit*, competenc*, conflict*, consens*, cooperat*, coordin*, cultur*, decentr*, employ*, empower*, engag*, expectat*, facilitator*, help*, hir*, human*, interpers*, involv*, life*, long-term*, loyal*, mentor*, mutual*, norm*, parent*, partic*, partner*, people*, relation*, retain*, reten*, skill*, social*, team*, teamwork*, tension*, train*, value*, work group*

Source: Fiordelisi and Ricci. (2014, page 68), Figure 1

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TABLE 2 : Summary Statistics

This table reports summary statistics of our variables. Firm-specific risk (FIRM-SPECIFIC RISK) is measured as log [(1- R2)/ R2] following Gul et al. (2011). R2 is the coefficient of determination from the modified market model regression. INTERNAL and EXTERNAL are two dimensions of culture as per Competing Value Framework (CVF) model. Earnings management (EM) is a measure of discretionary accrual following Dechow and Dichev (2002). Restatements (RESTATEMENTS) is maximum number of adverse restatements in a year. COLLABORATE, CONTROL, COMPETE and CREATE are four types of corporate culture. The culture types are expressed as a percentage. The control variables are market capitalization (SIZE) measured as log of market value of equity (ME), log firm age (AGE), financial leverage (LEV), market-to-book equity ratio (MB), return on equity (ROE), equity risk (RISK), board independence (BINDEP), board size (BSIZE), board gender diversity (GDIV) and the entrenchment index (EINDEX). Beta is systemic risk. HHI is proxy of product market competition. ME is in million USD. The detailed definition of the variables is provided in variable definition section. The number of observations, means, standard deviations, minimums, maximums, medians and percentile statistics are reported. We also report the medians grouped by different subperiods. The subperiods are 1997-2000, 2001-2006, 2007-2009 and 2010-2014.

Variables	Obs.	Mean	Stdev	Min	25%	Median	75%	Max	Median 1997-2000	2000-2006	2007-2009	2010-2014
Firm-specific risk variables:												
FIRM-SPECIFIC RISK	12,323	0.315	0.914	-1.808	-0.322	0.301	0.926	2.61	1.031	0.457	0.07	0.021
R2	12,323	0.435	0.193	0.069	0.284	0.425	0.58	0.859	0.263	0.388	0.482	0.495
EM	10,899	0.029	0.034	0	0.008	0.018	0.037	0.192	0.02	0.02	0.02	0.01
FRAUD	12,323	0.02	0.15	0	0	0	0	1	0	0	0	0
RESTATEMENTS	12,323	0.058	0.246	0	0	0	1	2	0	0	0	0
Corporate culture variables:												
INTERNAL	12,323	-0.074	1.014	-7.597	-0.638	-0.062	0.566	7.361	-0.079	-0.063	0.018	-0.084
EXTERNAL	12,323	0.286	1.102	-3.437	-0.806	-0.14	0.703	5.113	-0.161	-0.157	-0.094	-0.127
FLEXIBLE	12,323	1.574	0.381	0.693	1.301	1.512	1.781	3.391	1.562	1.605	1.631	1.513
STABLE	12,323	4.679	0.819	2.565	4.094	4.603	5.218	7.601	4.297	4.591	4.713	4.897
COLLABORATE	12,323	1.094	0.342	0.07	0.87	1.03	1.23	4.2	1.02	1.05	1.01	1.01
CONTROL	12,323	2.555	0.52	1.07	2.22	2.52	2.84	6.61	2.242	2.42	2.58	2.61
COMPETE	12,323	4.069	0.957	0.56	3.39	3.97	4.66	9.41	3.66	3.903	3.96	4.13
CREATE	12,323	1.141	0.43	0.17	0.84	1.08	1.37	4.281	1.02	1.08	1.185	1.06
Firm characteristics:												
ME	12,323	6,375	14,838	70	643	1,656	4,749	103,272	972	1463	1899	1964
SIZE	12,323	7.529	1.507	4.255	6.466	7.412	8.466	11.545	6.879	7.288	7.549	7.583
AGE	12,323	3.072	0.655	0.693	2.639	3.091	3.638	4.1744	3.178	2.996	3.091	3.178
LEV	12,323	0.219	0.173	0	0.057	0.212	0.335	0.724	0.274	0.22	0.197	0.195
MB	12,323	1.399	1.206	0.131	0.597	1.027	1.746	6.629	0.931	1.051	1.035	0.966
ROE	12,323	0.337	0.35	-0.848	0.193	0.3	0.419	2.251	0.351	0.295	0.301	0.291
RISK	12,323	0.113	0.061	0.029	0.071	0.099	0.14	0.347	0.115	0.102	0.092	0.101
Board and governance variables												
BINDEP	12,323	0.721	0.161	0	0.625	0.75	0.857	1	0.6	0.7	0.778	0.818
BSIZE	12,323	9.029	2.241	3	7	9	10	26	9	9	9	9
GDIV	12,323	0.099	0.095	0	0	0.1	0.167	0.625	0	0.091	0.111	0.111
EINDEX	12,323	2.514	1.269	0	2	2	3	6	2	3	3	2
Other Controls												
Beta	12,323	1.244	0.783	-0.144	0.678	1.129	1.679	3.684	1.004	1.061	1.25	1.166
HHI	12,323	0.086	0.082	0.016	0.044	0.065	0.089	1	0.056	0.058	0.071	0.072

