



An Investigation into the Impact of Managerial Overconfidence, Real Earnings Management, and Enterprise Risk Management on Corporate Social Responsibility

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ABSTRACT

Corporate social responsibility (CSR) has emerged as a new and sensitive topic in the theoretical literature of accounting research. It is considered a fundamental factor for the survival of companies and has attracted attention from various perspectives of investors, managers, and researchers. Researchers have identified numerous variables as influential factors in CSR. However, this study specifically focuses on examining factors such as Enterprise Risk Management (ERM), Real earnings management (REM), and CEO overconfidence in relation to CSR. This research used data related to 121 companies listed on the Tehran Stock Exchange (TSE) from 2010 to 2022. The results of the hypotheses in this study indicate that when a company lacks an appropriate risk management mechanism (with more unconventional risk management), the level of CSR is lower. Alternatively, managers with higher overconfidence are motivated and inclined to manipulate real earnings. They may endeavor to justify their misuse of company financial resources under the pretext of fulfilling CSR.

Keywords: Managerial Overconfidence, Real Earnings Management, Enterprise Risk Management, Corporate Social Responsibility

JEL Classifications: G1, G32, G34, M14

1. INTRODUCTION

Within the nuanced landscape of modern business, CSR has become an important topic, representing a recognition that companies have wider obligations to the broader community and environment (Carroll and Brown, 2018; Pourmansouri et al., 2023; Vuong et al., 2021). This multidimensional engagement is more than just profit period as it also involves ethics, green practices, and community networks (Abaeian et al., 2019). With businesses battling to achieve their financial goals in tandem with social welfare, a multisplit of variables is introduced. In particular, managerial overconfidence, REM, and ERM have been

of interest among them because they could influence CSR efforts in companies. Corporate Social Responsibility (CSR) is a basic dimension of a company's responsibility, going beyond mandatory efforts that a company has to apply to society and nature (Marco-Lajara et al., 2022). Social responsibility is a collection of duties and commitments that companies should take in order to protect, maintain, and support the society on which they operate (Griffin and Mahon, 1997). Researchers based on stakeholder theory argue that all stakeholders of an economic entity are not only individuals and investors. The stakeholder theory is the basic framework of the mutual relationship between companies and human societies (Freeman, 1984). Stakeholder theory has it that companies should

create a balance between stakeholder interests and stakeholder needs. This is because providing resources, and tangible and intangible benefits to these various stakeholders (investors, shareholders, employees, communities, suppliers, governmental bodies, and the environment) is essential for the survival and success of companies (Brin and Nehme, 2019; Palakshappa and Chatterji, 2014). The fulfillment of CSR by companies yields both tangible and intangible benefits for shareholders and investors, income, loyalty, and support for customers, skills, and dedication for employees, raw materials and components, as well as knowledge for suppliers, infrastructure and welfare structures for communities, and the preservation of the environment and beneficial ecological aspects for the natural ecosystem. In general, the findings are mostly that enhanced involvement of companies in fulfilling social responsibilities results in enhanced firm financial performance and all stakeholders interests (Coelho et al., 2023; Okafor et al., 2021).

Researchers in the past have also found that government and established regulations (Anthony Wong and Hong Gao, 2014), stakeholders (Bauman and Skitka, 2012), managers (Tingchi Liu et al., 2014), market competition (Porfakharian et al., 2020), and cash retention (Dhaliwal et al., 2012), and others can influence the performance of companies in fulfilling CSR. Recent studies have also shown that other factors such as ERM, REM, and managerial overconfidence might also influence how and to what extent companies take part in social responsibility (Kuo et al., 2021). In fact, companies are subject to many inherent risks in normal circumstances and this scope and complexity of these risks are increasing day by day due to the uncertainty caused by environmental changes. As a result, risk management has become a subject of academic research and is considered to be a very important business activity. When implemented properly, ERM sets the company's overall strategy at the right time and can optimally control threatening risks to the company (Friday et al., 2023). As stated by Beasley et al. (2005), many organizations use their risk management processes to improve the effectiveness of the management and control activities of their company, thereby increasing company value and shareholder equity (Beasley et al., 2005).

On the contrary, failure to use or using risk management processes in a poor manner will be responsible for the collapse of the company (Beasley et al., 2005). The ERM process over the past 10 years has been a dominant feature of mechanisms of company governance due to its immense contribution to companies' financial performance improvement (Aebi et al., 2012; Aslam and Haron, 2020). In addition to other variables that scholars suggest to impact CSR, REM is distinct. REM can be defined as the manipulation of a company's financial reporting of its economic performance to mislead specific stakeholders or impact a company's financial outcomes (Healy and Wahlen, 1999; Liu et al., 2017). There are a variety of reasons managers might engage in REM, including performance-based contract agreements, the financial market relationships of the company, access to financial facilities, corporate governance mechanisms, and many other specific factors (Li, 2021). Real assets, transactions or financial value is hidden intentionally to harm the shareholders, employees,

and communities, subsequently damaging job security and managerial reputation (Garanina, 2023; Tran and Dang, 2021). REM can be done in several ways that can be harmful to the collective interests of stakeholders. Therefore, it is also possible that managers who are involved in earnings manipulation will not take seriously matters and responsibilities that are related to the company's social obligations, and these essentially refer to the interests of shareholders, the general public, and the environment. In general, the amount of REM can reflect directly how much companies commit or not to stakeholders' interests and how much they are involved or not with issues that can benefit these collective interests, for instance, CSR. For instance, Kedia and Philippon (2009), Chih et al. (2008), and Michelon et al. (2015) reported that companies less involved in manipulation and REM are more active in playing a social responsibility role (Chih et al., 2008; Kedia and Philippon, 2009; Michelon et al., 2015).

Therefore, overconfident managers can be overly and unrealistically optimistic about the benefits of fulfilling CSR and hence the possible rise in the rewards for themselves. Such endeavors may lead them to overlook the risk involved and may choose activities that don't even advance the company's value (Kuo et al., 2021). Kuo et al. (2021) argued that overconfidence could be a moderator between companies' management of exceptional risks and manipulating earnings for the purposes of CSR. In particular, they indicated that managers with high levels of overconfidence may use company resources to take personal gain at lower risk, especially when the company's governance system is unable to prevent important risks. More simply, managers who are highly confident, and in particular in high-risk environments, could use company resources to their advantage at the expense of reduced personal risk (Kuo et al., 2021). Poor corporate governance conditions and large risks can be misused by some overly confident managers to spend resources of their companies in superficial and ineffective activities in CSR projects (Solomon, 2020). Nevertheless, short-term managerial rewards could be offered to manage exceptional risks, thereby reducing operational and especially threatening risks. It may discourage managers from wasting money on social responsibility investments in order to manipulate earnings. They may direct high-performing managers to be focused on value creation and performance improvement through sound investment in fulfilling social responsibilities (Kuo et al., 2021).

