Managerial Ability, CEO Overconfidence, and Firm Value

Sebahattin Demirkan
Manhattan College
sdemirkan01@manhattan.edu

Irem Demirkan
Loyola University Maryland
idemirkan@loyola.edu

Tuba Toksoz
Koc University, Istanbul, Turkey
ttoksoz@ku.edu.tr

January 2023

Managerial Ability, CEO Overconfidence, and Firm Value

Research summary: This study examines whether CEO overconfidence affects the relationship between the managerial ability and firm value. Using a sample of firms listed on the NYSE, AMEX, and NASDAQ exchanges from 1980–2019, we find that CEO overconfidence impairs the managerial ability-firm value relation. That is, benefits of able managers for firm value are diminished when firms are run by overconfident CEOs. In addition, the joint negative effect of CEO overconfidence and managerial ability on firm value is stronger for firms with more free cash flow and with less information asymmetry. Our results further indicate that high information asymmetry weakens the damage of CEO overconfidence on the managerial ability-firm value relation only when the firm does not have internal funds to support its projects. The study contributes to the literature on the impacts of cognitive biases on decision making by the top management team and firm performance.

Managerial summary: Conventional wisdom and research support that CEO characteristics strongly impact firm performance. Accordingly, researchers advise practitioners and firm board of directors to choose CEOs by considering not only their managerial abilities but also their certain characteristics. In this paper we focus on the CEO overconfidence as an important trait for CEOs and look into how firm value is impacted when a CEO, who has demonstrated managerial competencies but who are also overconfident. We find that overconfident CEOs impair the relationship between managerial ability and firm performance. Accordingly, the results of our study caution boards of directors in hiring "able" but also "overconfident" CEOs, since this particular mix of traits can derail future performance of the firm.

Key Words: Managerial Ability; CEO Overconfidence; Cognitive Bias; Corporate Governance; Firm Performance, Tobin's Q

1. INTRODUCTION

Building on the insights from the upper echelons theory, this paper examines the impact of cognitive biases on managerial decision making and firm performance. Specifically, we investigate the effect of managerial ability on firm value in the presence of an important Chief Executive Officer (CEO) characteristic: managerial overconfidence. Prior research shows both theoretically and empirically that top managers, in particular the CEOs, affect the way firms behave and perform (Hambrick and Mason 1984; Bertrand and Schoar 2003). CEOs make strategic decisions that impacts the organizational health and survival. Decision makers may use heuristics to deal with complex and uncertain environments that would result in suboptimal outcomes (Barnes, 1994: Bazerman, 1998). Even though there is an extensive literature documenting the role of managerial characteristics in various corporate policies and strategic decisions, they cover each managerial characteristic one at a time. Our study fills this void by integrating CEO overconfidence and managerial ability in the context of firm performance, in particular the firm value. More specifically, we investigate whether CEOs who have demonstrated managerial capabilities and who are also overconfident creates future firm value, compared to their able but non-overconfident counterparts.

Prior studies consider managerial ability, an important managerial characteristic, to be beneficial to the firm. They document that managerial ability is an important source of value creation for the firm and they define firm success in various measures. For example, Holcomb, Holmes, and Connelly (2009) showed that differences in managerial ability may impact their way of managing resources and such differences may be the reasons for why some firms create more value than others. Regarding firm value, Demerjian et al. (2013) showed that managerial ability is associated with higher earnings quality while Baik et al. (2020) demonstrated that able managers can show increase in earnings and have better stock price informativeness. Managerial ability, can also be associated with better returns in merger and acquisitions (Doukas and Zhang 2020) and

even impact the innovative success (Chen et al. 2015) of the firm and the future performance (Demerjian et al., 2012).

Managerial ability, however, can also be a source for disputable information about the firm in that some able managers also may demonstrate greater tax avoidance (Koester et al. 2017), more likely to obfuscate information in annual reports (Xu et al. 2022), can meddle with the accuracy of management earnings forecast and impact the useful information contained in those forecasts (Baik et al. 2011).

While existing studies further our understanding of the relationship between managerial ability and firm performance in various measures and the information environment of the firm, there is still a debate and another stream of research that focuses on the effect of managerial characteristics and attitudes on the firm. One such attitude that is discussed in the literature is that of the CEO overconfidence (also known as overconfidence bias). On the one hand, some studies focus on positive effects of CEO overconfidence by documenting an increase in innovation activities as well as success in these activities by firms with overconfident CEOs (Galasso and Simcoe, 2011 and Hirshleifer et al., 2012). On the other, many studies have provided evidence in favor of negative effects of CEO overconfidence such as value destroying merger and acquisition activities (Malmendier and Tate 2008), under investments when external financing is needed for a positive net present value projects (Heaton 2002), overinvestments (Malmendier and Tate 2005; Ben-David et al. 2013) when projects can be financed internally, less use of external finance ((Malmendier and Tate 2011), higher risk taking tendencies (Goel and Thakor 2008; Niu 2010), less likely to big-bath after managerial change (Pierck, 2021),and financial misreporting (Schrand and Zechman 2012) to cite a few. Since the effects of CEO overconfidence have shown mixed results, i.e. there is both a positive and negative side to CEO overconfidence, it remains an open and interesting question to investigate how CEO overconfidence impacts the firm performance in the presence of high managerial abilities. In other words, we ask the question of what happens to

firm performance when the firm is run by a CEO who is both overconfident and is a competent manager.

To test the joint effect of CEO overconfidence and managerial ability on firm performance we use a sample of firms listed on the NYSE, AMEX, and NASDAQ exchanges from 1980–2019. Our data includes a final sample of 140,542 firm year observations for the period 1980-2019. Firm performance is measured by considering the future firm value measured by Tobins'Q. The primary test involves regression of firm value on one year lagged measures of managerial ability, CEO overconfidence, interaction between over confidence and ability and firm-level control variables (i.e., leverage, return-on-assets, capital expenditures, size, property plant and equipment, firm age, sales growth, cash holdings and research and development expenditures). Our model also employs firm and year fixed effects to control for unobserved firm specific factors and macroeconomic conditions. We capture managerial ability through the measure developed by Demerjian et al. (2012). Since it is not possible to observe managerial capability directly, they estimate the portion of efficiency in sales generation from available resources that is attributable to managers. We construct two measures of CEO Overconfidence following Schrand and Zechman (2012) using firm level Compustat data which enables us to perform our analysis on a larger sample. Specifically, these firm specific time variant overconfidence measures include the following variables: excess investment, debt to equity ratio, net acquisitions, risky debt and dividend yield. In our large sample, in terms of direct effects, we find a positive and significant association between managerial ability and future firm value, whereas we find a negative and significant association between CEO overconfidence and the future value of the firm. Our results further show that the positive association between managerial ability and future firm value is significantly reduced if the firms are run by overconfident CEOs. This particular result suggests that able managers who are also overconfident improves firm value less compared to their non-

overconfident counterparts. In other words, CEO overconfidence significantly attenuates the positive impact of managerial ability on firm value.

We next examine under what conditions CEO overconfidence moderate (attenuate) the value added to the firm by able managers. Prior literature about the effect of managerial overconfidence reveals that overconfident managers who overestimate the return on their projects prefer to finance their projects with their own capital since they find external financing costly due to their belief that market undervalues their projects. Thus, overconfident CEOs are less likely to engage in value destroying projects when they must raise external capital. Validating these findings, we show that the marginal damage of CEO overconfidence on positive association between the managerial ability and firm value is less severe for firms facing internal financial constraints. Then we investigate the role of information asymmetry in the interplay of firm value, managerial ability and managerial overconfidence. Several studies show information asymmetry increases both cost of equity and debt while the sensitivity of cost of debt to information asymmetry is less. hence, high information asymmetry makes overconfident managers more reluctant to fund their projects with external capital which in turn will reduce investment distortions. We find that the negative effect of CEO overconfidence on the positive ability and firm value relationship is weaker for firms with high information asymmetry. We further investigate whether high information asymmetry, leading to high external financial costs alleviates the detrimental effect of overconfidence on the positive relation between managerial ability and subsequent firm value when the firm needs external funding to support the investments. Our results suggest that CEO overconfidence in the firms with high information asymmetry impairs the managerial ability-firm value relation less in the nonexistence of free cash flows.

This study contributes to the literature in several ways. Our study supports the prior research on the managerial traits viewed to be associated with corporate strategic decisions, policies and outcomes. However, these studies focus on a single managerial trait, and we extend

them by analyzing how the relationship between managerial ability and future firm value is affected when more able manager is also overconfident. We show that the detrimental effect of CEO overconfidence interferes with the positive effect of managerial ability leading to a joint negative effect on subsequent firm value. We also contribute to the extant literature and the grand question about the determinants of firm value by showing that managerial traits have implications for firm value. Tobin's Q displays how much value generated by the firm including the management performance in value creation and investment/growth opportunities provided by the management (Daines 2001; Servaes and Tamayo 2003; Buchanan et al. 2018). We address a way of improving firm value by providing evidence that different managerial traits affect firm value in opposite directions.

The remainder of the paper is organized as follows. Section 2 discusses the related literature on CEO overconfidence and managerial ability respectively, while Section 3 focused on hypothesis development. In Section 4, we describe our data, research design, and the empirical analyses. Sections 5 presents the results and Section 6 provides the conclusion.

2. MANAGERIAL ABILITY AND CEO OVERCONFIDENCE IN RELATION TO FIRM VALUE

The upper echelons theory (Hambrick and Mason, 1984; Hambrick, 2007) suggests that firm executives make decisions based on their personalized interpretations of situations and on their heuristics and that these "personalizations" are a function of the executives' experiences, trait, and characteristics. Hambrick (2007), as a part of the upper echelons theory also suggests that in considering these characteristics, experiences, and traits, in order to see the whole picture, we also need to consider the cognitive biases these executives may exhibit. Doing so can give us a more holistic perspective on why executives make certain decisions the way they make. Our literature review based on strategic management, finance, and accounting literatures has revealed

that top executive's ability (competence) and CEO overconfidence are important traits of CEOs that are closely followed and traded on by the research and markets, in practice.