TABLE 3 : Univariate Analysis

This table reports the univariate analysis that compares univariately the means of the firm, board and governance characteristics across the high and low corporate culture variables. We group the firm-year observations into high and low cultural dimensions according to their respective sample medians. Firm-specific risk (FIRM-SPECIFIC RISK) is measured as log [(1- R2)/ R2] following Gul et al. (2011). R2 is coefficient of determination measured using the modified market model. INTERNAL-EXTERNAL are two dimensions of culture as per Competing Value Framework (CVF) model. COLLABORATE, CONTROL, COMPETE, and CREATE are four types of corporate culture. The culture types are expressed as a percentage. We include control variables: market capitalization (SIZE) measured as log of market value of equity (ME), log firm age (AGE), financial leverage (LEV), market-to-book equity ratio (MB), return on equity (ROE), equity risk (RISK), board independence (BINDEP), board size (BSIZE), board gender diversity (GDIV) and the entrenchment index (EINDEX). ME is in million USD. The detailed definition of the variables is provided in the variable definition section. Panel A reports the results for the internally- and externally-oriented cultures. Panel B reports the results using the four cultural dimensions. The differences between the high and low groups are reported with statistical significance calculated based on two-sample t-tests. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Internal and External

	INTERNAL			EXTERNAL		
	High	Low	Diff.	High	Low	Diff.
FIRM-SPECIFIC RISK	0.299	0.332	-0.033**	0.391	0.24	0.152***
R2	0.438	0.431	0.007**	0.417	0.452	-0.034***
INTERNAL	0.76	-0.76	1.521***	0.14	-0.14	0.280***
EXTERNAL	0.14	-0.14	0.280***	0.874	-0.874	1.748***
COLLABORATE	1.157	1.03	0.128***	1.137	1.05	0.087***
CONTROL	2.834	2.275	0.559***	2.631	2.478	0.153***
COMPETE	4.19	3.948	0.242***	4.665	3.473	1.192***
CREATE	1.174	1.107	0.067***	1.388	0.894	0.494***
ME	6334	6415	-81	6502	6248	254
SIZE	7.54	7.518	0.022	7.482	7.577	-0.095***
AGE	3.063	3.081	-0.018	2.943	3.202	-0.259***
LEV	0.201	0.236	-0.034***	0.18	0.257	-0.077***
MB	1.47	1.329	0.141***	1.687	1.112	0.575***
ROE	0.329	0.344	-0.015**	0.29	0.383	-0.093***
RISK	0.113	0.114	-0.001	0.121	0.105	0.017***
BINDEP	0.726	0.715	0.011***	0.718	0.723	-0.004
BSIZE	8.95	9.109	-0.159***	8.625	9.434	-0.809***
GDIV	0.097	0.1	-0.003*	0.093	0.105	-0.012***
EINDEX	2.527	2.502	0.025	2.441	2.587	-0.145***

TABLE 3 : Univariate Analysis (Contd.)

Panel B: Four Cultural Dimensions

	COLLABORATE			CONTROL			COMPETE			CREATE		
	High	Low	Diff	High	Low	Diff	High	Low	Diff	High	Low	Diff
FIRM-SPECIFIC RISK	0.357	0.275	0.082***	0.259	0.37	-0.110***	0.38	0.251	0.129***	0.325	0.307	0.018
R2	0.425	0.444	-0.019***	0.446	0.423	0.023***	0.42	0.449	-0.029***	0.432	0.437	-0.006
INTERNAL	0.178	-0.171	0.348***	0.53	-0.513	1.043***	0.131	-0.131	0.263***	0.084	-0.082	0.166***
EXTERNAL	0.186	-0.179	0.365***	0.146	-0.142	0.288***	0.671	-0.671	1.342***	0.659	-0.646	1.305***
COLLABORATE	1.337	0.86	0.477***	1.101	1.086	0.015**	1.13	1.057	0.073***	1.098	1.09	0.008
CONTROL	2.58	2.531	0.049***	2.955	2.167	0.787***	2.656	2.453	0.203***	2.596	2.514	0.082***
COMPETE	4.228	3.916	0.311***	4.255	3.889	0.366***	4.825	3.313	1.512***	4.236	3.905	0.331***
CREATE	1.175	1.108	0.067***	1.155	1.127	0.028***	1.203	1.078	0.125***	1.467	0.821	0.646***
ME	6615	6143	472*	6300	6447	-147	5920	6829	-909***	7270	5497	1773***
SIZE	7.545	7.514	0.031	7.578	7.483	0.095***	7.457	7.602	-0.145***	7.547	7.512	0.035
AGE	3.009	3.134	-0.125***	3.09	3.056	0.034***	2.957	3.188	-0.231***	2.982	3.161	-0.179***
LEV	0.201	0.235	-0.034***	0.193	0.243	-0.050***	0.181	0.257	-0.076***	0.19	0.247	-0.057***
MB	1.514	1.289	0.226***	1.452	1.349	0.103***	1.595	1.204	0.392***	1.646	1.158	0.487***
ROE	0.333	0.341	-0.008	0.328	0.345	-0.017***	0.3	0.374	-0.074***	0.309	0.364	-0.055***
RISK	0.115	0.111	0.004***	0.109	0.117	-0.008***	0.119	0.108	0.011***	0.12	0.107	0.013***
BINDEP	0.716	0.725	-0.009***	0.746	0.696	0.050***	0.723	0.718	0.005*	0.725	0.717	0.008***
BSIZE	9.004	9.054	-0.05	8.929	9.126	-0.197***	8.607	9.451	-0.844***	8.755	9.298	-0.543***
GDIV	0.103	0.095	0.008***	0.101	0.096	0.005***	0.091	0.107	-0.016***	0.097	0.1	-0.003
EINDEX	2.544	2.486	0.058**	2.583	2.448	0.135***	2.457	2.571	-0.114***	2.454	2.573	-0.118***