This paper investigates an investigative exploration of the intricate relationships between managerial overconfidence, REM, ERM, and the execution of CSR. The concept of CSR has been widely studied but the mechanisms and the determinants influencing the implementation and effectiveness of CSR in corporate structures are still interesting academic topics. This study aims at investigating the effect of managerial overconfidence, real profit management and ERM on CSR. This paper aims to uncover the small differences between managerial behavior by examining in detail the resources of existing literature, empirical works and cases. And the results of CSR. The purpose of this research is to develop a complete framework to explain the complicated dynamics that occur, by revealing the possibility of managerial overconfidence, the strategic moves of real profit management

and the role of risk management in shaping CSR practices. The significance of the findings of this research lies both academically and practically for corporate leaders, policymakers, and stakeholders. With this knowledge, organizations can make decisions that are in line with financial goals as well as broader social responsibilities. These basic dynamics are important in the understanding of how to develop a sustainable and socially responsible corporate environment in the dynamic global business environment. The rest of this paper is organized as follows. Research hypotheses are developed in section 2 and prior literature is discussed. In Section 3, the research design is described in terms of data collection, variables' measures, and empirical models. The empirical results and robustness tests are presented in Section 4. Section 5 is the conclusion.

2. HYPOTHESIS DEVELOPMENT

2.1. Relationship between ERM and Social Responsibility

In the last decades, ERM and social responsibility have become concepts that have gradually gained the attention of the public in the fields of management and business. Due to the complex and dynamic changes in the business environment (such as market fluctuations, technological advancements, intense competition and environmental issues), organizations have turned to solutions that, at the same time, guarantee successful risk management and accountability to social commitments. Research shows that the relationship between CSR and risk management is complex. Surprisingly, firms with a strong CSR record do not exhibit less risk but rather undertake higher risk taking (Ayadi et al., 2015) and less diversifiable risk (Boutin-Dufresne and Savaria, 2004). This suggests that CSR is not a waste of resources, but can be a source of creating shareholder value. According to Kuo et al. (2021), companies with better ERM are more likely to be involved in CSR behaviors, particularly under the leadership of confident CEOs. In addition, firms with a better CSR performance are more likely to carry out integrated risk management practice and CSR activities to primary and secondary stakeholders are equally important (Lu et al., 2022). These results indicate that CSR can alter internal business practices by decreasing business risk and enhancing long term risk adjusted performance (Boutin-Dufresne and Savaria, 2004; Lu et al., 2022). Kure et al. (2022) referred to ERM as a systematic and integrated process of identifying, assessing, controlling, and managing various risks that may affect the performance and goals of an organization (Kure et al., 2022). Risk identification, risk probability, impact assessment, decision-making upon risk control and lessening strategies, and monitoring the implementation of the adopted approaches (Rastegar, 2021). Social responsibility is considered an organization's commitment to the positive and negative effects of their activities on society and the environment (Kaveh and Salemi, 2022). Social responsibility organizations are those organizations that are very active in improving social, cultural, environmental, and economic conditions, which are not of financial profits only (Rastegar, 2021). The studies related to social responsibility with the improvement of performance and wealth of shareholders are more, but the studies related to the relationship between ERM and CSR are less. However, researchers have not been able to

accurately describe the role of ERM in reducing and eliminating risk and social responsibility disclosure in the literature so far. This existing gap is what we intend to fill. In their study Kytle and Ruggie (2005), it was demonstrated that ERM is associated with the social responsibilities of corporations. In ERM, existing risks are identified, and appropriate responses and actions towards them are suggested. Therefore, through proper management of organizational risks, the disclosure of social responsibilities is also reinforced (Kytle and Ruggie, 2005). Harjoto and Laksmana (2018) found that ERM, through the implementation of social responsibilities, leads to an increase in the company's value (Harjoto and Laksmana, 2018). Wang et al. (2018) argued in their study that weak ERM can lead to the weakening of the company's control mechanisms. In such circumstances, the level of the company's commitment to social responsibilities diminishes (Wang et al., 2018). Naseem et al. (2020) demonstrated in their study that ERM can to some extent intervene in the relationship between social responsibilities and company performance (Naseem et al., 2020). Therefore, based on the previous studies, our first hypothesis is as follows:

H₁: The company with higher unconventional risk management displays less social responsibility.

2.2. The Impact of Managerial Overconfidence, Risk Management, and REM on CSR

Contemporary business is a complex environment that has given considerable attention to the role of managerial decisions, corporate financial performance, and social responsibility over the last decades. The study considers two parallel but related phenomena, managerial overconfidence, and REM, as companies seek to strike the equilibrium between making a profit and serving society. It discusses these concepts in the psychological as well as financial dimensions of corporate behavior to explain how they may affect corporate commitment to CSR. In the past few years, CSR has been attacked by shareholders who want a free market, anti-globalization, or environmentalists. Free trade investors believe that profit-seeking motives are not the best idea and that personal interests can be a means for social progress in some ways. However, critics of globalization and environmentalists argue that companies use this approach to rebuild their tarnished image and to exploit the chance to depict a good image for themselves. Many countries, however, despite not following the basic principles, are ahead of the curve when it comes to ethical issues, workplace conditions, environmental sustainability, and other issues. In recent years, the notion of companies acquiring competitive advantage through investment in social responsibility has become increasingly possible due to changes in investors' attitudes and perceptions towards social matters (Kaveh and Salemi, 2022). As reported by Oliver et al. (2014), overly confident managers are less engaged in activities related to social responsibility, and it has implications for shareholder value (Oliver et al., 2014).