2.1.CEO Overconfidence

Overconfidence is a specific managerial characteristic, and a cognitive bias, that stems from CEOs tendency to overestimate their own abilities (Lee, Hwang, and Chen, 2017) and the predicted outcome of their decisions (Russo and Schoemaker, 1992). CEO overconfidence may impact a company's financial decisions and firm performance. They also interpret the information about the financial performance of their company more optimistically than their non-overconfident counterparts (Schumacher, Keck, and Tang, 2020). Interestingly, overconfident CEOs are also more nonresponsive to corrective feedback when mistakes happen. Chen, Crossland, and Luo (2015) show evidence that firms led by overconfident CEOs are less responsive to corrective feedback in improving management forecast accuracy, hence correcting errors based on their decision making. Overconfident CEOs also predict future impact of their decision with an unjustifiable degree of certainty[1]. For example, an overconfident CEO overestimates future cash flow and companies with overconfident CEOs (and overconfident CFOs) are more likely to engage in tax-avoidance activities (Hsieh, Wang, and Demirkan, 2018). As a result of these cognitive biases in the form of overestimation, overconfident CEOs are more likely to view that it is costly if their firm using external financing, they prefer to use cash or less risky debt. Therefore, they are less likely issue equity to public markets. On the other hand, some biased managers have believed that their decisions are value-maximizing of firms.

However, from the board of directors' degree, the board do not desire bias-driven policies. So, some boards will have policies to constrain the overconfident CEOs. Since CEO overconfidence may be detrimental for firm performance, some scholars looked into mechanisms that could potentially restraint the overconfidence bias. One such mitigating mechanism is that of

[1] This is labeled as "miscalibration" effect, by Chen et al. (2015)

accounting conservatism. For example, Hsu, Novoselov, and Wang (2017) report that firms with conservative accounting practices and are run by overconfident CEOs exhibit better performance, measured by cash flow performance. In addition, they reported that overconfident executives are more willing to start promising investments and resolve midlife problems but tend to delay responding to bad news when work on the project hits a snag. But for delaying the acknowledgment of bad news will cause missing the value of exploration from the failure experience. Moreover, overconfident CEOs are less likely to invest effort in solving emergent problems because of their underestimation. Therefore, accounting conservatism and CEO overconfidence have joint positive impacts on firm performance.

Overall, the research has shown that while an overconfident CEO can bring some advantages to firms, as discussed above this overconfidence bias follow with the shortcoming as well. On average the CEO overconfidence bias does more harm to the firms than they do good. However, we will have more policies and tools that can help overconfident CEOs avoid shortcomings and maximize the firm value if scholars keep doing research on mitigation of shortcomings of overconfident CEO.

2.2.Managerial Ability

Penrose, in her seminal 1959 article suggested that the experience of management will impact how a firm conducts its operations. Specifically, she discusses how managers' experience with their firm produces firm-specific knowledge that provide opportunities for their firm. This perspective of managerial ability can be a source of competitive advantage for the firm. The literature today widely accepts that managerial ability is a significant source of value creation by the firm in that some companies consider managerial ability is conducive to operating a firm as corporate asset. Following Holcomb et al., (2009, pp.459), we define managerial ability as "the knowledge, skills, and experience that reside with and utilized by managers". Murphy and Zabojnik (2007) and Custodio, Ferreira, and Matos (2013) state that management skills are a

sought-after asset because companies often offer generous compensation packages to attract competent managers from other companies. Many scholars think that a high-able managers will have significant impacts on firms' performance and advancement, such as corporate earning quality, long-term positive development because they can be a source for creating unique productive opportunities for their firms (Penrose, 1959; Kor and Mahoney, 2004). In fact, many studies shows that managerial ability indeed affects firm behavior, profitability, credit rating process, or other operational activities.

Hambrick (2007) explains that in the actual situation, the firm is more willing to have the idiosyncratic importance of top managers since the firm is facing a complex situation. For example. During the global financial crisis of 2007-2009, the requirement of the top managers to make decisions to bail out the company from the crisis was improved. Yung and Nguyen (2020) document that during the financial crisis, companies with high managerial ability are likely to take market share from companies with low managerial ability. On the other hand, Yung and Nguyen (2020) also explained that when the firm is facing a competitive threat, high-ability managers are more willing to increase their research development expense and choose the investment with which they are confident. Nevertheless, some people consider that whether the characteristic of overconfidence of high-ability managers will also have negative impact on the markets share change, capital expense, and value of a company because they are not considered rational managers. The research shows that CEO overconfidence per se is positively related to managerial ability which means that when a high-able manager with a CEO overconfidence characteristic makes decisions, it will not have sensitive effects on the results (Yung et al., 2020).

The managerial ability not only affects operational behavior but also impacts the credit rating process. The existing research about managerial ability and credit risk assessment find that after the CEO replacements if the new CEO has high managerial ability, it will improve the credit rating. On the contrary, the rating worsens if a lower managerial ability CEO replaces the existing

CEO. Because the top managerial ability relatively has the lower variability of future performance, it brings the lower variability. Therefore, the rate agencies will consider that a signal of lower default risk exists when if a firm's CEO has the higher managerial ability (Bonsall et al. 2017).

Moreover, managerial ability has relation with real earnings management (REM). Huang and Sun (2017) have mentioned that the higher-ability managers do not have high frequency to use the activities-based earning management in their research. In addition, they found that high-capacity managers seem to choose accrual-based earnings management or classified transfers instead of REM. Therefore, the more able managers can better reduce the negative impact of REM on future company performance. Overall, compared to low-ability managers, higher-ability managers can give better future firm performance based on the earning management.

Overall, we concur with past research that managerial ability is a significant source of competitive advantage and value creation by the firms.

3. HYPOTHESIS DEVELOPMENT

Researchers from different fields show an interest in managerial traits and their relationship with corporate strategic decisions, policies, and outcomes. The upper echelons theory argues that managers' experiences, values, personalities and other traits shape the performance of the firm (Hambrick and Mason 1984). An emerging strand of this literature studies the role of managerial ability in firm decisions and outcomes. Managerial ability is associated with better financial reporting quality and less earnings management (Demerjian et al. 2013), lower audit fee as a result of lower audit risk (Krishnan and Wang 2015), higher corporate innovative success (Chen et al. 2015), less restatements (Plumlee and Yohn 2010), higher accuracy of management earnings forecasts (Baik et al. 2011), less tax aggressiveness (Francis et al. 2013), income smoothing which is used to convey forward looking information (Baik et al. 2020), a lower likelihood of firm's failure (Leverty and Grace 2012), value relevance of earnings (Francis et al. 2020) and greater corporate social culture commitment which in turn leads to higher post-merger performance

(Doukas and Zhang 2021). Overall, these studies suggest that managers with greater ability affect firm behavior positively and play an important role in the value creation process of the firm.

An earlier strand of this research focuses on overconfidence, a personality trait that can manifest itself through several aspects such as individuals' tendency to assess their capabilities greater than they really are, overestimate the probability of successful outcomes and underestimate the chance of undesirable outcomes occurring (Weinstein 1980; Svenson 1981; Moore and Healy 2008; Campbell et al. 2011; Heaton 2002). Prior literature shows that managerial overconfidence plays a significant role in firm behavior and outcomes. On the one hand Galasso and Simcoe (2011) and Hirshleifer et al. (2012) find a positive association between CEO overconfidence and organizations' innovation activities. On the other hand negative aspects of CEO overconfidence are documented by linking CEO overconfidence with distortions in corporate investment policies; overinvestment (Malmendier and Tate 2005; Ben-David et al. 2013), value destroying merger activities (Malmendier and Tate 2008), less use of external finance ((Malmendier and Tate 2011), financial misreporting (Schrand and Zechman 2012), reduction in dividend payout (Deshmukh et al. 2013), issuing less accurate forecasts (Hilary and Hsu 2011). As a result, there is still no consensus on whether managerial overconfidence is beneficial or detrimental to the firm.

While the abovementioned studies further our understanding both in terms of CEO overconfidence and managerial ability, there is still a gap in the literature how these two interact together. In other words, we are still in the dark about what happens to firm performance when we have CEOs who are overconfident (which is mostly found to be detrimental to firm performance) but also high in their managerial abilities. Here we are not looking for causality but rather state that the preceding discussion does not offer a coherent view on how managerial overconfidence affects the positive managerial ability-firm value relation. Therefore, we propose the following hypothesis:

Hypothesis (H1): CEO overconfidence significantly influences the association between managerial ability and subsequent firm value.

Hypothesized relationship is depicted in Figure 1.

_____ Insert Figure 1 about here_____

4. DATA AND RESEARCH DESIGN

4.1.Data

Our sample consists of firms listed on the NYSE, AMEX, and NASDAQ exchanges that have necessary data to measure our test and control variables. We obtain data from annual Compustat file, the Center for Research in Security Prices (CRSP) file and managerial ability data from Demerjian's website[2]. The intersection of these datasets produces an initial sample of 140,542 firm years from 1980 to 2019. Our subsequent tests require additional variables which reduces the sample size for them. In addition, our tests employing spread and effective spread as the proxy for information asymmetry are conducted over a shorter sample period (1983-2019) because Bid is reported for NASDAQ securities since November1, 1982. All continuous variables are winsorized at the top and bottom 1% to mitigate the effect of outliers.

