sustainability

MDPI

Article

CEO Overconfidence, Leadership Ethics, and Institutional Investors

Joohee Park [1] and Chune Young Chung [2,*]

[1] College of Art, Kookmin University, 02707 Seoul, Korea; joohee.theatre@gmail.com
[2] School of Business Administration, Chung-Ang University, 06974 Seoul, Korea
* Correspondence: bizfinance@cau.ac.kr; Tel.: +82-2-820-5544

Academic Editor: Barbara Aquilani
Received: 7 November 2016; Accepted: 20 December 2016; Published: 23 December 2016

Abstract: This paper explores the influence of institutional investors' external monitoring on CEOs' overconfidence. We particularly examine institutional monitoring's influence on overinvestments by overconfident CEOs and the likelihood of appointing these overconfident CEOs to firms. The results indicate that firms with overconfident CEOs have more overinvestment, as the CEOs tend to be overly optimistic about investment opportunities and are more likely to act on them. The findings, more importantly, show that institutional monitoring mechanisms attenuate overconfident CEOs' overinvestment. However, we find that institutional monitoring is only significant when long-term and/or large institutional investors hold the firms' shares. We also discover that investors' institutional monitoring not only actively reduces a CEO's overinvestments, but also negatively influences the appointment of overconfident CEOs. Overall, our study provides insights into institutional monitoring's role in corporate governance as an effective means of preventing value-destroying behaviors by an overconfident leader and cultivating an ethical business philosophy.

Keywords: leadership ethics; CEO overconfidence; corporate governance; institutional monitoring; overinvestment

1. Introduction

Over the past two decades, such various high-profile scandals as those involving Enron, Freddie Mac, and Fannie Mae have raised questions as to the relationship between CEOs' personal traits and ethical decision-making behaviors. Do the CEOs' personal characteristics influence them to make unethical decisions, or does the institutional environment make it irresistible to do so? Scholars from various disciplines, including business administration, economics, law, and behavioral psychology, have gathered impressive knowledge on both sides of the argument, often concluding that both personal traits and the system are to blame. This study was born from conversations regarding this matter, particularly whether a CEO's overconfidence can be perceived as unethical, and, if so, how this can be restrained. Hubris, a term stemming from ancient Greece, is understood as "overweening pride" in contemporary culture, and is cited as a cause of tragedy by Aristotle [1]. Were some of the most tragic incidents in contemporary corporate history then borne from CEOs' overconfidence? ("Hubris" is often used interchangeably with "overconfidence" in the existing literature [2–5]. However, we use the term "overconfidence" as a subset of hubris, as the latter often includes not only a heightened sense of one's abilities, but also the notion that one is superior to others and therefore not subject to the same set of rules as others [6]).

Overconfidence is defined as "the subjects' mean confidence estimate, minus their mean accuracy" [7]. Thus, one is regarded as overconfident if s/he more positively assesses his/her own abilities, including strategic judgment and leadership capabilities, than his/her peers [8]. Gervais and Odean [9] have found that success in investment markets may lead to traders' and managers'

overconfidence. Much research has been conducted on how a CEO's overconfidence can lead to defective decision-making: for instance, Chen [10] states that overconfidence in CEOs can cause bias in information processing, as well as errors in judgment. McManus [2] also asserts that hubris can impair moral awareness, thus allowing an individual to divert attention from ethical issues in decision-making. Regarding ethics, if an agent fails to adequately reflect upon a situation due to overconfidence prior to making a decision, that agent can then be held culpable, even if this was not akrasia, or acting against one's better judgment [11]. Therefore, a CEO whose decisions are inhibited by his or her own overconfidence can be considered unethical.

While several studies have addressed overconfidence in CEOs as something to overcome, few have actually offered a solution beyond raising awareness of the concept. Petit and Bollaert (2012) [12] call for the development of the virtue of reverence in CEOs as an internal prevention mechanism; Park et al. [8] and Bodolica and Spraggon [6] suggest ways to suppress CEOs' overconfidence through alterations in corporate culture. Our study focuses on how institutional investors' monitoring can restrain overconfident CEOs from inadequate decisions, thus adding an external, systematical factor to hinder CEOs from acting overconfidently.

Jensen and Meckling's [13] agency theory posits that, owing to misaligned interests, corporate managers have an incentive to maximize their own benefits through opportunistic behavior, rather than maximizing shareholders' wealth. Specifically, Jensen [14] argues that managers may exploit corporate free cash flows by undertaking investments with negative net present values (NPVs), but that provide personal benefits to the managers. Consistent with the free cash flow hypothesis, Roll's [15] hubris hypothesis contends that managers may overbid for not only empire-building, but also value-decreasing mergers, as they overestimate their own capabilities to manage merged firms. Malmendier and Tate [16] claim that managerial overconfidence can explain poor investments, as overconfident managers tend to overestimate their investment projects' returns and thereby overinvest, especially when they have sufficient internal funds. Additionally, Malmendier and Tate [17] demonstrate that overconfident managers tend to overpay for targets when they engage in value-decreasing mergers. These studies highlight the importance of monitoring and disciplining mechanisms to deter corporate managers from suboptimal investment decisions.

This study specifically investigates whether institutional investors' external monitoring mitigates overinvestment by overconfident CEOs, and whether this reduces the likelihood of overconfident CEOs' appointment to firms. We follow up on prior literature by measuring the extent of CEOs' overconfidence based on their option-exercising behaviors [16–20]. The rationale is that CEOs are under-diversified, as their human capital is fully invested in their firms and their compensation often includes the firms' stocks and options. As negative firm performance affects both CEOs' firm holdings and labor market opportunities, under-diversified CEOs should have incentives to exercise "deep-in-the-money" options to reduce their exposure to firms' idiosyncratic risks [21]. However, overconfident CEOs overestimate the potential increases in their firms' value, and are consequently more likely to delay exercising their options. Therefore, the timing of CEOs' exercising their options can be used to measure the extent of CEOs' overconfidence [16].

Constructing appropriate proxy variables to measure the degree of institutional monitoring is also important for this study. Recent studies show that not all institutional investors have the motivation and resources to monitor management. Chen et al. [22] and Chung et al. [23], among others, provide strong evidence that long-term institutions with large firm shareholdings more actively monitor and discipline the firms' management and governance structures. We follow these studies by measuring the degree of institutional monitoring as the fraction of shares outstanding owned by long-term institutions with large shareholdings.

Specifically, we empirically test the following hypotheses:

Hypothesis 1. *Firms with overconfident CEOs spend more on corporate investments, as overconfident CEOs tend to overestimate their own managerial capabilities and are more likely to make overinvestment decisions.*

Hypothesis 2. *Institutional monitoring mechanisms through ownership mitigate overconfident CEOs' potential overinvestment.*

Hypothesis 3. *Institutional monitoring of potential overinvestment by overconfident CEOs is more evident in long-term and/or larger institutional investors, as they have stronger monitoring incentives.*

Hypothesis 4. *Hypotheses 2 and 3 are not diluted by the internal monitoring mechanisms of the corporate board of directors, as institutional monitoring sufficiently complements the board's monitoring.*

Hypothesis 5. *Firms with strong institutional monitoring are less likely to appoint overconfident CEOs to preclude overinvestments' negative effects.*

We find that firms with overconfident CEOs undertake a larger investment quantum. This implies that these CEOs tend to be overoptimistic about investment opportunities, and are more likely to execute such opportunities. This finding is consistent with the literature, which indicates that an overconfident CEO's overinvestment increases with risk-taking behavior [24,25]. More importantly, these findings demonstrate that institutional monitoring mechanisms can potentially mitigate overconfident CEOs' overinvestments. However, we find that institutional monitoring's effect is only significant when considerably long-term and/or larger institutional investors hold the firms' shares. This result is consistent with the recent literature, wherein long-term institutions and/or institutional blockholders have substantial incentives to monitor management, and influence the governance structure, among heterogeneous institutions [22,23]. Additionally, we find that institutional monitoring's effect on overinvestments is significant, even after our empirical analysis controls for the internal monitoring effect by a firm's board of directors. The last finding reveals that institutional investors' monitoring not only attenuates overconfident CEOs' overinvestments, but also negatively influences their appointment. This is particularly remarkable as it suggests that a strong monitoring mechanism may preclude undesirable outcomes caused by overconfident CEOs. Overall, this study provides insights into institutional monitoring's role in corporate governance by focusing on how institutional monitoring affects corporate suboptimal investment decisions driven by overconfidence, a personal trait of some CEOs.

The remainder of this paper is organized as follows: Section 2 discusses related literature and Section 3 presents the sample data and descriptive statistics. The empirical analysis is discussed in Section 4, followed by Section 5, which concludes the paper.

2. Related Literature

The literature documents that overconfident CEOs tend to take more risks when making executive decisions. Many studies, as pioneered by Roll [15], have connected overconfidence, or, broadly hubris, with excessive and sometimes irrational risk-taking. Hayward and Hambrick [3] and Chatterjee and Hambrick [24] found that when overconfident CEOs engage in large corporate investments, such as mergers and acquisitions, they tend to offer higher bid premiums for targets. Subsequently, their firms' post-acquisition performance tends to be worse than that of firms led by CEOs who are not overconfident. Heaton [26] posits that managerial optimism may lead to distorted investment policies, which lack traditional agency and information asymmetry theories. Optimistic managers may invest in projects with a negative NPV due to the projects' systematic overvaluation. Simon and Houghton [27] found that overconfident managers tend to introduce risky products that are actually less likely to succeed. Park et al. [8] illustrate how ingratiation from other managers and board members can cause CEOs' overconfidence, and they are less likely to make strategic decisions in response to poor firm performance. McManus [2] states that hubris causes CEOs to become less aware of moral decisions, thus leading to unethical management. Thus, a substantial body of literature documents the relationship between a CEO's overconfidence, or hubris, and suboptimal decision-making. However, aside from Petit and Bollaert [12] and Park et al. [8], who suggest adjustments in private and corporate culture to suppress CEOs' overconfidence, most previous studies focus on the results

of CEO overconfidence rather than ways to address it. Therefore, our study is unique in its approach, which involves institutional monitoring as a control apparatus.

Institutional investors' monitoring roles in corporate governance mechanisms have become increasingly important in the United States' financial markets, as corporations' institutional ownership has substantially increased in past decades (according to the Conference Board, institutional ownership in the United States' largest 1000 corporations increased from 46% in 1987 to 73% by the end of 2009). Typically, institutional investors are large shareholders in a firm, and tend to have strong incentives to monitor the firm's management. An extensive body of literature documents institutional investors' monitoring of various corporate decisions and corporate governance structures, and the literature further suggests that institutional investors directly influence management activities. Smith [28], Carleton et al. [29], Del Guercio and Hawkins [30], and Gillan and Starks [31] reveal that institutional investors actively discipline corporate decisions and policies by negotiating with management and presenting shareholder proposals at corporate annual meetings. Specifically, institutional investors affect various corporate decisions, including those concerning mergers and acquisitions [32], payout policies [33], executive compensation [34], earnings management [35], risk-taking behaviors [36], and hedging policies [37]. Institutional investors also indirectly influence firms through their ability to sell their shares, which potentially initiates downward price pressures and provides negative information signals to other investors. Additionally, while institutional investors may not directly monitor firms, boards may consider their preferences, which may then indirectly affect corporate policies. A corporate board may prefer particular types of institutional shareholders due to beliefs regarding their effects on shares' value and/or corporate governance [38–40].