Mixed findings are found in research of CEO overconfidence and corporate social responsibility (CSR). According to some studies, overconfident CEOs are less likely to engage in CSR activities (Chen et al., 2022) or their presence undermines the positive relationship between CSR and financial performance (Bao and Li, 2016). Nevertheless, other studies suggest that firms with

overconfident CEOs that employ REM have higher CSR inputs (Kuo et al., 2021). This may be because of the overconfident CEOs' wish to make a good impression to the firm reputation through REM. For example, CEO overconfidence has been demonstrated to contribute to greater independent decision making in spending and CSR, which might make for long term sustainable management (Mo et al., 2021). CEO overconfidence is related to the CSR in a complicated manner: It can produce positive and negative effects on firm performance and sustainability depending on the industry context and the specific management practices used. Previous studies have shown that companies that report on their social responsibility face lower capital costs than the companies that do not report on their social responsibility and hence the company's performance. Managers want to achieve high profits. In Libby and Rennekamp (2016) the authors investigated the effect of managerial overconfidence on CEOs' decisions and forecasts. Their research indicates that managerial overconfidence has a strong impact on the decision to issue profit forecasts. The overconfident managers believe the positive future performance of the company and this encourages the managers to release profit forecasts (Libby and Rennekamp, 2016). The results of studies conducted by various researchers such as Kedia and Philippon (2009), Chih et al. (2008), and Michelon et al. (2015) have indicated that companies that are less engaged in activities related to manipulation and REM exhibit a more active participation in fulfilling social responsibilities (Chih et al., 2008; Kedia and Philippon, 2009; Michelon et al., 2015). According to agency theory, the most effective solution for aligning the interests of management and shareholders is through providing performance-based incentives to management or compensating them through stock grants. In such scenarios, management strives harder to achieve personal rewards by enhancing the social and financial performance of the economic entity (Hall and Liebman, 1998; Kim et al., 2012).

Otherwise, managers might cut down expenses related to social responsibility activities for short-term profit and manipulate them for personal gains (Liu et al., 2017). The study Nuryantini (2022) findings demonstrate that REM can completely mitigate the adverse effect of managerial overconfidence on company performance through excessive investments and intermediary capital spending activities. This diverges from the mechanism of effective corporate governance, assessed by independent board representation, institutional and managerial ownership, and audit committees, where REM can directly and partially impact company performance. Similarly, the mediating role of REM can also moderately and directly influence the connection between CSR and company performance (Nuryantini, 2022). Accordingly, the following hypothesis is proposed:

H₂: The company with a more CEO Overconfidence, by engaging in REM, exhibits a higher level of CSR.

Policies and activities related to social responsibilities can be accompanied by the reduction of companies' risks (Goss and Roberts, 2011). Reducing a company's risk or becoming more risk-averse can lead to a reduction in conflicts and tensions between the company and society. Consequently, social responsibility activities contribute to alleviating such disparities (Lu et al., 2023). Social responsibility activities are beneficial

for shareholder value (Nguyen et al., 2020). Managers can alter a company's performance through REM, thereby making such behavior an opportunistic avenue for managers. Consequently, this opportunistic behavior might hinder the proper implementation of ERM within the company, leading to a decline in the disclosure of social responsibilities due to the compromised quality of ERM. Therefore, it is expected that REM weakens the relationship between ERM and corporate social responsibilities (Kuo et al., 2021). Amidst this discussion, some researchers like Kuo et al. (2021), and (Buerthey et al., 2020) have raised the possibility of the impact of overconfidence as a moderating variable on the intensity of the effect of both extraordinary risk management and REM for engaging in corporate social responsibilities. They proposed that overconfident managers, especially when extraordinary risks are beyond the effective control of the corporate governance system, or in other words, in companies with higher extraordinary risk, might exploit company resources to the fullest and utilize them according to their personal preferences with less risk (Buerthey et al., 2020; Kuo et al., 2021). McWilliams et al. (2006) argue that engaging in REM reduces the effectiveness of ERM, consequently leading to a decrease in the disclosure of corporate social responsibilities as well. This decline is attributed to weakened risk management practices within the company (McWilliams et al., 2006). Kim et al. (2019) demonstrated in their study that after controlling for REM extracted from agency issues, managerial overconfidence increases the likelihood of stock price decline risk (Kim et al., 2019). The study by Kuo et al. (2021) reveals that a direct relationship exists between ERM and corporate social responsibilities. Their research also shows a meaningful positive correlation between managerial overconfidence and social responsibilities. However, REM weakens the link between ERM and social responsibilities. Moreover, in companies with more confident management, REM is prioritized over social responsibilities. Furthermore, REM diminishes the connection between managerial overconfidence and corporate social responsibilities (Kuo et al., 2021). We therefore propose the following hypothesis:

H₃: The company with a more CEO Overconfidence, when faced with higher levels of unconventional risk management, continues to exhibit a higher level of CSR through engagement in REM.

3. DATA AND METHODOLOGY

3.1. Data

Our initial sample is drawn from the TSE database for the period of 2010-2022. Our statistical method is multiple linear regression using pooled panel data. Our final sample consists of 121 Companies. Table 1 presents an analysis of the Research sample selection method.

3.2. Variables Definitions

CSR Corporate social responsibility of the dependent variable is considered in this study. To collect this variable, KLD indices have been utilized, with assistance from the board of directors' activity reports and explanatory notes in the financial statements (Carroll, 1979). This variable is composed of four dimensions. The fourfold dimensions of this variable include social involvement, employee and labor relations, environmental issues, and product

Table 1: The selected statistical sample for this research

Row	Conditions and limitations	Number
1	All companies listed on the stock exchange as of 2022	349
2	Companies under investigation excluding investment, holding, and financial intermediary companies	(69)
3	Companies listed on the stock exchange after the year 2010	(51)
4	Companies whose stock trading on the TSE has been suspended or their listing has been canceled for more than 6 months during the research period.	(26)
5	Their financial year doesn't end on the March 20	(32)
6	Financial information and statements for these companies are not fully available for the years from 2010 to 2022.	(50)
The selected statistical sample for this research.		121

characteristics. Each of these dimensions has its own unique strengths and weaknesses. In this research method, after studying the board of directors' activity reports and the supplementary notes to the financial statements specific to each year of the company, if the company engages in that responsibility and then, specifically, in that particular aspect of social responsibility, it is considered a strength and assigned a value of one. If the company doesn't play a role in that area, it is considered a weakness and assigned a value of zero. Finally, to calculate the overall social responsibility variable, the following relative cumulative formula is utilized:

$$Csr_t^i = \frac{\sum_{p=1}^{n_t^i} Strength_p^i}{n_t^i} - \frac{\sum_{q=2}^{m_t^i} Weakness_p^i}{m_t^i} \quad (1)$$

Where Csr_t^i = The score of CSR disclosure for company i at time t, $Strength_p^i$ = The total sum of positive scores for company i and the total sum of strengths for company i at time t, denoted by n_t , $Weakness_p^i$ = The total sum of all weaknesses of company i and the total sum of weaknesses for company i at time t, denoted by m_t .

In line with the study by El Ghouli et al. (2011), the weaknesses and strengths of CSR have been categorized as follows in Table 2 (El Ghouli et al., 2011):

Abnormal ERM is a systematic and integrated approach to managing all the risks that an economic entity faces. Essentially, ERM aims to manage all the company's risks collectively. It can be considered as a process of managing the company's risk where both financial and non-financial risks, such as operational and strategic risks, are managed in an integrated manner. In this study, to assess unconventional ERM, firstly the variable of ERM is calculated. Subsequently, following Wang et al. (2018), the variable of unconventional organizational risk is calculated. In this research, four factors have been utilized to calculate the ERM variable (Wang et al., 2018). These factors are drawn from the model developed by Gordon et al. (2009). They introduced an index for ERM based on four criteria: strategy, efficiency, reporting, and alignment. These criteria are all based on financial outputs of companies (Gordon et al., 2009).