TABLE 4 : Corporate Culture and Firm-Specific Risk

This table reports the baseline regression results for the four individual cultural dimensions. The dependent variable is firm-specific risk (FIRM-SPECIFIC RISK. The four main independent variables are the four culture variables: COLLABORATE, CONTROL, COMPETE and CREATE. Firm-specific risk (FIRM-SPECIFIC RISK) is measured as log [(1- R2)/ R2] following Gul et al. (2011). R2 is the coefficient of determination from the modified market model regression. Control variables are market capitalization (SIZE), log firm age (AGE), financial leverage (LEV), market-to-book equity ratio (MB), return on equity (ROE), equity risk (RISK), board independence (BINDEP), board size (BSIZE), board gender diversity (GDIV) and the entrenchment index (EINDEX). ME is in million USD. The detailed definition of the variables is provided in the variable definition section. Standard errors reported in parentheses are clustered at the firm level. Industry and year effects are controlled for by including dummies. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	FIRM-SPECIFIC RISK	*FIRM-SPECIFIC RISK*	*FIRM-SPECIFIC RISK*	*FIRM-SPECIFIC RISK*
COLLABORATE	0.037	0.012	-0.004	-0.002
	(0.043)	(0.033)	(0.033)	(0.020)
CONTROL	-0.087***	-0.057**	-0.051**	-0.053***
	(0.031)	(0.022)	(0.023)	(0.014)
COMPETE	0.139***	0.052***	0.057***	0.057***
	(0.018)	(0.014)	(0.013)	(0.008)
CREATE	-0.001	-0.017	-0.026	-0.026
	(0.040)	(0.031)	(0.031)	(0.017)
SIZE		-0.277***	-0.293***	-0.293***
		(0.010)	(0.010)	(0.006)
AGE		-0.116***	-0.130***	-0.128***
		(0.020)	(0.021)	(0.012)
LEV		0.071	0.05	0.054
		(0.069)	(0.069)	(0.046)
MB		0.079***	0.089***	0.088***
		(0.011)	(0.011)	(0.007)
ROE		-0.001	-0.013	-0.016
		(0.027)	(0.027)	(0.020)
RISK		-1.081***	-0.985***	-1.000***
		(0.189)	(0.188)	(0.137)
BINDEP			-0.133*	-0.140***
			(0.072)	(0.049)
BSIZE			0.017***	0.015***
			(0.006)	(0.004)
GDIV			0.544***	0.570***
			(0.116)	(0.077)
EINDEX			0.004	0.004
			(0.010)	(0.006)
Intercept	0.665***	3.217***	3.268***	3.287***
	(0.104)	(0.129)	(0.133)	(0.087)
Industry effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Obs.	12,323	12,323	12,323	12,323
R-squared	0.184	0.371	0.375	

Table 5 : Corporate Culture and Endogeneity

Panel A: Correlation Table Between Instrument Variables and Culture Types

This table reports the correlation matrix between the instrument variables and the culture types. PATENT PER EMP is number of patents per employee. PRODUCT STRENGTH is number of product strength minus number of product concerns. COMMUNITY is number of community strengths minus number of community concerns. WORK-LIFE BENEFITS is work-life benefits provided by the firm. PRODUCT STRENGTH, COMMUNITY, WORK-LIFE BENEFITS are estimated using the KLD database. CREATE, COMPETE, CONTROL, and COLLABORATION are culture types and FIRM-SPECIFIC RISK is firm-specific risk of a firm. The detailed definition of the variables is provided in the variable definition section. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	FIRM-SPECIFIC RISK	COLLABORATE	CREATE	COMPETE	CONTROL	PATENT PER EMP	PRODUCT STRENGTH	COMMUNITY	WORK-LIFE BENEFITS
FIRM-SPECIFIC RISK	1								
COLLABORATE	0.031	1							
CREATE	0.068	0.08	1						
COMPETE	0.117	0.171	0.222	1					
CONTROL	-0.036	0.035	0.073	0.186	1				
PATENT PER EMP	0.001	0.027	0.28	0.116	0.076	1			
PRODUCT STRENGTH	0.097	0.012	0.06	0.14	0.033	0.087	1		
COMMUNITY	-0.055	0.039	0.056	0.06	-0.027	0.012	-0.012	1	
WORK-LIFE BENEFITS	-0.135	0.021	0.091	0.005	-0.045	0.029	-0.119	0.319	1