In contrast, the literature also provides evidence of ineffective and inactive institutional monitoring. For example, Smith [28] and Del Guercio and Hawkins [30] note that active institutional monitoring may not influence a firm's performance. Additionally, Coffee [41] and Bhide [42] suggest that the costs of active monitoring could surpass the benefits. Given that increased market liquidity allows institutional investors to trade shares at low costs, it is often easier to sell shares when dissatisfied with a firm's management. Parrino et al. [43] observe greater declines in institutional ownership in the year preceding forced CEO turnovers than in voluntary CEO turnovers. Their finding suggests that institutional investors may simply sell their shares when dissatisfied with management, or when monitoring costs exceed their benefits.

While institutional monitoring studies focus heavily on the influence of firm-level characteristics and governance structures, we focus on institutional monitoring's role in managerial overinvestment decisions, and specifically those stemming from the cognitive bias of overconfidence. Cognitive psychology suggests that most people naturally display optimistic expectations for the future. Griffin and Tversky [44] state that experts are more likely to develop a sense of overconfidence compared to non-experts. Managers are particularly prone to exhibit optimism in their decision-making for numerous reasons. First, individuals are more optimistic when they believe that they control outcomes [45]. Managers are particularly more optimistic when they have significant control over their firms' performance [46]. Second, highly committed individuals are more optimistic about outcomes [45], and managers are committed to the firm because their personal wealth, reputation, and employability are highly dependent on the firm's performance [47]. Third, people tend to overstate their skills relative to others' when their reference point is abstract [48,49].

3. Sample Data and Descriptive Statistics

3.1. Sample

Our sample dataset includes all firms traded on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), and National Association of Securities Dealers (NASDAQ) from 1992 to 2010, excluding firms from the financial and utility sectors, as these are highly regulated. We assign each firm to one of the 48 Fama–French industry groups, based on the firms' Standard Industrial

Classification (SIC) codes at the end of each year. We excluded small firms with total assets of less than $25 million, book equity of less than $12.5 million, and an end-of-year share price of less than $2, to prevent outliers from skewing the empirical analyses. Specifically, we utilized three database sources to construct this study's variables: the Compustat executive compensation database, to measure CEO overconfidence; the Center of Research in Security Prices (CRSP) and Compustat data, to measure firms' characteristics; and institutional quarterly ownership data from Thomson Reuters, comprised of institutional investors' 13F filings, to capture monitoring influence. The United States Securities and Exchange Commission (SEC) requires that all institutional investors with $100 million or more under management in exchange-traded or NASDAQ-quoted equity securities report all equity positions greater than 10,000 shares or $200,000 in market value at the end of each quarter. These investors are required to file 13F reports within 45 days of the end of the calendar quarter. After merging these databases, our sample contained 17,051 firm-year observations.

3.1.1. CEO Overconfidence

As several major corporate accounting scandals have come to the public's attention in the past two decades, discourse on ethical leadership has also increased. Previous studies have noted that overconfident CEOs may not have made biased decisions for self-benefit, but because they truly misjudged their firms' performance [10]. This leads to the question of whether overconfident leaders can be considered unethical. If a CEO makes an akratic decision for personal benefit, it is undoubtedly considered unethical [50]. However, ethics argue that an agent who is reasonably expected to understand the importance of critical reflection before acting can also be held morally responsible for the ramifications of his or her actions [11]. Ethicist FitzPatrick provides the example of a fictional, educated executive to argue that someone who reflects critically on the "analysis of the stock market and interest rate trends" can also be expected to recognize the importance of arguments that oppose his or her judgements. If "the failure of adequate reflection and information gathering was [. . .] the result of voluntary exercises of vices, such as overconfidence, arrogance, [. . .] and so on", then that person can be held morally culpable, despite a lack of akrasia [11]. Thus, CEOs who fail to contemplate potential risks and alternative strategies due to overconfidence can be considered unethical.

Petit and Bollaert [12], whose study calls for cultivating a sense of reverence to restrain CEOs' hubris, define this hubris based on three cognitive and behavioral aspects: a grandiose self, a disrespectful attitude towards others, and a misperception of one's place in the world. They document that such aspects are related to manifestations of unethical behaviors, and argue that a corporate manager who displays hubristic behavior is an unethical tyrant. (This view is consistent with Ciulla [51] and Woodruff's [52] position regarding the importance of a leader's morality in an organization. Additionally, many studies relate managerial ethics to earnings management, and highlight the importance of a corporate governance system [53–58].) Hence, hubristic CEOs' unethical behaviors do not necessarily coincide with their acting in shareholders' best interest. More importantly, they detail the significance of a prevention mechanism against CEO hubris, and propose that developing the virtue of reverence may prevent this hubris. Bodolica and Spraggon [6] differentiate hubristic pride from authentic pride, arguing that while people who display the former tend to view themselves as infallible, people with authentic pride are more likely to achieve positive goals. They position hubris as the "dark side" of pride, and authentic pride as the "bright side", and propose that hubris can be monitored and transformed into a more positive state through constructive feedback from peers and external intervention through training programs. Park et al. [8] suggest that colleagues' controlling of flattery and opinion conformity towards corporate leaders may deter CEOs from overconfident decisions. All three studies position CEOs' overconfidence as unethical, and call for measures to govern this trait.

Many studies particularly related to CEOs' overconfident behaviors document managerial hubris' influence on corporate decisions. For example, the literature provides evidence that CEOs' overconfidence affects such material corporate decisions as capital expenditures [16], mergers and acquisitions [17], payout policies [59], and R&D expenses [19]. However, most of these studies have

encountered problems in measuring CEO overconfidence, as no commonly accepted definition or scale of such measurement exists.

This study defines the extent of CEO overconfidence based on the works of Malmendier and Tate [16,17], and we utilize two CEO overconfidence measures: Long_Holder and Holder_67. Long_Holder is an indicator variable identifying CEOs who have held an option until the year of expiration at least once during their tenure, even though the option is at least 40% "in-the-money" while entering its final year. The exercise threshold of 40% is calibrated using Hall and Murphy's [21] proposed model. Holder_67 is a hindsight measure, which relaxes the requirement that CEOs hold their options until expiration. This instead focuses on an exercise decision in the fifth year prior to expiration. Following the work of Malmendier and Tate (2008) [17], we consider five years before expiration as the earliest point, as most options in the United States' sample firms have a 10-year duration, and are only fully vested after the fourth year. Accordingly, we exclude the small quantity of option packages with five years remaining that are not fully vested. Specifically, Holder_67 is an indicator variable identifying CEOs who fail to exercise options with five years remaining, despite at least a 67% increase in stock prices since the grant date. Both indicator variables capture CEO overconfidence levels based on their overly optimistic views of their firms' future performance, driven by their confidence in their own abilities and efforts.

3.1.2. Institutional Monitoring

As this study focuses on the institutional monitoring of overconfident CEOs, it is critical that such institutional monitoring's degree of influence be properly measured. Institutional investors' monitoring role could be consistent with, and may even be enhanced by, their collective informational advantages. Hence, we consider the level of institutional ownership in a firm as a proxy for the extent of institutional monitoring. We follow previous literature by relying on institutional investors' ownership (IO_i), which is the quarterly ratio of the number of shares held by institutions to the total number of shares outstanding for stock i. Further, various studies indicate that not all institutional investors monitor and discipline the firms of which they hold stock. Hence, we categorize IO into ownership by both monitoring and non-monitoring institutions. Specifically, we define ownership by monitoring institutions from four different perspectives to illustrate that issues with measuring the monitoring do not crowd the results.

The first institutional ownership monitoring measure that we employ is based on the institutional investor's portfolio turnover, following the work of Yan and Zhang [60]. They classify institutions with high portfolio turnovers as short-term institutions, and those with low portfolio turnovers as long-term institutions. Long-term (or short-term) institutions are considered to have more long-term (or short-term) investment horizon strategies, and thus, are more (or less) likely to monitor institutions. Additionally, Chen et al. [22] argue that institutions balance the costs and benefits associated with trading and monitoring, and that only long-term investors specialize in monitoring and influencing efforts, rather than trading. Institutions in each quarter t are sorted into terciles based on their average portfolio turnover over the past four quarters, based on Yan and Zhang's [60] work, where quarterly portfolio turnover is computed as $CR_{k,t} = \frac{min\left(Buy_{k,t}, Sell_{k,t}\right)}{\sum_{i=1}^{N_k} \frac{S_{k,i,t}P_{i,t} + S_{k,i,t-1}P_{i,t-1}}{2}}$. $Buy_{k,t}$ and $Sell_{k,t}$ are the respective aggregate purchases and sales by investor k in quarter t; $P_{i,t-1}$ and $P_{i,t}$ are the share prices of stock i at the end of quarters $t-1$ and t, respectively; and, $S_{k,i,t-1}$ and $S_{k,i,t}$ are the number of shares of stock i held by investor k at the end of quarters $t-1$ and t, respectively. Institutional ownership in the top tercile is classified as short-term institutional ownership (SIO), while stock ownership by institutions in the bottom tercile is classified as long-term institutional ownership (LIO).

Chen et al. [22] argue that not all long-term institutions have the incentives and means to monitor firm management. They find that independent, long-term institutions with large shareholdings focus on monitoring and influencing the firms in which they hold shares. Following this study, we estimate a firm's monitoring of institutional ownership by the fraction of shares outstanding owned by the

five largest institutions (MON5). Ownership by all other institutions is considered non-monitoring institutional ownership (Non_MON5). Specifically, an institutional investor is classified as MON5 if the institution is: (1) one of the five institutions with the largest portfolio-dollar valuation holding the firm's stock at the end of the quarter; (2) one of the five largest institutions in the past year; and (3) a dedicated or quasi-indexer institution, based on Bushee's [61] proposed classification. These institutions are more likely to play a complete monitoring role by gathering information in an attempt to influence managers.

The third institutional ownership monitoring measure, also from the work of Chen et al., involves ownership by all institutions that (1) hold at least 5% of the shares outstanding (blockholders) at the end of the quarter; (2) hold at least 5% of the shares outstanding for the past year; and (3) are classified as dedicated or quasi-indexer institutions, as per Bushee's classifications. Ownership by such institutions is denoted as BLOCK, while ownership by all other institutions is classified as Non_BLOCK.

The last set of ownership measures, based on Chung et al.'s [23] work, considers the number of consecutive quarters in which an institution holds stock. Specifically, QH1 represents ownership by institutions that have continuously held at least 1% of a stock's shares outstanding in the past three years, including the current quarter. Ownership by all other institutions is represented as Non_QH1.

As this study examines institutional monitoring's effects on overconfident CEOs on an annual basis, we compute the annual average of quarterly monitoring institutional ownership for stock i at the end of year t for the four institutional monitoring metrics discussed above, and use them for our empirical analysis. For example, we examine the cross-sectional variations of a firms' annual investment behavior associated with their CEOs' overconfidence, in conjunction with institutional investors' degree of annual monitoring intensity.