Table 2: CSR weaknesses and strengths

Dimensions of CSR	Weaknesses	Strengths
Social Participation	<ul style="list-style-type: none"> Negative economic impact (negative effects on the quality of life of the community and stakeholders, company shutdown) Tax avoidance 	<ul style="list-style-type: none"> Contributions to charitable and philanthropic causes Support for innovation (assistance to non-profit organizations, collaboration in public initiatives)
Employee Relations	<ul style="list-style-type: none"> Health and safety issues (lack of ISO 18001 certification) Employee mistreatment 	<ul style="list-style-type: none"> Payment of bonuses to employees and staff Provision of retirement benefits
Environment	<ul style="list-style-type: none"> Hazardous waste generation Fines for waste management violations 	<ul style="list-style-type: none"> Use of clean fuels (utilizing cleaner fuels with lower pollution) Air pollution control and greenhouse gas reduction (having ISO 14000 certification)
Product characteristics	<ul style="list-style-type: none"> Inadequate advertising for products Fines for negative advertising 	<ul style="list-style-type: none"> Product quality (having ISO 9001 certification) Product safety

The main objective of this approach is to combine achieving the four aforementioned goals into a single metric. To measure the extent of achieving each goal, two indicators have been utilized, and the sum of the results from these two indicators represents each of the final indicators. It's worth noting that the timeframe of this research spans from 2010 to 2022. However, due to the fact that some indicators require data from the year before, for example, indicators related to the strategy criterion necessitate the calculation of the previous year's sales and beta coefficient, data from 2009 is also required, and this has been taken into account in the calculations for such variables.

$$ERM = \sum_{K=1}^2 Strategy + \sum_{K=1}^2 Operation + \sum_{K=1}^2 Reporting + \sum_{K=1}^2 Compliance \quad (2)$$

Where Strategy = Refers to the approaches adopted by companies to maintain their competitive position. Higher sales of company i compared to the industry average indicate the preservation of a competitive strategy. Two equations, (3) and (4), are used to measure competitive strategy.

$$Strategy\ 1 = \frac{Sales_{it} - M_{sales}}{\sum_{Sales}} \quad (3)$$

Where Sales = Company is sales in year t, M_{sales} = Industry's average sales in year t, \sum_{Sales} = Standard deviation of companies' sales in the industry in year t.

$$Strategy\ 2 = \frac{\Delta B - U_{\Delta B}}{\sigma_{\Delta B}} \quad (4)$$

Where ΔB = Company's beta in year t minus company's beta in year T-1, U_{AB} = Industry's average beta in year t, σ_{AB} = Standard deviation of total ΔB of companies in year t.

Operation: Defined as the relationship between a company's inputs and outputs in its operational process. The more a company's outputs are greater at a certain level of inputs, the better the company's performance will be. Increasing companies' efficiency will lead to risk reduction and increased company value. To measure efficiency, equations (5) and (6) are used.

$$\text{Operation 1} = \frac{\text{Sales}}{\text{Total Assets}} \quad (5)$$

Where Sales = Revenue generated from the sale of goods and services by the company, Total Assets = Total assets of the company.

$$\text{Operation 2} = \frac{\text{Sales}}{\text{Number of Employees}} \quad (6)$$

Where Number of Employees = The count of employees in the company. This variable is extracted from the attached file of financial statements, Compliance = To measure the compliance variable, equations (7) and (8) are utilized.

$$\text{Compliance 1} = \frac{\text{Auditor Fees}}{\text{Total Assets}} \quad (7)$$

Where Auditor Fees = The fees paid to auditors. This variable is extracted from the attached file of financial statements and the operational expenses section.

$$\text{Compliance 2} = \frac{\text{Net Gain (Loss)}}{\text{Total Assets}} \quad (8)$$

Where Net Gain (Loss) = The net profit or loss of the company, Reporting = The purpose of financial reporting is to provide reliable and trustworthy reports. Misrepresentation and financial fraud indicate weak financial reporting. To calculate weaknesses in financial reporting, equations (9) and a regression model (1) are used.

$$\text{Reporting 1} = \frac{|\text{Normal Accrual}|}{|\text{Normal Accrual} + \text{Abnormal Accrual}|} \quad (9)$$

Where Normal Accrual = Regular accrual items, Abnormal Accrual = Unusual accrual items. In this study, the measurement of abnormal accruals is carried out based on the Kothari et al. (2005) Model1 (Kothari et al., 2005). For this purpose, accrual items are first estimated using the following model 1:

Model (1)

$$\frac{\text{TACC}_{it}}{\text{Assets}_{it-1}} = \alpha_0 \left(\frac{1}{\text{Assets}_{it-1}} \right) + \alpha_1 \left(\frac{\Delta \text{REV}_{it}}{\text{Assets}_{it-1}} \right) + \alpha_2 \left(\frac{\text{PPE}_{it}}{\text{Assets}_{it-1}} \right) + \varepsilon$$

Where TACC = Total Accruals of company i in year t, Assets_{it-1} = Total assets of company i in year t, ΔREV_{it} = Difference in sales of company i in the current year compared to the previous year, PPE_{it} = Property, Plant, and Equipment of company i in year t.

In the next step, after fitting the regression model 1, and extracting the coefficients $\alpha_0, \alpha_1, \alpha_2$, non-discretionary accruals are estimated using equation (10):

$$\frac{\text{Abnormal Accrual}_{it}}{\text{Assets}_{it-1}} = \alpha_0 \left(\frac{1}{\text{Assets}_{it-1}} \right) + \alpha_1 \left(\frac{\Delta \text{REV}_{it} - \Delta \text{REC}_{it}}{\text{Assets}_{it-1}} \right) + \alpha_2 \left(\frac{\text{PPE}_{it}}{\text{Assets}_{it-1}} \right) \quad (10)$$

Where Abnormal Accrual = non-discretionary accruals of company i in year t. Finally, discretionary accruals (DA) are calculated as follows:

$$\text{DA}_{it} = \frac{\text{TACC}_{it}}{\text{Assets}_{it-1}} - \frac{\text{Abnormal Accrual}_{it}}{\text{Assets}_{it-1}} \quad (11)$$

$$\text{Reporting 2} = \text{Material Weakness} + \text{Auditor Opinion} + \text{Restatement} \quad (12)$$

Where:

- Material Weakness in Internal Control: A virtual variable in the following manner: If the independent auditor has reported a material weakness in the company's internal control in the current year, it is assigned a value of one, otherwise, it is assigned a value of zero.
- Auditor Opinion: In this study, to calculate the auditor opinion variable, ordinal variables have been used based on the severity of modified audit opinions, as introduced by Li and Wu (2004). A higher value of this variable indicates a greater extent of modification in the auditor's opinion (Li and Wu, 2004). Different types of audit opinions are defined with the following codes:
 - The number 1 indicates an unqualified opinion; the number 2 indicates a qualified opinion with an explanatory paragraph; the number 3 indicates a qualified opinion; the number 4 indicates a qualified opinion with an explanatory paragraph; the number 5 indicates a disclaimer of opinion by the auditor.