Panel B: First Stage Regression Results

This table reports the first stage regression results of 2SLS model. The dependent variables are the four culture types: CONTROL, CRE-ATE, COMPETE, and COLLABORATE and the independent variables are four instruments WORK-LIFE BENEFITS, PRODUCT STRENGTH, COMMUNITY, and PATENT PER EMP. Control variables are market capitalization (SIZE), log firm age (AGE), financial leverage (LEV), market-to-book equity ratio (MB), return on equity (ROE), equity risk (RISK), board independence (BINDEP), board size (BSIZE) and board gender diversity (GDIV).. The detailed definition of the variables is provided in the Appendix C. Standard errors reported in parentheses are clustered at the firm level. Industry and year effects are controlled for by including dummies. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
VARIABLES	CONTROL	COMPETE	COLLABORATE	CREATE
WORK-LIFE BENEFITS	-0.128**			
	(0.052)			
PRODUCT STRENGTH		0.085***		
		(0.025)		
COMMUNITY			0.02	
			(0.012)	
PATENT PER EMP				0.206***
				(0.027)
SIZE	0.013	-0.052**	-0.008	-0.009
	(0.014)	(0.023)	(0.008)	(0.008)
AGE	0.015	-0.133***	-0.039**	-0.058***
	(0.024)	(0.041)	(0.018)	(0.017)
LEV	-0.440***	-0.626***	-0.074	0
	(0.084)	(0.144)	(0.060)	(0.066)
MB	-0.016	0.089***	0.018*	0.074***
	(0.015)	(0.026)	(0.009)	(0.010)
ROE	0.003	-0.045	-0.005	-0.120***
	(0.032)	(0.066)	(0.025)	(0.031)
RISK	-0.382*	0.175	0.118	0.551***
	(0.202)	(0.334)	(0.143)	(0.131)
BINDEP	0.454***	0.111	0.038	0.151***
	(0.090)	(0.145)	(0.067)	(0.057)
BSIZE	-0.006	-0.022*	0.004	0.011*
	(0.007)	(0.012)	(0.004)	(0.006)
GDIV	-0.217	-0.341	0.247***	0.241**
	(0.138)	(0.216)	(0.085)	(0.104)
Intercept	2.012***	4.641***	1.188***	0.846***
	(0.144)	(0.218)	(0.086)	(0.072)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Observations	5,585	7,464	7,464	9,823
R-squared	0.095	0.297	0.056	0.227

Panel C: Second Stage Regression Results

This table reports the results of second stage 2SLS regression. The dependent variable is firm-specific risk(FIRM-SPECIFIC RISK) and the independent variables $\overline{COMPETE}$, $\overline{CONTROL}$, $\overline{CREATE}$, and $\overline{COLLABORATE}$ are fitted values of four culture types from first stage regression. Firm-specific risk (FIRM-SPECIFIC RISK) is measured as log [(1- R2)/ R2] following Gul et al. (2011). R2 is coefficient of determination measured using the modified market model. We include control variables: market capitalization (SIZE), log firm age (AGE), financial leverage (LEV), market-to-book equity ratio (MB), return on equity (ROE), equity risk (RISK), board independence (BINDEP), board size (BSIZE) and board gender diversity (GDIV). The detailed definition of the variables is provided in the Appendix C. Standard errors reported in parentheses are clustered at the firm level. Industry and year effects are controlled for by including dummies. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	FIRM-SPECIFIC RISK				
	(1)	(2)	(3)	(4)	(5)
$\overline{COMPETE}$	0.493*				0.657**
	(0.258)				(0.271)
$\overline{CONTROL}$		-0.337			-0.18
		(0.503)			(0.512)
$\overline{CREATE}$			-0.623***		-0.580***
			(0.145)		(0.185)
$\overline{COLLABORATE}$				2.689*	2.790*
				(1.415)	(1.602)
Intercept	5.550***	3.973***	3.921***	0.051	3.932
	(1.210)	(1.033)	(0.167)	(1.683)	(2.683)
Industry	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Observations	7,546	5,619	9,946	7,546	5,619
R-squared	0.306	0.326	0.371	0.306	0.332