3.1.3. Corporate Investments

We consider two metrics for the degree of corporate investments: capital expenditures (Compustat item CAPX) and increase in investments (IVCH), which gauge firms' mutually independent investment activities and are recorded in their financial statements. We follow the work of Malmendier and Tate [16] and normalize both variables for firm i in year t by lagged total assets (AT). CAPX represents the funds used for acquiring property, plant, and equipment, and IVCH represents the funds used to increase long-term investments. (We limit the definition of CAPX to the funds used for acquiring property, plant, and equipment as our study relies on Compustat's database, in which very few firms report expenditures related to intangible assets and acquisitions. Specifically, many firms have no reported expenses related to either research and development or mergers and acquisitions in Compustat. Thus, including the expenses could misrepresent ordinary levels of cross-sectional capital expenditures.) Both investment variables are typically significant, as they capture the amount of firms' long-term investments. This characteristic is well suited for this study, as a CEO's overinvestment behavior should be more evident in material investments. Both variables exclude investments related to acquisitions, allowing us to focus on institutional investors' continuous, annual monitoring of CEOs' overinvestments, rather than their transient monitoring of specific corporate events.

3.1.4. Control Variables

We construct the following control variables for our multivariate analysis: Profitability (PROF) is defined as the operating income before depreciation (OIBDP) over the total assets (AT) of firm i in year t. The firm's growth opportunities (MB) are defined as the assets' market value over the book value of the assets of firm i in year t. Sequentially, the book value is defined as the total assets (AT), while the market value is defined as the liabilities (LT) minus the balance sheet's deferred taxes and investment tax credit (TXDITC), plus preferred stock (PSTKL) and market equity. The market equity is defined as the number of shares outstanding (CSHO) multiplied by the price of shares (PRCC_F) of firm i in year t. A firm's relative size (SIZE) is the natural logarithm of sales (SALE) of firm i in year t. The nature of the firm's assets (TANG) is the net property, plant, and equipment (PPENT) over the total assets (AT) of firm i in year t. These variables are widely used in literature to measure

firm-specific characteristics. We control for these because corporate decisions regarding investments and CEO appointments would likely vary cross-sectionally, depending on firm characteristics.

3.2. Descriptive Statistics

Table 1 provides the descriptive statistics for the full sample from 1992 to 2010. Table 1 reports the time-series mean, standard deviation, 25th percentile, median, and 75th percentile values of the cross-sectional means for the variables capturing CEO overconfidence. The mean value of Holder_67 is approximately 0.48, which implies that nearly 48% of the sampled CEOs satisfy the definition of Holder_67 on average over the sample period. However, the mean value of Long_Holder is approximately 0.28, which suggests that only 28% of the sampled CEOs meet the Long_Holder definition.

Table 1 also presents summary statistics for the institutional monitoring measures. The average total institutional ownership is approximately 44.2%, out of which long-term (or short-term) institutions account for 13.2% (or 11.9%). The remaining total institutional ownership (19.1%) comes from medium-term institutions. Further, the average values of MON5, BLOCK, and QH1 are approximately 12.4%, 7.5%, and 23.4% of the total shares outstanding, respectively. The average BLOCK, as anticipated, is significantly smaller than other institutional ownership measures due to its more restrictive definition.

Additionally, Table 1 reports the descriptive statistics for firm characteristics. Specifically, the mean value of CAPX is approximately 0.075, which suggests that the sample firms on average spend 7.5% of total assets on acquiring property, plant, and equipment. These summary statistics are highly comparable to those from Malmendier and Tate [16], on which we base our CAPX computations. Similarly, although smaller, the mean value of IVCH is approximately 0.028, implying that firms tend to spend 2.8% of total assets on long-term investments other than CAPX. (Note that IVCH is skewed to the left because many firms report zero increases in investments over the sample period. Additionally, some of the sample firms report a missing value for IVCH, and thus, the number of observations for IVCH is smaller than those of CAPX. However, we employ IVCH as a supplementary measure to gauge the extent of corporate investments for the empirical analysis, and place more weight on the analysis with CAPX.) Finally, the mean value of MB (PROF) at 4.67 (−0.33) significantly differs from its median value of 1.43 (0.099) due to its large dispersion. This skewness is commonly observed in many data series from the United States.

Table 1. Key variables' descriptive statistics.

Variable	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
CEO Overconfidence					
Holder_67	0.4829	0.4171	0.0000	1.0000	1.0000
Long_Holder	0.2838	0.4352	0.0000	0.0000	1.0000
Institutional Ownership					
IO	0.4421	0.2559	0.2274	0.4276	0.6445
LIO	0.1326	0.1010	0.0570	0.1117	0.1883
SIO	0.1190	0.1044	0.0377	0.0940	0.1739
MON5	0.1238	0.1024	0.0468	0.1039	0.1784
Non_MON5	0.3183	0.2259	0.1198	0.2908	0.4906
BLOCK	0.0750	0.1014	0.0000	0.0512	0.1207
Non_BLOCK	0.3671	0.2282	0.1722	0.3448	0.5440
QH1	0.2340	0.2223	0.0209	0.1789	0.3939
Non_QH1	0.2081	0.1728	0.0812	0.1627	0.2857
Firm Characteristics					
CAPX	0.0754	0.0841	0.0194	0.0434	0.0878
IVCH	0.0289	0.0382	0.0024	0.0189	0.0567
PROF	−0.3349	30.7604	−0.0142	0.0991	0.1665
SIZE	4.5447	2.5480	2.8055	4.4604	6.2434
MB	4.6750	160.4011	1.0436	1.4292	2.2985
TANG	0.5787	3.1259	0.2083	0.4316	0.7618

Table 2 presents the Pearson (contemporaneous) correlation coefficients among the key variables used in the empirical analysis. First, the correlations between Holder_67/Long_Holder and CAPX are both significantly positive, implying that firms under overconfident CEOs have a greater tendency to engage in investment activities than their counterpart firms. However, Holder_67/Long_Holder and IVCH do not appear to be significantly associated. This weak result, as discussed, may stem from the small sample issue. Second, the correlation between IO and CAPX is significantly negative, while the correlation between IO and IVCH is significantly positive. Such mixed results become clearer when IO is split into monitoring and non-monitoring institutions. The correlations between LIO/MON5/BLOCK/QH1 and CAPX/IVCH are generally and significantly negative, but their counterpart variables tend to be positively associated with CAPX/IVCH, with the exception of NON_MON5. This result suggests that only monitoring institutions may influence firms' excessive investment activities, thereby highlighting the importance of identifying institutions that engage in monitoring and, therefore, influence firms. Finally, the correlations between Holder_67/Long_Holder and IO are both significantly positive. This suggests that aggregate institutions may prefer overconfident CEOs, and/or do not actively influence their appointment. Nevertheless, the result diverges when the aggregate institutions are split into monitoring and non-monitoring institutions. This indicates that the correlations between LIO/MON5/BLOCK/QH1 and Holder_67 are all significantly negative, while the counterpart variables are positively associated with Holder_67. Hence, monitoring institutional investors do not prefer overconfident CEOs, and/or prevent appointing overconfident CEOs. This is also consistent with Long_Holder, except for LIO.

Overall, these pairwise correlations suggest that overconfident CEOs may overestimate the benefits of their investment decisions, and that monitoring institutions may be concerned with the corporate investment decisions of such overconfident CEOs. Thus, monitoring institutions should monitor overconfident behavior. However, the results in Table 2 should be interpreted with caution, as they only show contemporaneous correlations among key variables and other firm characteristics and/or how governance mechanisms may affect these relationships. We address these issues by presenting our multivariate regression analysis in the following section.

Table 2. Key variables' correlation matrix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Holder_67 (1)	1												
Long_Holder (2)	0.0520 (0.000) ***	1											
IO (3)	0.0334 (0.000) ***	0.1340 (0.000) ***	1										
CAPX (4)	0.0658 (0.000) ***	0.0718 (0.000) ***	−0.0609 (0.000) ***	1									
IVCH (5)	0.0012 (0.845)	0.0067 (0.309)	0.0546 (0.000) ***	−0.0013 (0.549)	1								
LIO (6)	−0.1124 (0.000) ***	0.1472 (0.000) ***	0.6691 (0.000) ***	−0.0898 (0.000) ***	−0.0237 (0.000) ***	1							
SIO (7)	0.1467 (0.000) ***	−0.0470 (0.000) ***	0.6220 (0.000) ***	0.0608 (0.000) ***	0.0449 (0.000) ***	0.1023 (0.000) ***	1						
MON5 (8)	−0.0483 (0.000) ***	−0.0795 (0.000) ***	0.4753 (0.000) ***	−0.0895 (0.000) ***	−0.0069 (0.101)	0.5076 (0.000) ***	0.0172 (0.000) ***	1					
Non_MON5 (9)	0.0604 (0.000) ***	0.0989 (0.000) ***	0.9170 (0.000) ***	−0.0283 (0.000) ***	0.0645 (0.000) ***	0.5276 (0.000) ***	0.6966 (0.000) ***	0.0850 (0.000) ***	1				
BLOCK (10)	−0.0311 (0.000) ***	−0.0753 (0.000) ***	0.4560 (0.000) ***	−0.0867 (0.000) ***	−0.0075 (0.078) *	0.4389 (0.000) ***	0.0596 (0.000) ***	0.9037 (0.000) ***	0.1067 (0.000) ***	1			
Non_BLOCK (11)	0.0528 (0.000) ***	0.1003 (0.000) ***	0.9185 (0.000) ***	−0.0296 (0.000) ***	0.0643 (0.000) ***	0.5552 (0.000) ***	0.6709 (0.000) ***	0.1314 (0.000) ***	0.9806 (0.000) ***	0.0670 (0.000) ***	1		
QH1 (12)	−0.0657 (0.000) ***	−0.1484 (0.000) ***	0.7476 (0.000) ***	−0.1118 (0.000) ***	−0.0386 (0.000) ***	0.6973 (0.000) ***	0.2052 (0.000) ***	0.4918 (0.000) ***	0.6237 (0.000) ***	0.4335 (0.000) ***	0.6455 (0.000) ***	1	
Non_QH1 (13)	0.1180 (0.000) ***	0.0378 (0.000) ***	0.5190 (0.000) ***	0.0552 (0.000) ***	0.0307 (0.000) ***	0.0936 (0.000) ***	0.6572 (0.000) ***	0.0710 (0.000) ***	0.5556 (0.000) ***	0.1174 (0.000) ***	0.5297 (0.000) ***	−0.1795 (0.000) ***	1

The *p*-values are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

4. Results

4.1. Institutional Investor Investment Horizons and CEO Overinvestments

The literature on institutional investors' roles in corporate governance reveals that institutions with long-term investment strategies are likely to engage in monitoring activities and exert influence, compared to those with short-term investment strategies [22,23,60,62]. Hence, we begin our empirical analysis by examining the relationship between LIO/SIO and the corporate investments related to CEO overconfidence. Specifically, we focus on estimating the following multivariate linear models based on Fama and Macbeth's [63] regression. (As a robustness test, we re-estimate all Fama–Macbeth regressions using Petersen's [64] model, with two-way clustered standard errors. The primary results remain unchanged.