Finally, the composite index of ERM represents the total scores of the aforementioned criteria. The developed approach and criteria, as elaborated above, by Gordon et al. (2009), formulate an ERM system in the form of a composite index. This index measures the system's ability to achieve the four strategic, productivity, reporting, and compliance objectives (Gordon et al., 2009). After calculating the ERM variable (referred to as ERMI), the calculation of non-discretionary ERM variable is carried out using Model 2, Equations (13) and (14), which will be explained below. In this method, initially, by employing Model 2, and five variables that likely best control the company's risk in the optimal scenario.

Model (2)

$$\text{ERMI}_{it} = \alpha_0 + \alpha_1 \text{EUN}_{it} + \alpha_2 \text{Ind Com}_{it} + \alpha_3 \text{Size}_{it} + \alpha_4 \text{Fcom}_{it} + \alpha_5 \text{BDM}_{it} + \varepsilon$$

Where ERMI_{it} = The Comprehensive Enterprise Risk Management Index, EUN_{it} = Represents Environmental Uncertainty, calculated

using the coefficient of variation of sales changes, as higher sales volatility is associated with greater environmental uncertainty. This variable is calculated as the ratio of the standard deviation of sales over the past 3 years to the average sales over the same period. $Ind\ Com_{i,t}$ = Industry Competition Index, calculated using the Herfindahl-Hirschman Index. This index is obtained by summing the squared market shares of all companies in the industry.

$$HHI_{i,t} = \sum_{i=1}^n \left(\frac{Sales_{i,t}}{\sum_{i=1}^{nl} Sales_{i,t}} \right)^2 \quad (13)$$

Where $HHI_{i,t}$ = The Herfindahl-Hirschman Index for Company i at time t , $Sales_{i,t}$ = The sales of Company i at time t , $\sum_{i=1}^{nl} Sales_{i,t}$ = The total sales of companies in the industry at time t , $Size_{i,t}$ = The size of the company, calculated using the natural logarithm of the total assets of the company, $Fcom_{i,t}$ = It represents the complexities of the company. In this study, following El Ghouli et al. (2011), company complexity is measured using the size and leverage ratios. Accordingly, if both the size and leverage ratios for a company in year t are equal to or greater than the median value, the company is considered complex and assigned a value of one. Otherwise, it is assigned a value of zero (El Ghouli et al., 2011), $BDM_{i,t}$ = It represents the size of the company's board of directors and is calculated through the total number of board members of the company.

After estimating this regression equation, the coefficients are extracted. Following normalization of these coefficients using the non-regression equation (14), the optimal state of ERM is calculated (referred to as PERMI).

$$PERMI = EUN + Ind\ Com + Size + Fcom + BSM \quad (14)$$

The extent of deviation from optimal ERM indicates weaknesses in risk management and is referred to as abnormal ERM. In this study, it is calculated using equation (15) and the absolute value of the difference between the ERM variable and the optimal ERM variable.

$$ABERMI = |ERMI - PERMI| \quad (15)$$

REM In this study, Roychowdhury (2006) and Cohen et al. (2008) are used to calculate the level of manipulation of actual activities, employing three indicators: abnormal level of operating cash flows, abnormal level of production costs, and abnormal level of non-operating costs (Cohen et al., 2008; Roychowdhury, 2006). To measure these three indicators, regression models 3, 4, and 5 are respectively utilized, and in all of them, the residual term (ϵ) represents the level of abnormality of the estimated variable.

a. Abnormal operating cash flows

$$\frac{CFO_{i,t}}{Assets_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Assets_{i,t-1}} + \alpha_2 \frac{Sales_{i,t}}{Assets_{i,t-1}} + \alpha_3 \frac{\Delta Sales_{i,t}}{Assets_{i,t-1}} + \epsilon$$

Model (3)

b. Abnormal production costs

Model (4)

$$\frac{Prod_{i,t}}{Assets_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Assets_{i,t-1}} + \alpha_2 \frac{Sales_{i,t}}{Assets_{i,t-1}} + \alpha_3 \frac{\Delta Sales_{i,t}}{Assets_{i,t-1}} + \alpha_4 \frac{\Delta Sales_{i,t-1}}{Assets_{i,t-1}} + \epsilon$$

c. Abnormal discretionary costs

Model (5)

$$\frac{DISEX_{i,t}}{Assets_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Assets_{i,t-1}} + \alpha_2 \frac{Sales_{i,t-1}}{Assets_{i,t-1}} + \epsilon$$

Where: CFO: Cash flow from operations, Prod.: Production costs (cost of goods sold plus changes in inventory), Disex: Discretionary expenses (research and development costs, advertising and general administrative expenses), Assets: Total assets, Sales: Sales revenue, Δ Sales: Changes in sales revenue compared to the previous year.

CEO overconfidence in this study, the overconfidence of the CEO in their ability to change the capital structure is calculated using the Debt-to-Equity ratio. This is done by calculating the ratio and comparing it to the industry average. If the ratio is greater than the industry average, it indicates management overconfidence, and a value of one is assigned. Otherwise, a value of zero is assigned.

Other control variables to avoid the problem of omitted correlated factors, we include various control variables that could affect CSR firms' financial reporting and performance.

CEOShare: Percentage of shares held by members of the board of directors, CEOChair: A virtual variable that is assigned a value of 1 if the CEO of the company simultaneously holds the position of the chairman of the board of directors, and a value of 0 otherwise, CEOBONUS: The ratio of CEO bonus payments to shareholder equity, ROA: The ratio of net income to total assets, Size: The natural logarithm of the company's total assets, CAPEX: Capital Expenditures, calculated as (Tangible Assets + Intangible Assets) divided by Total Assets, Beta (β): In this study, systematic risk is used as a measure of risk. Systematic risk refers to the portion of the overall return variability of financial products that is directly related to market or economic changes. The beta coefficient of a stock is interpreted as its systematic risk. The equation (16) is used to calculate the beta coefficient.

$$\beta = \frac{cov(R_i, R_m)}{\sigma^2(R_m)} \quad (16)$$

Where $COV(R_i, R_m)$ represents the covariance (co-movement of changes) between the returns of sample company stocks (R_i) and the market portfolio returns (R_m), and $\sigma^2(R_m)$ indicates the variance of market returns (Kuo et al., 2021).