Panel D: CEO Turnover and Corporate Culture

This table reports the results of Firm-risk on corporate culture around the CEO turnover. Firm-specific risk (FIRM-SPECIFIC RISK) is measured as firm-risk following Campbell et al. (2014). CREATE, COMPETE, CONTROL, and COLLABORATION are culture types based on CVF framework. TURNOVER is dummy variable if CEO changed in that firm-year; otherwise 0. We include control variables: market capitalization (SIZE), log firm age (AGE), financial leverage (LEV), market-to-book equity ratio (MB), return on equity (ROE), equity risk (RISK), board independence (BINDEP), board size (BSIZE) and board gender diversity (GDIV). The detailed definition of the variables are provided in variable section. Standard errors reported in parentheses are clustered at the firm level. Industry and year effects are controlled for by including dummies. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	FIRM-SPECIFIC RISK	*FIRM-SPECIFIC RISK*	*FIRM-SPECIFIC RISK*	*FIRM-SPECIFIC RISK*
TURNOVER	0.004	-0.268***	-0.244***	-0.136***
	(0.045)	(0.051)	(0.071)	(0.037)
COLLABORATE	-0.018			
	(0.014)			
TURNOVER X COLLABORATE	0.000			
	(0.041)			
COMPETE		0.232***		
		(0.015)		
TURNOVER X COMPETE		0.068***		
		(0.013)		
CONTROL			0.108***	
			(0.014)	
TURNOVER X CONTROL			0.096***	
			(0.028)	
CREATE				0.191***
				(0.014)
TURNOVER X CREATE				0.119***
				(0.033)
SIZE	-0.007	-0.005	-0.007	-0.008
	(0.007)	(0.007)	(0.007)	(0.007)
AGE	-0.081***	-0.066***	-0.083***	-0.071***
	(0.014)	(0.013)	(0.014)	(0.014)
LEV	-0.472***	-0.389***	-0.423***	-0.447***
	(0.052)	(0.049)	(0.050)	(0.048)
MB	0.039***	0.033***	0.040***	0.026***
	(0.008)	(0.007)	(0.008)	(0.007)
ROE	-0.100***	-0.087***	-0.102***	-0.085***
	(0.020)	(0.019)	(0.020)	(0.018)
RISK	0.298***	0.271***	0.354***	0.167*
	(0.101)	(0.095)	(0.100)	(0.098)
BINDEP	0.339***	0.295***	0.291***	0.306***
	(0.049)	(0.046)	(0.048)	(0.047)
BSIZE	-0.020***	-0.016***	-0.018***	-0.018***
	(0.004)	(0.004)	(0.004)	(0.004)
GDIV	-0.105	-0.083	-0.108	-0.145*
	(0.085)	(0.078)	(0.083)	(0.080)
EINDEX	-0.009	-0.009*	-0.011**	-0.008
	(0.006)	(0.005)	(0.005)	(0.005)
Constant	1.647***	1.456***	1.603***	1.565***
	(0.066)	(0.060)	(0.063)	(0.062)
Inudstry	Yes	Yes	Yes	Yes
Observations	11,083	11,083	11,083	11,083
R-squared	0.296	0.353	0.310	0.336

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Table 6 : External Validity of Constructs

Panel A: Validation of Corporate Culture Constructs

This table shows the regression results of CVF culture constructs on Li et al. (2020) culture constructs. COMPETE, COLLABORATE, CONTROL, CREATE are four culture variables constructed based on CVF framework. Innovation, Respect, Integrity, Team Work, and Quality are culture variables based on Li et al. (2020) computed by topic modeling algorithm. To control for firm and time unobservables, firm and year fixed effects are used. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
VARIABLES	*COMPETE*	*COLLABORATE*	*CONTROL*	*CREATE*
Innovation	0.160***	0.026**	0.067***	0.103***
	(0.026)	(0.010)	(0.016)	(0.012)
Respect	0.018	0.055***	-0.013	0.036***
	(0.024)	(0.010)	(0.014)	(0.010)
Integrity	-0.018	0.016***	0.034***	0.004
	(0.014)	(0.006)	(0.009)	(0.006)
Team Work	-0.006	0.130***	-0.035	0.076***
	(0.057)	(0.027)	(0.027)	(0.020)
Quality	0.106***	0.007	0.003	-0.019
	(0.024)	(0.013)	(0.015)	(0.012)
Constant	3.910***	0.998***	2.516***	1.036***
	(0.032)	(0.015)	(0.020)	(0.014)
Observations	11,717	11,717	11,717	11,717
R-squared	0.844	0.767	0.777	0.829
Firm	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes

Panel B: Validation of Firm-Specific Risk Construct

This table shows the regression results of firm-specific risk on culture constructs. COMPETE, COLLAB-ORATE, CONTROL, CREATE are four culture variables constructed based on CVF. FIRM-SPECIFIC RISK is a firm risk measure based on Campbell et al. (2014).Control variables are market capitalization (SIZE), log firm age (AGE), financial leverage (LEV), market-to-book equity ratio (MB), return on equity (ROE), equity risk (RISK), board independence (BINDEP), board size (BSIZE), board gender diversity (GDIV) and the entrenchment index (EINDEX). ME is in million USD. The detailed definition of the variables is provided in the variable definition section. Standard errors reported in parentheses are clustered at the firm level. Industry and year effects are controlled for by including dummies. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

| | Camphbell et al. (2014) | |
VARIABLES	FIRM-SPECIFIC RISK	FIRM-SPECIFIC RISK
COLLABORATE	-0.049***	-0.043***
	(0.014)	(0.013)
CONTROL	0.040***	0.047***
	(0.010)	(0.010)
COMPETE	0.025***	0.059***
	(0.006)	(0.006)
CREATE	0.283***	0.285***
	(0.013)	(0.013)
SIZE		0.099***
		(0.004)
AGE		-0.091***
		(0.007)
LEV		0.324***
		(0.031)
MB		-0.073***
		(0.005)
ROE		-0.109***
		(0.014)
RISK		1.175***
		(0.092)
BINDEP		0.310***
		(0.035)
BSIZE		0.005*
		(0.003)
GDIV		-0.06
		(0.048)
EINDEX		0.012***
		(0.004)
Constant	5.446***	4.601***
	(0.059)	(0.071)
Observations	11,134	11,134
R-squared	0.253	0.343
Industry	Yes	Yes
Year	Yes	Yes

