

THE EFFECT OF CEO OVERCONFIDENCE ON FIRM'S SUSTAINABLE MANAGEMENT

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ABSTRACT

This study examines whether CEO overconfidence would enhance capital expenditures, selling, general and administrative expenses, and corporate social responsibility (CSR) by preventing the CEO's sunk-cost bias. Using data from publicly traded U.S. firms from 1992 to 2015, we find that CEO overconfidence is less influenced by the previous level of investment and leads to independent decision-making regarding expenditures and CSR. Moreover, we discovered that overconfident CEOs incur fewer expenditures by making an independent and sustainable judgment, not driven by sunk costs incurred in prior periods. We also found evidence that independent decision-making helps enable long-term sustainable management and decrease the cost burden that may arise from repeating and continuing previous CSR activities.

Keywords: CEO Overconfidence, Corporate Social Responsibility, Corporate Sustainability, Cost Stickiness, Investment Decision.

JEL Classifications: G41, M14, M41

INTRODUCTION

This study explores the association between CEO overconfidence with sustainable management. We focus on whether CEO overconfidence would enhance various aspects of sustainable management of a firm, such as corporate social responsibility (CSR), capital expenditures, and selling, general and administrative expenses, by preventing the CEO's sunk-cost bias. Managers have fundamental authority to make decisions that have a significant impact on the company's values and goals and, ultimately, on sustainable management (Mintzberg, 1973; Hambrick & Mason, 1984). In South Korea, CEOs' confidence in and judgment of the future have played an important role in leading the country's economic leap and the development of the electronics, automobile, and chemical business of the Samsung Group, Hyundai Group, and LG Group, respectively. Outside South Korea, Facebook, Amazon, Netflix, and Google, collectively called "FANG," embraced the 4th Industrial Revolution as their key management strategy, and they have seen a significant increase in market capitalization. These companies' market values exceed those of Walmart and Coca-Cola, the previous leaders of traditional industries. Managers' confidence in the future plays an important role in corporate profitability and sustainable management, especially when the business environment is undergoing significant changes. In this regard, it would be meaningful to investigate how managerial

characteristics affect various management decisions related to corporate policy. Recently, researchers in corporate finance and accounting have studied the relationship between managers' psychological biases or their characteristics and management decisions (Bertrand & Schoar, 2003; Baker et al., 2012). In addition, many studies have focused on managerial overconfidence, which is considered one of the most representative factors inducing irrational decision-making.

Managerial overconfidence refers to manager's cognitive bias, based on which managers demonstrate unwarranted belief in their judgments and decision-making capabilities (Park et al., 2019). In general, overconfidence is defined as an excessively positive and therefore inaccurate perception of one's abilities or knowledge (Anderson et al., 2012), which may lead to overestimation of a company's future performance or one's superiority in terms of capabilities (Hilary et al., 2016). In other words, managerial overconfidence is a manager's tendency to be overly optimistic about future profits or cash flows from the planned investments, or to be overly confident of his/her capability to overcome current unfavorable circumstances (Hayward & Hambrick, 1997; Brown & Sarma, 2007). Sometimes, decisions made by overconfident managers lead to positive effects (group effort, innovation, etc.) in terms of motivation, but at other times, they harm the company's efficient use of resources by obsessing over sunk costs of past investments.

The preceding studies have analyzed the influence of managerial overconfidence on various aspects, mainly in negative contexts, including capital expenditure (Malmendier & Tate, 2005), corporate acquisitions and mergers (Hayward & Hambrick, 1997; Roll, 1986; Malmendier & Tate, 2008), dividend policy (Deshmukh et al., 2013), capital procurement policy (Malmendier et al., 2011), R&D expenditure (Hirshleifer et al., 2012), risk management (Adam & Fernando, 2006; Alsubaie, 2009), disclosure of management forecast (Hribar & Yang, 2013), conservatism (Ahmed & Duellman, 2013), earnings management (Schrand & Zechman, 2012), stock price crash risk (Kim & Ryu, 2014), intentional adjustment of cash flows (Yang & Kim, 2020), and passive response to corporate social activities (Park et al., 2019).

Recently, however, several studies have presented positive aspects of managerial overconfidence, which may have a positive impact on corporate performance or policy-making (Hilary et al., 2016). In particular, psychological research suggests that overconfident people are relatively more respected and influential compared with others. Anderson et al. (2012) showed that overconfident people tend to be more respected and have more influence and that their peers view overconfidence as a proxy for competence. Meanwhile, Phua et al. (2018) found that the leadership of overconfident CEOs tends to increase other people's level of commitment and lead them toward their vision, implying the positive side of overconfidence. Daniel Kahneman, a Nobel Prize-winning psychologist and the author of "Thinking, Fast and Slow," argued that people need to be optimistic and overconfident about their chances to be wildly successful, particularly if they are leaders.

The positive side of managerial confidence is also studied in connection with optimism. Hilary et al. (2016) classified managerial optimism as an upward bias in the mean of estimating future circumstances whereas managerial overconfidence as an upward bias in its precision. Based on this classification, researchers suggested that managerial optimism, which expects

future events to be positive, has a positive effect on inducing efforts from participants, including managers.

The main purpose of this study is to examine whether the overconfidence of managers is positively related to independent management decision in terms of sustainable management. Although sustainable management has various attributes, this study focuses on certain internal aspects – the level of investment and cost management. In addition, from an external perspective, CSR, a key element of sustainable management and measurement of the characteristics of an enterprise's external activities, was empirically examined for its relevance to management overconfidence. Among various attributes required for long-term sustainable management of a company, this study focuses on managerial overconfidence, especially its positive aspects.

Examining 13,704 firm-year observations from publicly traded U.S. firms from 1992 to 2015, we found evidence that overconfident CEOs are less influenced by the previous level of investment and can make decisions to cut capital expenditures drastically for sustainable management using their own judgment. Also, we discovered that overconfident CEOs incur fewer expenditures by making independent and sustainable judgment not driven by sunk costs incurred in prior periods. Moreover, we found that CEO overconfidence leads to independent decision-making, which helps enable long-term sustainable management and decrease the cost burden that may arise from repeating and continuing previous CSR activities.

This study has several contributions to the current literature. In contrast to prior studies of the negative impact of CEO overconfidence on management decision-making, this study suggests the bright side of CEO overconfidence that improves a firm's sustainable management, which has been a key goal of corporate management since the late 1980s by curbing CEO's sunk-cost bias. Some of these management decisions include capital expenditures, SG&A expenses and CSRs. Moreover, we extended the research on the determinants of manager decision-making by empirically proving that managers with higher overconfidence lead to higher sustainable management. This implies that managerial characteristics, especially CEO overconfidence, affect the investment and administrative expenditure, including CSR activities, for sustainable management of the company. Our findings supported this argument and empirically found that management overconfidence plays a role in reducing the obsession with the sunk cost of past investment and expenditure. We also found that management overconfidence inhibits the effects of previous CSR activities and helps sustainable management.