$$\begin{array}{l} Industry-Adjusted\ CAPX_{t+1}\ (IVCH_{t+1}) = \alpha + \beta_1 \cdot \\ Holder\_67_{t+1}\ (Long\_Holder_{t+1}) + \beta_2 \cdot LIO_t + \beta_3 \cdot SIO_t + \beta_4 \cdot Holder\_67_{t+1} \times \\ LIO_t\ (Long\_Holder_{t+1} \times LIO_t) + \beta_5 \cdot Holder\_67_{t+1} \times SIO_t\ (Long\_Holder_{t+1} \times \\ SIO_t) + \beta_6 \cdot PROF_t + \beta_7 \cdot SIZE_t + \beta_8 \cdot MB_t + \beta_9 \cdot TANG_t + \varepsilon_{t+1}, \end{array} \quad (1)$$

where the industry-adjusted CAPX/IVCH is the dependent variable, as an individual firm's CAPX/IVCH value may significantly vary across industries. We compute the industry-adjusted values by subtracting the industry average CAPX/IVCH from the firm CAPX/IVCH for each firm i in each year t. The industry average is computed based on Fama and French's 48 industry classifications. (This industry classification is publicly available on Ken French's website.) The use of industry-adjusted corporate investments also allows us to capture firms' above- and below-average investment activities. We use lagged values for institutional monitoring variables as institutional monitoring efforts and their influence on corporate investment decisions require time. This approach is consistent with the existing literature, which examines this causal relationship by considering the relationships between current institutional holdings and future corporate policies [33,34,60]. Finally, CEO overconfidence can be endogenously determined. This may raise an endogeneity issue in the regression analyses. We alleviate the endogeneity concerns using additional controls, which may also affect the probability of overconfident CEO appointment. Additionally, we use lagged values for firm characteristics to mitigate the endogeneity in the relationship between corporate investment decisions and firm-specific features. Our model specification to mitigate the endogeneity issue is similar to the one proposed by Malmendier and Tate [16].

Table 3 presents the model estimation results using CAPX. (We employ IVCH instead of CAPX as an alternative dependent variable in this study's models to find qualitatively similar estimation results. However, for brevity, all results are available upon request.) The t-statistics corresponding to each independent variable's respective time-series average coefficients are adjusted for Newey–West autocorrelations with three lags. Model 1 with Holder_67 (and Model 4 with Long_Holder) provides the estimation results without considering institutional variables, while Model 2 with Holder_67 (and Model 5 with Long_Holder) includes the aggregate institutional variable and its interaction term with the CEO overconfidence indicator. Model 3 with Holder_67 (and Model 6 with Long_Holder) further splits the IO from Table 3 into LIO and SIO, along with their respective interaction terms with the CEO overconfidence indicator, as specified in Equation (1).

First, we find that the coefficients of Holder_67 in Model 1, and Long_Holder in Model 4, are both positive and statistically significant at the 1% level. This implies that firms under overconfident CEOs invest funds that exceed industry averages, consistent with Hypothesis 1, which relates to self-interested managers who tend to retain free cash flows and overinvest [13,14].

Table 3. Institutional investor investment horizons and CEO overinvestments.

Industry-Adjusted CAPX							
	Model 1	**Model 2**	**Model 3**		**Model 4**	**Model 5**	**Model 6**
Holder_67	0.0094 *** (7.71)	0.0038 *** (3.89)	0.0045 ** (2.13)	Long_Holder	0.0034 *** (3.45)	0.0049 *** (4.47)	0.0035 ** (2.36)
IO		−0.0053 ** (−2.59)		IO		−0.0097 * (−1.91)	
IO × Holder_67		−0.0019 *** (−3.37)		IO × Long_Holder		−0.0025 ** (−2.11)	
LIO			−0.0657 *** (−6.46)	LIO			−0.0613 *** (−7.37)
SIO			0.0641 *** (9.26)	SIO			0.0632 *** (10.51)
LIO × Holder_67			−0.0199 *** (−2.87)	LIO × Long_Holder			−0.0012 ** (−2.25)
SIO_67 × Holder_67			−0.0075 (−0.84)	SIO × Long_Holder			−0.0165 (−0.85)
PROF	0.0496 *** (5.33)	0.0459 *** (5.20)	0.0485 *** (5.69)	PROF	0.0526 *** (5.47)	0.0489 *** (5.36)	0.0503 *** (5.66)
SIZE	−0.0036 *** (−3.13)	−0.0038 *** (−3.17)	−0.0021 * (−2.03)	SIZE	−0.0037 *** (−3.32)	−0.0040 *** (−3.39)	−0.0021 ** (−2.14)
MB	0.0043 *** (9.21)	0.0045 *** (10.30)	0.0041 *** (9.55)	MB	0.0049 *** (9.34)	0.0050 *** (10.38)	0.0044 *** (9.70)
TANG	0.0895 *** (20.01)	0.0902 *** (19.73)	0.0919 *** (19.13)	TANG	0.0887 *** (20.47)	0.0892 *** (20.21)	0.0914 *** (19.44)
Intercept	0.0144 (1.52)	0.0123 (1.03)	0.0068 (0.81)	Intercept	0.0209 ** (2.15)	0.0143 (1.32)	0.0104 (1.22)
N	17,051	17,051	17,051	N	17,051	17,051	17,051
Adjusted-R^2	0.3944	0.397	0.4158	Adjusted-R^2	0.3876	0.39	0.4118

The *t*-statistics are adjusted for Newey–West autocorrelations with three lags, and are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Second, after adding the aggregate institutional variable and its interaction term with the CEO overconfidence indicator to the baseline models, the coefficients of Holder_67 in Model 2, and Long_Holder in Model 5, are still positive and statistically significant. We also discover that the coefficients of IO in Models 2 and 5 are both negative and significant, suggesting that aggregate institutions may attempt to mitigate a firm's overinvestment. This supports Hypothesis 2. Moreover, the finding indicates that the coefficients of IO plus their interactions with Holder_67 and Long_Holder in Models 2 and 5, respectively, are both negative and significant. This implies that aggregate institutional monitoring is more pronounced when CEOs are more overconfident, and thus, are more likely to overinvest.

Finally, the estimation results from Models 3 and 6 demonstrate that the coefficients of Holder_67 and Long_Holder, respectively, are positive and significant. Additionally, we find that the coefficient of LIO is negative and significant, and the coefficient of SIO is positive and significant in both models. This suggests that long-term institutions monitor firms' overinvestments, whereas short-term institutions rather exacerbate corporate investment decisions. Alternatively, short-term institutions, typically considered informed traders, may exploit the misevaluation of firms caused by asymmetric investments between firms and investors. More importantly, we find that the coefficients of respective LIO interactions with Holder_67 and Long_Holder are negative and significant, while the coefficients of respective SIO interactions with Holder_67 and Long_Holder are not significant. This indicates that the aggregate institutional monitoring of overconfident investments is only pronounced in long-term institutions, consistent with Hypothesis 3.

Overall, we find that CEO overconfidence positively relates to a firm's above-average investment activities, which are considered unfavorable to institutional investors. Our results are consistent with previous literature, as only institutions with long investment horizons monitor and reduce the agency costs of managerial discretion [22,60]. Literature argues that institutions balance the costs and benefits associated with trading and monitoring. Moreover, only long-term investors specialize in monitoring and influencing efforts rather than trading, while short-term institutions are more well-informed, and tend to actively trade to exploit their informational advantages.

4.2. Long-Term Institutions with Large Shareholdings and CEO Overinvestments

Chen et al. (2007) [22], among others, argue that not all long-term institutions have the incentive and means to monitor firm management. They find that long-term institutions with large shareholdings focus on monitoring and influencing the firms of which they hold shares. We incorporate this notion by constructing the variables MON5/Non_MON5, BLOCK/Non_BLOCK, and QH1/Non_QH1 to capture the degree of monitoring by long-term institutions with large shareholdings. We then substitute this for LIO/SIO in Equation (1) to estimate the models. For example, we estimate the following models based on the Fama–Macbeth regression:

$$\begin{aligned} &Industry-Adjusted\ CAPX_{t+1}\ (IVCH_{t+1}) = \alpha + \beta_1 \cdot \\ &Holder\_67_{t+1}\ (Long\_Holder_{t+1}) + \beta_2 \cdot MON5_t + \beta_3 \cdot Non\_MON5_t + \beta_4 \cdot \\ &Holder\_67_{t+1} \times MON5_t\ (Long\_Holder_{t+1} \times MON5_t) + \beta_5 \cdot Holder\_67_{t+1} \times \\ &Non\_MON5_t\ (Long\_Holder_{t+1} \times Non\_MON5_t) + \beta_6 \cdot PROF_t + \beta_7 \cdot SIZE_t + \\ &\beta_8 \cdot MB_t + \beta_9 \cdot TANG_t + \varepsilon_{t+1}. \end{aligned} \tag{2}$$

Similarly, we substitute BLOCK/Non_BLOCK and QH1/Non_QH1 for LIO/SIO in Equation (1) to derive the respective regression models.

Table 4 reports the estimation results based on CAPX. The results illustrate that long-term institutions with large shareholdings tend to negatively and significantly influence corporate industry-adjusted investments, while their counterparts exert a positive influence. Specifically, we find that all coefficients of the interaction terms MON, BLOCK, and QH1 with Holder_67 and Long_Holder are negative and statistically significant at the 5% level or better. This result is consistent with the

model results, including LIO and supplements, in that not all institutions engage in monitoring firms' overinvestment activities. Moreover, we find that the more overconfident the CEO, the more pronounced the monitoring activities of long-term institutions with large shareholdings. This result also supports Hypothesis 3. These results confirm, in summary, that long-term institutions with large shareholdings have strong incentives to monitor CEOs, and reinforce the view that monitoring institutions reduce CEOs' overinvestments.

4.3. Institutional Monitoring and Overinvestment Depending on Extent of Free Cash Flows

Malmendier and Tate [16,17] provide empirical evidence that overconfident CEOs overestimate their investment projects' returns and consequently overinvest, especially when they have more cash flows. This implies that the institutional monitoring of overconfident CEOs' overinvestments should be more evident when firms retain sufficient internal funds. Hence, this section incorporates the extent of free cash flows into the empirical analysis.

We first define the extent of free cash flows (FCF) as the operating activities (Compustat item OANCF) minus the common and preferred dividends (DVC and DVP), divided by total assets (AT), based on Chen et al.'s [65] work. We account for the variation of FCF across industries by computing the industry-adjusted values, and subtracting the industry average FCF from the firm FCF for each firm i in each year t based on the 48 Fama–French industry classifications. Specifically, we sort the sample firms by FCF and place them into five quintiles, where Quintile 1 represents firms with the lowest FCF, and Quintile 5 represents firms with the highest FCF. We then estimate Equations (1) and (2) for the highest and lowest quintile firms and compare their estimation results.