Lev: Calculated through the ratio of total debt to total assets of the company, CFO: Ratio of cash flows from operations to current assets divided by total assets, Blockholders (Institutional

Ownership): Total percentage of shares held by institutional owners that possess more than 5% of the company's shares, Outside Director: Ratio of non-executive members of the board of directors to the total board members, Big Audit Firm (BIG): A virtual variable where if the company's independent auditor is a major audit firm, it is assigned a value of 1; otherwise, if the independent auditor is from other private institutions, it is assigned a value of 0, Age: The age of the company from its establishment to the current year.

3.3. Empirical Model

To test H₁ and H₂, according to the research conducted by Kuo et al. (2021) we use the following OLS fixed effects model 6.

Model (6)

$$CSRS_{it} = \alpha_0 + \alpha_1 ABERMI_{it} + \alpha_2 REM_{it} + \alpha_3 CEO\ Overconfidence_{it} + \alpha_4 CEOShare_{it} + \alpha_5 CEOBONUS_{it} + \alpha_6 CEO\ Overconfidence_{it} * REM_{it} + \alpha_7 CEOShare_{it} * REM_{it} + \alpha_8 CEOBONUS_{it} * REM_{it} + \alpha_9 ROA_{it} + \alpha_{10} LEV_{it} + \alpha_{11} CAPEX_{it} + \alpha_{12} BETA_{it} + \alpha_{13} SIZE_{it} + \alpha_{14} CFO_{it} + \alpha_{15} Blockholders_{it} + \alpha_{16} Outside\ Director_{it} + \alpha_{17} BIG_{it} + \alpha_{18} CEOChair_{it} + \alpha_{19} Age_{it} + \varepsilon$$

Where: CSRS: Corporate social responsibility score of the company, ABERMI: Abnormal enterprise risk management index, REM: Real earnings management, CEO Overconfidence: CEO's Overconfidence, CEO Share: CEO's Ownership, CEOBONUS: CEO's bonus, Size: Company size, ROA: Return on assets, CAPEX: Capital expenditures, LEV: Financial leverage, Beta: Beta coefficient, CFO: Cash flow from operations, Block holders: Institutional block holders ownership, Outside director: Proportion of outside directors, BIG: Auditor size, CEO chair: CEO-chairperson duality, Age: Company age.

To accept H₁, after estimating regression model 6, if the coefficient α_1 is negative and statistically significant, H₁ is confirmed. This

indicates that companies with higher abnormal risk management tend to exhibit lower levels of CSR. Additionally, after estimating regression model 6, if the coefficient is positive and statistically significant, H₂ is confirmed. This suggests that companies with CEOs exhibiting higher overconfidence, when engaged in REM, tend to display higher levels of CSR.

In the continuation of this study, to test H₃, the following regression model 7 is utilized:

Model (7)

$$CSRS_{it} = \alpha_0 + \alpha_1 ABERMI_{it} + \alpha_2 REM_{it} + \alpha_3 CEO\ Overconfidence_{it} + \alpha_4 CEOShare_{it} + \alpha_5 CEOBONUS_{it} + \alpha_6 CEO\ Overconfidence_{it} * ABERMI * REM_{it} + \alpha_7 CEOBONUS_{it} * ABERMI * REM_{it} + \alpha_8 ROA_{it} + \alpha_9 LEV_{it} + \alpha_{10} CAPEX_{it} + \alpha_{11} BETA_{it} + \alpha_{12} SIZE_{it} + \alpha_{13} CFO_{it} + \alpha_{14} Blockholders_{it} + \alpha_{15} Outside\ Director_{it} + \alpha_{16} BIG_{it} + \alpha_{17} CEOChair_{it} + \alpha_{18} Age_{it} + \varepsilon$$

For the acceptance of H₃, after estimating regression model 7, if the coefficients are positive and significant, H₃ is confirmed. This implies that a company with a more overconfident CEO, when having higher levels of non-normal risk management, continues to exhibit higher levels of CSR by engaging in REM.

4. EMPIRICAL RESULTS

4.1. Descriptive Statistics

Table 3 presents a statistical summary of our main empirical analysis. According to Table 3, the average of the CSR variable is 42.00, with the highest and lowest values being 15.90 and 61.30 respectively. Examining the skewness of this variable, which should range from 0 to 3 for the variable to have a normal distribution, indicates a value of 1.562. This implies that this variable follows a normal distribution. Furthermore, the average

Table 3: Descriptive statistics

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	skewness	Kurtosis
CSRS	0.420	0.434	0.613	0.159	0.132	0.392	2.156
ABERMI	0.008	0.002	0.056	0.000	0.014	2.450	3.066
REM	-0.013	-0.052	1.081	-0.896	0.470	0.397	2.997
CEO share	0.022	0.000	0.258	0.000	2.266	1.927	3.041
CEO Bonusit	0.002	0.000	0.016	0.000	0.004	2.111	2.590
ROA	0.117	0.091	0.611	-0.404	0.138	0.429	2.95
CEO_OVERCONFIDENCE_REM	-0.017	0.000	0.155	-0.361	0.098	-2.353	3.486
CEOSHARE_REM	-0.016	0.000	0.076	-0.239	0.066	-2.420	2.488
CEOBONUS_REM	0.000	0.000	0.003	-0.004	0.001	2.992	3.526
CEO Overconfidence _{it} * ABERMI * REM _{it}	-0.006	0.000	0.013	-0.103	-0.025	-3.373	3.961
CEOBONUS _{it} * ABERMI * REM _{it}	0.0001	0.000	0.008	-0.001	0.000	-1.209	3.390
LEV	0.560	0.555	0.958	0.177	0.212	0.012	2.236
CAPX	0.302	0.256	0.775	0.026	0.209	0.681	2.542
Size	1.954	13.752	17.268	11.240	1.606	0.362	2.528
Beta	0.442	0.395	2.195	-0.010	0.482	2.586	4.090
CFO	0.139	0.111	0.525	0.084	0.153	0.890	3.351
Outside director	0.469	0.400	0.800	0.200	0.139	0.639	0.192
Block holders	0.710	0.761	0.953	0.260	0.190	-0.922	0.019
Age	0.383	0.390	0.580	0.170	0.132	-0.061	1.597

Variable definitions Where CSRS: Corporate social responsibility score of the company, ABERMI: Abnormal enterprise risk management index, REM: Real earnings management, CEO Overconfidence: CEO's overconfidence, CEO Share: CEO's Ownership, CEOBONUS: CEO's bonus, Size: Company size, ROA: Return on assets, CAPEX: Capital expenditures, LEV: Financial leverage, Beta: Beta coefficient, CFO: Cash flow from operations, Block holders: Institutional block holders ownership, Outside director: Proportion of outside directors, BIG: Auditor size, CEO Chair: CEO-chairperson duality, Age: Company age

of ERM is 0.080, with the lowest and highest values being 0.000 and 0.560 respectively. The kurtosis and skewness of this variable are 2.450 and 3.066 respectively, indicating that these numbers represent the normal distribution of this variable.