4.2.Measures

CEO Overconfidence

We follow Schrand and Zechman (2012) to construct two firm specific proxies for CEO Overconfidence (OC). which are combinations of four and five measures of firm-level investing and financing activities. Schrand and Zechman (2012) provide a detailed overview of the construction of these measures and how they capture overconfidence from an executive's other decisions. The assumption of this measure is that "overconfident executives are consistently

[2] https://peterdemerjian.weebly.com/managerialability.html

optimistic across decision contexts" (Schrand and Zechman 2012, 323) and analyzing firm level decisions informs us about the executive's overconfidence. One of the main advantages of these proxies is that they can be constructed for a larger sample compared to other proxies of overconfidence since they only rely on firm level Compustat data[3].

The first measure of CEO overconfidence is Ocfirm4 which equals 1 if the firm meets the requirements of at least 2 of 4 criteria following, 0 otherwise. The first element is XSINVEST_INDADJ, the residual from a regression of the firm's total asset growth as a function of its sales growth less the industry median, greater than zero. It reflects overconfidence since prior literature (Malmandier and Tate 2005; Ben-David et al. 2013) documents overconfident CEOs tend to overestimate the probability of achieving good results from the projects and underestimate the risks associated with them. The second element ACQUIRE_INDADJ, is acquisitions made by the firm as obtained from the statement of cash flows less the median industry amount. If it is greater than zero, it is considered as a sign of overconfidence with the idea being that overconfident CEOs tend to take part in value destroying acquisitions (Malmandier and Tate 2008). DERATIO_INDADJ, total debt scaled by total assets less the median industry amount, is the third element of Ocfirm4. Overconfident CEOs believe that their firms are undervalued, and they are reluctant to use external financing to fund their projects. In the case when they are required to raise external funds, they prefer to issue debt over equity financing (Malmendier et al. 2011; Heaton 2002; Hackbarth 2008). Thus, DERATIO_INDADJ's being greater than zero can be another proxy for overconfidence. Prior literature (Heaton 2002; Ben-David et al. 2013) also documents that overconfident managers are more likely to choose risky debt. As a result, RISKYDT, an indicator variable equal to one if the firm uses either convertible debt or preferred stock is the last element of Ocfirm4. For the second measure of overconfidence,

[3] Variable definitions are also included in Appendix A.

Ocfirm 5, Schrand and Zechman (2012) added a fifth element. DIVYLD is an indicator variable if the firm issued dividends. It is considered as a proxy for overconfidence since Schrand and Zechman (2012) suggest that firms with overconfident CEOs prefer to keep cash to fund projects rather than to distribute them in the form of dividends. OCfirm5 is defined as 1 if the firm meets the requirements of at least 3 of 5 elements, 0 otherwise.

Managerial Ability

We obtain managerial ability scores from Demerjian's website[4]. Demerjian et al. (2012) explains the intuition behind how this score captures revenue generating efficiency of executives in detail. To avoid repetition, we only summarize the construction of this measure here. Demerjian et al. (2012) calculates managerial ability score in two steps. In the first step overall, firm efficiency is estimated using data envelopment analysis (DEA)[5]. DEA solves an optimization problem that maximizes sales revenue by employing seven firm specific inputs (cost of goods sold; selling, general and administrative expenses; property, plant and equipment; operating lease; research and development cost; goodwill; and other intangibles). It defines efficient firms as the ones generating more revenues with these inputs. Firm efficiency scores range from 0 (lowest efficiency) to 1 (highest efficiency). The second step aims to isolate efficiency attributed to managerial ability from efficiency attributed to firm-specific characteristics. To do so, they run a Tobit regression of firm efficiency on six firm characteristics (firm size, firm market share, cash availability, lifecycle, operational complexity, and foreign operations by industry) and include year fixed effects . Managerial ability score is defined as the residual term from this regression. We create an indicator variable (MA) if managerial ability scores from Demerjian et al. (2012) is greater than median score (by industry and year) as our proxy for managerial ability.

[4] https://peterdemerjian.weebly.com/managerialability.html
[5] DEA is a nonlinear optimization program that analyzes inputs used in the generation of outputs to measure the relative unit-specific relative efficiency.

4.3.Research Design

To test our hypothesis, we estimate the following model using OLS regression:

$$\text{Tobin's Q}_{jt} = \beta_1 + \beta_2 OC_{jt-1} + \beta_3 MA_{jt-1} + \beta_4 OC_{jt-1} \times MA_{jt-1} + \sum \beta_i Control_i + v_{jt}, \quad (1)$$

where *j* indexes the firm, *t* indexes the year, and *i* indexes the i^{th} control for $i >= 5$. We cluster the standard errors by firm and account for year and firm fixed effects (Petersen 2009) to remove unobserved heterogeneity across time and any time invariant heterogeneity among firms.

Following prior literature on firm value (Buchanan et al. 2018; Konijn et al. 2011; Black and Kim 2012; Faleye 2007; Servaes and Tamayo 2013), we measure firm value using Tobin's Q. "Different from stock returns, Tobin's Q not only incorporates forward looking market valuation, but also reflects management performance because a high Tobin's Q suggests that managers can generate large market value from per unit of underlying assets" (Buchanan et al. 2018, 74). Our measure of Tobin's Q is commonly used in the literature (Li et al. 2014; Fauver et al. 2017; Fauver and Naranjo 2010; Benson and Davidson 2009; Kalcheva and Lins 2007) and equal to market value of assets (the book value of assets plus the market value of equity less book value of equity) divided by book value of assets.

Following prior literature (Laeven and Levine 2008; Kalcheva and Lins 2007; Buchanan et al. 2018; Fauver et al. 2017; Daines 2001), we include several control variables. All of them are lagged by one year. We measure leverage (Lev) as the ratio of total debt to total assets. Return on assets (ROA) is defined as net income before extraordinary items divided by total assets. Firm size (Size) is natural logarithm of total assets. Capital expenditures (Capex) is the ratio of capital expenditures scaled by total assets. Property plant and equipment (PPE) equals property plant and equipment divided by total assets. We define firm age (Age) as the natural logarithm of number of years of financial data available in Compustat prior to a firm's fiscal year end. Sales growth (Sales_growth) is calculated as sales divided by sales of the prior year minus one. Cash is defined

as cash and short-term investments divided by total assets. Rd is research and development expenditures divided by total assets.

Following Gul (2001), Manry and Nathan (1999), Fauver and Naranjo (2010), McLaughlin et al. (1996), we calculate free cash flow as operating income before depreciation minus interest expense minus income taxes net of the change in deferred tax.

We use three measures of information asymmetry that are commonly used in the literature. First one is Bid-ask spread. Daily Bid_ask spread is calculated as the difference between ask and bid quotes by the midquote. (Glosten 1987). Then we average daily values over the fiscal year. Effective Bid-ask spread is our second measure and is the average of daily values over the fiscal year. We measure daily effective bid-ask spread as two times the absolute value of the difference between the trade execution price and the midquote scaled by the midquote (Chordia et al. 2000). As our third measure of illiquidity , we use Amihud's (2002) measure of market illiquidity (the ratio of absolute stock return to dollar volume), which uses daily CRSP data. Then, we average these daily measures over the fiscal year for each stock and multiply the estimate by 10^6 to facilitate the interpretation of coefficients.

5. RESULTS

5.1.Descriptive Statistics

Table 1 shows descriptive statistics for the variables used in our regression analysis. The mean and median value for Tobin's Q over the period 1980 to 2019 are approximately 1.90 and 1.41 respectively. The firms with overconfident CEOs account for 46.9% (36.7%) of our sample when Ocfirm4 (Ocfirm5) is used as our measure of overconfidence. These percentages are lower than the ones reported by Schrand and Zechman 2012 for the broad sample of firms from 1989 to 2001. The percentage of firms in the sample run by higher ability managers is 49.7%.

_____ Insert Table 1 about here_____

5.2. The Impact of CEO overconfidence on the association between managerial ability and firm value

In Table 2, regression results using equation (1) are reported. Columns 1 and 2 of Table 2 report the results of OLS regressions with *Ocfirm4* and *Ocfirm5* as the measure of CEO overconfidence respectively. In both columns the coefficient on CEO overconfidence is significantly negative at the one percent level. This is consistent with prior research that overconfident CEOs are associated with worse firm performance. The managerial ability variable, *Ability* loads significantly positively at the one percent level in both columns, providing evidence that higher ability managers improve subsequent firm value. Our main variable of interest, the interaction variable *OC*Ability* in both columns is significantly negative at the one percent level, indicating that CEO overconfidence impairs the managerial ability-firm value relation. The magnitude of the coefficients on *OC*, *Ability* and *OC*Ability* suggests considerable economic significance. When *Ocfirm4* (*Ocfirm5*) is the overconfidence proxy, the results reveal that able managers who are not overconfident adds 12.1% (11.5%) to the Tobin's Q while overconfident and able managers add only 5.54% (4.61%) to the Tobin's Q. In other words, firms run by able managers experience 6.56% less increase in Tobin's Q when the CEO is at the same time defined as overconfident. Table 2 reports that all the control variables except ROA are significant at the one percent level in both columns. Capex, Sales_growth, Lev, Cash and Rd load significantly positively. In addition, the coefficients on Size, PP&E and Age are significantly negative, consistent with prior research. Graph 1 shows the interaction effect of CEO overconfidence on the relationship between managerial ability and firm value; the existence of overconfident CEO clearly downgrades the impact of managerial ability on firm value.

_____ Insert Table 2 about here_____

_____ Insert Graph 1 about here_____

We take one step further to exploit the cross-sectional variation in the availability of internal funds (the level of free cash flows) and the information environment in the next two subsections. We also conduct an additional test to provide empirical evidence on whether the role of availability of internal funds in shaping the impact of CEO overconfidence on the relation between managerial ability and firm value is conditional on information asymmetry.