Table 5 is based on CAPX, and only reports the primary results for brevity, and provides the coefficients for the interactions of monitoring and non-monitoring variables with CEO overconfidence indicators. (In addition to the results related to the key interaction terms, though unreported, the overall results do not alter this study's primary inferences. The full tables are available upon request.) The results, based on the highest FCF quintile firms, demonstrate that except for the insignificant QH1 interaction with Long_Holder, the coefficients of all other interaction terms with monitoring institutional ownership measures are negatively and statistically significant at the 1% level. Additionally, interaction terms with non-monitoring institutional ownership measures tend to be insignificant, or positively related to CAPX. The results based on the lowest FCF quintile firms, in contrast, illustrate that the coefficients are mostly insignificant. Hence, institutional monitoring of overconfident CEOs' overinvestments is present only in firms with sufficient cash flows. Overall, these findings indicate that overconfident CEOs' overinvestment activities are likely to occur when firms have sufficient funds available, and that the institutional monitoring mechanism intensifies under such circumstances. This additionally supports Hypotheses 1, 2, and 3.

Table 4. Long-term institutions with large shareholdings and CEO overinvestments.

Industry-Adjusted CAPX							
	Model 1	**Model 2**	**Model 3**		**Model 4**	**Model 5**	**Model 6**
Holder_67	0.0040 *** (3.15)	0.0045 ** (2.35)	0.0051 *** (4.14)	Long_Holder	0.0064 ** (2.45)	0.0058 *** (3.53)	0.0060 *** (3.56)
MON5	−0.0419 *** (−4.53)			MON5	−0.0320 *** (−4.01)		
Non_MON5	0.0155 *** (5.07)			Non_MON5	0.0218 *** (7.75)		
MON5 × Holder_67	−0.0142 ** (−2.44)			MON5 × Long_Holder	−0.0232 ** (−2.37)		
Non_MON5 × Holder_67	0.0069 (1.01)			Non_MON5 × Long_Holder	−0.0099 (−0.62)		
BLOCK		−0.0270 *** (−3.54)		BLOCK		−0.0201 *** (−3.13)	
NON_BLOCK		0.0145 *** (3.36)		NON_BLOCK		0.0214 *** (6.82)	
BLOCK × Holder_67		−0.0085 *** (−3.85)		BLOCK × Long_Holder		−0.0253 ** (−2.34)	
NON_BLOCK × Holder_67		0.0079 (1.10)		NON_BLOCK × Long_Holder		−0.0098 (−0.60)	
QH1			−0.0200 ** (−2.51)	QH1			−0.0116 ** (−2.59)
Non_QH1			0.0439 *** (12.32)	Non_QH1			0.0413 *** (12.01)
OH1 × Holder_67			−0.0139 ** (−2.52)	OH1 × Long_Holder			−0.0075 ** (−2.38)
Non_QH1 × Holder_67			0.0072 * (1.89)	Non_QH1 × Long_Holder			−0.0158 (−0.91)
PROF	0.0443 *** (4.99)	0.0436 *** (4.84)	0.0456 *** (5.31)	PROF	0.0469 *** (5.06)	0.0462 *** (4.94)	0.0483 *** (5.44)
SIZE	−0.0041 *** (−3.07)	−0.0043 *** (−3.36)	−0.0014 (−1.40)	SIZE	−0.0042 *** (−3.24)	−0.0045 *** (−3.57)	−0.0014 (−1.56)
MB	0.0041 *** (10.43)	0.0042 *** (9.88)	0.0045 *** (9.98)	MB	0.0046 *** (10.45)	0.0047 *** (9.65)	0.0048 *** (10.14)
TANG	0.0915 *** (19.67)	0.0911 *** (19.74)	0.0922 *** (19.80)	TANG	0.0906 *** (20.28)	0.0902 *** (20.29)	0.0913 *** (20.43)
Intercept	0.0161 (1.28)	0.0141 (1.17)	−0.0044 (−0.45)	Intercept	0.0182 (1.54)	0.0164 (1.49)	−0.0018 (−0.19)
N Adjusted-R^2	17,051 0.4034	17,051 0.4016	17,051 0.4147	N Adjusted-R^2	17,051 0.3977	17,051 0.3952	17,051 0.4074

The *t*-statistics are adjusted for Newey–West autocorrelations with three lags, and are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Table 5. Institutional monitoring and CEO overinvestment, based on the extent of free cash flows.

Industry-Adjusted CAPX	Highest FCF Quintile				Lowest FCF Quintile			
Variable (*t*)	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
				Holder_67				
LIO × Holder_67	−0.063 *** (−11.56)				−0.039 (−1.21)			
SIO × Holder_67	0.039 (1.21)				0.063 (0.56)			
MON5 × Holder_67		−0.110 *** (−3.32)				−0.040 ** (−2.21)		
Non_MON5 × Holder_67		0.140 *** (5.31)				0.110 *** (3.32)		
BLOCK × Holder_67			−0.078 *** (−3.66)				0.068 (1.24)	
Non_BLOCK × Holder_67			0.068 *** (3.24)				0.078 (0.66)	
QH1 × Holder_67				−0.119 *** (−4.03)				−0.096 (−1.21)
Non_QH1 × Holder_67				0.096 *** (4.51)				−0.119 *** (−4.03)
Average R^2	42.85%	42.18%	31.67%	32.00%	12.85%	22.18%	21.67%	22.00%
				Long_Holder				
LIO × Long_Holder	−0.031 *** (−12.28)				−0.032 (−0.63)			
SIO × Long_Holder	0.032 *** (8.63)				0.031 (1.28)			
MON5 × Long_Holder		−0.226 *** (−8.50)				−0.026 ** (−2.40)		
Non_MON5 × Long_Holder		−0.005 (−0.19)				0.005 (0.19)		
BLOCK × Long_Holder			−0.172 *** (−4.98)				−0.017 (−0.98)	
Non_BLOCK × Long_Holder			0.023 *** (3.89)				0.023 (0.89)	
QH1 × Long_Holder				−0.115 (−1.22)				0.015 (1.22)
Non_QH1 × Long_Holder				0.001 (0.01)				0.001 (0.01)
Average R^2	32.17%	41.62%	41.24%	32.76%	12.17%	21.62%	11.24%	18.76%

The *t*-statistics are adjusted for Newey–West autocorrelations with three lags, and are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

4.4. Institutional Monitoring versus Monitoring by the Board of Directors

Corporate governance mechanisms can generally be classified as internal and external to firms [66]. Institutional monitoring is often regarded as an important mechanism of external governance, which we find effective in attenuating overconfident CEOs' overinvestment decisions. However, the mitigation of these decisions cannot be solely attributed to institutional monitoring, as other monitoring mechanisms do exist. We attempt to separate institutional monitoring's effects in this section after controlling for various corporate board characteristics, given that monitoring from the board of directors is considered the apex of internal governance. Eliminating the board's monitoring role in CEO overinvestments alleviates the concern that institutional monitoring's effectiveness is driven by institutional investors' preference for firms with superior internal governance. Further, this may help differentiate institutional monitoring's direct and indirect impacts through influencing the board of directors.

Data on boards of directors are obtained from RiskMetrics, which contains detailed information on the individual directors in approximately 1500 firms from 1998 to 2010. Due to the limited sample size, the analysis in this section is confined to firms included in RiskMetrics, and may not be widely generalizable to all 13F firms. We follow the extant literature and construct five variables to capture a firm's internal governance. Specifically, BOARD_SIZE and IND_PCT capture the board's composition [67–69]. The former is the total number of directors on the board, while the latter is the ratio of the number of independent directors on the board to the board's size. The percentages of shares outstanding owned by the CEO and outside directors, CEO_OWN and OUTSIDER_OWN, are proxies for the alignment of incentives between the CEO and outside directors. According to Morck et al. [70], higher ownership leads to a better alignment of management and shareholder incentives. Therefore, higher CEO ownership indicates less concern for moral hazards, and higher outside director ownership indicates superior oversight. We also include the percentage of independent directors that hold three or more board seats: BUSY_IND_PCT. Directors with many board seats may signal either better quality or over-commitment [71–73]. All board characteristic variables lag the corporate investment measure by one year.

We begin by reexamining the relationship between LIO/SIO and corporate investments related to CEO overconfidence after controlling for the board characteristics in Equation (1), and report the estimation results in Table 6 with CAPX. These findings reveal that the differential monitoring impacts of short- and long-term institutions on overconfident CEOs' overinvestments remain unchanged. Specifically, Models 3 and 6 in the table continue to reflect that the coefficients of LIO interactions with Holder_67 and Long_Holder are negative and significant, while the coefficients for the SIO interactions with Holder_67 and Long_Holder are not significant, even after controlling for board characteristics. These results reinforce our finding that long-term monitoring institutions attempt to enhance a firm's investment decisions that may be distorted by overconfident CEOs.

Additionally, we re-estimate Equation (2) after controlling for board characteristics' variables. Table 7 reports the estimation results using CAPX. The result indicates that long-term institutions with large shareholdings negatively and significantly influence overconfident CEOs' overinvestment activities. Specifically, we find that the coefficients for all respective interaction terms of MON, BLOCK, and QH1 with Holder_67 and Long_Holder are negative and statistically significant at the 10% level or better. This finding supports Hypothesis 4, and this result is consistent with the results from our earlier model, which does not consider firms' internal monitoring mechanisms. Overall, the results presented in Tables 6 and 7 indicate that the monitoring effect captured by institutional investors is not diluted by the board's monitoring through internal governance, and thus is independently material in a firm.

Table 6. Institutional monitoring versus board of directors' monitoring: Institutional investor investment horizons.

Industry-Adjusted CAPX							
	Model 1	**Model 2**	**Model 3**		**Model 4**	**Model 5**	**Model 6**
Holder_67	0.0078 *** (6.36)	0.0014 * (1.88)	0.0037 * (1.87)	Long_Holder	0.0019 *** (6.16)	0.0043 (0.64)	0.0060 * (2.03)
IO		−0.0134 *** (−3.49)		IO		−0.0230 *** (−8.86)	
IO × Holder_67		−0.0129 ** (−2.34)		IO × Long_Holder		−0.0134 * (−2.06)	
LIO			−0.0397 *** (−6.03)	LIO			−0.0271 *** (−9.44)
SIO			0.0531 *** (4.97)	SIO			0.0645 *** (5.41)
LIO × Holder_67			−0.0328 *** (−3.22)	LIO × Long_Holder			−0.0142 ** (−2.79)
SIO_67 × Holder_67			0.0139 (1.21)	SIO × Long_Holder			0.0037 (0.59)
BOARD_SIZE	−0.0017 *** (−8.26)	−0.0014 *** (−5.56)	−0.0012 *** (−3.16)	BOARD_SIZE	−0.0020 *** (−10.03)	−0.0016 *** (−6.49)	−0.0013 *** (−3.52)
IND_PCT	−0.0320 *** (−8.02)	−0.0358 *** (−8.28)	−0.0322 *** (−7.23)	IND_PCT	−0.0330 *** (−9.16)	−0.0367 *** (−9.41)	−0.0318 *** (−8.28)
CEO_OWN	−0.0063 ** (−2.86)	−0.0025 (−0.98)	−0.0046 * (−1.86)	CEO_OWN	−0.0030 (−1.36)	0.0009 (0.32)	−0.0015 (−0.50)
OUTSIDER_OWN	−0.0187 (−0.59)	0.0054 (0.16)	−0.0009 (−0.03)	OUTSIDER_OWN	−0.0218 (−0.70)	0.0030 (0.09)	0.0025 (0.08)
BUSY_IND_PCT	−0.0075 *** (−5.64)	−0.0072 *** (−5.04)	−0.0061 *** (−3.32)	BUSY_IND_PCT	−0.0077 *** (−6.87)	−0.0072 *** (−6.02)	−0.0059 *** (−3.59)
PROF	0.0656 *** (6.15)	0.0604 *** (6.41)	0.0618 *** (6.48)	PROF	0.0692 *** (6.08)	0.0635 *** (6.49)	0.0643 *** (6.08)
SIZE	0.0009 (1.31)	0.0006 (0.74)	0.0011 (1.25)	SIZE	0.0010 (1.60)	0.0007 (0.85)	0.0012 (1.46)
MB	0.0026 *** (4.80)	0.0029 *** (6.01)	0.0027 *** (5.74)	MB	0.0029 *** (5.30)	0.0032 *** (6.38)	0.0030 *** (5.98)
TANG	0.0838 *** (23.01)	0.0846 *** (23.08)	0.0850 *** (22.85)	TANG	0.0834 *** (22.40)	0.0842 *** (22.51)	0.0849 *** (22.28)
Intercept	0.0243 *** (6.01)	0.0159 ** (2.19)	0.0187 *** (3.97)	Intercept	0.0307 *** (6.83)	0.0154 ** (2.41)	0.0176 *** (4.80)
N Adjusted-R^2	9675 0.4552	9675 0.4593	9675 0.4702	N Adjusted-R^2	9675 0.4493	9675 0.4545	9675 0.4661