In addition to the continuous variables reported in Table 3, Table 4 presents the descriptive statistics of the key categorical variables used in the study. As shown in Table 4, 15.7% of the sample firms are classified as having overconfident managers, while the remaining 84.3% are considered to have normal managerial behavior. Regarding CEO duality, only 5.3% of the firms have a CEO who simultaneously serves as the chairman of the board, whereas the majority (94.7%) maintain a separation of these

Table 4: Descriptive indices of virtual research variables

Variable	Number	Measurement	Percentage
Managerial overconfidence	1210	Overconfidence	15.7
		Normal	84.3
CEO duality	1210	Simultaneous CEO and Board Chairman	0.053
		CEO Only	99.4
		Auditing Organization	28.3
Auditor type	1210	Private Audit Firms	71.7

Table 5: The results obtained from testing the first and second hypotheses of the study

Variable	Coefficient	t-Statistic	Prob.
ABERMI	-0.004319	-8.566236	0.0000***
REM	-0.002803	-3.523733	0.0007**
CEO_OVERCONFIDENCE	-0.020607	-3.052752	0.0023**
CEOSHARE	0.001407	0.269408	0.7877
CEOBONUS	0.664678	4.554732	0.0000***
CEO_OVERCONFIDENCE_REM	0.008532	3.257904	0.0012**
CEOSHARE_REM	-0.042539	-3.576653	0.0004***
CEOBONUS_REM	-0.243887	-0.441302	0.6591
ROA	0.004721	1.555801	0.1201
LEV	-0.024383	-2.764457	0.0058*
CAPEX	0.003910	0.646687	0.5180
BETA	-0.002525	-1.154972	0.2484
SIZE	0.010482	5.001692	0.0000***
CFO	-0.018927	-4.047554	0.0001***
BLOCKHOLDERS	0.011263	1.778392	0.0757
OUTSIDE_DIRECTOR	-0.009393	-1.426820	0.1540
BIG	-0.005346	-2.095700	0.0364*
CEOGHAIR	-0.018751	-4.098226	0.0000***
AGE	-0.000772	-1.503164	0.1331
RESID01 (-1)	0.454825	9.080516	0.0000***
C	0.313365	9.229738	0.0000***
Year fixed effects		Yes	
Industry fixed effects		Yes	
R-squared	0.679141		
Adjusted R-squared	0.676060		
Durbin-Watson stat	1.891197		
F-statistic	317.8525		
Prob (F-statistic)	0.000000		

1. ***, ** and * denote significance at the 1, 5 and 10% levels respectively. 2. Variable definitions: CSRS: Corporate social responsibility score of the company; ABERMI: Abnormal enterprise risk management index, REM: Real earnings management, CEO Overconfidence: CEO's Overconfidence, CEO Share: CEO's Ownership, CEOBONUS: CEO's bonus, Size: Company size, ROA: Return on assets, CAPEX: Capital expenditures, LEV: Financial leverage, Beta: Beta coefficient, CFO: Cash flow from operations, Block holders: Institutional block holders ownership, Outside director: Proportion of outside directors, BIG: Auditor size, CEO chair: CEO-chairperson duality, Age: Company age

roles. In terms of auditor type, 28.3% of the firms are audited by the Auditing Organization, while 71.7% employ private audit firms. These proportions indicate the distribution of qualitative governance-related characteristics across the sample, which may influence firms' financial behavior and reporting quality.

4.2. The Effects of ERM on Social Responsibility

Table 5 shows the effects of ERM on Social Responsibility. The H_1 of this study suggests that a company with higher unconventional corporate risk management exhibits less social responsibility. Consequently, to not reject the H_1 , it is expected that at the desired level of significance, the estimated coefficient and significance level of the unconventional corporate risk management explanatory variable are negative and significant. Since the significance level for the coefficient of the unconventional corporate risk management variable is <0.05 , the H_1 of the study is not rejected at a 95% confidence level. This indicates that a company with higher unconventional corporate risk management demonstrates less social responsibility. Therefore, the H_1 is confirmed at a significance level of 0.05%.

4.3. The Impact of CEO Overconfidence and REM on CSR

Table 5 shows The Impact of CEO Overconfidence and REM on CSR. H_2 of this study is formulated as follows: A company with a more overconfident CEO, when engaged in REM, demonstrates a greater level of CSR. Considering the results presented in Table 5 and the significance level for the interaction coefficient of CEO overconfidence and REM, which is <0.05 , H_2 of the study is not rejected at a 95% confidence level. This indicates that a company with a more overconfident CEO, when engaged in REM, displays a higher level of CSR. Therefore, H_2 is not rejected at a significance level of 0.05%. The F-statistic value for the overall model is 317.8525 and the corresponding P-value is 0.000, indicating the significance of the model in the general context (since the P-value for this statistic is <0.05). The most well-known goodness-of-fit statistic is the coefficient of determination, which has a value between zero and one. If the coefficient of determination is large and close to one, the model fits the data well. Conversely, if the adjusted coefficient of determination is low, meaning it's close to zero, the model doesn't provide a good fit for the data. In Table 5, the value of the adjusted coefficient of determination is 0.67, indicating that this model explains more than 67% of the variations in the dependent variable, which is CSR. The Durbin-Watson statistic, which also demonstrates autocorrelation among the model's residuals, is 1.891 and falls within the acceptable range of 1.5-2.5.