The remainder of this paper is organized as follows. Section 2 presents the literature review and hypotheses development. Section 3 provides the definitions of the main variables, sample, and research design. Section 4 discusses descriptive statistics and empirical results, and Section 5 concludes this study.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

CEO Overconfidence

Literature research related to this study is largely divided into research on sustainable management and the negative and positive aspects of management overconfidence. From a psychological perspective, individuals generally have an over-confidence tendency, which acts

as a cause for instrumentation errors and upward bias. Overconfident people expect that favorable future events are more likely to occur and believe that they have more precise knowledge about future events than they actually have (Svenson, 1981; Hackbarth, 2008). Managerial overconfidence can be described as an extension of the personal characteristic theory (Alicke, 1985) in which a particular individual is better at judging or responding to a situation than others. In other words, management overconfidence has been added to the individual's "above average self-assurance effect" characteristics described in psychology as having the confidence to be the company's top decision-maker. As a result, they tend to view their future prospects relatively high or strongly confident (Weinstein, 1980). Previous studies on managerial overconfidence are divided into studies focusing on its negative effects and those on positive effects. The various characteristics of management overconfidence may explain these conflicting studies.

First, studies on the negative effects of managerial confidence explore asymmetric cost recognition and the propensity for overinvestment caused by an overestimation of future revenues, sunk-cost effects resulting from an obsession with past investments and error avoidance, manipulation of cash flows, and negative effects on CSR activities. Schrand and Zechman (2012) reported that the stronger managers' propensity for overconfidence is, the more frequent errors are found in financial statements. Ahmed & Duellman (2013) argued that overconfident managers with a relatively higher propensity for investment exercise a less conservative accounting practice to overestimate future returns under both conditional and unconditional circumstances and defer cost recognition. Meanwhile, Kim & Ryu (2014) defined the criteria for overwriting managers as a higher capital investment group than the industrial average set out by Schrand & Zechman (2012). They found that management overconfidence relates to a downward rigidity of the total cost, cost of goods sold, and sales and administrative cost. They also reported that the lower the transparency of profits, the stronger the downward rigidity of the cost due to management overconfidence. In other words, an entity with a tendency for management overconfidence has a high expectation of a sales recovery, providing a characteristic that even if sales decline temporarily, it would not reduce associated costs proportionally and incur additional costs for holding idle resources. Using empirical data from the Korean stock market, Yang & Kim (2020) reported that CEOs tend to adjust or over represent their operating cash flows (OCF) from negative to positive to avoid negative signals of cash flows from overinvestment.

Liu (2017) classified whether management over-confidence was based on the number of shares held by the CEO and observed that management over-confidence was closely related to overinvestment. He also found that the extent of the relationship between management overconfidence and overinvestment depends on the company's financial capabilities, and that in situations where financial ability is weak, management overconfidence has a negative association with overinvestment. However, in situations where financial capability is strong, the degree of overinvestment increases. In other words, overconfident managers underestimate investment-related risks and overestimate investment opportunities; this is empirically studied for the Chinese stock market where such characteristics show stronger effects when the financial situation was favorable. Park et al. (2019) observed the unseen stock market and discovered that

management overconfidence had a negative relationship with an entity's CSR activities. Specifically, they demonstrated that management overconfidence, divided by text analysis, has a negative relationship with the level of CSR activity and reported that management overconfidence harms the entity's long-term revenue in its interactions with CSR activities. However, in the presence of financial constraints, CSR activities were observed to reverse to a positive relationship with the entity's long-term revenue. This finding indicates that although management overconfidence tends to negatively affect CSR activities in general, entities' returns may be positively affected by CSR activities when financial conditions are unfavorable.

Yet, note that prior studies on the phenomena in which management overconfidence positively influences corporate performance are mainly linked to the characteristics of management optimism. Overconfident managers are optimistic about the future and are looking at how a positive mindset affects corporate performance and sustainable management positively. It is reasonable for managers to recognize their limitations appropriately and set realistic objectives. However, there are questions about why people think they are overconfident about their abilities and their future prospects (Ehrlinger & Dunning, 2003). Overconfidence in one's abilities leads to self-esteem (Alicke, 1985), which is beneficial to mental health (Taylor & Brown, 1988). It has various effects on improving motivation and persistence in performing tasks (Pajares, 1996). One theory states that traits of believing that you are overconfident and more capable than you really are help persuade others (Leary, 2007). Kenny et al. (2018) argued that management overconfidence causes stakeholders to be more assertive in their vision of leaders and optimistic about the company's future prospects. Hence, self-confident CEOs have the characteristics of smoothly inducing outside stakeholders to invest, providing greater satisfaction to suppliers, and encouraging the company's employees to concentrate on work, thereby enabling a lower turnover rate. A recent study on management overconfidence concerning positive corporate performance reported that management overconfidence is similar to optimism and ultimately helps corporate performance by raising future expectations and inducing positive efforts (Hilary et al., 2016). Specifically, previous researchers noted that overconfident managers become overoptimistic after a series of successful experiences, and such optimism positively affects the company's gross return on assets in the case of listed companies in the United States.

Sustainable Management

The key point of this research is to discover the positive aspects of management overconfidence on corporate management and study its relevance to sustainable management, which is the core objective of modern enterprises. Elkington (1998) presented that the concept of "sustainable development" has become a key environmental issue from social, political, and economic perspectives, since the 1987 "Our Common Future" and the June 1992 "UN Conference on Environment and Development (UNCED)" held in Rio de Janeiro. It has been argued that future business activities should consider a win-win strategy that meets customer needs and resolves environmental issues at the same time. Christofi et al. (2012) presented the Triple Bottom Line (TBL) criteria as a result of its multidisciplinary research on corporate sustainability, explaining that the TBL has been a standard for aligning corporate efforts to the

environment and community since the mid-1990s. Although the corporate sustainability theory and practice have evolved over the past half-century at an independent and different pace in both the United States and the European Union, the three factors surrounding the enterprise (economic, social, and environmental) have formed a corporate sustainability paradigm. However, the method for measuring and reporting companies' sustainability based on TBL has not yet been standardized.