5.3.Cross sectional variation in the joint effect of CEO overconfidence and managerial ability on firm value: free cash flow

Prior literature (Malmendier and Tate, 2005; Malmendier and Tate, 2008; Malmendier et al., 2011; Brown and Sarma 2007; Hirshleifer et al., 2012; Ben-David et al., 2013) explores how CEO overconfidence affects investment and financing decisions of firms. Many of these studies generally present the tendency of overconfident CEOs to overinvest and engage in higher levels of merger and acquisition activities (which in turn harms firm value) if they have sufficient internal funds and to avoid investment projects if they require external financing. Overconfident CEOs tend to overestimate the prospects of their investments to generate cash flows and earnings and perceive the cost of capital required by debtors and investors to be high (Malmendier et al., 2011) and the value of their investment to be underestimated by the market (Malmendier and Tate, 2005). On the one hand overconfident CEOs are more likely to stay away from overinvestment behavior when they do not have sufficient internal funds. On the other hand, lack of sufficient internal funds may lead to underinvestment problem because positive net present value (NPV) projects that require external financing will be declined by overconfident CEOs. Thus, evaluating the impact of free cash flow on overconfident managers' investment decisions is an empirical question. Based on the above arguments, the availability of free cash flows, depending on how it affects overconfident managers' investment decisions, may amplify or abbreviate the negative impact of CEO overconfidence on managerial ability-firm value relation. To test this question

empirically, we expand Equation (1) to include free cash flow (fcf) as an additional variable along with its interactions with the proxies for managerial ability and CEO overconfidence . Results are reported in Table 3 and the coefficients on three-way interaction on managerial ability, overconfidence and free cash flow are of primary interest. In the first column, where *Ocfirm4* is the overconfidence measure, the coefficient on *Ocfirm4*Ability*Fcf* is significantly negative at 1 % level. In the second column, where *Ocfirm5* is the overconfidence measure, we observe similar results on the three-way interaction term. These results indicate that the negative effect of overconfidence on the relation between managerial ability and firm value becomes stronger with the increase in free cash flow. These results are consistent with the literature depicting the destructive effects of overconfident CEOs fortified by access to internal financing.

_____ Insert Table 3 about here_____

5.4.Cross sectional variation in the joint effect of CEO overconfidence and managerial ability on firm value: information asymmetry

The negative impact of information asymmetry on firm's investments has received a lot of attention in the literature. A common finding is that information asymmetry leads to higher external financing costs. It is also documented by prior literature that overconfident CEOs find external financing costly. Based on these findings, it implies that in the presence of information asymmetry, overconfident CEOs will find external capital even more costly to fund their investments. Thus, we examine whether the impact of CEO overconfidence on the association between managerial ability and firm value varies with the level of information asymmetry. We analyze this question by expanding Equation (1) to include the proxy for information asymmetry as an additional variable along with its interactions with the proxies for managerial ability and CEO overconfidence . Three measures of information asymmetry commonly used in the literature that we use in this study are bid-ask spread, effective bid-ask spread and Amihud's (2002) measure of market illiquidity. They are all explained in the research design section.

_____ Insert Table 4 about here_____

First, second and third pair of columns of Table 4 report the results obtained by using bid-ask spread, effective bid-ask spread and Amihud's (2002) measure of market illiquidity as the proxy for information asymmetry respectively. The first (second) column in each pair employs *Ocfirm4 (Ocfirm5)* as the measure of CEO overconfidence. The coefficient on three-way interaction on managerial ability, overconfidence and information asymmetry, our variable of interest is significantly positive in each pair of columns. Our proxies for information asymmetry reveal similar results suggesting that the positive impact of CEO overconfidence on ability-firm value association is increasing in the level of information asymmetry. This result implies that information asymmetry increases the perceived cost of external financing for overconfident CEOs which in turn leads to a decrease in value destroying investment activities.

5.5. Cross sectional variation in the joint effect of CEO overconfidence and managerial ability on firm value: information asymmetry conditional on the availability of free cash flow

The theoretical model of Cleary et al. 2007 associates the increase in the investment-cash flow sensitivity with the increase in the degree of information asymmetry. Firms with sufficient internal financing do not need to obtain external financing for their investments. Thus, information asymmetry would be less likely to play a part in decreasing the overinvestment behavior if firms with overconfident CEOs have relatively high levels of free cash flows. Based on these arguments, we investigate whether information asymmetry prevents the value destroying impact of overconfident CEOs on the ability-firm value association only when the availability of internal funds is low. For this purpose, we create a binary variable called *Low FCF_High IA* equal to one for firms that have simultaneously low (defined as lower than median score by industry and year) free cash flow and high ((defined as higher than median score by industry and year) information asymmetry and zero otherwise. In this analysis, we re-estimate Equation (1) by adding the binary

variable, *Low FCF_High IA* along with its interactions with the proxies for managerial ability and ceo overconfidence . First, second and third pair of columns of Panel A, Table 5 present the results obtained by three different proxies for information asymmetry: bid-ask spread, effective bid-ask spread and Amihud's (2002) measure of market illiquidity respectively. The first (second) column in each pair employs *Ocfirm4 (Ocfirm5)* as the measure of CEO overconfidence. We observe significantly negative coefficients on three-way interaction on managerial ability, overconfidence and Low *FCF_High IA* at 1% level in each pair of columns. In other words, high information asymmetry in a low free cash flow firm run by an overconfident and a higher ability manager is associated with higher firm value. This result is consistent with the theoretical model discussed above and implies that the information asymmetry in firms run by higher ability managers plays a role in decreasing overinvestment behavior when the firm has low free cash flow impeding value destruction by overconfident CEOs. To check whether high information asymmetry in firms run by higher ability managers prevents value destruction by the overconfident CEOs when the firm has high free cash flow, we repeat the analysis by replacing *Low FCF_High IA* with another binary variable, *High FCF_High IA*, equal to one for firms that have simultaneously high (defined as higher than median score by industry and year) free cash flow and high (defined as higher than median score by industry and year) information asymmetry and zero otherwise. The results are displayed in Panel B, Table 5 where first, second and third pair of columns employ bid-ask spread, effective bid-ask spread and Amihud's (2002) measure of market illiquidity respectively as the proxy for information asymmetry and the first (second) column in each pair employs *Ocfirm4 (Ocfirm5)* as the measure of CEO overconfidence. The insignificant coefficient on *OC*Ability*High FCF_High IA* illustrates that firms facing high information asymmetry do not experience any reduction in the value destructive behavior by overconfident CEOs when they have relatively high free cash flow. This result further suggests that higher external capital costs perceived by overconfident CEOs led by high information asymmetry

attenuates these CEOs' value destructive behavior (such as overinvestment) only in the absence of internal capital for firms with high ability managers.

_____ Insert Table 5 about here_____

6. DISCUSSION AND CONCLUSION

Conventional wisdom and research support that CEO characteristics strongly impact firm performance. Accordingly, researchers advise practitioners and firm board of directors to choose CEOs by considering not only their managerial abilities but also their certain characteristics. In this paper we focus on the CEO overconfidence as an important trait for CEOs and look into how firm value is impacted when a CEO, who has demonstrated managerial competencies but who are also overconfident. From research perspective, CEO overconfidence and managerial ability are two of the managerial characteristics that impact firm performance in various ways, but mostly in different directions. Therefore, in this paper, we address the need to research these two characteristics in a more holistic manner and we examine the impact of CEO overconfidence on the relation between managerial ability and firm value.

CEOs play significant role in determining the strategic decisions of the firm. They collect information from all available resources for them to come up with best possible action plans. Ability plays an important role in evaluating this information and reports accurately, therefore CEO's ability positively related with firm performance. There is an extensive literature about CEO overconfidence, which documents that this trait may hurt the performance of the firm especially stock performance in the long run, because overconfident CEOs overinvest, and they pay less attention to the reports they have rather their personal instincts. By following above arguments, we posit that CEO overconfidence may impact the relationship between managerial ability and firm performance. We show that CEO overconfidence impairs the positive impact of managerial ability on firm value. We address a way of improving firm value by providing evidence that different

managerial traits affect firm value in opposite directions. In other words, overconfident CEOs impair the relationship between managerial ability and firm value.

There is an extensive literature documenting the role of managerial characteristics in various corporate policies and strategic decisions, they cover each managerial characteristic one at a time. Our study takes this stream of research in another level by investigating the impact of CEO overconfidence and managerial ability in the context of firm value. More specifically we investigate whether able managers who are also overconfident creates future firm value, compared to their non-overconfident counterparts. This is an interesting approach to understand why we should understand set of managerial traits when we come up with a conclusion about the future of the business performance and firm's valuation.

We also contribute to the literature on CEO overconfidence and managerial ability interaction by taking a fine-grained approach. We specifically consider the roles of existence internal funds and the information environment of the firm in this relationship and show that CEO overconfidence is more detrimental on the relation between managerial ability and firm value when an overconfident CEO also has access to internal financing. Moreover, in environments where informational asymmetry exists, the perceived cost of external financing for overconfident CEOs leads to a decrease in value destroying investment activities, and external capital costs perceived by overconfident CEOs led by high information asymmetry attenuates the overconfident CEOs value destructive behavior (such as overinvestment) only in the absence of internal capital for firms with high ability managers.

So, our results show that in the existence of able but overconfident CEOs, firms need to strengthen the mechanisms that control the availability of internal funds to the CEO and invest in how these firms should decrease information asymmetry.