Table 7 : Robustness Tests

This table reports results of our robustness tests. The dependent variable is firm-specific risk (FIRM-SPECIFIC RISK) whereas the four main independent variables are a collaboration (COLLABORATION), control (CONTROL), compete (COMPETE) and create (CREATE) culture variables. Firm-specific risk (FIRM-SPECIFIC RISK) is measured as log [(1- R2)/ R2] following Gul et al. (2011). R2 is coefficient of determination measured using the modified market model. Columns 1 and 2 examine whether our results are sensitive to alternative estimation approaches. Column 1 uses a generalized least square Random-Effect (GLS RE) model. Column 2 estimates a Fama-MacBeth cross-sectional regression. Column 3 replaces FIRM-SPECIFIC RISK with the estimated R-squared that is not log-transformed. Column 4 clusters standard errors two-way by firm and year. Column 5 excludes crisis years: 2007, 2008 and 2009. Column 6 explicitly controls for the effect of corporate social responsibility (NETCSR) on firm-specific risk. Column 6 examines the impact of informativeness on culture types controlling for systematic risk (Beta). Column 7 examines whether the effect of culture on firm-specific risk exhibit any non-linearity by including the squared terms of the culture variables. Column 8 shows the results controlling for CEO effects i.e controlling for CEO tenure and clustering errors at CEO level. Column 9 shows the results controlling for product market competition. We include control variables: market capitalization (SIZE), log firm age (AGE), financial leverage (LEV), market-to-book equity ratio (MB), return on equity (ROE), equity risk (RISK), board independence (BINDEP), board size (BSIZE) and board gender diversity (GDIV). HHI (Herfindahl-Hirschman Index) is a proxy for product market competition and percentage market share that all companies hold in the given industry The detailed definition of the variables is provided in the variable definition section. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) GLS RE	(2) Fama-MacBeth	(3) R2	(4) Clustered by firm	(5) Excludes 07-09 crisis	(6) Controlling for BETA	(7) Non-linearity	(8) CEO Effects	(9) Product Market Competition
COLLABORATE	-0.02	0.006	0	-0.004	-0.004	-0.011	0.066	-0.016	-0.006
	(0.027)	(0.025)	(0.007)	(0.035)	(0.034)	(0.033)	(0.105)	(0.034)	(0.033)
CONTROL	-0.033*	-0.042*	0.012***	-0.051**	-0.057**	-0.062***	-0.228**	-0.067***	-0.048**
	(0.019)	(0.024)	(0.005)	(0.023)	(0.023)	(0.022)	(0.111)	(0.023)	(0.022)
COMPETE	0.040***	0.058***	-0.012***	0.057***	0.050***	0.064***	0.155**	0.068***	0.059***
	(0.012)	(0.012)	(0.003)	(0.016)	(0.014)	(0.013)	(0.067)	(0.014)	(0.013)
CREATE	-0.038	-0.04	0.004	-0.026	-0.047	-0.011	0.038	-0.017	-0.02
	(0.026)	(0.027)	(0.007)	(0.038)	(0.032)	(0.031)	(0.099)	(0.033)	(0.031)
NETCSR									
COLLABORATE2							-0.022		
							(0.033)		
CONTROL2							0.031		
							(0.019)		
COMPETE2							-0.011		
							(0.007)		
CREATE2							-0.023		
							(0.034)		
BETA						-0.155***		-0.154***	
						(0.015)		(0.015)	
CEO Tenure								0	
								(0.001)	
HHI									0.303**
									(0.153)
Intercept	3.280***	2.628***	-0.191***	3.268***	3.361***	3.378***	3.216***	3.293***	3.220***
	(0.120)	(0.128)	(0.028)	(0.153)	(0.136)	(0.132)	(0.233)	(0.140)	(0.135)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,323	12,323	12,323	12,323	9,764	12,323	12,323	11,639	12,323
R-squared	0.373	0.305	0.377	0.376	0.376	0.376	0.375	0.359	0.375