The *t*-statistics are adjusted for Newey–West autocorrelations with three lags, and are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Table 7. Institutional monitoring versus board of directors' monitoring: Long-term institutions with large shareholdings.

Industry-Adjusted CAPX							
	Model 1	**Model 2**	**Model 3**		**Model 4**	**Model 5**	**Model 6**
Holder_67	0.0016 *** (3.34)	0.0002 (0.04)	0.0016 * (2.09)	Long_Holder	0.0038 *** (3.53)	0.0041 ** (2.66)	0.0040 ** (2.57)
MON5	−0.0214 *** (−3.29)			MON5	−0.0098 (−1.51)		
Non_MON5	0.0223 *** (5.53)			Non_MON5	0.0307 *** (11.27)		
MON5 × Holder_67	−0.0204 ** (−2.58)			MON5 × Long_Holder	−0.0011 *** (−3.07)		
Non_MON5 × Holder_67	0.0100 (1.34)			Non_MON5 × Long_Holder	0.0030 (0.36)		
BLOCK		−0.0140 ** (−2.73)		BLOCK		−0.0030 (−0.48)	
NON_BLOCK		0.0248 *** (5.32)		NON_BLOCK		0.0322 *** (11.66)	
BLOCK × Holder_67		−0.0177 ** (−2.90)		BLOCK × Long_Holder		−0.0038 * (−2.03)	
NON_BLOCK × Holder_67		0.0087 (1.12)		NON_BLOCK × Long_Holder		0.0037 (0.50)	
QH1			0.0012 (0.19)	QH1			0.0110 *** (3.41)
Non_QH1			0.0383 *** (13.37)	Non_QH1			0.0454 *** (10.23)
QH1 × Holder_67			−0.0128 ** (−2.44)	QH1 × Long_Holder			0.0000 (0.00)
Non_QH1 × Holder_67			0.0104 * (1.80)	Non_QH1 × Long_Holder			0.0115 (1.32)
BOARD_SIZE	−0.0014 *** (−4.86)	−0.0014 *** (−5.07)	−0.0012 *** (−4.29)	BOARD_SIZE	−0.0015 *** (−5.47)	−0.0015 *** (−5.66)	−0.0014 *** (−5.02)

Table 7. *Cont.*

Industry-Adjusted CAPX							
	Model 1	**Model 2**	**Model 3**		**Model 4**	**Model 5**	**Model 6**
IND_PCT	−0.0347 *** (−7.34)	−0.0348 *** (−7.34)	−0.0340 *** (−7.52)	IND_PCT	−0.0355 *** (−8.47)	−0.0356 *** (−8.35)	−0.0344 *** (−8.68)
CEO_OWN	−0.0021 (-0.83)	−0.0018 (−0.71)	−0.0021 (−0.88)	CEO_OWN	0.0009 (0.32)	0.0015 (0.54)	0.0000 (0.01)
OUTSIDER_OWN	0.0162 (0.47)	0.0158 (0.46)	−0.0055 (−0.15)	OUTSIDER_OWN	0.0137 (0.40)	0.0123 (0.36)	−0.0068 (−0.20)
BUSY_IND_PCT	−0.0066 *** (−4.09)	−0.0068 *** (−4.24)	−0.0061 *** (−3.95)	BUSY_IND_PCT	−0.0065 *** (−4.61)	−0.0067 *** (−4.87)	−0.0062 *** (−4.94)
PROF	0.0588 *** (6.12)	0.0578 *** (5.94)	0.0581 *** (6.39)	PROF	0.0612 *** (5.97)	0.0603 *** (5.84)	0.0610 *** (6.25)
SIZE	0.0004 (0.42)	0.0001 (0.07)	0.0017 * (1.98)	SIZE	0.0004 (0.54)	0.0001 (0.16)	0.0017 ** (2.27)
MB	0.0027 *** (6.07)	0.0027 *** (6.08)	0.0031 *** (6.69)	MB	0.0031 *** (6.74)	0.0030 *** (6.68)	0.0035 *** (6.67)
TANG	0.0854 *** (23.64)	0.0853 *** (23.54)	0.0857 *** (24.36)	TANG	0.0851 *** (23.06)	0.0851 *** (22.83)	0.0854 *** (23.37)
Intercept	0.0175 ** (2.58)	0.0153 ** (2.28)	0.0058 (0.82)	Intercept	0.0166 ** (2.75)	0.0156 ** (2.72)	0.0047 (0.73)
N Adjusted-R^2	9675 0.4637	9675 0.4631	9675 0.4666	N Adjusted-R^2	9675 0.4603	9675 0.4596	9675 0.4623

The *t*-statistics are adjusted for Newey–West autocorrelations with three lags, and are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

4.5. Does Institutional Monitoring Prevent the Appointment of an Overconfident CEO?

When institutions actively engage in monitoring, we expect that the most effective monitoring of overconfident CEOs' overinvestments will prevent them from even being initially appointed as CEOs. Hence, we examine whether monitoring institutions can identify overconfident CEOs ex-ante and proactively deter their appointment. Specifically, we anticipate that firms with a higher level of institutional ownership monitoring have fewer overconfident CEO appointments. We consider the 2231 CEO appointments in the sample firms, and the four institutional ownership monitoring measures (LIO, MON5, BLOCK, and QH1), which are proxies for monitoring institutions' ownership. We obtain the most recent quarterly monitoring institutional ownership for each firm-year observation closest to the CEO appointment dates, obtained from Compustat's executive compensation database. For example, if a CEO is appointed in February 2005, then the most recent quarterly monitoring of institutional ownership is obtained from December 2004. (The institutional ownership date is December 2004 because institutions disclose their stockholding information in the 13F every quarter. December 2004 is the most recent quarter-end, and is two months before February 2005. We also used lagged average quarterly ownership over the year as in the previous analysis, although unreported for brevity. However, the results remain robust, and we contend that using the most recent quarterly ownership is more appropriate for this analysis as CEO appointment may be considered a corporate event.) This approach reflects the most recent institutional monitoring intensity near CEO appointments. Specifically, we form five equally weighted quintile portfolios, based on each monitoring institutional ownership measure. We then compute the mean values of the overconfident CEO indicator variables and present the results in Table 8.

Table 8. Institutional monitoring and overconfident CEO appointment: The portfolio-sorting approach.

Mean	Q1	Q2	Q3	Q4	Q5	Q5–Q1
Quintiles Formed on LIO						
Holder_67	0.5212	0.4981	0.4702	0.3824	0.3760	−0.1453
						(−3.35) ***
Long_Holder	0.1978	0.1397	0.1186	0.1135	0.0816	−0.1162
						(−3.70) ***
Quintiles Formed on MON5						
Holder_67	0.4558	0.4450	0.4020	0.4338	0.3796	−0.0762
						(−2.08) **
Long_Holder	0.1352	0.0893	0.1618	0.1719	0.1679	0.0327
						(1.25)
Quintiles Formed on BLOCK						
Holder_67	0.5076	0.4274	0.4246	0.4180	0.3983	−0.1093
						(−2.17) **
Long_Holder	0.1908	0.1639	0.1463	0.1375	0.1294	−0.0614
						(−2.97) ***
Quintiles Formed on QH1						
Holder_67	0.4514	0.5333	0.4832	0.4097	0.3720	−0.0794
						(−2.06) **
Long_Holder	0.2195	0.1232	0.0767	0.0849	0.1004	−0.1191
						(−4.75) ***

The last column provides the difference in mean numbers of hubristic CEO appointments (Q5–Q1) with the associated *t*-statistics. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Generally, we find a negative relationship between monitoring institutional ownership and the corresponding mean values of Holder_67 and Long_Holder, except for MON5 with Long_Holder. This result suggests that monitoring institutional ownership somewhat identifies overconfident CEOs

ex ante. For example, BLOCK, the smallest quintile portfolio, has an average Holder_67 of 0.5076, which is 0.1093 larger than the largest quintile portfolio of 0.3983. This indicates that 50% of the firms in the smallest quintile portfolio appoint overconfident CEOs, while 40% of firms in the largest quintile portfolio appoint overconfident CEOs. Additionally, the difference is statistically significant. The last column in Table 8 reports the differences in the average values for Holder_67 and Long_Holder between the largest and smallest quintile portfolios, with the associated *t*-statistics. We find that all differences between the two extreme portfolios are statistically significant at the 5% level or better, except for MON5 with Long_Holder. These results confirm the expectation that monitoring institutions also engage in precluding overconfident CEOs from the firms of which they own shares, and this supports Hypothesis 5. Finally, the findings complement institutional monitoring's role in overinvestments after the appointment of overconfident CEOs, as previously documented.

The portfolio-sorting approach in Table 8 indicates that high institutional ownership monitoring measures tend to predict low mean numbers of overconfident CEO appointments. However, this prediction should be made after controlling for firm characteristics, as each firm may seek different types of CEOs, and/or CEOs may have their own employment preferences. Specifically, we employ a logistic regression method with the following specification:

$$\begin{aligned} &Holder_{67t+1}\left(Long_{Holdert+1}\right) = \alpha + \beta_1 \cdot Monitoring\ Institutional\ Ownership_t + \\ &\beta_2 \cdot Non - Monitoring\ Institutional\ Ownership_t + \beta_3 \cdot PROF_t + \beta_4 \cdot SIZE_t + \beta_5 \cdot \\ &MB_t + \beta_6 \cdot TANG_t + \beta_7 \cdot FF48\ Industry\ Dummy_t + \beta_8 \cdot Year\ Dummy_t + \gamma \\ &Board\ Characteristics_t + \varepsilon_{t+1}, \end{aligned} \tag{3}$$

where Monitoring Institutional Ownership denotes LIO, MON5, BLOCK, and QH1, and Non-Monitoring Institutional Ownership denotes SIO, Non_MON5, Non_BLOCK, and Non_QH1. The FF48 industry dummy is an indicator variable, equal to 1 based on the Fama–French industry groups 1 through 48, with the omission of industry group 1. We control for time-fixed effects by including Year Dummy in the model. Additionally, the board of directors, as an internal monitoring mechanism, may consider CEO overconfidence when choosing a CEO. Hence, we also control for the board-related variables included in Tables 6 and 7 in Equation (3)'s regression model. However, this limits the estimation sample to 1227 due to the compatibility between RiskMetrics and 13F firm samples.