7. LIMITATIONS AND FUTURE RESEARCH

Our study is not without limitations. First, we rely on the secondary data sources for the measurement of our constructs. Some scholars have brought up the measurement of the CEO overconfidence construct and the assumptions behind its measurements (Hill et al., 2012). For example finance literature widely relies on the option-based measurement for CEO overconfidence, we did not use this measure because our data did not include longer time periods, While we concur that there is value in discussing various measures for this construct, we relied on one of the most widely used measurements using the secondary, published company data. As a limitation our measure of overconfidence may not fully reflect all aspects of overconfidence. In addition to our measure of overconfidence, future studies can employ other alternative measures of overconfidence constructed using surveys, interviews, and news articles that may reflect a more comprehensive picture of this managerial trait. Second, we also acknowledge that there is still some level of confusion in the literature on whether overconfidence and managerial hubris are synonymous, however we concur with the research that hubris can include social construction and hence is different from overconfidence measures (Hayward, Shephard, and Griffin, 2006). Third, we did not include industry fixed effects in our analyses but included firm fixed effects. Controlling for firm fixed effects also controls for industry effects because industry is time invariant within a firm. In other words, if we added industry fixed effects, the results would not have changed. Firm fixed effects provide more robust specifications as they control for more unobservable factors in addition to industry. However future research may test whether our findings vary from industry to industry using a subsample analysis.

Despite these limitations, our study makes significant contributions to the literature from upper echelons perspective in that we consider two important characteristics for CEOs, namely overconfidence and managerial ability, in a holistic manner and show that these two, when present maybe detrimental for the future value of the firm.

Appendix A
Variable Definitions

Variable	*Description*
Tobin's Q	(Market value of equity + book value of assets - book value of equity)/ book value of assets
Lev	total debt/total assets
ROA	net income before extraordinary items / total assets
Capex	Capital Expenditures /total assets.
Size	Log of total assets
Ppe	property plant and equipment/total assets.
Age	Log of firm age. Firm age is the number of years of financial data available in Compustat prior to a firm's fiscal year end
Sales_growth	(Sales in year t - sales in year t-1)/sales in year t-1
Cash	Cash and Short-Term Investments/total assets
Rd	Research and development expenditures/total assets
Oc	equals 1 if a CEO is identified as an overconfident CEO, 0 otherwise
Ocfirm4	equals 1 if the firm meets the requirements of at least 2 of 4 criteria following, 0 otherwise. 1) XSINVEST_INDADJ greater than zero; 2) ACQUIRE_INDADJ greater than zero; 3) DERATIO_INDADJ greater than zero; and 4) RISKYDT equal to one. XSINVEST_INDADJ is the residual from a regression of the firm's total asset growth as a function of its sales growth less the industry median. ACQUIRE_INDADJ is acquisitions made by the firm as obtained from the statement of cash flows less the median industry amount. DERATIO_INDADJ is total debt scaled by total assets less the median industry amount. RISKYDT is an indicator variable equal to one if the firm uses either convertible debt or preferred stock (Schrand and Zeckman 2012).
Ocfirm5	1 if the firm meets the requirements of at least 3 of 5 criteria, 0 otherwise. 1–4 are the same as for *Ocfirm4* and 5) DIVYLD is equal to zero. DIVYLD is an indicator variable if the firm issued dividends (Schrand and Zeckman 2012).
Ability	Equals 1 if managerial ability scores from Demerjian et al. (2012) is greater than median score (by industry and year) , 0 otherwise
Fcf	Equals 1 if free cash flow is greater than median score (by industry and year), 0 otherwise. Free cash flow: operating income before depreciation - interest expense -income taxes net of the change in deferred tax
Spread	Equals 1 if annual average of daily bid-ask spread over the fiscal year is greater than median score (by industry and year), o otherwise. Daily spread :(Ask−Bid)/Midpoint Midpoint: Bid-Ask Midpoint
Illiquidity	Equals 1 if annual average of Amihud (2002) illiquidity measure is greater than median score (by industry and year), 0 otherwise. Amihud (2002) illiquidity measure: the ratio of absolute stock return to dollar volume (multiplied by 1, 000,000)
Effective Spread	Equals 1 if annual average of daily effective spread over the fiscal year is greater than median score (by industry and year), o otherwise. Daily effective spread: 2*|Price−Midpoint|/Midpoint Midpoint: Bid-Ask Midpoint
Low FCF_High IA	Equals 1 if free cash flow is lower than median score (by industry and year) and information asymmetry proxy is higher than median score (by industry and year) , 0 otherwise
High FCF_High IA	Equals 1 if free cash flow is higher than median score (by industry and year) and information asymmetry proxy is higher than median score (by industry and year) , 0 otherwise

References

Amihud, Y. 2002. Illiquidity and stock returns: cross-section and time-series effects. *Journal of Financial Markets* 5:31–56.

Amihud, Y., and H. Mendelson. 1988. Liquidity and asset prices: Financial management implications. *Financial Management* 1: 5–15.

Baik, B., D.B. Farber, and S. Lee. 2011. CEO ability and management earnings forecasts. *Contemporary Accounting Research* 28(5): 1645–1668.

Baik, B., S.Choi, and D.B. Farber. 2020. Managerial ability and income smoothing. *The Accounting Review* 95 (4): 1–22.

Barnes, J. H. (1984). Cognitive biases and their impact on strategic planning. Strateg. Manag. J. 5, 129–137.

Bazerman, M. H. (1998). *Judgment in Managerial Decision Making*. New York: Wiley.

Bertrand, M., and A. Schoar. 2003. Managing with style: The effect of managers on firm policies. *Quarterly Journal of Economics* 118(4): 1169–1208.

Black, B., and W. Kim. 2012. The effect of board structure on firm value: A multiple identification strategies approach using Korean data. *Journal of Financial Economics* 104: 203-226.

Benson, B. W., and W. I. I. I. Davidson. 2009. Reexamining the managerial ownership effect on firm value. *Journal of Corporate Finance* 15(5): 573–586.

Ben-David, I., J. R. Graham, and C.R. Harvey, 2013. Managerial miscalibration. *Quarterly Journal of Economics* 128: 1547–1584.

Bonsall, S. B., Holzman, E. R., and Miller, B. P. (2017). Managerial ability and credit risk assessment. Management Science, 63(5), 1425–1449.

Buchanan, B., C. X. Cao, and C. Chen. 2018. Corporate social responsibility, firm value, and influential institutional ownership. *Journal of Corporate Finance* 52: 73–95.

Campbell, T. C., M. Galleyer, S.A. Johnson, J. Rutherford, and B. W. Stanley. 2011. CEO Optimism and Forced Turnover. *Journal of Financial Economics* 101: 695–712.

Chen, G., Crossland, C., and Luo, S. (2015). Making the same mistake all over again: CEO overconfidence and corporate resistance to corrective feedback. *Strategic Management Journal*, 36(10), 1513-1535.

Chen, Y., E.J. Podolski, and M. Veeraraghava. 2015b. Does managerial ability facilitate corporate innovative success? *Journal of Empirical Finance* 34: 313–326.

Chordia, T., R. Roll, and A. Subrahmanyam. 2000. Commonality in liquidity. *Journal of Financial Economics* 56: 3–28.

Cleary, S., P. Povel, and M. Raith. 2007. The U-shaped investment curve: Theory and evidence. *Journal of Financial and Quantitative Analysis* 42 (1): 1–40.

Custodio, C., Ferreira, M. A., and Matos, P. (2013). Generalists versus specialists: Lifetime work experience and chief executive officer pay. Journal of Financial Economics, 108(2), 471–492.

Daines, R. 2001. Does Delaware Law Improve Firm Value? *Journal of Financial Economics* 62:559–71.

Demerjian, P., B. Lev, and S. McVay. 2012. Quantifying managerial ability: A new measure and validity tests. *Management Science* 58: 1229–1248.

Demerjian, P., B. Lev, M. F., Lewis, and S. McVay, S. 2013. Managerial ability and earnings quality. *The Accounting Review* 88: 463–498.

Deshmukh, S., A.M. Goel and K.M. Howe, 2013. CEO overconfidence and dividend policy. *Journal of Financial Intermediation* 22, 440-463.

Doukas, J. A., and R. Zhang. 2020. Corporate managerial ability, earnings smoothing, and acquisitions. *Journal of Corporate Finance* 65: 101756.

Doukas, J. A., and R. Zhang. 2021. Managerial ability, corporate social culture, and M&As. *Journal of Corporate Finance* 68: 101942.

Faleye, O. 2007. Classified boards, firm value, and managerial entrenchment. *Journal of Financial Economics* 83: 501–529.

Fauver, L., M. Hung, X. Li, and AG. Taboada. 2017. Board reforms and firm value: worldwide evidence. *Journal of Financial Economics* 125(1):120–142.

Fauver, L., and A. Naranjo. 2010. Derivative usage and firm value: The influence of agency costs and monitoring problems. *Journal of Corporate Finance* 16 (5): 719-735.

Francis, B. B., X. Sun and Q. Wu. 2014. Managerial ability and tax aggressiveness. *Working paper.* Available at SSRN: https://ssrn.com/abstract=2348695.

Francis, B., I. Hasan, and I. Siraj. 2020. Managerial ability and value relevance of earnings. China Accounting and Finance Review, Forthcoming.

Galasso, A., Simcoe, T.S., 2011. CEO overconfidence and innovation. *Management Science* 57;1469–1484.

Glosten, L. R. 1987. Components of the bid–ask spread and the statistical properties of transaction price. *Journal of Finance* 42: 1293–1307.

Goel, A. M. and A. V. Thakor. 2008. Overconfidence, CEO Selection, and Corporate Governance. *Journal of Finance* 63 (6), 2737-2784.

Graham, J.R., C.R. Harvey, and M. Puri, 2013. Managerial attitudes and corporate actions. *Journal of Financial Economics* 109: 103–121.