Table 8: Post-Crisis Subsamples

This table evaluates whether the effect of the culture variables is different before and after 2009. The dependent variable is firm-specific risk (FIRM-SPECIFIC RISK). Firm-specific risk (FIRM-SPECIFIC RISK) is measured as $log[(1 - R2)/R2]$ following Gul et al. (2011). R2 is coefficient of determination measured using the modified market model. The main independent variables are the internally (INTERNAL) - externally-oriented (EXTERNAL) culture variables and collaboration (COLLABORATION), control CONTROL), COMPETE (COMPETE) and create (CREATE) culture variables Post-Crisis is a dummy equal one after 2009 and zero otherwise. (1 Post-Crisis) is one minus Post-Crisis. We interact these dummy variables with the culture variables and perform Chow tests to examine whether their estimated coefficients are significantly different. We include control variables: market capitalization (SIZE), log firm age (AGE), financial leverage (LEV), market-to-book equity ratio (MB), return on equity (ROE), equity risk (RISK), board independence (BINDEP), board size (BSIZE) and board gender diversity (GDIV). Industry and year effects are controlled for by including dummies. The detailed definition of the variables is provided in the variable definition section. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

FIRM-SPECIFIC RISK		
COLLABORATION_(Post Crisis)	-0.033	
	(0.048)	
COLLABORATION _(1 - Post-Crisis)	0.011	[0.394]
	(0.037)	
CONTROL_(Post Crisis)	-0.103***	
	(0.034)	
CONTROL_(1 - Post-Crisis)	-0.03	[0.037]
	(0.025)	
COMPETE_(Post Crisis)	0.048***	
	(0.018)	
COMPETE _(1 - Post-Crisis)	0.061***	[0.455]
	(0.015)	
CREATE_(Post Crisis)	0.06	
	(0.046)	
CREATE_(1 - Post-Crisis)	-0.054*	[0.009]
	(0.032)	
Intercept	3.224***	
	(0.135)	
Industry	Yes	
Year	Yes	
Controls	Yes	
Observations	12,323	
R-squared	0.375	

Table 9: Culture and Misconduct

Panel A: First Stage Regression

This table reports the baseline regression results for the four individual cultural dimensions. The dependent variable is firm-specific risk (FIRM-SPECIFIC RISK. The four main independent variables are the four culture variables: COLLABORATE, CONTROL, COMPETE and CREATE. Firm-specific risk (FIRM-SPECIFIC RISK) is measured as log [(1- R2)/ R2] following Gul et al. (2011). R2 is the coefficient of determination from the modified market model regression. Control variables are market capitalization (SIZE), log firm age (AGE), financial leverage (LEV), market-to-book equity ratio (MB), return on equity (ROE), equity risk (RISK), board independence (BINDEP), board size (BSIZE), board gender diversity (GDIV) and the entrenchment index (EINDEX). ME is in million USD. The detailed definition of the variables is provided in the variable definition section. Standard errors reported in parentheses are clustered at the firm level. Industry and year effects are controlled for by including dummies. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
VARIABLES	FIRM-SPECIFIC RISK	FIRM-SPECIFIC RISK	FIRM-SPECIFIC RISK	FIRM-SPECIFIC RISK
COLLABORATE	0.011			
	(0.037)			
COMPETE		0.053***		
		(0.014)		
CONTROL			-0.041*	
			(0.023)	
CREATE				-0.018
				(0.033)
SIZE	-0.296***	-0.294***	-0.296***	-0.296***
	(0.010)	(0.010)	(0.010)	(0.010)
AGE	-0.139***	-0.132***	-0.139***	-0.140***
	(0.021)	(0.021)	(0.021)	(0.021)
LEV	0.044	0.070	0.028	0.042
	(0.069)	(0.069)	(0.069)	(0.069)
MB	0.093***	0.089***	0.093***	0.095***
	(0.011)	(0.011)	(0.011)	(0.011)
ROE	-0.011	-0.007	-0.010	-0.013
	(0.028)	(0.028)	(0.028)	(0.028)
RISK	-1.005***	-1.019***	-1.018***	-0.987***
	(0.188)	(0.188)	(0.187)	(0.189)
BINDEP	-0.151**	-0.147**	-0.139*	-0.148**
	(0.072)	(0.072)	(0.072)	(0.072)
BSIZE	0.016***	0.017***	0.016***	0.016***
	(0.006)	(0.006)	(0.006)	(0.006)
GDIV	0.519***	0.537***	0.514***	0.527***
	(0.116)	(0.115)	(0.116)	(0.117)
EINDEX	0.002	0.002	0.002	0.002
	(0.010)	(0.010)	(0.010)	(0.010)
Constant	3.361***	3.145***	3.462***	3.392***
	(0.115)	(0.119)	(0.115)	(0.110)
Observations	12,323	12,323	12,323	12,323
R-squared	0.373	0.375	0.374	0.373
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes

Panel B: Second Stage Regression

This table evaluates the impact of culture on misconduct activities by affecting the firm-specific risk. Earnings management (EM) is absolute value of residual from regression of change in working capital on past, present, and future value of cash flow from operations, revenue, and PPE. RES is number of restatments. Fraud is a dummy variable which takes value 1 (zero otherwise) if the firm has experienced one of following three events in a year class action lawsuit, misstated earnings as per SECs Accounting and Auditing Enforcement Releases (AAER) or earnings restatement which classified as irregularity according to General Accounting Office (GAO) database. $\widehat{COMPETE}$, $\widehat{CREATE}$, $\widehat{CONTROL}$, and $\widehat{COLLABORATE}$ are four culture variables. Control variables are market capitalization (SIZE), log firm age (AGE), financial leverage (LEV), market-to-book equity ratio (MB), return on equity (ROE), equity risk (RISK), board independence (BINDEP), board size (BSIZE), board gender diversity (GDIV) and the entrenchment index (EINDEX). ME is in million USD. The detailed definition of the variables is provided in the variable definition section. Standard errors reported in parentheses are clustered at the firm level. Industry and year effects are controlled for by including dummies. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

VARIABLES	(1) EM	(2) EM	(3) EM	(4) EM	(5) RES	(6) RES	(7) RES	(8) RES	(9) FRAUD	(10) FRAUD	(11) FRAUD	(12) FRAUD
$\widehat{COLLABORATE}$	-0.058 (0.119)				-0.052 (0.628)				-9.297 (17.812)			
$\widehat{COMPETE}$		0.026*** (0.010)				0.057* (0.034)				1.517* (0.913)		
$\widehat{CONTROL}$			0.010 (0.022)				-0.001 (0.129)				-1.667 (3.868)	
$\widehat{CREATE}$				-0.177*** (0.066)				-0.222 (0.341)				-13.333 (9.190)
Constant	0.251 (0.404)	-0.032 (0.034)	0.022 (0.073)	0.655*** (0.222)	0.240 (2.120)	-0.129 (0.118)	0.065 (0.436)	0.811 (1.154)	26.945 (60.124)	-9.557*** (3.142)	1.191 (13.111)	40.562 (31.022)
Observations	10,899	10,899	10,899	10,899	12,323	12,323	12,323	12,323	12,323	12,323	12,323	12,323
R-squared/Psuedo R-squared	0.131	0.132	0.131	0.132	0.024	0.024	0.024	0.024	0.0396	0.0396	0.0396	0.0403
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Variable Definition

Variables	Definition	Source
Firm Risk variables:		
Firm-Specific Risk	Log-transformed idiosyncratic volatility.	CRSP
R^2	The estimated R-squared from an expanded market model using weekly returns within a given fiscal year.	CRSP
Restatements	Number of adverse restatements enforced by SEC.	Audit Analytics
Earnings Management (EM)	Discretionary accrual measure following Dechow and Dichev (2002)	Compustat
Fraud	A dummy variable which takes value 1 (zero otherwise) if the firm has experienced one of following three events in a year class action lawsuit, misstated earnings as per SECs Accounting and Auditing Enforcement Releases (AAER) or earnings restatement which classified as irregularity according to General Accounting Office (GAO) database	GAO database, Stanford database, Audit Analytics
Corporate culture variables:		
Internal	The first principal component of the two internal-oriented culture types, namely Collaborates and Control. The principal component analysis is performed annually.	
External	The first principal component of the two external-oriented culture, namely Competition and Create. The principal component analysis is performed annually.	
Collaborate	Collaborate-oriented culture estimate obtained using text analysis of 10-K report.	SEC 10-K reports
Control	Control-oriented culture estimate obtained using text analysis of 10-K report.	SEC 10-K reports
Competition	Competition-oriented culture estimate obtained using text analysis of 10-K report.	SEC 10-K reports
Create	Create-oriented culture estimate obtained using text analysis of 10-K report.	SEC 10-K reports
Firm characteristics:		
ME	Market capitalization computed as the product of stock prices and the number of shares outstanding. It is in Million USD.	Compustat
SIZE	Natural log of ME.	Compustat
AGE	Log of firm age. The firm age is measured in years.	Compustat
LEV	Financial leverage, computed as the sum of long-term and short-term debt, all divided by total assets.	Compustat
MB	The ratio of market capitalization to total book equity.	Compustat
ROE	Return on equity computed as the income before extraordinary items divided by total book equity.	Compustat
EARNINGS	Earnings divided by total assets.	
RISK	Firm risk as proxies by the monthly stock return volatilities, estimated over the 12 months in each fiscal year.	CRSP
Board, governance and other variables		
BINDEP	Board independence computed as the number of independent directors divided by board size.	RiskMetrics
BSIZE	Board size, defined as the total number of board of directors.	RiskMetrics
GDIV	Board gender diversity computed as the number of female directors divided by board size.	RiskMetrics
EINDEX	An index, defined by Bebchuk et al. (2009) based on six antitakeover provisions. The six provisions include staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments. The index counts the number of an antitakeover provision in place.	Bebchuk et al. (2009)
		and RiskMetrics
NETCSR	A firms corporate social responsibility net ratings. It is measured as the relative difference between all strengths and concerns in the MSCI KLD database. The relative difference is computed as the number of all strength indicators reported by a firm divided by the total number of strength indicators in KLD minus the number of all concerns reported by a firm divided by the total number of concerns in KLD.	MSCI KLD
BETA	A measure for the systematic risk. It is calculated by using the CAPM model.	CRSP
CEO Tenure	It is measured as difference in the years when CEO joined the firm and when CEO left the firm.	RiskMetrics