Corporate Social Responsibility

The concepts mentioned when discussing sustainable management of companies are CSR. H. Bowen, who is known as the "Father of the CSR" (Carroll, 1999), described the concept of CSR as "the obligation of businessmen to pursue those policies, to make those decisions, or to follow those lines of action, which are desirable in terms of the objectives and values of our society" (Christofi et al., 2012). CSR emerged in the 1950s and 1960s amid concerns over the recognition of growth limits and environmental conservation following the industrialization drive. Early CSR activities were criticized for being limited to local communities, but later expanded to include various stakeholders such as employees, suppliers, communities, and countries (Christofi et al., 2012). Votaw & Sethi (1973) criticized CSR for being overestimated as a panacea that would address the global poverty gap, social exclusion, and environmental degradation, and that CSR's management principles are biased toward specific companies and their interests (Johnson, 1973).

In many cases, the concept of CSR is too broad or diverse to be defined, so the future corporate CSR concepts have been argued to be strategically selected and applied to suit a company's environment and purpose. Catalina et al. (2020) argued that a difference exists between emerging markets and developed countries in the approach of CSR. In the case of emerging markets, the researchers stated that economic and technological demands are stronger than socio-cultural demand, tending to react to the institutional environment. Moreover, they argued that the content of CSR activities also tends to be centered on philanthropic, cultural, and religious values. In comparison, CSR activities in developed countries represent a more active and universal tendency. The researchers explained that social expectations for CSR activities are relatively high in developed countries compared with their overall low social expectations in emerging economies due to weak social economy and low quality of life. Generally, sustainable management and CSR imply voluntary business activities for the benefit of both the enterprise and environment and a survival strategy for modern enterprises in solving issues related to stakeholders and the environment (Van Marcel, 2003).

Hypothesis Development

Through prior research, we looked at both the negative and positive aspects of managerial overconfidence in the process of management decision-making. The focus of this study is the positive aspect of management decision-making characteristics in terms of investment and cost associated with management overconfidence. Before analyzing these positive aspects, we looked at the negative aspects through prior research. According to Ahmed & Duellman (2013) and Kim

and Ryu (2014), the main negative aspects of overconfidence in management are delay in cost recognition based on optimistic expectations of future earnings and the stickiness of total costs, cost of goods sold, and sales and administrative costs due to overconfidence in management. In addition, management overconfidence propensity is closely related to overinvestment, which is observed to increase relevance when financial capacity is strong (Liu, 2017). Management overconfidence is negatively correlated with the entity's CSR activities and long-term returns, which are reported to reverse to positive relevance under financial constraints (Park et al., 2019). However, despite prior research on negative characteristics of managerial overconfidence, the cost stickiness and the control of CSR activities are judged to have positive factors in terms of corporate performance. This is because cost stickiness can be a pre-investment in case the future business environment optimistically turns, and the control of CSR activities has a cost-reduction effect in terms of the entity's profitability as a whole.

A prior study of the positive aspects of management overconfidence reports a positive association with corporate performance through motivation, mainly linking managerial tendencies to optimistic characteristics (Hilary et al., 2016; Pajares, 1996). Motivational factors have mainly preceded the positive characteristics of management overconfidence, and few studies have focused on direct corporate investment or cost aspects. In other words, little prior studies have been conducted on how management overconfidence characteristics relate to the level of the entity's expenditure and investment amount. Therefore, research on the relevance of an entity's investment amount or expenditure to its management overconfidence propensity is expected to provide a useful opportunity to view management overconfidence behavior from more diverse angles.

Analytical review of the preceding study of management overconfidence often shows that the negative and positive characteristics of management overconfidence are present at the same time. For example, management overconfidence is related to the consequences of avoiding one's own unsuccessful investment judgment (Yang & Jung, 2019), but also to cost-cutting aspects through the suppression of social responsibility activities (Park et al., 2019). In other words, the optimistic overconfidence of managers is analyzed to have the characteristic of inducing independent and confident decision-making to curb municipal responsibility activities, as opposed to corporate social responsibility activities that are universally enforced. Thus, the study noted the possibility of management overconfidence making independent and sustainable decisions based on their own future prospects, rather than being routinely guided by previous decisions in terms of investment and expenditure. To more clearly examine this possibility, the following first and second hypotheses are established to determine whether over-confidence managers will make decisions that repeatedly follow existing expenditure and investment levels, or whether they will control customary expenditure and investment levels and make independent management decisions.

H1: The tendency of management overconfidence inhibits the continuation of the level of previous capital expenditure.

H2: The tendency of management overconfidence inhibits the level of previous SG&A expenditure.

Management overconfidence is related not only to the consequences of avoiding one's own unsuccessful investment judgment but also to cost-cutting aspects through the suppression of CSR activities. In other words, the optimistic overconfidence of managers is analyzed to have decision-making characteristics that determine the level of CSR activities appropriate for the company based on independent forecasts, instead of involuntarily participating in the CSR activities required as a member of society. In this respect, the level of CSR activities will be determined in terms of long-term and comprehensive sustainability rather than the entity's expenditure or investment-related standards. This is because although corporate expenditure and investment are directly related to profitability, CSR activities are generally long-term and comprehensive. If CSR activities are closely related to the tendency of management to overconfidence, then managers are likely to make independent management decisions in terms of sustainable management rather than routinely repeating or maintaining previous CSR activities. Accordingly, we would like to establish the following third hypothesis.

H3: Management overconfidence has the characteristic of suppressing the level of previous social responsibility activities.

RESEARCH MODEL

Sample and Data

For this study, we obtained samples from publicly traded U.S. firms operating from 1992 to 2015. We extracted CEO option holding data to construct CEO overconfidence (OC) from the ExecuComp database and CSR activity data from the KLD Socrates database. Most financial data are derived from Compustat and the Center for Research in Security Prices (CRSP) databases to construct other variables. Data from the financial and utility industries (SIC codes 4900–4999 & 6000–6999) and companies with missing data were excluded from our samples for consistency. This process yielded a final sample of 13,704 annual firm- year observations from listed companies over the period of 1992–2015. We then winsorized each continuous variable at the top and bottom one-percentile level to mitigate the influence of outliers. Panel A and B in Table 1 show sample selection procedure and industry distribution of the sample, respectively.