4.4. The Impact of Overconfidence of the CEO, Unconventional Corporate Risk Management, and REM on CSR

Table 6 shows The Impact of Overconfidence of the CEO, Unconventional Corporate Risk Management, and REM on CSR. The H_3 is formulated as follows: A company with a CEO exhibiting higher overconfidence, when engaged in unconventional corporate risk management and simultaneously involved in REM, demonstrates a higher level of CSR. Therefore, to not reject the H_3 , it is anticipated that at the desired level of significance, the

Table 6: The Impact of Overconfidence of the CEO, Unconventional Corporate Risk Management, and REM on CSR

Variable	Coefficient	t-Statistic	Prob.
ABERMI	-0.004657	-7.913848	0.0000
REM	-0.005119	-2.675848	0.0076
CEO_OVERCONFIDENCE	-0.001927	-4.047554	0.0001
CEOSHARE	0.004548	1.314949	0.1888
CEOBONUS	0.594445	5.635423	0.0000
CEO_OVERCONFIDENCE_ ABERMI_REM	0.004061	3.310957	0.0010
CEOBONUS_ABERMI_REM	0.694368	0.225543	0.8216
ROA	0.002818	0.892504	0.3723
LEV	-0.020607	-3.052752	0.0023
CAPEX	0.005513	1.040534	0.2984
BETA	-0.002192	-1.086068	0.2777
Size	0.009774	5.795591	0.0000
CFO	-0.021229	-4.188691	0.0000
BLOCKHOLDERS	0.005228	0.824369	0.4099
OUTSIDE_DIRECTOR	-0.008346	-1.746943	0.0810
Big	-0.004323	-2.743302	0.0062
CEOGHAIR	-0.015492	-4.352611	0.0001
Age	-0.000578	-1.404087	0.1606
Resid02 (-1)	0.450980	8.798332	0.0000
C	0.316664	13.59900	0.0000
ABERMI	-0.004657	-7.913848	0.0000
Year fixed effects		Yes	
Industry fixed effects		Yes	
R-squared	0.685122		
Adjusted R-squared	0.682960		
Durbin-Watson stat	1.870655		
F-statistic	455.8089		
Prob. (F-statistic)	0.000000		

1. ***, ** and * denote significance at the 1, 5 and 10% levels respectively. 2. Variable definitions: CSRS: Corporate social responsibility score of the company, ABERMI: Abnormal enterprise risk management index, REM: Real earnings management, CEO Overconfidence: CEO's overconfidence, CEO Share: CEO's ownership, CEOBONUS: CEO's bonus, Size: Company size, ROA: Return on assets, CAPEX: Capital expenditures, LEV: Financial leverage, Beta: Beta coefficient, CFO: Cash flow from operations, Block holders: Institutional block holders ownership, Outside Director: Proportion of outside directors, BIG: Auditor size, CEO Chair: CEO-chairperson duality, Age: Company age

estimated coefficient and the significance level of the interactive effect of CEO overconfidence, unconventional corporate risk management, and REM (α_6) should be positive and statistically significant. Given that the significance level for the coefficients of the interactive variables of CEO overconfidence, unconventional corporate risk management, and REM is <0.05 (0.001), and they are positive, the H_3 of the research is not rejected at a 95% confidence level. This indicates that a company with a CEO exhibiting higher overconfidence, engaged in more unconventional corporate risk management, and also involved in REM, demonstrates a higher level of CSR.

Considering the F-statistic value of 455.808 and the associated probability value of 0.000, which indicates the overall significance of the model (since the probability value is <0.05), the model is generally deemed significant. In the second model, the adjusted coefficient of determination is 0.68, indicating that this model explains over 68% of the variations in the dependent variable, which is CSR. The Durbin-Watson statistic, which illustrates the autocorrelation among the model residuals, is 0.870, falling within the acceptable range of 1.5-2.1.

5. CONCLUSION

Changes in risk management approaches aimed at improving efficiency lead to the formation of an ideal environment and a synergistic relationship between ERM and more effective fulfillment of CSR. However, considering the average of the unconventional corporate risk management variable (as presented in Table 3), it can be inferred that the concept of risk management has not been adequately established in Iranian organizations. Few organizations can be found that utilize this method, and it might even be considered a unified strategy for risk management under this label. On the other hand, Iranian economic units and businesses have been placed under unique economic and social policies, leading to a complex operating environment for these entities. This has exposed them to various unconventional risks that they had encountered less frequently in the past.

The results of H_1 indicate that companies and managers have a significant gap to bridge before reaching the desired point of risk management. They face significant challenges when confronted with threatening unconventional risks that impede company operations. Such circumstances lead to a reduction in the efforts of economic units to align stakeholder interests, which is achievable through the fulfillment of CSR. Additionally, Kuo et al. (2021) found in their research that companies with effective ERM are more inclined to engage in CSR behaviors. From this perspective, it can be concluded that the findings of the present study align with the results of their research. H_2 addressed the question of whether a company with a CEO displaying higher overconfidence, when engaged in REM, exhibits a greater level of CSR. The significance of the coefficients was examined based on the results presented in Table 5. Given that the probability of the t-statistic for the interactive effect of CEO overconfidence and REM is 0.006 (<0.05), and the positive coefficient for this variable is -0.002 , it can be concluded that a company with a CEO exhibiting higher overconfidence, involved in REM, tends to demonstrate a higher level of CSR. Therefore, H_2 is confirmed. In analyzing the findings of this hypothesis, it can be stated that when there is a stronger mutual relationship between CEO's self-confidence and REM, or in other words, when confident managers tend to engage more in REM, they strive to communicate the message to external stakeholders that they are effectively implementing the CSR strategy and duty of the economic unit, aiming to gain reputation. However, in reality, this might not be the case, and economic unit resources might be utilized under the pretext of "investment in CSR" Kuo et al. (2021) similarly found that a company with a CEO displaying higher overconfidence, involved in REM, tends to exhibit a higher level of CSR. The results of this hypothesis align with the findings of Kuo et al. (2021).

H_3 delved into investigating whether a company with a CEO exhibiting higher overconfidence, when faced with greater unconventional risk management, and also involved in REM, tends to demonstrate a higher level of CSR. When examining the significance of the coefficients of the model related to this hypothesis (as presented in Table 6), and given that the t-statistical probability for the interactive effect of CEO overconfidence, unconventional corporate risk management, and REM is 0.002

(<0.05), along with a positive coefficient of 0.032, it can be concluded that a company with a CEO displaying higher overconfidence, dealing with greater unconventional risk management, and also involved in REM, tends to demonstrate a higher level of CSR. Therefore, H₃ is confirmed in this study. When a company lacks an appropriate risk management mechanism (with more unconventional risk management), managers with high overconfidence tend to exhibit greater motivation and audacity for manipulating real earnings items. They may attempt to justify their misuse of company financial resources under the guise of CSR. The results of this hypothesis imply that unconventional risk management by the management is not effectively controllable, and managers with high confidence (overconfidence) in an environment of heightened unconventional risk management are prone to exploiting such threatening unconventional corporate risks to the maximum extent. They exploit these risks to better suit their personal interests, directing company resources towards inefficient investment projects labeled as increased fulfillment of CSR, all while minimizing their personal risk exposure.

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