Gul, F.A. 2001. Free Cash Flow, Debt Monitoring and Managers' LIFO/FIFO Policy Choice. *Journal of Corporate Finance* 13: 475 – 492.

Hackbarth, D. 2008. Managerial traits and capital structure decisions. J*ournal of Financial and Quantitative Analysis* 43 (4): 843–881.

Hambrick, D. C, and P.A. Mason. 1984. Upper echelons: The organization as a reflection of its top managers. *The Academy of Management Review* 9(2): 193-206.

Hambrick, D. C. 2007. Upper echelons theory: An update. *Academy of Management Review* 32(2): 334–343.

Hayward, M. L., Shepherd, D. A., and Griffin, D. (2006). A hubris theory of entrepreneurship. *Management Science*, 52(2), 160-172.

Heaton, J.B. 2002. Managerial optimism and corporate finance. *Financial Management* 31 (2): 33–45.

Hirshleifer, D.A., A. Low, and S.H. Teoh. 2012. Are overconfident CEOs better innovators? *Journal of Finance* 67, 1457–1498.

Hilary, G., Hsu, C., 2011. Endogenous overconfidence in managerial forecasts. *Journal of Accounting and Economics* 51, 300–313.

Holcomb, T. R., Holmes Jr, R. M., and Connelly, B. L. (2009). Making the most of what you have: Managerial ability as a source of resource value creation. *Strategic Management Journal*, 30(5), 457-485.

Hsieh, T. S., Wang, Z., and Demirkan, S. (2018). Overconfidence and tax avoidance: The role of CEO and CFO interaction. *Journal of Accounting and Public Policy*, 37(3), 241-253.

Hsu, C., Novoselov, K. E., and Wang, R. (2017). Does accounting conservatism mitigate the shortcomings of CEOs overconfidence? *The Accounting Review*, 92(6), 77-101. doi:10.2308/accr-51718

Huang, X. S., and Sun, L. (2017). Managerial ability and real earnings management. *Advances in Accounting*, *39*, 91–104. https://doi.org/10.1016/j.adiac.2017.08.003

Kalcheva, I., and K.V. Lins. 2007. International evidence on cash holdings and expected managerial agency problems. *Review of Financial Studies* 20 (4): 1087–1112.

Koester, A., T. Shevlin, and D. Wangerin. 2017. The Role of Managerial Ability in Corporate Tax

Avoidance. *Management Science* 63(10):3285-3310.

Konijn SJJ, R. Kräussl, and A. Lucas. 2011. Blockholder dispersion and firm value. *Journal of Corporate Finance* 17(5):1330–39.

Kor, Y. Y., and Mahoney, J. T. (2004). Edith Penrose's (1959) contributions to the resource-based view of strategic management. *Journal of Management Studies*, 41(1), 183-191.

Krishnan, G., and C. Wang. 2015. The relation between managerial ability and audit fees and going concern opinions. *Auditing: A Journal of Practice & Theory* 34 (3): 139–160.

Laeven, L., and R. Levine. 2008. Complex ownership structures and corporate valuations. *Review of Financial Studies* 21:579–604.

Lee, J. M., Hwang, B. H., and Chen, H. (2017). Are founder CEOs more overconfident than professional CEOs? Evidence from S&P 1500 companies. *Strategic Management Journal*, 38(3), 751-769.

Leverty, T., and M. Grace. 2012. Dupes or incompetents? An examination of management's impact on firm distress. *The Journal of Risk and Insurance* 79 (3): 751–783.

Malmandier, U, and G. Tate, 2005. CEO Overconfidence and Corporate Investment. *The Journal of Finance* 60(6): 2661-2700.

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

Malmendier, U., G. Tate, and J.O.N. Yan, 2011. Overconfidence and early-life experiences: The effect of managerial traits on corporate financial policies. *Journal of Finance* 66: 1687–1733.

Manry, D., and K. Nathan. 1999. Greenmail premia, board composition and management shareholdings. *Journal of Corporate Finance* 5: 369-382.

McLaughlin, R., A. Safieddine, and G. Vasudevan. 1996. The operating performance of seasoned equity issuers: Free cash flow and post-issue performance, *Financial Management* 25 (4): 41-53.

Moore, D.A., and P.J. Heal. 2008. The trouble with overconfidence. *Psychological Review* 115 (2): 502.

Murphy, K. J., & Jan, Z. 2007. Managerial capital and the market for CEOs. SSRN working paper

Niu, Jijun, 2010. The effect of CEO overconfidence on bank risk taking. *Economics Bulletin* 30(4), 3288-3299.

Penrose, E. T. (1959). *The Theory of the Growth of the Firm*. New York: John Wiley

Petersen, M. 2009. Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies* 22 (1): 435-480.

Plumlee, M., and T. Yohn. 2010. An analysis of the underlying causes attributed to restatements. *Accounting Horizons* 24 (1): 41–64.

Russo, J. E., & Schoemaker, P. J. (1992). Managing overconfidence. *Sloan Management Review*, 33(2), 7-17.

Schrand, C., and S. Zechman. 2012.Executive overconfidence and the slippery slope to financial misreporting. *Journal of Accounting and Economics* 53: 311-329.

Schumacher, C., Keck, S., & Tang, W. (2020). Biased interpretation of performance feedback: The role of CEO overconfidence. *Strategic Management Journal*, 41(6), 1139-1165.

Servaes, H., and A. Tamayo. 2013. The impact of corporate social responsibility on firm value: The role of customer awareness. *Management Science* 59: 1045–1061.

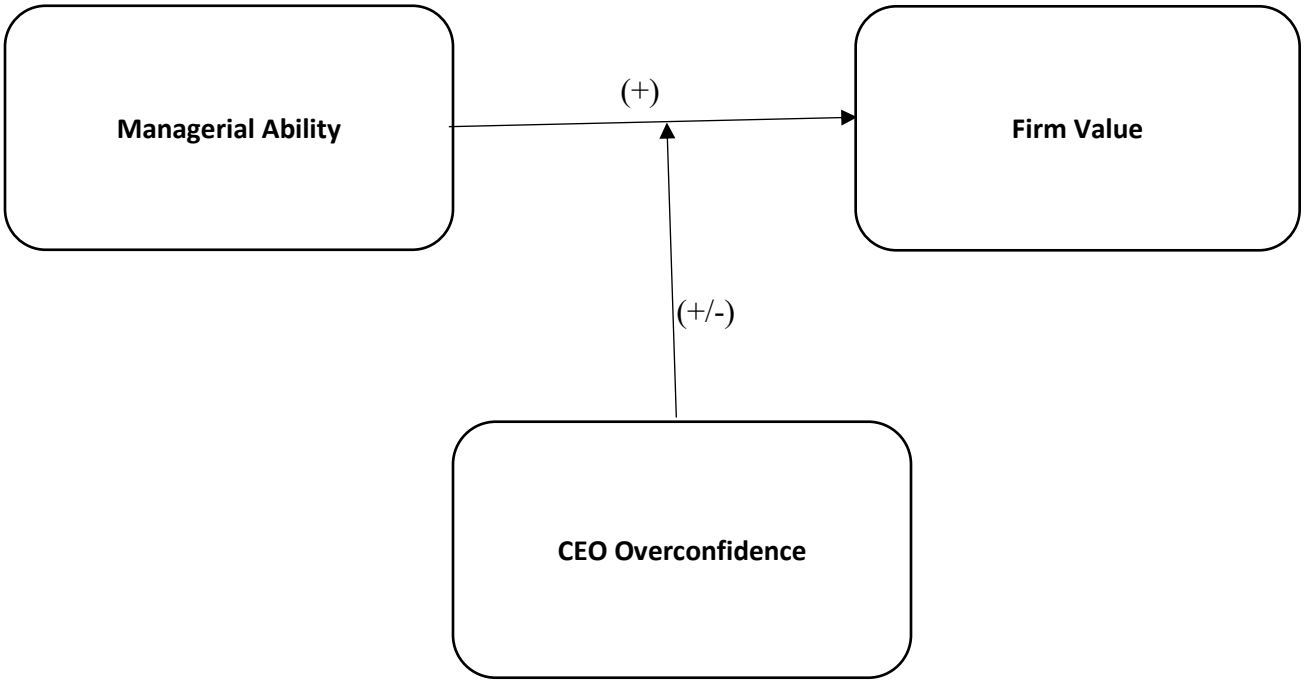
Svenson, Ola, 1981. Are we all less risky and more skillful than our fellow drivers? *Acta Psychologica* 47, 143-148.

Weinstein, N.D., 1980. Unrealistic optimism about future life events. *Journal of Personality and Social Psychology* 39, 806–82.

Xu, H. Dao, M. Wu, J. & Sun, H. 2022. Political corruption and annual report readability: evidence from the United States, *Accounting and Business Research*, 52:2, 166-200.