Table 1	
DISTRIBUTION OF THE SAMPLE	
Panel A: Sample Size	
All observations available on Compustat for 1992–2015	305,652
Less:	
Financial institutions and insurance companies (SIC code with 6000–6999 and 4900–4999)	(1,13,148)
Unavailable data to estimate control variables	(379)

Firm-years without compensation data from Execu Comp to estimate overconfidence variable (OC)	(1,78,421)		
Total observations	13,704		
Panel B: Industry Composition of the Sample			
Fama-French industry classification	Code	No. of obs.	Percentage of sample (%)
Consumer non-durables: Food, Tobacco, Textiles, Apparel, Leather, Toys	1	1,144	8.35
Consumer durables: Cars, TVs, Furniture, Household Appliances	2	458	3.34
Manufacturing: Machinery, Trucks, Planes, Office Furniture, Paper	3	2,202	16.07
Oil, Gas, and Coal Extraction and Products	4	753	5.49
Chemicals and Allied Products	5	627	4.58
Business Equipment: Computers, Software, and Electronic Equipment	6	3,222	23.51
Telephone and Television Transmission	7	416	3.04
Wholesale, Retail, and Some Services (Laundries, Repair Shops)	9	1,990	14.52
Healthcare, Medical Equipment, and Drugs	10	1,391	10.15
Other: Mines, Construction, Transportation, Hotels, Bus Service, Entertainment	12	1,501	10.95
Total		13,704	100

Measurement of CEO Overconfidence

This study investigates whether CEO overconfidence would enhance various aspects of sustainable management of a firm by preventing the CEO's sunk-cost bias. To examine this, we defined and measured CEO overconfidence based on the CEO's option holdings and exercises and the level of moneyness used in previous studies (Malmendier & Tate, 2005; Campbell, et al., 2011). Campbell et al. (2011) suggested that overconfident CEOs hold stock options too long or too deep in the money. We employed CEO overconfidence (OC) dummy variables that take the value of 1 if the average moneyness of the options is higher than 100%; in other words, if a CEO holds stock options with a stock price that exceeds the exercise price by more than 100% two or more times during the sample period, the variables were denoted by 1. We used the specific calculation of the average option moneyness employed by Campbell et al. (2011).

Empirical Methodology and Variable Definitions

To verify the effect of CEO overconfidence on sustainable management, we estimated the following model (1):

$$SUSTAIN_{i,t} = \beta_0 + \beta_1 LSUSTAIN_{i,t} + \beta_2 OC_{i,t} + \beta_3 LSUSTAIN * OC_{i,t} + \beta_4 SALE_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 LEV_{i,t} + \beta_7 MTB_{i,t} + \beta_8 INVT_{i,t} + \beta_9 QUICK_{i,t} + \beta_{10} OCF_{i,t} + \beta_{11} TENURE_{i,t} + \beta_{12} AGE_{i,t} + \beta_{13} GENDER_{i,t} + YD + ID \quad (1)$$

where

$SUSTAIN_t$	
$CAPEXP_t$	= the logarithm of total capital expenditure of a firm in year t;
$SG\&A_t$	= the logarithm of total selling, general, and administrative expenditure of a firm in year t;
CSR_t	= 1 if adjusted CSR score is above median value, and 0 otherwise;
$LSUSTAIN_t$	= the lagged $SUSTAIN$ variables in year t
OC_t	= 1 if CEOs hold stock options with a stock price exceeding the exercise price by more than 100%, and 0 otherwise;
$SALE_t$	= the logarithm of total sales of a firm in year t;
$SIZE_t$	= the logarithm of total assets value of a firm in year t;
LEV_t	= firm leverage measures as the ratio of total liabilities to total assets in year t;
MTB_t	= market value divided by total equity in year t;
$INVT_t$	= total asset divided by sales in year t;
$QUICK_t$	= (cash + receivables) divided by current liabilities in year t;
OCF_t	= operating cash flows divided by total assets in year t;
$TENURE$	= the period after the change of CEO in year t;
AGE_t	= the age of a CEO of a firm in year t;
$GENDER_t$	= 1 if the adjusted CSR score is above median value, and 0 otherwise

The dependent variable for Model (1) is sustainable management ($SUSTAIN_t$). To capture different aspects for our testing hypothesis, we used the following three variables as proxies for sustainable management: (1) $CAPEXP_t$, the logarithm of total capital expenditure; (2) $SG\&A_t$, the logarithm of total selling, general, and administrative expenditures; and (3) CSR_t , a binary

indicator variable which equals 1 if the adjusted *CSR* score is above the median value, and 0 otherwise. Therefore, we used ordinary least squares (OLS) when *SG&A_t* and *CAPEXP_t* are dependent variables and a logit regression when *CSR_t* is a dependent variable. The key variable of interest, *OC_t*, represents 1 if CEOs hold stock options with a stock price exceeding the exercise price by more than 100% two or more times, and 0 otherwise. If overconfident CEOs make independent and sustainable decisions using their own judgment on future prospects, unguided by the previous level and direction of investment, to prevent sunk-cost effects and enable enhanced sustainable management, we expected a negative coefficient of the interaction between *LSUSTAIN_t* and *OC_t* (β_3).

The set of extensive control variables included firm-specific characteristics, such as *SALE_t*, *SIZE_t*, *LEV_t*, *MTB_t*, *INVT_t*, *QUICK_t*, and *OCF_t*; CEO-specific variables included *TENURE_t*, *AGE_t*, *GENDER_t*, and Year and Industry dummy to reduce any potential endogeneity bias or omitted variable problems.

We included *SALE_t*, measured as the logarithm of total sales and expected a positive sign. We expected a positive sign for *SIZE_t*, proxied by the logarithm of the book value of total assets, since a larger firm tends to have more investment and expenditures. *LEV_t* is the firm leverage measured as the ratio of total liabilities to the total asset; we expected more leveraged firms would less likely to make investments. As a proxy for investment opportunities and future profitability, we included *MTB_t* measured as the natural logarithm of the market-to-book ratio and expected a positive sign. *INVT_t* is total assets deflated to total sales, and *QUICK_t* is measured as the ratio of the sum of cash and receivables to total current liabilities. *OCF_t* is measured by operating cash flow delated by total assets. In addition, we controlled for CEO characteristics such as *TENURE_t*, *AGE_t*, and *GENDER_t*, which are measured as the period after the change of CEO, the age of CEO, and the indicator variable of female CEO, respectively. The model also controlled for dummies by year (*YD*) and industrial sector (*ID*).

EMPIRICAL ANALYSES

Descriptive Statistics

Panel A of Table 2 presents the descriptive statistics of the variables used in our regression model. The mean (median) value of *CAPEXP_t*, *SG&A_t*, and *CSR_t*, which are measures of sustainable management behavior, are 3.86 (3.80), 5.50 (5.36), and -0.33 (-0.33), respectively. These values are similar to the values found in the earlier study of Yuan et al. (2019). The mean value of *OC_t*, CEO overconfidence level, is 0.256, which is comparable with the figure reported by Gul et al. (2020). Based on this present study's definition, the value indicates that approximately 25.6% of the samples are controlled by overconfident CEOs. The average firm sizes, measured by the natural logarithm value of total sales (*SALE_t*) and total assets (*SIZE_t*), are 7.102 and 7.154, respectively. The mean (median) value of *MTB_t*, which is the ratio of market value to book value, is 3.065 (2.273), implying that the market value of equity is greater than its

book value. The descriptive statistics for the CEO-level variables are comparable with those in prior studies (e.g., McCarthy et al., 2017). The average $TENURE_t$ and AGE_t of CEOs are 8.577 and 55.153 years, respectively. The mean value of $GENDER_t$, an indicator for the employment of female CEOs, is 0.026, which implies that female CEOs account for 2.6% of our sample. A recent report indicated that 4.6% of Fortune 1000 CEOs were female (see <http://www.catalyst.org/knowledge/women-ceos-fortune-1000>).