Table 9 presents the logistic regression's coefficient estimates. (As a robustness test, we also use the ordered probit model to estimate Equation (3), and obtain similar quantitative results.) We follow Petersen's [64] work to account for both time-series and cross-sectional correlations, and compute the *p*-values using two-way clustered standard errors. We find that the coefficients for all monitoring institutional ownership measures are negative and statistically significant across all tested models. This implies that firms with high monitoring of institutional ownership are less likely to appoint overconfident CEOs who may potentially deteriorate their firm value. The results indicate that, in contrast, the coefficients for non-monitoring institutional ownership measures are generally positive and significant. All coefficients seem economically meaningful in addition to statistically significant. For example, the coefficient for BLOCK based on Long_Holder is -1.535, indicating that for a 10% increase in BLOCK, the expected change in the log of odds is $-0.153 = 10\% \times -1.535$. The coefficient may also be interpreted in terms of probabilities. A 10% increase in BLOCK in such a case decreases the odds of appointing an overconfident CEO by 14% = 1 – exp(10% × (−1.535)). The Non_BLOCK, based on Long_Holder, exhibits an opposite pattern. Specifically, for a 10% increase in Non_BLOCK, the odds of appointing an overconfident CEO increase by 21% = exp(10% × (1.936)) − 1. Quantitatively similar results are obtained for the other three pairs of institutional ownership measures. In summary, the results presented in Table 9 reinforce the finding from Table 8, in that monitoring institutions may be able to identify CEO candidates' personal characteristics and prevent overconfident CEO appointments; moreover, the results are robust after considering the board's monitoring role.

Table 9. Institutional monitoring and overconfident CEO appointment: The logistic regression approach.

	Holder_67				Long_Holder			
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
LIO	−1.0183 *** (0.001)				−0.9244 ** (0.023)			
SIO	−0.0183 (0.321)				0.1499 ** (0.043)			
MON5		−0.3832 *** (0.003)				−1.1254 * (0.088)		
Non_MON5		0.1934 (0.184)				1.4854 ** (0.037)		
BLOCK			−0.1324 * (0.078)				−1.5353 ** (0.024)	
Non_BLOCK			0.2434 * (0.043)				1.9358 * (0.075)	
QH1				−0.5263 ** (0.037)				−0.3452 * (0.086)
Non_QH1				0.0124 * (0.087)				0.2442 (0.124)
BOARD_SIZE	0.0886 *** (0.000)	0.0875 *** (0.000)	0.0880 *** (0.000)	0.0833 *** (0.000)	0.0996 *** (0.000)	0.0773 *** (0.000)	0.0765 *** (0.000)	0.0834 *** (0.000)
IND_PCT	0.2930 (0.233)	0.7135 *** (0.003)	0.7460 *** (0.002)	0.6844 *** (0.005)	−0.5452 ** (0.027)	−0.7515 *** (0.002)	−0.7726 *** (0.002)	−0.6874 *** (0.005)
CEO_OWN	−0.3369 *** (0.000)	−0.3948 *** (0.000)	−0.4012 *** (0.000)	−0.3536 *** (0.000)	−0.4092 *** (0.000)	−0.3112 *** (0.001)	−0.3044 *** (0.001)	−0.2957 *** (0.001)
OUTSIDER_OWN	0.3026 (0.519)	0.2507 (0.544)	0.2476 (0.553)	0.3155 (0.560)	0.2433 *** (0.000)	0.1117 *** (0.000)	0.9744 *** (0.001)	0.6907 *** (0.000)
BUSY_IND_PCT	−0.1237 (0.167)	−0.1466 (0.101)	−0.1429 (0.1108)	−0.1542 * (0.075)	0.5472 *** (0.000)	0.5308 *** (0.000)	0.5255 *** (0.000)	0.5520 *** (0.000)
PROF	−1.8864 *** (0.000)	−1.7091 *** (0.000)	−1.6663 *** (0.000)	−1.7004 *** (0.000)	0.8506 *** (0.001)	0.8293 *** (0.002)	0.8386 *** (0.002)	0.8034 *** (0.003)

Table 9. *Cont.*

	Holder_67				Long_Holder			
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
SIZE	−0.0666 *** (0.001)	−0.0154 (0.399)	−0.0038 (0.836)	−0.0567 *** (0.003)	−0.0365 * (0.058)	−0.0570 *** (0.003)	−0.0575 *** (0.003)	−0.0182 (0.367)
MB	−0.3522 *** (0.001)	−0.3565 *** (0.000)	−0.3534 *** (0.000)	−0.3736 *** (0.000)	−0.0337 * (0.098)	−0.0266 (0.1895)	−0.0260 (0.199)	−0.0215 (0.292)
TANG	0.0665 (0.2712)	0.0330 (0.581)	0.0299 (0.622)	0.0276 (0.648)	−0.0456 (0.468)	−0.0821 (0.193)	−0.0881 (0.162)	−0.0631 (0.318)
Industry Dummy	Included	Included	Included	Included	Included	Included	Included	Included
Year Dummy	Included	Included	Included	Included	Included	Included	Included	Included
Intercept	0.0740 (0.753)	−0.2358 (0.317)	−0.2344 (0.320)	0.1808 (0.459)	1.4493 *** (0.000)	2.1749 *** (0.000)	2.1100 *** (0.000)	1.7192 *** (0.000)
N	1227	1227	1227	1227	1227	1227	1227	1227
Pseudo R^2	0.0213	0.0242	0.0314	0.0255	0.0175	0.0203	0.0199	0.0278

All models include industry and year dummies. The *p*-values using two-way clustered standard errors are reported in parentheses. *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

5. Conclusions

A substantial body of literature suggests that corporate decisions made by overconfident CEOs result in negative outcomes for the firm. Specifically, CEOs' personal characteristics highly relate to firms' overinvestment activities. This study provides evidence that external monitoring by institutional investors can mitigate CEOs' overconfident behaviors. We particularly examine institutional monitoring's influence on overinvestments by overconfident CEOs, as well as the likelihood of an overconfident CEO's appointment. Our empirical findings indicate that firms under overconfident CEOs are indeed prone to overinvestment, as their CEOs tend to be both overconfident regarding investment opportunities and more likely to execute decisions based on such overconfidence. The findings, more importantly, illustrate that the institutional monitoring mechanism attenuates overconfident CEOs' overinvestment. However, we find that the institutional monitoring effect is only significant when long-term and/or large institutional investors hold the firms' shares. We also find that monitoring by institutional investors not only actively attenuates a CEO's overconfident investments, but also negatively influences the appointment of an overconfident CEO. This finding is notable, as it suggests that the institutional monitoring mechanism precludes associated undesirable outcomes from the decisions of overconfident CEOs. Overall, these findings provide insight into institutional monitoring's role in corporate governance, as they specifically focus on institutional monitoring's effects on corporate investment decisions, as driven by a CEO's personal overconfidence.

This study contributes to the discourse on ethical leadership, particularly as it offers a concrete measure as to how to prevent overconfident CEOs from making suboptimal decisions through institutional amendments. This paper complements Petit and Bollaert [12], who propose developing the virtue of reverence as a personal prevention mechanism for CEO hubris, and also Park et al. [8] and Bodolica and Spraggon [6], who call for alterations in corporate culture to monitor and manage CEO confidence. Our findings complement their recommendations for personal and cultural changes within the system, and suggest that developing a comprehensive monitoring environment through external institutions could effectively prevent an overconfident leader's value-destroying behaviors.

Currently, few studies offer institutional or personal solutions as to how CEOs' overconfidence can be prevented or alleviated. We intend to continue research on the subject, especially on how external institutional changes can affect the corporate governance system. Specifically, it would be useful to survey firms that have established the ownership structure suggested in our study and investigate the long-term consequences of their actions, such as CEOs' decision-making processes and firm performance.

Acknowledgments: This work was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea (NRF-2016S1A5A8018422).

Author Contributions: The authors contributed equally to this work. Joohee Park and Chune Young Chung conceived and designed the experiments; Chune Young Chung performed the experiments and analyzed the data; Joohee Park wrote the paper.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Aristotle; Gerald Frank Else. *Aristotle: Poetics*; University of Michigan Press: Ann Arbor, MI, USA, 1967.
2. McManus, J. Hubris and unethical decision making: The tragedy of the uncommon. *J. Bus. Ethics* **2016**. [CrossRef]
3. Hayward, M.L.A.; Hambrick, D.C. Explaining the premiums paid for large acquisitions: Evidence of CEO hubris. *Adm. Sci. Q.* **1997**, *42*, 103–127. [CrossRef]
4. Hiller, N.J.; Hambrick, D.C. Conceptualizing executive hubris: The role of (hyper-)core self-evaluations in strategic decision-making. *Strateg. Manag. J.* **2005**, *26*, 297–319. [CrossRef]
5. Norberg, P. "I don't care that people don't like what I do"—Business codes viewed as invisible or visible restrictions. *J. Bus. Ethics* **2009**, *86*, 211–225. [CrossRef]