Yung, K., and T. Nguyen.. 202). Managerial ability, product market competition, and firm behavior. *International Review of Economics & Finance* 70: 102–116. https://doi.org/10.1016/j.iref.2020.06.027

Figure 1- Hypothesized Relationship



Graph 1- Moderating effect of CEO overconfidence on the relationship between managerial ability and firm value

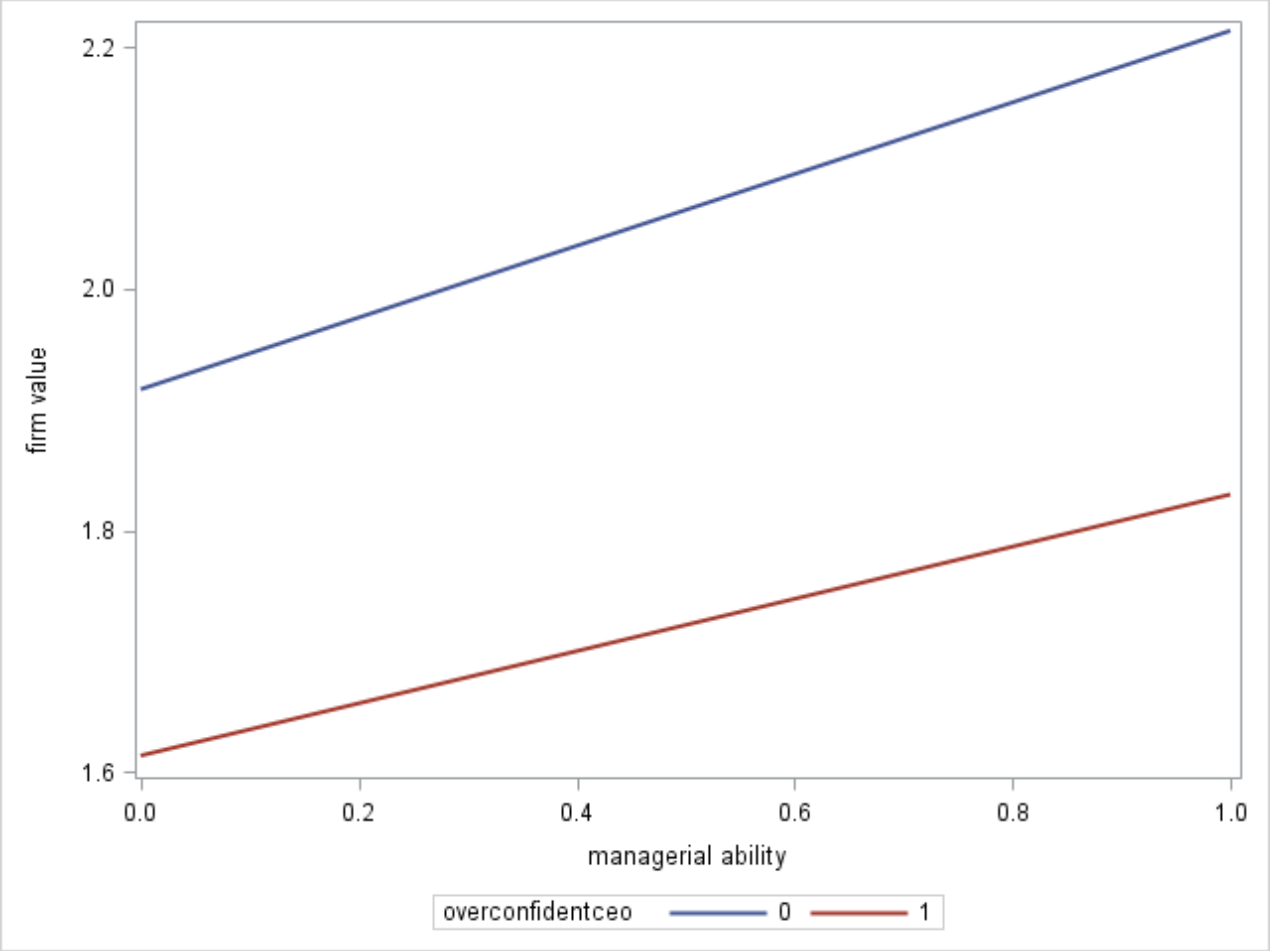


Table 1: Descriptive Statistics

Variables	N	Mean	Median	Std Dev	Q1	Q3
Tobin's Q	140,542	1.904	1.408	1.494	1.060	2.114
Lev	140,542	0.231	0.198	0.210	0.040	0.359
ROA	140,542	-0.027	0.033	0.219	-0.035	0.075
Capex	140,542	0.067	0.044	0.073	0.021	0.085
Size	140,542	5.202	5.038	2.271	3.535	6.755
Ppe	140,542	0.532	0.438	0.397	0.222	0.759
Age	140,542	2.390	2.485	0.917	1.792	3.091
Sales_growth	140,542	0.252	0.096	0.742	-0.019	0.271
Cash	140,542	0.177	0.093	0.205	0.028	0.251
Rd	140,542	0.044	0.000	0.086	0.000	0.050
Ocfirm4	140,542	0.469	0.000	0.499	0.000	1.000
Ocfirm5	140,542	0.367	0.000	0.482	0.000	1.000
Ability	140,542	0.497	0.000	0.500	0.000	1.000
Fcf	140,537	0.497	0.000	0.500	0.000	1.000
Spread	109,499	0.496	0.000	0.500	0.000	1.000
Illiquidity	136,608	0.497	0.000	0.500	0.000	1.000
Effective Spread	109,499	0.496	0.000	0.500	0.000	1.000

Notes: Variable definitions are presented in Appendix A.

Table 2: The Impact of CEO overconfidence on the association between managerial ability and firm value

	Ocfirm4 (1)	*Ocfirm5* (2)
Lev	0.32	0.335
	7.23***	7.54***
Roa	0.0246	0.0296
	0.53	0.64
Capex	0.675	0.668
	8.14***	8.08***
Size	-0.314	-0.314
	-24.88***	-25.00***
Ppe	-0.12	-0.123
	-3.44***	-3.52***
Age	-0.196	-0.197
	-11.30***	-11.37***
Sales_growth	0.0805	0.0814
	9.82***	9.92***
Cash	0.781	0.779
	13.79***	13.75***
Rd	2.374	2.373
	11.70***	11.70***
Oc	-0.0421	-0.0595
	-4.18***	-5.78***
Ability	0.121	0.115
	9.63***	10.11***
*Oc*Ability*	-0.0656	-0.0689
	-4.68***	-4.79***
Constant	3.021	3.02
	39.24***	39.27***
Firm FE	Yes	Yes
Year FE	Yes	Yes
Observations	140,542	140,542
Adj. R^2	0.104	0.104

Notes: Dependent variable is Tobin's Q for both models in Equation 1. Columns 1 and 2 of Table 2 report the results of OLS regressions with *Ocfirm4* and *Ocfirm5* as the measure of CEO overconfidence respectively. Standard errors are clustered by firm. *, (**), and [***] denote two-tailed statistical significance at 10%, (5%), and [1%] levels, respectively. All the continuous variables are winsorized at the 1st and 99th percentiles.

Table 3: Cross sectional variation in the joint effect of CEO overconfidence and managerial ability on firm value: free cash flow

	Ocfirm4	*Ocfirm5*
	(1)	(2)
Lev	0.36	0.373
	8.15***	8.44***
Roa	-0.106	-0.1
	-2.27**	-2.14**
Capex	0.601	0.595
	7.27***	7.22***
Size	-0.316	-0.316
	-25.19***	-25.31***
Ppe	-0.107	-0.11
	-3.09***	-3.17***
Age	-0.196	-0.198
	-11.38***	-11.50***
Sales_growth	0.0775	0.0784
	9.44***	9.54***
Cash	0.785	0.783
	13.96***	13.93***
Rd	2.366	2.363
	11.68***	11.67***
Oc	-0.0322	-0.0387
	-2.43**	-2.87***
Ability	0.035	0.0343
	2.10**	2.32**
*Oc*Ability*	-0.0158	-0.0157
	-0.81	-0.8
Fcf	0.124	0.135
	9.08***	11.01***
*Ocfirm4*Fcf*	-0.0227	-0.0533
	-1.36	-3.22***
*Ability*Fcf*	0.127	0.113
	6.20***	6.14***
*Ocfirm4*Ability*Fcf*	-0.0793	-0.0725
	-3.18***	-2.86***
Constant	2.957	2.953
	38.07***	38.12***
Firm FE	Yes	Yes
Year FE	Yes	Yes
Observations	140,537	140,537
Adj. R^2	0.108	0.109

Notes: Dependent variable is Tobin's Q for both models in Equation 1. Columns 1 and 2 report the results of OLS regressions with *Ocfirm4* and *Ocfirm5* as the measure of CEO overconfidence respectively. Standard errors are clustered by firm. *, (**), and [***] denote two-tailed statistical significance at 10%, (5%), and [1%] levels, respectively. All the continuous variables are winsorized at the 1st and 99th percentiles.

Table 4: Cross sectional variation in the joint effect of CEO overconfidence and managerial ability on firm value: information asymmetry