Panel B of Table 2 provides the correlation matrix for the variables used in our study. The upper and lower diagonals, respectively, show the Pearson and Spearman correlations. It is difficult to draw a conclusion on the association between CEO overconfidence and sustainable management simply based on this correlation coefficient. Hence, we conducted a final empirical analysis considering all variables included in the research model; the result is reported in the next section.

Table 2A						
DESCRIPTIVE STATISTICS AND PEARSON CORRELATION						
Panel A: Descriptive Statistics						
Variables	N	Mean	Median	Std.	Q1	Q3
CSR	7,558	-0.3322	-0.3333	0.6914	-0.7500	0.0024
SG&A	13,704	5.4969	5.3577	1.4833	4.4270	6.4789
CAPEXP	13,646	3.8574	3.7955	1.8513	2.6677	5.0130
OC	13,704	0.2562	0.0000	0.4366	0.0000	1.0000
SALE	13,704	7.1021	7.0095	1.5777	6.0031	8.1096
SIZE	13,704	7.1543	6.9963	1.5541	6.0032	8.1886
LEV	13,704	1.4157	0.9646	2.6700	0.4802	1.6718
MTB	13,704	3.0648	2.2736	3.2985	1.4409	3.6554
INT	13,704	1.2701	1.0300	0.8811	0.7094	1.5419
QUICK	13,704	1.681	1.231	1.504	0.797	1.979
OCF	13,704	0.114	0.110	0.099	0.063	0.165
TENURE	13,704	8.5767	6.0000	7.3678	3.0000	11.0000
AGE	13,389	55.1530	55.0000	7.5335	50.0000	60.0000
GENDER	13,704	0.0255	0.0000	0.1575	0.0000	0.0000

Table 2B								
DESCRIPTIVE STATISTICS AND PEARSON CORRELATION								
Panel B I: Pearson and Spearman Correlation								
#	Variables	1	2	3	4	5	6	7
1	SG&A		0.682	0.187	-0.08	0.865	0.832	0.127
			0	0	0	0	0	0
2	CAPEXP	0.664		0.096	-0.031	0.816	0.867	0.135
		0		0	0	0	0	0
3	CSR	0.161	0.085		0	0.117	0.106	0.017

		0	0		-0.971	0	0	-0.141
4	<i>OC</i>	-0.075	-0.03	0		-0.075	-0.082	-0.03
		0	0	-0.997		0	0	-0.001
5	<i>SALE</i>	0.857	0.809	0.103	-0.075		0.925	0.168
		0	0	0	0		0	0
6	<i>SIZE</i>	0.815	0.861	0.077	-0.082	0.922		0.168
		0	0	0	0	0		0
7	<i>LEV</i>	0.314	0.353	0.036	-0.095	0.431	0.408	
		0	0	-0.002	0	0	0	
8	<i>MTB</i>	0.163	0.089	0.103	0.36	0.059	0.055	0.135
		0	0	0	0	0	0	0
9	<i>INT</i>	-0.088	0.114	-0.047	-0.015	-0.179	0.175	-0.093
		0	0	0	-0.077	0	0	0
10	<i>QUICK</i>	-0.288	-0.369	-0.015	0.081	-0.405	-0.314	-0.545
		0	0	-0.183	0	0	0	0
11	<i>OCF</i>	0.085	0.173	0.061	0.231	0.07	0.05	-0.173
		0	0	0	0	0	0	0
12	<i>TENURE</i>	-0.07	-0.062	-0.049	0.104	-0.084	-0.081	-0.103
		0	0	0	0	0	0	0
13	<i>AGE</i>	0.076	0.103	-0.008	-0.028	0.13	0.114	0.065
		0	0	-0.488	-0.001	0	0	0
14	<i>GENDER</i>	0.011	-0.014	0.091	-0.025	-0.013	-0.02	-0.016
		-0.189	-0.111	0	-0.004	-0.127	-0.021	-0.066

Table 2B
DESCRIPTIVE STATISTICS AND PEARSON CORRELATION

Panel B 2: Pearson and Spearman Correlation

#	Variables	8	9	10		12	13	14
1	<i>SG&A</i>	0.112	-0.109	-0.298	0.085	-0.071	0.074	0.021
		0	0	0	0	0	0	-0.014
2	<i>CAPEXP</i>	0.031	0.122	-0.351	0.188	-0.069	0.097	-0.017
		0	0	0	0	0	0	-0.05
3	<i>CSR</i>	0.086	-0.038	-0.018	0.061	-0.026	-0.023	0.081
		0	-0.001	-0.115	0	-0.026	-0.045	0
4	<i>OC</i>	0.253	0	0.067	0.22	0.079	-0.027	-0.025
		0	-0.972	0	0	0	-0.002	-0.004
5	<i>SALE</i>	0.022	-0.184	-0.411	0.104	-0.088	0.12	-0.004
		-0.009	0	0	0	0	0	-0.654

6	<i>SIZE</i>	0.018	0.166	-0.3	0.072	-0.095	0.109	-0.009
		-0.031	0	0	0	0	0	-0.303
7	<i>LEV</i>	0.556	0.008	-0.185	-0.074	-0.054	0.011	-0.012
		0	-0.323	0	0	0	-0.186	-0.168
8	<i>MTB</i>		-0.012	0.035	0.246	-0.016	-0.058	-0.006
			-0.156	0	0	-0.068	0	-0.473
9	<i>INT</i>	0.008		0.256	-0.1	-0.01	-0.043	-0.003
		-0.378		0	0	-0.239	0	-0.718
10	<i>QUICK</i>	0.076	0.274		0.056	0.1	-0.055	0.034
		0	0		0	0	0	0
11	<i>OCF</i>	0.419	-0.06	0.088		0.046	-0.009	0.005
		0	0	0		0	-0.293	-0.531
12	<i>TENURE</i>	0.025	0.012	0.085	0.072		0.419	-0.022
		-0.004	-0.168	0	0		0	-0.009
13	<i>AGE</i>	-0.06	-0.029	-0.071	-0.007	0.333		-0.033
		0	-0.001	0	-0.401	0		0
14	<i>GENDER</i>	-0.006	-0.014	0.019	0.004	-0.04	-0.036	
		-0.463	-0.099	-0.024	-0.651	0	0	

Table 3 presents the regression analysis results of Hypothesis 1, focusing on the impact of CEO overconfidence on capital expenditure decision-making. We found that the interaction term $LSUSTAIN_t \times OC_t$ always has a negative sign and is highly significant at a 1% level before and after CEO characteristic variables are controlled, as shown in Columns (3) and (4). These results indicate that overconfident CEOs may not be influenced by the level of investment in prior periods and can make decisions to cut capital expenditures drastically to achieve sustainable management.