6. Bodolica, V.; Spraggon, M. Behavioral governance and self-conscious emotions: Unveiling governance implications of authentic and hubristic pride. *J. Bus. Ethics* **2011**, *100*, 535–550. [CrossRef]
7. Smith, K.A. Psychology, factfinding, and entrapment. *Mich. Law Rev.* **2005**, *103*, 759–806.
8. Park, S.H.; Westphal, J.D.; Stern, I. Set up for a fall: The insidious effects of flattery and opinion conformity toward corporate leaders. *Adm. Sci. Q.* **2011**, *56*, 257–302. [CrossRef]
9. Gervais, S.; Odean, T. Learning to be overconfident. *Rev. Financ. Stud.* **2001**, *14*, 1–27. [CrossRef]
10. Chen, S. The role of ethical leadership versus institutional constraints: A simulation study of financial misreporting by CEOs. *J. Bus. Ethics* **2010**, *93*, 33–52. [CrossRef]
11. FitzPatrick, W.J. Moral responsibility and normative ignorance: Answering a new skeptical challenge. *Ethics* **2008**, *118*, 589–613. [CrossRef]
12. Petit, V.; Bollaert, H. Flying too close to the sun? Hubris among CEOs and how to prevent it. *J. Bus. Ethics* **2012**, *108*, 265–283. [CrossRef]
13. Jensen, M.C.; Meckling, W.H. Theory of the firm: Managerial behavior, agency cost, and ownership structure. *J. Financ. Econ.* **1976**, *3*, 305–360. [CrossRef]
14. Jensen, M.C. Agency cost of free cash flow, corporate finance, and takeovers. *Am. Econ. Rev.* **1986**, *76*, 323–329.
15. Roll, R. The hubris hypothesis of corporate takeovers. *J. Bus.* **1986**, *59*, 197–216. [CrossRef]
16. Malmendier, U.; Tate, G. CEO Overconfidence and corporate investment. *J. Financ.* **2005**, *60*, 2661–2700. [CrossRef]
17. Malmendier, U.; Tate, G. Who makes acquisitions? CEO overconfidence and the market's reaction. *J. Financ. Econ.* **2008**, *89*, 20–43. [CrossRef]
18. Campbell, T.C.; Gallmeyer, M.; Johnson, S.A.; Rutherford, J.; Stanley, B.W. CEO optimism and forced turnover. *J. Financ. Econ.* **2011**, *101*, 695–712. [CrossRef]
19. Hirshleifer, D.; Low, A.; Teoh, S.H. Are overconfident CEOs better innovators? *J. Financ.* **2012**, *67*, 1457–1498. [CrossRef]
20. Ahmed, A.S.; Duellman, S. Managerial overconfidence and accounting conservatism. *J. Account. Res.* **2013**, *51*, 1–30. [CrossRef]
21. Hall, B.J.; Murphy, K.J. Stock options for undiversified executives. *J. Account. Econ.* **2002**, *33*, 3–42. [CrossRef]
22. Chen, X.; Harford, J.; Li, K. Monitoring: Which institutions matter? *J. Financ. Econ.* **2007**, *86*, 279–305. [CrossRef]
23. Chung, C.Y.; Liu, C.; Wang, K.; Zykaj, B.B. Institutional monitoring: Evidence from the F-score. *J. Bus. Financ. Account.* **2015**, *42*, 885–914. [CrossRef]
24. Chatterjee, A.; Hambrick, D.C. It's all about me: Narcissistic CEOs and their effects on company strategy and performance. *Adm. Sci. Q.* **2007**, *52*, 351–386.
25. Li, J.; Tang, Y.I. CEO hubris and firm risk taking in China: The moderating role of managerial discretion. *Acad. Manag. J.* **2010**, *53*, 45–68. [CrossRef]
26. Heaton, J.B. Managerial optimism and corporate finance. *Financ. Manag.* **2002**, *31*, 33–45. [CrossRef]
27. Simon, M.; Houghton, S.M. The relationship between overconfidence and the introduction of risky products: Evidence from a field study. *Acad. Manag. J.* **2003**, *46*, 139–149. [CrossRef]
28. Smith, M.P. Shareholder activism by institutional investors: Evidence from CalPERS. *J. Financ.* **1996**, *51*, 227–252. [CrossRef]
29. Carleton, W.T.; Nelson, J.A.; Weisbach, M.S. The influence of institutions on corporate governance through private negotiations: Evidence from TIAA-CREF. *J. Financ.* **1998**, *53*, 1335–1362. [CrossRef]
30. Del Guercio, D.; Hawkins, J. The motivation and impact of pension fund activism. *J. Financ. Econ.* **1999**, *52*, 293–340. [CrossRef]
31. Gillan, S.L.; Starks, L.T. Corporate governance proposals and shareholder activism: The role of institutional investors. *J. Financ. Econ.* **2000**, *57*, 275–305. [CrossRef]
32. Ferreira, M.A.; Massa, M.; Matos, P. Shareholders at the gate? Institutional investors and cross-border mergers and acquisitions. *Rev. Financ. Stud.* **2010**, *23*, 601–644. [CrossRef]
33. Grinstein, Y.; Michaely, R. Institutional holdings and payout policy. *J. Financ.* **2005**, *60*, 1389–1426. [CrossRef]
34. Hartzell, J.C.; Starks, L.T. Institutional investors and executive compensation. *J. Financ.* **2003**, *58*, 2351–2374. [CrossRef]
35. Chung, R.; Firth, M.; Kim, J. Institutional monitoring and opportunistic earnings management. *J. Corp. Financ.* **2002**, *8*, 29–48. [CrossRef]

36. Chan, C.C.; Lin, B.H.; Chang, Y.H.; Liao, W.C. Does bank relationship matter for corporate risk-taking? Evidence from listed firms in Taiwan. *N. Am. J. Econ. Financ.* **2013**, *26*, 323–338. [CrossRef]
37. Tai, V.W.; Lai, Y.H.; Lin, L. Local institutional shareholders and corporate hedging policies. *N. Am. J. Econ. Financ.* **2014**, *28*, 287–312. [CrossRef]
38. Brickley, J.; Lease, R.; Smith, C. Ownership structure and voting on antitakeover amendments. *J. Financ. Econ.* **1998**, *20*, 267–292. [CrossRef]
39. Allen, F.; Bernardo, A.E.; Welch, I. A theory of dividends based on tax clienteles. *J. Financ.* **2000**, *55*, 2499–2536. [CrossRef]
40. Hotchkiss, E.S.; Strickland, D. Does shareholder composition matter? Evidence from the market reaction to corporate earnings announcements. *J. Financ.* **2003**, *58*, 1469–1498. [CrossRef]
41. Coffee, J.C. Liquidity versus control: The institutional investor as corporate monitor. *Columbia Law Rev.* **1991**, *91*, 1277–1368. [CrossRef]
42. Bhide, A. Efficient markets, deficient governance: US securities regulations protect investors and enhance market liquidity. But do they alienate managers and shareholders? *Harv. Bus. Rev.* **1994**, *72*, 128–140.
43. Parrino, R.; Sias, R.W.; Starks, L.T. Voting with their feet: Institutional ownership changes around forced CEO turnover. *J. Financ. Econ.* **2003**, *68*, 3–46. [CrossRef]
44. Griffin, D.; Tversky, A. The weighing of evidence and the determinants of confidence. *Cogn. Psychol.* **1992**, *24*, 411–435. [CrossRef]
45. Weinstein, N. Unrealistic optimism about future life events. *J. Pers. Soc. Psychol.* **1980**, *39*, 806–820. [CrossRef]
46. March, J.G.; Shapira, Z. Managerial perspectives on risk and risk taking. *Manag. Sci.* **1987**, *33*, 1404–1418. [CrossRef]
47. Gilson, S.C. Management turnover and financial distress. *J. Financ. Econ.* **1989**, *25*, 241–262. [CrossRef]
48. Larwood, L.; Whittaker, W. Managerial myopia: Self-serving biases in organizational planning. *J. Appl. Psychol.* **1977**, *62*, 94–198. [CrossRef]
49. Alicke, M.D.; Klotz, M.L.; Breitenbecher, D.L.; Yurak, T.J.; Vredenburg, D.S. Personal contact, individuation, and the better-than-average effect. *J. Pers. Soc. Psychol.* **1995**, *68*, 804. [CrossRef]
50. Levy, N. Culpable ignorance and moral responsibility: A reply to FitzPatrick. *Ethics* **2009**, *119*, 729–741. [CrossRef]
51. Ciulla, J.B. Leadership ethics: Mapping the territory. *Bus. Ethics Q.* **1995**, *5*, 5–28. [CrossRef]
52. Woodruff, P. The shape of freedom: Democratic leadership in the ancient world. In *The Quest for Moral Leaders: Essays on Leadership Ethics*; Ciulla, J.B., Price, T.L., Murphy, S.E., Eds.; Edward Elgar Publishing: Northampton, UK, 2005.
53. Kaplan, S. Ethically related judgments by observers of earnings management. *J. Bus. Ethics* **2001**, *32*, 285–298. [CrossRef]
54. Elias, R. Determinants of earnings management ethics among accountants. *J. Bus. Ethics* **2002**, *40*, 33–45. [CrossRef]
55. Kaplan, S.; McElroy, J.; Ravenscroft, S.; Shrader, C. Moral judgment and causal attributions: Consequences of engaging in earnings management. *J. Bus. Ethics* **2007**, *74*, 149–164. [CrossRef]
56. Greenfield, A.C.; Norman, C.S., Jr.; Wier, B. The effect of ethical orientation and professional commitment on earnings management behavior. *J. Bus. Ethics* **2008**, *84*, 419–434. [CrossRef]
57. Huang, P.; Louwers, T.; Moffitt, J.; Zhang, Y. Ethical management, corporate governance, and abnormal accruals. *J. Bus. Ethics* **2008**, *83*, 469–487. [CrossRef]
58. He, L.; Ho, S.K. Monitoring costs, managerial ethics, and corporate governance: A modeling approach. *J. Bus. Ethics* **2011**, *99*, 623–635. [CrossRef]
59. Deshmukh, S.; Goel, A.M.; Howe, K.M. CEO overconfidence and dividend policy. *J. Financ. Intermed.* **2013**, *22*, 440–463. [CrossRef]
60. Yan, X.S.; Zhang, Z. Institutional investors and equity returns: Are short-term institutions better informed? *Rev. Financ. Stud.* **2009**, *22*, 893–924. [CrossRef]
61. Bushee, B.J. Do institutional investors prefer near-term earnings over long-run value? *Contemp. Account. Res.* **2001**, *18*, 207–246. [CrossRef]
62. Gaspar, J.M.; Massa, M.; Matos, P. Shareholder investment horizons and the market for corporate control. *J. Financ. Econ.* **2005**, *76*, 135–165. [CrossRef]

63. Fama, E.F.; MacBeth, J.D. Risk, return, and equilibrium: Empirical tests. *J. Political Econ.* **1973**, 607–636. [CrossRef]
64. Petersen, M.A. Estimating standard errors in finance panel data sets: Comparing approaches. *Rev. Financ. Stud.* **2009**, *22*, 435–480. [CrossRef]
65. Chen, C.X.; Lu, H.; Sougiannis, T. The agency problem, corporate governance, and the asymmetrical behavior of selling, general, and administrative costs. *Contemp. Account. Res.* **2012**, *29*, 252–282. [CrossRef]
66. Gillan, S.L. Recent developments in corporate governance: An overview. *J. Corp. Financ.* **2006**, *12*, 381–402. [CrossRef]
67. Boone, A.; Field, L.; Karpoff, J.; Raheja, C. The determinants of corporate board size and composition: An empirical analysis. *J. Financ. Econ.* **2007**, *85*, 66–101. [CrossRef]
68. Coles, J.; Daniel, N.; Naveen, L. Boards: Does one size fit all? *J. Financ. Econ.* **2008**, *87*, 329–356. [CrossRef]
69. Linck, J.; Netter, J.; Yang, T. The determinants of board structure. *J. Financ. Econ.* **2008**, *87*, 308–328. [CrossRef]
70. Morck, R.; Shleifer, A.; Vishny, R. Management ownership and market valuation: An empirical analysis. *J. Financ. Econ.* **1988**, *20*, 293–315. [CrossRef]
71. Ferris, S.; Jagannathan, M.; Pritchard, A. Too busy to mind the business? Monitoring by directors with multiple board appointments. *J. Financ.* **2003**, *58*, 1087–1112. [CrossRef]
72. Fich, E.; Shivdasani, A. Are busy boards effective monitors? *J. Financ.* **2006**, *61*, 689–724. [CrossRef]
73. Field, L.; Lowry, M.; Mkrtchyan, A. Are busy boards detrimental? *J. Financ. Econ.* **2013**, *109*, 63–82. [CrossRef]