	Spread		*Effective Spread*		*Illiquidity*	
	Ocfirm4	*Ocfirm5*	*Ocfirm4*	*Ocfirm5*	*Ocfirm4*	*Ocfirm5*
	(1)	(2)	(1)	(2)	(1)	(2)
Lev	0.374	0.387	0.372	0.384	0.337	0.352
	7.19***	7.43***	7.14***	7.36***	7.58***	7.89***
Roa	0.185	0.191	0.193	0.198	0.0306	0.0369
	3.82***	3.93***	3.99***	4.09***	0.67	0.81
Capex	0.428	0.431	0.454	0.456	0.597	0.595
	4.34***	4.38***	4.60***	4.63***	7.12***	7.12***
Size	-0.391	-0.39	-0.391	-0.391	-0.341	-0.342
	-25.75***	-25.78***	-25.77***	-25.79***	-26.40***	-26.51***
Ppe	-0.0898	-0.0925	-0.0851	-0.0874	-0.102	-0.105
	-2.19**	-2.26**	-2.07**	-2.13**	-2.94***	-3.02***
Age	-0.138	-0.14	-0.136	-0.137	-0.145	-0.146
	-6.35***	-6.44***	-6.24***	-6.32***	-8.27***	-8.36***
Sales_growth	0.0757	0.0767	0.0759	0.0768	0.0787	0.0798
	8.06***	8.15***	8.07***	8.16***	9.49***	9.62***
Cash	0.757	0.755	0.765	0.764	0.755	0.753
	11.96***	11.94***	12.09***	12.08***	13.36***	13.33***
Rd	2.334	2.332	2.329	2.328	2.369	2.366
	11.26***	11.25***	11.28***	11.27***	11.97***	11.95***
Oc	-0.0489	-0.077	-0.0556	-0.083	-0.0751	-0.0938
	-3.23***	-5.03***	-3.64***	-5.44***	-5.28***	-6.62***
Ability	0.209	0.186	0.195	0.175	0.177	0.165
	10.52***	10.69***	9.76***	9.97***	9.80***	10.45***
*Oc*Ability*	-0.12	-0.103	-0.108	-0.096	-0.0943	-0.0963
	-5.27***	-4.48***	-4.77***	-4.20***	-4.64***	-4.67***
Information Asymmetry	-0.188	-0.192	-0.202	-0.204	-0.191	-0.184
	-9.81***	-10.67***	-10.12***	-10.93***	-10.75***	-11.38***
*Oc*Information Asymmetry*	0.0531	0.0645	0.0691	0.0817	0.0785	0.0747
	2.63***	3.15***	3.39***	4.02***	4.41***	4.18***
*Ability*Information Asymmetry*	-0.18	-0.16	-0.153	-0.138	-0.124	-0.118
	-7.07***	-6.90***	-5.96***	-5.88***	-5.51***	-5.90***
*Oc*Ability*Information Asymmetry*	0.105	0.0943	0.0826	0.079	0.0569	0.0675
	3.45***	3.04***	2.75***	2.59***	2.18**	2.55**
Constant	3.626	3.63	3.629	3.635	2.874	2.867
	22.63***	22.64***	22.69***	22.74***	40.82***	40.85***
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	109,499	109,499	109,499	109,499	136,608	136,608
Adj. R^2	0.114	0.114	0.114	0.114	0.11	0.11

Notes: Columns 1 and 2 report the results of OLS regressions with *Ocfirm4* and *Ocfirm5* as the measure of CEO overconfidence respectively. Standard errors are clustered by firm. *, (**), and [***] denote two-tailed statistical significance at 10%, (5%), and [1%] levels, respectively. All the continuous variables are winsorized at the 1st and 99th percentiles.

Table 5

Panel A: Low Free Cash Flow & High Information Asymmetry

	Spread		*Effective Spread*		*Illiquidity*	
	Ocfirm4	*Ocfirm5*	*Ocfirm4*	*Ocfirm5*	*Ocfirm4*	*Ocfirm5*
	(1)	(2)	(1)	(2)	(1)	(2)
Lev	0.356	0.369	0.356	0.37	0.34	0.356
	6.82***	7.06***	6.80***	7.06***	7.60***	7.94***
Roa	0.121	0.126	0.122	0.128	-0.0483	-0.0407
	2.44**	2.54**	2.46**	2.58***	-1.04	-0.87
Capex	0.473	0.473	0.477	0.478	0.588	0.585
	4.77***	4.78***	4.81***	4.84***	7.02***	7.01***
Size	-0.363	-0.363	-0.364	-0.364	-0.324	-0.324
	-24.11***	-24.16***	-24.19***	-24.23***	-25.23***	-25.34***
Ppe	-0.085	-0.0879	-0.0822	-0.0853	-0.0927	-0.0959
	-2.06**	-2.14**	-2.00**	-2.07**	-2.66***	-2.76***
Age	-0.139	-0.141	-0.138	-0.14	-0.16	-0.162
	-6.37***	-6.46***	-6.32***	-6.40***	-9.15***	-9.26***
Sales_growth	0.0751	0.076	0.0751	0.076	0.0779	0.079
	7.97***	8.06***	7.98***	8.07***	9.38***	9.50***
Cash	0.783	0.781	0.786	0.785	0.773	0.77
	12.32***	12.30***	12.38***	12.35***	13.61***	13.58***
Rd	2.35	2.35	2.35	2.349	2.383	2.38
	11.26***	11.26***	11.29***	11.29***	11.99***	11.97***
Oc	-0.0323	-0.0632	-0.0387	-0.0689	-0.0608	-0.0886
	-2.50**	-4.85***	-3.02***	-5.33***	-5.25***	-7.63***
Ability	0.167	0.15	0.164	0.147	0.149	0.137
	10.16***	10.14***	9.99***	9.95***	10.30***	10.55***
*Oc*Ability*	-0.0992	-0.0856	-0.0948	-0.0805	-0.084	-0.0797
	-5.31***	-4.52***	-5.09***	-4.27***	-5.20***	-4.83***
Low FCF_High IA	-0.108	-0.119	-0.124	-0.133	-0.152	-0.155
	-6.06***	-7.24***	-6.89***	-7.95***	-9.35***	-10.47***
*Oc*Low FCF_High IA*	0.0245	0.0511	0.0455	0.071	0.0712	0.0892
	1.12	2.32**	2.10**	3.27***	3.79***	4.70***
*Ability*Low FCF High IA*	-0.168	-0.151	-0.167	-0.149	-0.139	-0.127
	-6.61***	-6.36***	-6.59***	-6.30***	-6.11***	-6.13***
*Oc*Ability*Low FCF_High IA*	0.121	0.108	0.117	0.0993	0.0904	0.0851
	3.65***	3.17***	3.52***	2.92***	3.17***	2.90***
Constant	3.42	3.429	3.423	3.43	2.779	2.776
	22.11***	22.16***	22.11***	22.13***	39.55***	39.58***
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	109,499	109,499	109,499	109,499	136,608	136,608
Adj. R^2	0.111	0.112	0.112	0.112	0.108	0.108

Notes: Columns 1 and 2 report the results of OLS regressions with *Ocfirm4* and *Ocfirm5* as the measure of CEO overconfidence respectively. Standard errors are clustered by firm. *, (**), and [***] denote two-tailed statistical significance at 10%, (5%), and [1%] levels, respectively. All the continuous variables are winsorized at the 1st and 99th percentiles.

Table 5

Panel B: High Free Cash Flow & High Information Asymmetry

	Spread		*Effective Spread*		*Illiquidity*	
	Ocfirm4	*Ocfirm5*	*Ocfirm4*	*Ocfirm5*	*Ocfirm4*	*Ocfirm5*
	(1)	(2)	(1)	(2)	(1)	(2)
Lev	0.33	0.343	0.329	0.342	0.315	0.33
	6.30***	6.54***	6.29***	6.53***	7.04***	7.35***
Roa	0.237	0.24	0.229	0.232	0.0599	0.0643
	4.78***	4.85***	4.62***	4.69***	1.29	1.38
Capex	0.564	0.559	0.566	0.56	0.668	0.661
	5.67***	5.63***	5.69***	5.64***	7.96***	7.91***
Size	-0.352	-0.352	-0.351	-0.351	-0.315	-0.315
	-23.35***	-23.38***	-23.26***	-23.29***	-24.40***	-24.51***
Ppe	-0.0986	-0.101	-0.0974	-0.1	-0.108	-0.111
	-2.38**	-2.44**	-2.35**	-2.41**	-3.08***	-3.17***
Age	-0.144	-0.146	-0.144	-0.145	-0.173	-0.174
	-6.55***	-6.62***	-6.54***	-6.60***	-9.82***	-9.90***
Sales_growth	0.0795	0.0803	0.0792	0.08	0.0825	0.0834
	8.40***	8.48***	8.37***	8.45***	9.88***	9.98***
Cash	0.792	0.789	0.794	0.791	0.777	0.774
	12.40***	12.36***	12.42***	12.39***	13.58***	13.54***
Rd	2.351	2.352	2.352	2.352	2.384	2.383
	11.24***	11.25***	11.25***	11.25***	11.91***	11.91***
Oc	-0.0304	-0.0473	-0.0302	-0.0469	-0.0392	-0.0542
	-2.45**	-3.71***	-2.41**	-3.67***	-3.47***	-4.72***
Ability	0.133	0.125	0.127	0.12	0.135	0.129
	8.63***	8.98***	8.22***	8.63***	9.59***	10.23***
*Oc*Ability*	-0.0702	-0.0681	-0.0656	-0.0661	-0.0729	-0.0785
	-3.86***	-3.65***	-3.60***	-3.55***	-4.50***	-4.71***
High FCF_High IA	-0.0588	-0.0501	-0.0513	-0.0423	-0.0231	-0.0113
	-3.39***	-3.00***	-2.98***	-2.60***	-1.63	-0.85
*Oc*High FCF_High IA*	0.0295	0.0107	0.0272	0.00856	0.0064	-0.0222
	1.39	0.48	1.28	0.39	0.37	-1.23
*Ability*High FCF_High IA*	-0.0338	-0.0392	-0.00533	-0.0158	-0.0448	-0.0552
	-1.3	-1.59	-0.2	-0.64	-2.07**	-2.78***
*Oc*Ability*High FCF_High IA*	0.00618	0.0277	-0.0147	0.0163	0.00873	0.0425
	0.19	0.83	-0.46	0.5	0.33	1.57
Constant	3.362	3.365	3.353	3.356	2.733	2.728
	21.40***	21.43***	21.42***	21.45***	38.84***	38.82***
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	109,499	109,499	109,499	109,499	136,608	136,608
Adj. R^2	0.109	0.109	0.108	0.109	0.104	0.105

Notes: Columns 1 and 2 report the results of OLS regressions with *Ocfirm4* and *Ocfirm5* as the measure of CEO overconfidence respectively. Standard errors are clustered by firm. *, (**), and [***] denote two-tailed statistical significance at 10%, (5%), and [1%] levels, respectively. All the continuous variables are winsorized at the 1st and 99th percentiles.