Among the control variables, $SIZE_t$, MTB_t , and OCF_t in all columns have significantly positive coefficients, which is consistent with Fazzari et al. (1988) and Sanjai and Welch (1995). This implies that firms with a larger size, a higher market-to-book ratio, and more operating cash flow are more likely to incur capital expenditure. In addition, consistent with the findings of Sanjai and Welch (1995) and Mustapha and Chyi (2010), the coefficients on LEV_t and $QUICK_t$ are statistically negative, suggesting that higher debt holdings and larger cash assets tend to decrease the level of capital expenditure.

Table 3
CEO OVERCONFIDENCE AND SUSTAINABLE MANAGEMENT IN
CORPORATE SOCIAL RESPONSIBILITY INVESTMENT

Dependent variable: CSR

	Subsample	Subsample	Full sample	Full sample
	(High <i>OC</i>)	(Low <i>OC</i>)		
Independent variables	-1	-2	-3	-2
<i>Intercept</i>	-0.7658*	-0.7319***	-0.7336***	-0.6801***
	(-1.69)	(-5.31)	(-5.74)	(-4.88)
<i>LCSR</i>	0.591***	0.6996***	0.7***	0.6971***
	-26.53	-62.25	-65.06	-64.17
<i>OC</i>			-0.0559***	-0.0537***
			(-3.15)	(-3.02)
<i>LCSR*OC</i>			-0.0701***	-0.0668***
			(-3.08)	(-2.92)
<i>SALE</i>	0.0647	0.0456	0.0485	0.0469
	-1	-1.24	-1.55	-1.49
<i>SIZE</i>	0.0016	0.0117	0.0105	0.0129
	-0.03	-0.32	-0.34	-0.41
<i>LEV</i>	-0.0081	-0.0117**	-0.0110***	-0.0113***
	(-1.01)	(-2.53)	(-2.81)	(-2.84)
<i>MTB</i>	0.0049	0.0113***	0.0094***	0.0093***
	-0.91	-2.89	-3.03	-2.96
<i>INVT</i>	0.0163	0.0105	0.0089	0.0079
	-0.38	-0.43	-0.43	-0.38

<i>QUICK</i>	-0.0070	0.0093	0.0069	0.0075
	(-0.64)	-1.48	-1.29	-1.38
<i>OCF</i>	0.2292	0.1337	0.1346	0.1428
	-1.43	-1.18	-1.47	-1.55
<i>TENURE</i>				-0.0003
				(-0.27)
<i>AGE</i>				-0.0010
				(-1.02)
<i>GENDER</i>				0.0572
				-1.38
Year-fixed effect	Yes	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes	Yes
[F-value]	[21.36] ***	[76.68] ***	[92.63] ***	[88.39] ***
R²	0.564	0.595	0.583	0.584
N	1,382	4,197	5,579	5,511

Table 4 illustrates the results of the regression analysis of Hypothesis 2 that explored whether CEO overconfidence affects the sustainable cost-spending decisions. Columns (1) and (2) in Table 4 show the results of the analysis performed for subsamples of firms with CEOs with a high level and a low level of overconfidence. The coefficient of $LSUSTAIN_t$ is significantly positive for both subsamples, suggesting the existence of sunk-cost effects. In Column (3), the coefficients of the interaction term $LSUSTAIN_t \times OC_t$ is significantly negative (-0.018; p-value < 0.01), supporting the fact that overconfident CEOs would suppress cost spending by exercising independent and sustainable judgments rather than continuing the

previous level of sunk costs and maintaining the direction of such costs. As shown in Column (4), the interaction coefficient is still statistically negative (-0.016 ; p -value < 0.01) even after the CEO characteristic control variables are controlled.

For the control variables, the coefficients of $SALE_t$ and $SIZE_t$ are significantly positive in all columns, which is similar to the findings of Anderson, Banker, and Janakiraman (2003), suggesting that the larger the firm size, the higher the SG&A expenditures.

	Dependent variable:SG&A			
	Subsample	Subsample	Full sample	Full sample
	(High OC)	(Low OC)		
Independent variables	-1	-2	-3	-4
<i>Intercept</i>	0.0169	-0.0177	-0.0372	0.0807*
	-0.1	(-0.40)	(-0.87)	-1.79
<i>LSG&A</i>	0.8337***	0.8566***	0.8549***	0.8541***
	-128.72	-248.48	-272.3	-269.51
<i>OC</i>			0.1217***	0.1168***
			-8.03	-7.66
<i>LSG&A*OC</i>			-0.0167***	-0.0164***
			(-6.04)	(-5.90)
<i>SALE</i>	0.0306*	0.0492***	0.0472***	0.0434***
	-1.78	-5.28	-5.75	-5.26
<i>SIZE</i>	0.0933***	0.0628***	0.0681***	0.0739***
	-5.35	-6.72	-8.26	-8.89
<i>LEV</i>	-0.0182***	-0.0082***	-0.0111***	-0.0110***
	(-8.70)	(-8.05)	(-12.23)	(-11.99)
<i>MTB</i>	0.0167***	0.0108***	0.0133***	0.0131***
	-11.76	-11.2	-17.06	-16.64

<i>INVT</i>	0.0206*	0.0117*	0.0168***	0.0123**
	-1.88	-1.94	-3.16	-2.31
<i>QUICK</i>	-0.0003	-0.0009	0	-0.0008
	(-0.10)	(-0.51)	0	(-0.52)
<i>OCF</i>	0.0956**	0.2828***	0.2111***	0.2172***
	-2.39	-11.46	-10.14	-10.32
<i>TENURE</i>				0.0015***
				-5.54
<i>AGE</i>				-0.0023***
				(-8.45)
<i>GENDER</i>				-0.0045
				(-0.39)
Year-fixed effect	Yes	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes	Yes
[F-value]	[1547.74] ***	[6658.38] ***	[7736.28] ***	[7361.38] ***
R²	0.975	0.983	0.981	0.981
N	3,511	10,193	13,704	13,389

Table 5 shows the results of the logistic regression analysis of Hypothesis 3. For comparison, we first classified the sample firms into two subsamples on the basis of the level of CEO overconfidence, namely, the “Low” group (below median) and the “High” group (above the median). As shown in Columns (1) and (2) in Table 3, the coefficient of $LSUSTAIN_t$ is significantly positive for both subsamples, suggesting that we can empirically observe the sunk-cost effects in our samples. Our main interest in Hypothesis 1 is whether CEO overconfidence would impact the independent decision-making regarding CSR, which is helpful for long-term sustainable management by preventing the CEO’s sunk-cost bias. Hence, the results shown in Columns (3) and (4) are based on regression Model (1), which includes $LSUSTAIN_t$, OC_t , and their interaction term $LSUSTAIN_t \times OC_t$. In Column (3), the coefficient of the interaction term $LSUSTAIN_t \times OC_t$ is significantly negative (-0.070 ; p -value < 0.01); this supports the fact that

CEO overconfidence leads to an independent decision-making, which is helpful for long-term sustainable management and does not increase the cost burden caused by repeating or continuing CSR activities. Column (4) presents the results of the regression analysis that include CEO characteristic variables; in this analysis, the coefficient of the interaction term $LSUSTAIN_t \times OC_t$ is still significantly negative (-0.067 ; p -value < 0.01).

In terms of our control variables, we found that the coefficient on LEV_t and MTB_t is significantly positive, which is consistent with the findings of prior CSR studies (McCarthy *et al.*, 2017; Waddock and Graves, 1997; Harper and Sun, 2019). Firms with more leverage (LEV_t) are suggested to have a higher tendency to be involved in CSR activities. The market-to-book ratio (MTB) shows a positive effect on the likelihood of CSR.

In sum, our evidence supports the notion that CEO overconfidence has a positive impact on suppressing conventional capital expenditures, SG&A expenses, and CSR investments, as overconfident CEOs are more likely to make decisions based on independent judgment and prospects, ultimately enabling sustainable corporate management.

	Dependent variable: <i>CAPEXP</i>			
	Subsample (High <i>OC</i>)	Subsample (Low <i>OC</i>)	Full sample	Full sample
Independent variables	-1	-2	-3	-4
<i>Intercept</i>	-0.8240**	-1.3037***	-1.2643***	-1.1331***
	(-2.25)	(-11.66)	(-12.20)	(-10.39)
<i>LCAPEXP</i>	0.7436***	0.698***	0.7164***	0.7166***
	-69.64	-106.09	-123.6	-122.34
<i>OC</i>			0.1736***	0.1659***
			-7.64	-7.24
<i>LCAPEXP*OC</i>			-0.0144***	-0.0133**
			(-2.62)	(-2.40)
<i>SALE</i>	0.0264	0.0182	0.0276	0.0238
	-0.71	-0.8	-1.43	-1.21
<i>SIZE</i>	0.2135***	0.2897***	0.2623***	0.2666***

	-5.6	-12.34	-13.17	-13.24
<i>LEV</i>	-0.0182***	-0.0093***	-0.0122***	-0.0125***
	(-4.05)	(-3.72)	(-5.64)	(-5.71)
<i>MTB</i>	0.0125***	0.0085***	0.0101***	0.01***
	-4.13	-3.62	-5.51	-5.39
<i>INVT</i>	0.016	-0.0041	0.0053	0.0006
	-0.67	(-0.28)	-0.42	-0.05
<i>QUICK</i>	-0.0104	-0.0237***	-0.0184***	-0.0191***
	(-1.58)	(-5.73)	(-5.26)	(-5.39)
<i>OCF</i>	0.4922***	1.1743***	0.9486***	0.954***
	-5.63	-19.2	-19.05	-18.89
<i>TENURE</i>				0.0006
				-0.85
<i>AGE</i>				-0.0023***
				(-3.53)
<i>GENDER</i>				0.0093
				-0.34
Year-fixed effect	Yes	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes	Yes
[F-value]	[453.41] ***	[1648.24] ***	[2012.19] ***	[1901.27] ***
R ²	0.92	0.934	0.931	0.93
N	3,478	10,139	13,617	13,304

CONCLUSIONS

In this study, we explored the association between CEO overconfidence and a firm's sustainable management using data from U.S. firms. Particularly, we empirically investigated

how managerial overconfidence is related to investment and administrative expenditures, including CSR activities, for sustainable management of the company. Among various attributes required for long-term sustainable management of a company, managerial overconfidence, especially its bright sides, is the main focus of this study.

Using 13,704 firm-year observations from publicly traded U.S. firms from 1992 to 2015, we found that overconfident CEOs are less influenced by the previous level of investment and can make decisions to cut capital expenditures drastically for sustainable management using their own judgment. Also, we discovered that overconfident CEOs incur fewer expenditures by making an independent and sustainable judgment, not driven by sunk costs incurred in prior periods. Moreover, we found evidence that CEO overconfidence leads to independent decision-making, which helps enable long-term sustainable management and decrease the cost burden that may arise from repeating and continuing previous CSR activities

Our study shed some light not only on CEO overconfidence literature but also on the sustainable management literature. Despite increasing attention on CEO overconfidence, to our best knowledge, there is little empirical research on how the extent of CEO overconfidence would positively affect the firm's sustainable management such as investment and expenditure.

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Author Contributions

Conceptualization, methodology, data curation, and formal analysis, K.M; writing—original draft preparation, review and editing, S.P.; writing—original draft preparation and review, Y.L.

REFERENCES

- Adam, T.R., & C.S. Fernando (2006). Hedging, speculation, and shareholder value. *Journal of Finance and Economics* 81, 283–309.
- Ahmed, A.S., & S. Duellman (2013). Managerial overconfidence and accounting conservatism. *Journal of Accounting Research* 51(1), 1–30.
- Alicke, M.D. (1985). Global self-evaluation as determined by the desirability and controllability of trait adjectives. *Journal of Personality and Social Psychology* 49(6), 1621–1630.
- Alsubaie, A.N. (2009). CEO Overconfidence and corporate derivative hedging decisions. *International Review of Business Research Papers* 5, 22–32.
- Anderson, C., S. Brion, D.A. Moore, & J.A.Kennedy (2012). A status-enhancement account of overconfidence. *Journal of Personality and Social Psychology* 103(4), 718–735.
- Anderson, M., R. Banker, & S. Janakiraman (2003). Are selling, general and administrative costs ‘sticky’? *Journal of Accounting Research* 41 (1),47–63. doi:10.1111/joar.2003.41.issue-1.
- Baker, M., X. Pan, & J. Wurgler (2012). The effect of reference point prices on mergers and acquisitions. *Journal of Financial Economics* 106, 49–71.
- Bertrand, M., & A. Schoar (2003). Managing with style: The effect of managers on firm policies. *The Quarterly Journal of Economics* 118, 1169–1208.

- Brown, R., & N. Sarma (2007). CEO overconfidence, CEO dominance and corporate acquisitions. *Journal of Economics and Business* 59(5), 358–379.
- Campbell, T.C., M. Gallmeyer, S. A. Johnson, J. Rutherford, & B. W. Stanley (2011). CEO optimism and forced turnover. *Journal of Financial Economics* 101(3), 695–712. doi:10.1016/j.jfineco.2011.03.004
- Carroll, A.B. (1999). Corporate social responsibility: Evolution of a definitional construct. *Business & Society* 38, 268–295.
- Catalina, S.C., L. Stanca, & D. Dabija (2020). Corporate social performance: An assessment model on an emerging market. *Sustainability* 12(10), 4077.
- Christofi, A., P. Christofi, & S. Sisaye (2012). Corporate sustainability: historical development and reporting practices. *Management Research Review* 35(2), 157–172
- Deshmukh, S., A.M. Goel, & K.M. Howe (2013). CEO overconfidence and dividend policy. *Journal of Financial Intermediation* 22(3), 440–463.
- Ehrlinger, J., & D. Dunning (2003). How chronic self-views influence (and potentially mislead) estimates of performance. *Journal of Personality and Social Psychology* 84(1), 5–17.
- Elkington, J. (1998). Accounting for the triple bottom line. *Measuring Business Excellence* 2(3), 18–22.
- Fazzari S. M., R. G. Hubbard, & B. C. Petersen (1988). Financing constraints and corporate investment. *Brookings Papers on Economic Activity* 37(1), 141–205.
- Greenberg, M. (2013). What on earth is sustainable? *The Journal of California* 3(4), 54–66.
- Gul, F.A., C. Krishnamurti, S. Shams, & H. Chowdhury (2020). Corporate social responsibility, overconfident CEOs and empire building: Agency and stakeholder theoretic perspectives. *Journal of Business Research* 111(4), 52–68.
- Hackbarth, D. (2008). Managerial traits and capital structure decisions. *Journal of Financial Quantitative Analysis* 43(4), 843–862
- Hambrick, D.C., & P.A. Mason (1984). Upper echelons: The organization as a reflection of its top managers. *The Academy of Management Review* 9(2), 193–206.
- Harper, J., & L. Sun (2019). CEO power and corporate social responsibility. *American Journal of Business* 34(2), 93–115.
- Hayward, M.L., & D.C. Hambrick (1997). Explaining the premiums paid for large acquisitions : Evidence of CEO Hubris. *Administrative Science Quarterly* 42(1), 103–127.
- Hilary, G., C. Hsu, B. Segal, & R. Wang (2016). The bright side of managerial over-optimism. *Journal of Accounting and Economics* 62(1), 46–64.
- Hirshleifer, D., A. Low, & S.H. Teoh (2012). Are overconfident CEOs better innovators?. *The Journal of Finance* 67, 1457–1498.
- Hribar, P., & H. Yang (2013). CEO overconfidence and management forecasting, *Working Paper*, University of Iowa.
- Jha, M.K., & K. Rangarajan (2020). Analysis of corporate sustainability performance and corporate financial performance causal linkage in the Indian context. *Asian Journal of Sustainability and Social Responsibility* 5(1), 1–30.
- Johnson, H.L. (1973). A Berkeley view of business and society: A review of *The Corporate Dilemma: Traditional Values versus Contemporary Problems* by S. Prakash Sethi and Dow Votaw (Prentice-Hall, 1973). *California Management Review* 16(2), 95–100.
- Kenny, P., T.M. Tham, & C. Wei (2018). Are overconfident CEOs better leaders? Evidence from stakeholder commitments. *Journal of Financial Economics* 127(3), 519–545.
- Kim, S., & H. Ryu (2014). Managerial overconfidence and cost stickiness. *Korean Accounting Journal* 23(6), 309–345.
- Leary, M.R. (2007). Motivational and emotional aspects of the self. *Annual Review of Psychology* 58(1), 317–344.
- Liu, X. (2017). Can overconfident executives restrain overinvestment? *Modern Economy* 8, 1056–1068.
- Malmendier, U., & G. Tate (2005). CEO overconfidence and corporate investment. *Journal of Finance* 60(6), 2661–2700.

- Malmendier, U., & G. Tate (2008). Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of Financial Economics* 89(1), 20–43.
- Malmendier, U., G. Tate, & J. Chen (2011). Overconfidence and early-life experiences: The effect of managerial traits on corporate financial policies. *Journal of Finance* 66(5), 1687–733.
- McCarthy, S., B. Oliver, & S. Song (2017). Corporate social responsibility and CEO confidence. *Journal of Banking and Finance* 75, 280–291.
- Mintzberg, H. (1973). Strategy-making in three modes. *California Management Review*, 16(2), 44–53.
- Mustapha, M., & N.H. Chyi (2010). Firm size and investment-cash flow sensitivity: The developing country evidence. *International Conference on Business and Economic Research* 3, 1317–1330.
- Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research* 66(4), 43–578.
- Park, K., J. Byun, & P.M. Choi (2019). Managerial overconfidence, corporate social responsibility activities, and financial constraints. *Sustainability* 12(1), 61.
- Phua, K., T.M. Tham, & C. Wei (2018). Are overconfident CEOs better leaders? Evidence from stakeholder commitments. *Journal of Financial Economics* 127, 519–545.
- Roll, R. (1986). The hubris hypothesis of corporate takeovers. *Journal of Business* 59(2), 197–216.
- Sanjai, B., & I. Welch (1995). Corporate research and development investment: international comparison. *Journal of Accounting and Economics* 19, 443–470.
- Schrand, C.M., & S.L.C. Zechman (2012). Executive overconfidence and the slippery slope to financial misreporting. *Journal of Accounting & Economics* 53(1–2), 311–329.
- Svenson, O. (1981). Are we all less risky and more skillful than our fellow drivers? *Acta Psychologica* 47(2), 143–148.
- Taylor, S.E., & J.D. Brown (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin* 103(2), 193–210.
- van Beurden, P., & T. Gössling (2008). The worth of values – a literature review on the relation between corporate social and financial performance. *Journal of Business Ethics* 82(2), 407–424.
- van Marcel, M. (2003). Concepts and definitions of CSR and corporate sustainability: Between agency and communion. *Journal of Business Ethics* 44 (2/3), 95–105.
- Waddock, S.A., & S.B. Graves (1997). The corporate social performance-financial performance link. *Strategic Management Journal* 18, 303–319.
- Weinstein, N.D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology* 39(5), 806–820.
- Yang, D., & H. Kim (2020). Managerial overconfidence and manipulation of operating cash flow. *Finance Research Letters* 32, 101343.
- Yuan, Y., G. Tian, L.Y. Lu, & Y. Yu, (2019). CEO ability and corporate social responsibility. *Journal of Business Ethics* 157(2), 391–411.